Project Manual

Livonia Public Schools
Stevenson High School – 2024 Synthetic Turf Auxiliary Field
Livonia, Michigan

Date: May 10, 2024

Issued for: Construction Documents

Owner:
Livonia Public Schools
15125 Farmington Road
Livonia, MI 48154

Landscape Architect:
Foresite Design, Inc.
3269 Coolidge Highway
Berkley, MI 48072
Ph: 248-547-7757
Email: mike@foresitedesign.com

Civil Engineer:
Spalding DeDecker Associates
905 South Blvd. East
Rochester Hills, MI 48307

Owner's Representative:
Plante Moran Realpointe
3000 Towne Center, Suite 100
Southfield, MI 48075

FORESITE design

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LIVONIA PUBLIC SCHOOLS
15125 FARMINGTON ROAD
LIVONIA, MI 48154-5474
(734) 744-2500

The Livonia Public Schools Board of Education, Livonia, Michigan, hereby invites the submission of **sealed bids** for the purchase of: **Synthetic Turf Auxiliary Field at Stevenson High School Bid**
(See Attached Specifications)

Request for Proposal (RFP) documents can be obtained at the Livonia Public School Website, www.livoniapublicschools.org under the section titled DISTRICT, Purchasing Bids, 2023-24 school year, Open Bids OR the SIGMA Website, www.michigan.gov/SIGMAVSS**.** Please feel free to include additional pages of information if necessary. For bids to be considered they must meet or exceed all specifications herein.

Sealed bids marked *Synthetic Turf Auxiliary Field at Stevenson High School* will be received until 2:00 p.m on the 29th day of May, 2024, in the Operations Office at the Board of Education complex, 15125 Farmington Road, Livonia, Michigan. Mailed bids should be sent to the attention of: Phillip Francis, Assistant Superintendent of District Services, Livonia Public Schools, 15125 Farmington Road, Livonia, Michigan, 48154. **Livonia Public Schools is not liable for any delivery or postal delays.**

A walk through will be held on Friday, May 17, 2024, starting at 11:00 a.m., at the auxiliary field site - Stevenson High School, 33500 W. Six Mile Road, Livonia, Michigan.

The Bid Opening will take place at **2:00 p.m.** on the **29th** day of **May, 2024**, at the Livonia Public Schools Board of Education Complex, at which time all bids will be publicly opened and read. No bids will be accepted after the date and time specified and will not be opened. Oral, telephone, fax or electronic mail bids are invalid and will not receive consideration.

All bids must be accompanied by a sworn and notarized statement of disclosing any familial relationship that exists between the owner and any employee of the bidder and any member of the Livonia Board of Education, the Livonia Public Schools Superintendent or Director of Finance, any member of the Wayne RESA Board of Education or the Superintendent of Wayne RESA. **No bid shall be accepted that does not include this sworn and notarized disclosure statement**.

All bids must be accompanied by a sworn and notarized Affidavit of Compliance – Iran Economic Sanctions Act. **No bid shall be accepted that does not include this sworn and notarized statement.**

All bids must be accompanied by the Equal Opportunity Statement. **No bid shall be accepted that does not include this statement.**

All bids must include a Treasury listed bid bond or certified check made payable to Livonia Public Schools for not less than five percent (5%) of the contract for each bid over $29,500.00 and must be submitted with the bid forms furnished with specification.

All bids must be submitted on the forms provided in the bid packet and all sheets must be returned for the bid. All proposals shall remain firm for a period of ninety (90) days.

The Board of Education reserves the right to accept or reject any or all bids, either in whole or in part: to award to other than the low bidder: to waive any irregularities and/or informalities: and in general to make awards in any manner deemed to be in the best interests of the district, including awarding by line item, with rationale to support such a decision. Livonia Public Schools local preference resolution will be followed for all proposals.

Prices bid are to be **F.O.B. Destination**.

Any bid submitted will be binding for ninety (90) days subsequent to the date of the bid submission. All bids must be submitted on the attached bid form and signed by the bidder. Two (2) signed copies of the bid package are to be addressed to the attention of:

Phillip Francis, Assistant Superintendent
District Services
Livonia Public Schools
15125 Farmington Road
Livonia, MI 48154-5474
"Synthetic Turf Auxiliary Field at Stevenson High School Bid"

One (1) copy of the bid package should be retained for your files. Any questions **regarding bid specifications** should be referred to Harry Lau, Administrator of Facilities and Operations, hlau@livoniapublicschools.org, 734.744.2511, and Mike Sims, Foresite Design, mike@foresitedesign.com 248.547.7757 between 8 a.m. and 3:30 p.m. EST. ***All samples should be sent to Harry Lau, 15125 Farmington Road, Livonia, MI 48154.***

LATE BIDS WILL NOT BE ACCEPTED

OFFICIAL BID REQUIREMENTS

Synthetic Turf Auxiliary Field at Stevenson High School Bid

NAME OF COMPANY_____

REPRESENTATIVE_____

BUSINESS ADDRESS _____

CITY, STATE, ZIP_____ **DATE**_____

The bidder above-mentioned declares and certifies:

A. That said bidder is of lawful age and the only one interested in this bid; that no one other than said bidder has any interest herein.

B. That this bid is made without any previous understanding, agreement or connection with any other person, firm or corporation making a bid for the same purpose, and is in all respects fair and without collusion or fraud.

C. Bid prices MUST include ALL delivery charges.

D. Specifications: Any deviation from the specifications set forth must be clearly identified and detailed on the bid proposal form; otherwise, it will be considered that items offered are in strict compliance with these specifications, and successful bidder will be held responsible. In the event that a supplier wishes to bid a voluntary alternate in addition to the base bid (and as a cost savings consideration for the District), such alternate shall be submitted with the bid, on separate sheets and labeled as such with a brief description of the difference and rationale. However, if any substitution or departure is not clearly noted and described, it will be understood that the bid intends to exactly meet the specifications.

E. That the prices quoted herein are net and exclusive of all federal, state and municipal sales and excise taxes. TAXES- The successful company within this context is considered to be providing a service in which the company is the consumer of all equipment, supplies and materials used in providing this service. The company must pay tax on all equipment, supplies and materials used. When it comes to the affixation of materials to real property or the purchasing of services from a company, the school district's exemption does not flow through to the company who is the consumer of material for tax purposes. Any questions regarding this issue of tax, please contact the Michigan Department of the Treasury at 517.339.1123.

F. All price proposals and delivery terms shall remain firm for ninety days after the date of bid opening and pricing should be based on current market value with agreement to invoice according to any price **reduction** that may occur prior to final delivery.

G. District reserves the right to award this bid separately or in total, or for reasons of establishing uniformity, to other than the low bidder.

H. No member of Livonia Public Schools Board of Education, or any officer, employee or person whose salary is payable in whole or in part from the treasury of said Board of Education is directly or indirectly interested in this bid or in the supplies, materials, equipment, work, services or any portion of the profits thereof to which it relates.

I. The bid **MUST** be signed by an authorized company agent and submitted on the attached forms (**School District designed form**).

J. Under penalty of perjury, the vendor bidding certifies that this bid has not been arrived at collusively or otherwise in violation of Federal or State anti-trust laws. The bidder also certifies that their bid is made without any previous understanding, agreement or connection with any other person, firm or corporation making a bid for the same purpose, and is in all respects fair and without collusion or fraud.

OFFICIAL BID REQUIREMENTS (continued):

K. All bids must be accompanied by the following three statements:
   1) Familial Disclosure Statement – **sworn and notarized**.
   2) Affidavit of Compliance – Iran Economic Sanctions Act – **sworn and notarized**.
   3) Equal Opportunity Statement.

   No bid shall be accepted that does not include all of these statements.

L. A bid bond executed by a U.S. Treasury listed surety company acceptable to the owner, or a cashier's check in the amount of 5% of the sum of the proposal payable to Livonia Public Schools shall be submitted with each proposal in excess of $28,000.

M. Any error or omission found within this specification packet shall be communicated to all bidders as soon as possible. Bidders will not be allowed to take advantage of any errors or omissions in the specifications of this bid. Full instructions shall be given regarding any errors and omissions if called to the attention of Livonia Public Schools within two working days of the bid date.

N. Bidder must be a firm established not less than three (3) years in the field for which this bid is solicited.

O. Additional references may be requested after the bids are submitted. When requested, references are to be furnished as called for. Failure to honor this request will cause the bidder to be subject to rejection.

P. The undersigned certifies that the bid contained herein meets or exceeds specifications.

Signature_____ **Print Name**_____

Title_____ **Date**_____

LIVONIA PUBLIC SCHOOLS
SWORN AND NOTARIZED FAMILIAL DISCLOSURE STATEMENT
Synthetic Turf Auxiliary Field at Stevenson High School Bid

All bidders must complete the following disclosure in compliance with MCL 380.1267 and attach this information to the bid. The bid proposal will be accompanied by a sworn statement disclosing any familial relationship that exists between the owner or any employee of the bidder and any member of the Livonia Public Schools Board of Education, the Livonia Public Schools Superintendent or the Director of Finance, any member of the Wayne RESA Board of Education or the Superintendent of Wayne RESA. The District will not accept a bid proposal that does not include this sworn and notarized disclosure statement.

The members of the Livonia Public Schools Board are: Karen Bradford, Tammy Bonifield, Colleen Burton, Madeline Acosta, Crystal Frank, Liz Jarvis, Mark Johnson. The Livonia Public Schools Superintendent is Andrea Oquist and the Director of Finance and Board Treasurer is Alison Smith.

The following are the familial relationship(s):

	Owner/Employee Name	**Related to:**	**Relationship:**
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____

Attach additional pages if necessary to disclose familial relationships

BIDDER'S FIRM NAME _____

BY (SIGNATURE _____

PRINTED NAME AND TITLE _____

STATE OF MICHIGAN)
)SS
COUNTY OF)

Subscribe and sworn before me on this _____

Day of_____, 20__ , a Notary Public

In and for_____county,

_____
Notary Public

My Commission expires_____ _____

AFFIDAVIT OF COMPLIANCE – IRAN ECONOMIC SANCTIONS ACT
Michigan Public Act No. 517 of 2012

The undersigned, the owner or authorized officer of the below named contractor (the "Contractor"), pursuant to the compliance certification requirement provided in the Livonia Public Schools' (the "School District") Request For Proposals For **Synthetic Turf Auxiliary Field at Stevenson High School Bid** (the "RFP"), hereby certifies, represents and warrants that the Contractor (including its officers, directors and employees) is not an "Iran linked business" within the meaning of the Iran Economic Sanctions Act, Michigan Public Act No. 517 of 2012 (the "Act"), and that in the event Contractor is awarded a contract as a result of the aforementioned RFP, the Contractor will not become an "Iran linked business" at any time during the course of performing the work or any services under the contract.

The Contractor further acknowledges that any person who is found to have submitted a false certification is responsible for a civil penalty of not more than $250,000.00 or 2 times the amount of the contract or proposed contract for which the false certification was made, whichever is greater, the cost of the School District's investigation, and reasonable attorney fees, in addition to the fine. Moreover, any person who submitted a false certification shall be ineligible to bid on a request for proposal for three (3) years from the date it is determined that the person has submitted the false certification.

CONTRACTOR:

_____
Name of Contractor

By: _____

Its: _____

Date: _____

STATE OF_____)
)ss.

COUNTY OF_____)

This instrument was acknowledged before me on the_____day of_____, 20 , by_____.

_____
, Notary Public

_____County, _____

My Commission Expires:_____

Acting in the County of :_____

EQUAL OPPORTUNITY STATEMENT

Synthetic Turf Auxiliary Field at Stevenson High School Bid

Livonia Public Schools:

It is the publicly stated policy of_____not to discriminate against any employee, applicant for employment, contractor, or material supplier, because of race, religion, national origin, ancestry or sex. With regard to employment, such non-discrimination includes, but not limited to, our (my) policies of recruitment, recruitment advertising, selection for apprenticeships or other training, rates of pay, promotion, transfer, lay-off or termination.

In all advertising for employment, subcontractors, or suppliers we (1) shall state all applicants or respondents will receive consideration without regard to race, religion, color, national origin, ancestry or sex.

We (I) understand that any contract for the Livonia Public Schools shall be in consideration of our maintaining the above mentioned non-discrimination policy.

We (I) understand that we (I) may be required to submit further information covering the race, color and work classification for our employees and those of subcontractors to be employed on this project.

NAME OF BIDDER (COMPANY): _____

SIGNATURE: _____

NAME: _____

TITLE: _____

VENDOR PROFILE:

Livonia Public Schools requests that vendors participating in the Synthetic Turf Auxiliary Field at Stevenson High School Bid, provide specific information about their company. This information will be taken into consideration when the bids are evaluated.

CONTACT INFORMATION:

NAME OF COMPANY: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

PHONE:_____FAX: _____

SALES MANAGER:_____

Email address: _____

NO. YEARS IN BUSINESS:_____TOTAL NUMBER OF EMPLOYEES: _____

CLIENT CONTACTS:

Please provide a list of the five (5) or more references of school districts and/or companies using the products or services recommended in this bid proposal:

NAME OF SCHOOL DISTRICT/COMPANY:_____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE: _____

Estimated volume of business per year: $_____

NAME OF SCHOOL DISTRICT/COMPANY:_____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE: _____

Estimated volume of business per year: $_____

NAME OF SCHOOL DISTRICT/COMPANY: _____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE: _____

Estimated volume of business per year: $_____

CLIENT CONTACTS (continued):

NAME OF SCHOOL DISTRICT/COMPANY: _____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE:_____

Estimated volume of business per year: $_____

NAME OF SCHOOL DISTRICT/COMPANY:_____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE: _____

Estimated volume of business per year: $_____

NAME OF SCHOOL DISTRICT/COMPANY:_____

Contact/position: _____

Email Address: _____

Address: _____

City:_____PHONE:_____

Estimated volume of business per year: $_____

SECTION 00 1115
SCOPE OF WORK

GENERAL NOTES (Applicable to All Bid Categories)

1. Contractor shall visit the site and familiarize themselves with the project layout, existing conditions, site access, etc. and all other obstacles with the work areas. Contractor is responsible for all means of setting up and relocating their equipment and materials to perform this work as well as in conjunction with other trade contractors. There will be no additional compensation made for reason of omission or interpretation as it relates to the aforementioned required site visit.

2. Bidder/Contractor shall be aware of and include the cost for, all State and Local laws, codes, ordinances, building rules and regulations, as are or may become applicable to the Work.

3. Bidders shall exclude costs of quality control construction testing from bid unless required on the proposal form. Independent testing will be hired directly by the Owner/Owner's Representative and contractor shall cooperate with the testing agency.

4. Each contractor/subcontractors shall coordinate and cooperate with other contractors for expedient completion of the work of this project.

5. Each contractor shall be solely responsible and make every effort to locate existing underground utilities. This shall include consulting with all local utility companies, using a signal locator prior to excavation for private utility lines, or consulting with a private utility locating company.

6. The Scope of Work for each Bid Category includes cleaning and maintaining streets free of dirt, debris, mud, gravel caused by the construction operations as it pertains to their scope of work. Contractors shall be aware that local authorities intend to enforce local ordinances in this regard. Penalties resulting from contractor negligence in adhering to the State and Local ordinances, laws, codes shall be the responsibility of the Contractor.

7. The Scope of Work for each Bid Category includes strict adherence to the safety requirements as defined in the General Conditions and Supplementary General Conditions and current MiOSHA Guidelines.

8. Each Contractor shall review existing building and site conditions prior to commencement of work and advise the Owner's Representative of any claim of changes in the work within seventy-two (72) hours therefore, or waive its right for claim of changes in the existing site conditions. Each Contractor shall be responsible for restoring site to its original conditions upon completion of their respective work.

9. All excess materials shall be legally disposed of off-site unless indicated otherwise.

10. Milestone Schedule. All trades will be required to confirm a detailed schedule prior to award of this contract.

SECTION 00 1115
SCOPE OF WORK

PROPOSAL A: SITE WORK

CM Supplementary Conditions
General Conditions
Division 1 General Requirements
Division 2 Existing Conditions

	Specification Section	02 3208	Soil Borings
	Specification Section	02 4113	Demolition
	Specification Section	03 3000	Cast In Place Concrete
	Specification Section	03 3053	Concrete Turf Anchor
	Specification Section	06 1050	Turf Wood Nailer
	Specification Section	11 6834	Football Goalposts
	Specification Section	11 6836	Soccer & Lacrosse Goals
	Specification Section	27 5119	Field Utility Boxes
	Specification Section	31 1000	Site Clearing
	Specification Section	31 1012	Fine Grading
	Specification Section	31 1018	Soil Erosion Control
	Specification Section	31 2000	Earth Moving
	Specification Section	31 2010	Earthwork - Turf
	Specification Section	31 3219	Geotextile Fabric
	Specification Section	32 1123	Aggregate Drainage Layer
	Specification Section	32 1216	Hot Mix Asphalt Concrete Paving
	Specification Section	32 1313	Cement Concrete Pavements, Curbs and Gutters
	Specification Section	32 1415	Pavement Markings
	Specification Section	32 9119	Topsoil
	Specification Section	32 9227	General Lawn Restoration
	Specification Section	33 4100	Storm Sewers, Underdrains and Drainage Structures
	Specification Section	33 4416	Utility Trench Drain
	Specification Section	33 4615	Turf Subdrainage Systems

General Scope of Work:

1. Requirements of items included under General Work to be completed by all contractors.
2. Provide engineering and layout as required to complete this work.
3. Coordinate work with other trades on site.
4. Strict enforcement of this contractor's requirement to provide timely clean-up, removal and disposal of all rubbish and debris generated by this trade during the work. Maintain a clean condition at all areas on site and free from dirt, mud, and gravel.
5. **Provide all Soil Erosion and Stormwater Management permits required as part of this work. Contractor shall provide an allowance in the amount of $10,000.00 for permits and inspections. Provide supporting documentation related to fees incurred. Unused monies will revert back to Owner.**
6. Provide and install complete soil erosion control measures, including permits, bonds and maintenance. Maintain system including system log and remove system at the completion of the project or until approved to remove by governing authorities.
7. Provide temporary pavement measures for vehicle or walkway traffic.
8. Protect existing asphalt/concrete from damage by equipment.

9. Furnish, install, maintain and remove all necessary shoring, bracing, fall protection, barricades, flashers, and other safety equipment in accordance with MIOSHA/OSHA rules and regulations as required for the performance of the work and safety of the workers.
10. Remove and legally dispose of all excess materials and debris generated by scope of work. Work shall include removal of lawn, excavating existing topsoil on proposed turf field and re-locating to natural grass practice field (based on ~4.5" average topsoil depth).
11. **Contractor shall provide an allowance in the amount of $50,000.00 to be used toward undercut, if found to be necessary during proof-roll. Provide supporting documentation related to fees incurred. Unused monies will revert back to Owner.**
12. Provide necessary dewatering associated with this work division.
13. Saw cut and remove existing asphalt and/or concrete paving (walks, parking areas and driveways) as necessary for new utility work.
14. Provide all labor and equipment necessary for the complete site demolition as shown within the Construction Limits unless specifically noted to be completed by others. Work includes but not limited to: concrete, asphalt, netting, chainlink fence, topsoil and unsuitable soil. Work includes necessary backfill from footing removal.
15. Provide removal of all trees and shrubs, including root systems.
16. Remove and dispose of footings from existing net system. Removal of net system and reinstallation of new by Proposal C Contractor.
17. Field locate existing irrigation mainline on outside of field and terminate at source.
18. Demolition of all underground utility items shown on Civil drawings.
19. Adjust and repair all structures as shown and/or noted. Set structures for final paving/lawn elevations.
20. Prepare and proof roll sub-grades, including sub-grade for paving and site concrete contractors.
21. Perform earthwork as necessary to establish grades, and site grading to within 0.1 feet of the sub-grades indicated.
22. Contractor is responsible for scheduling all construction testing with Owner's Independent Testing Agency as noted in Bid Documents and shall comply with all recommendations.
23. Provide all earthwork as shown unless specifically noted to be completed by others. Work includes but not limited to rough grading, compacting and re-compacting, subgrade fine grading and positive drainage swales to existing and proposed catch basins as shown on drawings.
24. Furnish and install new site utilities as shown. Work includes, but not limited to, perforated and solid wall draintile PVC pipe, HDPE pipe, concrete pipe, HDPE detention pipe and new storm sewer structures as indicated. Work includes all backfill and tie-ins as noted on Drawings.
25. Provide labor, materials and equipment necessary for complete installation of new concrete turf anchor, wood nailer and sawcutting of concrete turf anchor. Scope shall include providing foam or temporary protection, including removal, around fence posts during pouring operations.
26. Furnish and install synthetic turf field drainage system, geotextile fabric, flat draintile, and free draining aggregate stone as indicated.
27. Furnish and install new football, soccer, and lacrosse goalposts.
28. Provide labor, materials and equipment necessary for new asphalt paving, base material, and markings as indicated.
29. Conduct string check of completed aggregate base with Landscape Architect and Turf Installer. String check must be completed before base can be accepted for synthetic turf installation. Contact Foresite Design Project Manager 72 hours prior to anticipated completion date to coordinate the string check.
30. Provide new topsoil and seed as indicated on drawings and provide all required lawn maintenance as specified. Seed all general areas disturbed during construction.
31. At new natural grass practice field, screen existing topsoil, place and grade. Provide new topsoil as required to transition lawn areas within grading limits. Seed and straw-mat new natural grass practice field.
32. Provide all cleanup as it relates to Scope of Work.
33. Provide all required closeout documents upon completion of project.

SECTION 00 1115
SCOPE OF WORK

Proposal A Excluded Work:
1. Removal and re-installation of existing net system.
2. Installation of new chainlink fence.
3. Installation of synthetic turf

PROPOSAL B: SYNTHETIC TURF

CM Supplementary Conditions
General Conditions
Division 1 General Requirements
Division 2 Existing Conditions
Specification Section 32 1817 Synthetic Turf

General Scope of Work:

1. Requirements of items included under General Work to be completed by all contractors.
2. Provide engineering and layout as required to complete this work. Layout points of reference will be provided prior to commencement of work.
3. Coordinate work with other trades on site.
4. Contractor shall provide (1) representative to "string-line check" the aggregate base planarity with Proposal A Contractor and Architect. Once installation of this category's work takes place, this Contractor acknowledges acceptance of the provided grades.
5. Provide electronic copies of submittals as noted in specifications.
6. Provide all labor, materials and equipment necessary for a complete installation of the synthetic turf system as shown on the plans and specified.
7. Provide inlaid game lines and markings as shown. Line packages include football, soccer and unified lacrosse.
8. Furnish and install centerfield logo as noted.
9. Alternate No.1: Furnish and install endzone lettering as indicated.
10. Furnish and install infill system as specified.
11. Include all required testing and warranties.
12. Furnish attic stock of materials in the amounts indicated in the specifications.
13. Provide all cleanup as it relates to Scope of Work.
14. Provide all required closeout documents upon completion of project.

PROPOSAL C: FENCING

CM Supplementary Conditions
General Conditions
Division 1 General Requirements
Division 2 Existing Conditions

Specification Section	03 3000	Cast In Place Concrete
Specification Section	32 3130	Chainlink Fence – Vinyl

General Scope of Work:

1. Requirements of items included under General Work to be completed by all contractors.
2. Provide engineering and layout as required to complete this work.
3. Include all required permits and bonds.
4. Coordinate work with other trades on site.

SECTION 00 1115
SCOPE OF WORK

5. Contractor shall be aware that this scope of work may require multiple mobilizations and installation times.
6. Furnish and install new 4’ vinyl chainlink fence and gates around field. Contractors shall be aware that chainlink fence posts shall be set prior to installation of concrete curb border. Coordinate all work with Proposal A Trade, particularly regarding the installation of chainlink fence posts and concrete curb.
7. Caulk around all driven fence posts as required.
8. Furnish and install new concrete footings and sleeves for existing net system. Re-install salvaged netting systems at both ends of the field.
9. Provide all cleanup as it relates to Scope of Work.
10. Provide all required closeout documents upon completion of project.

Excluded Work:

1. Demolition of existing fence.

END OF SECTION 00 1115

SECTION 00 2113
INSTRUCTIONS TO BIDDERS

STANDARD FORM

The Standard Form of Instructions to Bidders, AIA Document A701, 1997 edition, issued by the American Institute of Architects, is part of this specification. Copies are on file and may be obtained at the office of the Architect.

TABLE OF ARTICLES

The following includes modifications or additions to the above standard form which are applicable to this project.

ARTICLE 1

DEFINITIONS

1.2 All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, are applicable to these Instructions to Bidders.

1.3 Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed. All changes in cost resulting from addenda shall be included in proposals.

ARTICLE 2

BIDDER'S REPRESENTATION

2.1.3 Each bidder, by making his bid, represents that he has visited the site and familiarized himself with the local conditions under which the work is to be performed. No claims for extra compensation shall be allowed due to failure of any Bidder to examine the conditions that exist at the building site nor for conditions or difficulties encountered in the execution of the work which may have been avoided by such examination.

In submitting his proposal, the Bidder also:

- represents that he has reviewed the work outlined in the Description of Work and fully understands the scope of the work required by interfacing Bid Categories as well as that required by Bid Categories covered in his proposal;

- acknowledges that the scope of the work is not necessarily restricted to a single trade, specification division, or section and that his proposal includes the work of all trades within the Bid Category or Categories covered in his proposal;

- agrees that his proposal, if accepted by the Owner, will be the basis for a contract directly with the Owner and to enter into such contract in accordance with the intent of the Contract Documents.

2.1.5 The Bidder shall familiarize himself, prior to bidding, with the work requirements of all other contractors which precede, interface, follow, or are concurrent with the work of this Category.

ARTICLE 3

BIDDING DOCUMENTS

3.3 SUBSTITUTIONS

3.3.1 Each Bidder represents that his bid is based upon the materials and equipment described in the Bidding Documents.

3.3.2 The successful Contractor must include without approved substitution, all materials and equipment which are specifically identified by manufacturer's name, model or catalog number in the respective Specification Section. Where more than one (1) product or material manufacturer is specified, the Bidder may use the one of his choice in his base bid. It is required that Bidder indicated his choice of material by identifying same in check list attached to his proposal together with the cost attributed to such material. This cost shall be a part of Base Bid, not in addition thereto.

Other substitutions will be considered only when:

A. Request of substitution by the Bidder is made seven (7) days prior to the bid opening and approval for such request is given in the form of an Addendum.

B. Offered as a voluntary alternate presented on the Bidder's letterhead together with the amount to be deducted from his base proposal. The Owner may accept or reject such voluntary alternate based upon his best judgment.

3.3.2.1 Each such request shall include a complete description of their proposed substitute, the name of the material or equipment for which it is to be substituted, drawings, cuts, performance and test data and any other data or information necessary for a complete evaluation.

3.3.2.2 The Owner shall receive the benefit of all cost differences resulting from any substitution.

3.3.2.3 Any revisions necessary after substitutions of equipment or materials have been approved shall be the full responsibility of the Contractor without extra cost to the Owner.

3.3.4 Refer to Article 3.19 of Supplementary Conditions regarding substitutions after Award of Contract.

SECTION 00 2113
INSTRUCTIONS TO BIDDERS

ARTICLE 4

BIDDING PROCEDURES

4.1 PREPARATION OF BIDS

4.1.1 All bids must be prepared on the forms provided by the Architect and submitted in accordance with the Instructions to Bidders.

4.2 BID SECURITY

4.2.2 ANY BID NOT ACCOMPANIED BY A BID BOND, CERTIFIED OR CASHIER'S CHECK MAY BE REJECTED.

4.2.2.1 Either a CERTIFIED OR CASHIER'S CHECK on an open, solvent bank or a BID BOND issued by an approved bonding company payable to Livonia Public Schools in an amount equal to five percent (5%) of the bid shall be submitted with each proposal as liquidated damages if successful Bidder fails to sign contract and file necessary general insurance within fifteen (15) days after Notice of Award from Architect or Owner.

4.2.2.2 The bonding company on issuing a bid bond thereby obligates themselves to furnish a Performance, Labor and Material Bond within (10) ten days, in the full amount of the contract should subject Bidder be Low Bidder.

4.2.2.3 The bid deposit of all except the three (3) lowest responsible bidders will be returned within three (3) days after the opening of bids. The bid deposit of the three (3) lowest responsible bidder will be returned within 48 hours after the contract and their required bonds have been finally approved by the Owner.

4.2.3 (d) Contractor fails to provide required bonding and submit post-bid information required to determine contract award.

4.3 SUBMISSION OF BIDS

4.3.2.1 Proposals shall be addressed as follows:

Livonia Public Schools
15125 Farmington Road
Livonia, Mi 48154

Attn: Phillip Francis, Asst. Superintendent of District Services
STEVENSON TURF AUX. FIELD PROPOSAL

4.3.3 A bid is invalid if it has not been deposited at the designated location prior to the time and date for receipt of any bids indicated in the Advertisement for Bids, or prior to any extension thereof issued to the bidders.

4.3.5 The contractor shall include in the bid and contract price all Sales Taxes and Use Taxes currently imposed by Legislative enactment and as administered by the Department of Revenue on the Bid Date. If the Contractor is not required to pay or bear the burden, or

obtains a refund or drawback in whole or in part of any Sales or Use Tax, Interest or Penalty thereon, which was required to be and was deemed to have been included in the bid and contract price, the contract price shall be reduced by the amount thereof and the amount of such a reduction whether as a refund or otherwise, shall insure solely to the benefit of the Owner.

4.3.6 If required, a Bidder shall submit to the Architect a properly executed Contractor's qualification statement prior to receipt of proposals. Requested material may include the following:

Bidder's performance record, list of construction equipment, financial statement covering a period of two (2) years and any additional information required to satisfy the Owner that the Contractor is qualified to fulfill the Contract.

4.3.7 Within one (1) hour after the completion of the opening of the bids, the General Contractors who submitted the three lowest bids must submit a list of the names of each subcontractor who will provide labor or a portion of the work or improvement to the Contractor for which he will be paid an amount exceeding 5 percent of the prime Contractor's total bid or $40,000 whichever is greater. If the General Contractor fails to submit such a list within the required time, his bid shall be deemed not responsive.

4.4 MODIFICATION OR WITHDRAWAL OF BID

4.4.1 Unless otherwise provided in any supplement to these Instructions to Bidders, no Bidder shall modify, withdraw or cancel his bid or any part thereof for sixty (60) days after the time designated for the receipt of bids in the Advertisement for Bids.

4.4.2.1 Prior to receipt of the bids, Addenda will be mailed or delivered to each person or firm recorded by the Architect as having received the bidding documents and will be available for inspection wherever the bidding documents are kept available for that purpose. Addenda issued after receipt of bids will be mailed or delivered only to the selected bidder.

ARTICLE 5

CONSIDERATION OF BIDS

5.2 REJECTION OF BIDS

5.2.1 The Bidder acknowledges the right of the Owner to reject any or all bids and to waive any informality or irregularity in any bid received. In addition, the Bidder recognizes the right of the Owner to reject a bid if the Bidder failed to furnish any required BID SECURITY, or to submit the data required by the Bidding Documents, or if the bid is in any way incomplete or irregular.

5.3 ACCEPTANCE OF BID (AWARD)

5.3.1 Emphasis is placed upon the fact that the Owner's decision regarding award of contracts will be influenced by such factors as quality, completion time, construction features, his best judgment of value, etc., and not entirely upon cost, and further, shall reserve the right to

accept or reject any or all bids and to waive irregularities in proposals.

5.3.3 Contracts will be awarded based upon proposals received for one Bid Category only or for all work combined under a single proposal.

5.3.4 Time is the essence of the Contract. It is understood that the work is to be carried through to completion with the utmost speed, consistent with good workmanship. The work of all trades shall be complete on days indicated except for minor replacement, correction or adjustment items which will not interfere with the complete operation and utilization of all parts of the contract work. The time of completion will be an important factor in determining award of the contract. Failure to comply with the construction document will result in rejection of the bid and/or cancellation of award.

5.3.5 Amounts entered in Proposal for Breakdowns or Unit Costs are subject to award, unless specifically noted otherwise.

ARTICLE 6

POST-BID INFORMATION

6.3 SUBMITTALS

6.3.1 Upon request by the Architect, the selected Bidder, within seven (7) days thereafter, shall submit the following:

6.3.1.1 A designation of the work to be performed by the Bidder with his own forces. Not to exceed a 10% markup for self performed/subcontracted work, material, and labor

6.3.1.2 A list of names of the Sub-Contractors or other persons or organizations (including those who are to furnish the materials or equipment fabricated to a special design) proposed for such portions of the work as may be designated, the names of the Sub-Contractors proposed for the principal portion of the work.

6.3.1.3 A statement of costs for each major item or work included in the bid or in detail as requested by the Architect.

6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the proposed Sub-Contractors to furnish and perform the work described in the divisions of the Specifications pertaining to such proposed Sub-Contractor's respective trades.

6.3.3 Prior to the Award of Contract, the Architect will notify the Bidder in writing if either the Owner or the Architect, after due investigation, has reasonable and substantial objection to any person or organizations on such list and refuses in writing to accept such person or organization. The Bidder may, at this option, withdraw his bid without forfeiture of bid security, notwithstanding anything to the contrary contained in Paragraph 4.3.3. If the Bidder submits an acceptable substitute with an increase in his bid price to cover the difference in cost occasioned by such substitution the Owner may, at his discretion, accept the increased bid price or he may disqualify the Bidder.

6.3.4 Sub-Contractors, manufacturers, material suppliers and other persons and organizations proposed by the Bidder and accepted by the Owner and Architect must be used on the

work for which they were proposed and accepted and shall not be changed except with written approval of the Owner or Architect. Failure to provide the information, as stated, will result in rejection of bid and/or cancellation of award (post-award).

ARTICLE 7

PERFORMANCE BOND AND PAYMENT BOND

7.1 BOND REQUIREMENTS

7.1 The Owner shall require the Bidder to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising there under in such form and amount as the Owner may prescribe and with such sureties secured through the Bidder's usual sources as may be agreeable to the parties. Premiums shall be paid by the Bidder. The bonding companies are to be limited to those listed on U.S. Department of Treasury Circular 570. All surety bonds will be checked for validity before an Award will be made. If for any reason the bonds are not valid, the selected Contractor's Proposal will be null and void.

7.2 TIME OF DELIVERY AND FORM OF BONDS

7.2.1 The Bidder shall deliver the required bonds to the Owner not later than (10) ten days from the date of intent to enter the contract, or if the work is commenced prior thereto in response to a letter of intent or Notice of Award, the Bidder shall, prior to commencement of the work, submit evidence satisfactory to the Owner that such bonds will be issued.

7.2.2.1 All successful Bidders, except those noted above, shall be required to furnish Performance and Labor and Material Bonds in the following amounts:

1. Performance Bond in the full amount of the contract insuring the faithful performance of all provisions of the contract and the satisfactory completion of the work embraced there under within the time agreed upon, and the covering of guarantees herein provided for. This bond shall also insure the Owner against defective material or workmanship in any work under the contract for a period of one (1) year after completion and acceptance of the project.

2. Payment Bond in the full amount of the contract for the protection of sub-contractors, labor and material men

7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his Power of Attorney indication the monetary limit of such power.

ARTICLE 10

WARRANTY AND INDEMNITY

10.1 WARRANTY

10.1 All work shall be guaranteed in writing against defects in workmanship and materials for two (2)

years from issuance by the Board of Education's architect of the Certificate of Substantial Completion, or approval, acceptance and final payment by the Board of Education, whichever occurs first.

10.2 INDEMNITY

10.2 Contractor shall indemnify, defend and hold the Livonia Public Schools harmless from any damages to property or personal injuries resulting from or reasonable attributable to any defects in supplies or services provided by contractor hereunder.

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SECTION 00 2300
SCHEDULE AND PHASING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to Division 00 Procurement and Contracting Requirements, and to Division 01 General Requirements which are hereby made a part of this section.

1.2 MILESTONE SCHEDULE

A. The following are the milestone schedule dates for the listed work and will become part of the Contract Documents. A Master Construction Schedule will be developed after award of contract(s) with Contractor input.

MILESTONE ACTIVITY	SCHEDULED START	SCHEDULED COMPLETION
Proposal A: Site Work	August 26, 2024	October 25, 2024
Proposal B: Synthetic Turf	October 7, 2024	October 25, 2024
Proposal C: Fencing	September 6, 2024	October 4, 2024

B. Close coordination will be required between all construction trades to ensure construction operations can be completed within the scheduled time.

C. It is expressly agreed that time is of the essence for the completion of Work and Contractor agrees to perform the Work within the designated time specified. Contractor is responsible for any damage and expenses arising or resulting from the failure of Contractor to perform the Work in accordance with the specifications and milestone schedule.

1.3 CONSTRUCTION SCHEDULE PROCESS

A. Contractor shall commence work in the field within five (5) days upon receiving a “Notice to Proceed” from Foresite Design, Inc. Contractor shall be responsible for performing and completing the Work to the approval of the Owner and Foresite Design, inc.

B. Contractor shall submit to Foresite Design, Inc. within fifteen (15) days upon Award of Contract, information including but not limited to scheduling, anticipated work activities and working days, shop drawings and shall also note issues relating to availability of materials.

C. If Contractor delays progress for any reason other than delays specifically excused under the Contract Documents, Contractor shall take any and all necessary actions to expedite its Work and maintain the project schedule at no additional expense to the Owner or Foresite Design, Inc.

D. Contractor agrees that it shall have no claim against the Owner or Foresite Design, Inc. for an increase in awarded contract price nor for a payment or allowance of any kind for damage, loss, or expense arising from delays, regardless of whether the delay is the basis for an extension of time. This provision includes claims from damages, loss, or expense arising from interruptions to necessary suspension of Contractor’s Work to enable others to perform their work.

SECTION 00 2300
SCHEDULE AND PHASING

E. The Contractor shall be back-charged an observation fee of $1,000.00 per day for each day that the Contractor fails to meet the projected deadlines, weather permitting, and through no fault of the Owner, or Foresite Design, Inc.

    1. Observation Fees, as agreed upon by Owner, Contractor and Architect, will be deducted from Contractor's direct Contract with the Owner and fees paid by the Owner to Foresite Design, Inc.

END OF SECTION 00 2300

SECTION 00 4200
PROPOSAL FORM

PROPOSAL FOR: **Stevenson High School**
2024 Synthetic Turf Auxiliary Field
31000 Joy Road
Livonia, MI 48150

PROPOSAL TO: **Livonia Public Schools**
15125 Farmington Road
Livonia, Mi 48154
Attn: Phillip Francis, Asst. Superintendent of District Services

ARCHITECT: FORESITE DESIGN, INC
3269 Coolidge Highway
Berkley, MI 48072
248-547-7757
Email: mike@foresitedesign.com

SUBMITTING CONTRACTOR: _____

ADDRESS: _____

PHONE:_____EMAIL: _____

1. BASE PROPOSAL

I have carefully examined the bidding documents which include the Instructions to Bidders, all General Conditions and Supplemental Conditions, all drawings title " Livonia Public Schools" and all various addenda as prepared by FORESITE DESIGN, INC. which cover the general and architectural trades, as well as the premises and conditions affecting this work.

The undersigned proposes to furnish all labor, materials and equipment, all utilities, transportation services and taxes for the general construction as indicated under each proposal in accordance with said documents.

Within one (1) hour after the completion of the opening of the bids, the Contractors who submitted the apparent low bid must submit a list of the names of each subcontractor who will provide labor or a portion of the work or improvement to the Contractor for which he will be paid an amount exceeding 5 percent of the prime Contractor's total bid or $40,000 whichever is greater. If the Contractor fails to submit such a list within the required time, bid may be deemed not responsive.

A. PROPOSAL _____ COMPLETE

PROPOSAL _____: BASE BID $_____

_____ Dollars
(written sum)

B. COMBINATION BID FOR CATEGORIES _____ & _____ COMPLETE

$_____

_____ Dollars
(written sum)

SECTION 00 4200
PROPOSAL FORM

2. ALTERNATES
The Undersigned further proposes to execute the work specified in the respective technical division or indicated on the drawings for the sum added to (unless otherwise noted) the Base Proposal Amount as stated below:

A. ALTERNATE No. 1: State the cost to be ADDED TO OR DEDUCTED FROM the Base Bid to install new turf endzone lettering as detailed.

ADD or DEDUCT $ _____

3. VOLUNTARY ALTERNATES
The following alternates are offered at this time for the consideration of the Owner. If accepted, the Base Proposal will be changed by the amount listed. (provide additional sheets as needed).

A.

_____

_____

Add to or Delete from Base Proposal Amount: $ _____

B.

_____

_____

Add to or Delete from Base Proposal Amount: $ _____

4. TIME OF COMPLETION
The undersigned understands and agrees that time is of the essence and that all services, the installation of all work and materials, provided for in the contract must be fully completed on or before the following dates:

Proposal A: Site Work

Start-	August 26, 2024
Complete-	October 25, 2024

Proposal B: Synthetic Turf

Start-	October 7, 2024
Complete-	October 25, 2024

Proposal C: Fencing

Start-	September 16, 2024
Complete-	October 4, 2024

5. PRICE GUARANTEE
The Undersigned agrees that its proposal shall not be withdrawn and the price stated in the Proposal is guaranteed for sixty (60) consecutive days from the bid date.

SECTION 00 4200
PROPOSAL FORM

6. TAXES
The undersigned acknowledges that the prices stated above include all applicable taxes of whatever character or description.

7. ADDENDA
If any Addenda covering changes to the Bidding Documents have been received during the bidding period, the bidder shall fill in their numbers and dates which acknowledge having received the same, and having included in this proposal the work involved.

No. __ Dated _____

No. __ Dated _____

8. NEGOTIATION
The Undersigned agrees that, should the overall cost exceed the funds available, it will be willing to negotiate with the Owner for the purpose of making further reductions in the Contract Work, and shall agree to give full credit for all such reductions in the work requested by the Owner, including full value of labor, materials, and subcontract work and reasonable proportionate reductions in overhead and profit, thereby arriving at an agreed upon Contract price.

9. UNIT PRICES
All unit prices quoted shall include the sum total of all additional costs of labor, material, overhead, profit, fees, general conditions, and such other costs incidental to the work described. Any increase in cost must be approved by the Owner in writing prior to work being performed.

For all revisions involving the deletion of Contract work, it is agreed that full credit shall be given the Owner for such work deleted on a unit basis as quoted hereinafter.

UNIT PRICING BID PROPOSAL A (SITE WORK)

A.	Turf Wood Nailer	$ _____	Per lineal foot (lf)
B.	6” Reinforced Concrete	$ _____	Per square foot (sf)
C.	12” Concrete Turf Anchor	$_____	Per lineal foot (lf)
D.	Aggregate Drainage Layer Finishing Stone	$ _____	Per ton
E.	Aggregate Drainage Layer Base Stone	$ _____	Per ton
F.	Undercutting (w/o backfill, trucked offsite)	$ _____	Per cubic yard (cy)
G.	Undercutting (w/o backfill, placed at onsite location)	$ _____	Per cubic yard (cy)
H.	MDOT Structural Fill	$ _____	Per ton
I.	Screened Topsoil (new)	$ _____	Per cubic yard (cy)
J.	Lawn Restoration	$ _____	Per square foot (sf)
K.	Undercutting (w/o backfill, placed at onsite location)	$ _____	Per cubic yard (cy)

UNIT PRICE BID PROPOSAL B (SYNTHETIC TURF)

A.	Silica Sand	$ _____	Per pound
B.	Infill Rubber	$ _____	Per pound
C.	Synthetic Turf System with Infill	$ _____	Per square foot (sf)

SECTION 00 4200
PROPOSAL FORM

UNIT PRICING BID PROPOSAL C (FENCING)

A. 4' vinyl clad chainlink fence $ _____ Per lineal foot (lf)

Any increased cost based on the unit prices must be approved by Owner's written change order prior to starting work. Quantities must be confirmed by a Testing Agency or Architect and the Owner.

10. LIQUIDATED DAMAGES PROVISION
Contractor shall complete the entire work and obtain a Certificate of Substantial Completion by the substantial completion date indicated on the Proposal Form. Contractor and Owner agree that if the Certificate of Substantial Completion is obtained later than the date, the following liquidated provisions apply. The project completion date shall be adjusted by an amount of time properly documented in Change Orders. If the Owner and Contractor do not agree with the adjustment in Contract time due to Change directives, such adjustment shall be determined by the Architect.

A. SITE OBSERVATION FEE
If the Contractor fails to obtain the Certification of Substantial Completion for the Project by the Project Completion Date (as adjusted pursuant to this paragraph), the Contract Sum payable to the Contractor will be reduced in the amount of $1000.00 for each day that the issuance of the Certificate of Occupancy exceeds the Project Completion Date, weather permitting and through no fault of the Owner or Foresite Design, Inc.

11. RIGHTS RESERVED BY OWNER
The Owner reserves the unconditional right to waive any irregularities, reject any or all proposals or to accept proposals which in the judgment of the Owner will serve the best interests of the Owner. The Owner reserves the right to award to a Contractor based on factors other than low bid.

12. PROPOSAL GUARANTEE (BID BOND)
Is required: Refer to AIA Document A701-1997 "Instruction to Bidders"
Amount: 5% of contract sum

13. CONTRACT SECURITY (Performance and Labor & Material Payment Bond)
Is required: Refer to AIA Document A701-1997 "Instruction to Bidders"
Amount: 100% of contract sum

14. CONTRACT EXECUTION
The Undersigned agrees to execute a Contract for work covered by this Proposal as provided for in the Bidding Documents. The Undersigned declares the legal status indicated below:
( ) Individual
( ) Partnership, having the following partners:
1. _____
2. _____
3. _____
( ) Corporation, Incorporated under the laws of the State of _____

The Undersigned affirms that:
A. This proposal is based upon the materials and construction, equipment, etc., named or described in the specifications.
B. The address, given below, is the legal address to which all notices, directions, or other

communications may be served or mailed.

C. Its proposal is made in good faith, without collusion or connection with any other person or persons bidding for the same work, and that the process quoted herein include all terms, insurance, royalties, transportation charges, allowances, taxes, use of all tools and equipment, overhead, profit, etc., necessary to fully complete the work in accordance with the Contract Documents.

15. The Contractor shall hold harmless from and indemnify the Owner and Architect against all claims, suits, actions, costs, counsel fees, expenses, damages, judgments or decrees, by reason of any person or persons or property being damaged or by the Contractor, or any other employed under said Contractor, in any capacity during the progress of the work whether by negligence or otherwise.

The Undersigned agrees to live up to the above specifications and gives the Owner the right to deduct the cost of any damage caused by faulty work and any item conflicting with good workmanship from the final payment.

If notified of acceptance of this proposal, the undersigned agrees to execute a contract for the above work, for the above stated compensation, in form of the standard form of the AIA.

*****INCLUDE ALL FORMS FROM THE ADVERTISEMENT FOR BID WITH YOUR PROPOSAL FORM. *****

SECTION 00 4200
PROPOSAL FORM

FIRM NAME : _____

ADDRESS: _____

_____

SIGNED: _____

NAME: _____

TITLE: _____

TELEPHONE: _____

FAX: _____

EMAIL: _____

DATE: _____

Return TWO (2) signed copies.

The Owner reserves the unconditional right to waive any informality or irregularity, reject any or all proposals, or to accept proposals which in the judgment of the Owner will serve its best interests, and to make in its judgment a determination as to the adequacy of the Contractor's qualifications, experience, and capability.

END OF SECTION 00 4200

SECTION 00 4336
LIST OF SUBCONTRACTORS

TO BE COMPLETED BY BIDDER:

Project:

	Proposal A – Site Work
	Proposal B – Synthetic Turf
	Proposal C – Fencing

COMPLETE LIST OF SUBCONTRACTORS BIDDER WILL BE USING:

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

Company Name
Contact Name
Address
City, State Zip
Phone # Fax #

(USE ADDITIONAL SHEETS AS REQUIRED)

SECTION 00 6513
MATERIAL COMPLIANCE CERTIFICATE

PROPOSAL ____ -- _____

This document serves as guarantee by the contractor that all products, devices, materials, etc. used or intended for use in the project are as approved for use in the Specifications issued by Foresite Design, Inc. for Novi Community Schools – Novi Middle School 2021 Tennis Reconstruction. Furthermore, no additional formal shop drawings will be necessary unless specifically requested by Novi Community Schools or Foresite Design, Inc. Items listed below are approved products and no substitutions have been made without written permission by Foresite Design, Inc. (please attach). By signing this document, the contractor is committed to use products required by the contract documents.

LIST SPECIFICATION #, ITEM, MANUFACTURER AND MODEL #

Spec Section	Item	Manufacturer	Model #

Contractor: _____ Signature: _____

Date: _____ Print Name: _____

Title: _____

Reviewed by: _____ _____

Date: _____ _____

SECTION 00 6513
MATERIAL COMPLIANCE CERTIFICATE

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AIA® Document A201™ – 2007

General Conditions of the Contract for Construction

for the following PROJECT:
(Name and location or address)

THE OWNER:
(Name, legal status and address)

THE ARCHITECT:
(Name, legal status and address)

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

Init.
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INDEX
(Topics and numbers in bold are section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 THE WORK

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION

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

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the

portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY

The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES

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

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

.1 Allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;

.2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and

.3 Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect's approval. The Architect's approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and

completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING

§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor's consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP

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

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK

The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for such defense or loss when a particular design, process or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the Architect.

§ 3.18 INDEMNIFICATION

§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a separate contractor or subcontractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

.1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

.2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the

Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Article 15.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY

§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

§ 7.2 CHANGE ORDERS

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:

.1 The change in the Work;
.2 The amount of the adjustment, if any, in the Contract Sum; and
.3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

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

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount

for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom, and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

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

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or

encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

.1 defective Work not remedied;
.2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

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

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

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

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

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;

.2 failure of the Work to comply with the requirements of the Contract Documents; or

.3 terms of special warranties required by the Contract Documents.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to

.1 employees on the Work and other persons who may be affected thereby;

.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

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

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

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

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

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

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

.1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;

.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;

.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;

.4 Claims for damages insured by usual personal injury liability coverage;

.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;

.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;

.7 Claims for bodily injury or property damage arising out of completed operations; and

.8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's completed operations.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE

The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 LOSS OF USE INSURANCE

The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment

property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

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

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION

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

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

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

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by

such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;

.2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;

.3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

.4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor or a Subcontractor, Sub-subcontractor or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

.1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

.2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;

.3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or

.4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

.1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

.2 Accept assignment of subcontracts pursuant to Section 5.4; and

.3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

.1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and

.2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER

§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.

Additions and Deletions Report for
AIA® Document A201™ – 2007

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 10:01:04 on 01/05/2010.

There are no differences.

Certification of Document's Authenticity

AIA® Document D401™ – 2003

I, Heather Cobb, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 10:01:04 on 01/05/2010 under Order No. 3780522392_1 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2007 - General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

_____

(Signed)

_____

(Title)

_____

(Dated)

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

STANDARD FORM

The Standard Form of General Conditions of the Contract for Construction, AIA Document A201 - 2007, issued by the American Institute of Architects, is a part of this specification. Copies are on file and may be obtained at the office of the Architect.

TABLE OF ARTICLES

The following supplements modify, change, delete from or add to the above named documents. Where any article of the General conditions is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these supplements, the unaltered provisions of that article, paragraph, subparagraph or clause shall remain in effect.

ARTICLE 1

GENERAL PROVISIONS

1.1 DEFINITIONS

1.1.2 The Contract

1.1.2.1 The work shall be performed under separate or combined contracts. It is the duty of each Contractor to coordinate his work with that of each other Contractor. A complete set of drawings and specifications will be made a part of the Contract Documents for each Contractor.

1.1.4 The Project

1.1.4.1. The work covered in this project manual consists of construction and other related items, as set forth in the Instruction to Bidders, all pursuant to completion of the Franklin High School Tennis Reconstruction 2023.

1.1.6.1 The term "product" as used in these Supplementary Conditions includes material, systems and equipment.

1.1.7.1 The term "Project Manual" as used in these Supplementary Conditions is the volume which includes the Bidding Requirements, Conditions of Contract and the Specifications.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

1.2.3.1 No responsibility either direct or implied is assumed by the Architect for omission or duplications by the Contractor or his Sub-contractor due to real or alleged error in arrangements of matter in these Contract Documents.

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

It is the intent that the Drawings and Specifications include everything necessary for the completion of the project and to be consistent with each other. It is hereby agreed and understood that work shown on the Drawings and not mentioned in the Specifications, or vise versa, is to be included the same as if it were mentioned in both the Drawings and the Specifications, with no extra charge to the Owner. If any part of the Drawings and/or Specifications are inconsistent, incorrect, or obscured in their meaning, these discrepancies shall be brought to the attention of the Architect in writing before execution of the Contract. Where there is conflict regarding the quality of any equipment or material, the one having the better quality shall be used unless directed by the Architect.

In submitting his proposal, the Contractor agrees to furnish all labor and supervision necessary to produce the construction required by the Contract Documents and all materials and equipment incorporated or to be incorporated in such construction.

1.2.4 The organization of the Specifications is done with the intent of defining the work for multiple Contract performance. The extent of responsibility for Contractor performance is overlapping from one technical section to another. It is the responsibility of each Contractor to cooperate and coordinate his work with other Contractors as necessary to meet all interface conditions standard to the industry and obvious to the intended extent of the work on this particular project.

1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

1.5.1.1 Drawings and Specifications provided to those not party to the contract are to be returned immediately upon request of the Architect.

ARTICLE 2

OWNER

2.1 GENERAL

2.1.1.1 The Owner of this Project is:

Livonia Public Schools
15125 Farmington Road
Livonia, MI 48154

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.3.1 The Owner shall obtain and pay for those items described (if any) set forth in the General Requirements.

2.2.4.1 The Owner shall issue all instruction to the Contractor through the Architect.

2.4 OWNER'S RIGHTS TO CARRY OUT THE WORK

2.4.1 The written notice will arrive in the form of, two (2) "forty-eight (48) hour notices" prior to Owner's carrying out the work. The method of notification is distributed via an email transmittal and the original will be sent 1st Class Mail.

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

ARTICLE 3

CONTRACTOR

3.7 PERMITS, FEES AND NOTICES

3.7.1.1 The individual contractor will be responsible for securing and paying for permits pertaining to their area of work, and other items as set forth in the general requirements. Costs and arrangements for governmental inspection shall be the responsibility of the Contractor.

3.9 SUPERINTENDENT

3.9.1 The contractor shall provide adequate supervision over the work involved in his portion of the project. The Contractor shall designate a representative through which all communications shall be made. This representative shall work closely with the Architect in the performance of the work and his communications shall be binding on the part of the Contractor. Important communications shall be confirmed in writing.

3.9.1.1 All work shall be of the highest quality and in strict accordance with Manufacturer's published specifications and to Owner's satisfaction. Unacceptable workmanship will not be tolerated or permitted to continue.

3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

3.10.1.1 The Contractor and all Sub-Contractors, suppliers and manufacturers shall schedule materials, deliveries and installation expeditiously, and provisions to this effect shall be included in all subcontracts.

3.10.2.1 The Projected Construction Schedule as endorsed or modified by the Contractor, is part of the Contract Documents. This schedule constitutes the Contractor's commitment to expedient performance.

3.10.2.2 Modification to the Schedule as a result of allowable time extensions or increased scope of work shall be accepted by the Contractor as inherent to the construction process and shall not qualify as a basis for extra compensation from the Owner.

3.11 DOCUMENTS AND SAMPLES AT THE SITE

3.11.1.1 The drawings marked to record all changes and of underground installations made during construction, shall be delivered to the Architect upon completion of the work. Receipt of as-built drawings by the Architect is a condition for Final Payment.

3.11.1.2 The prints for record drawings will be a set of black and white prints provided by the Architect at start of construction. The Contractor shall maintain the set in good condition and shall use colored pencils to mark up the set in a legible manner to show:

3.11.1.2.A Significant deviations made during construction.

3.11.1.2.B Significant details not previously shown on drawings.

3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.12.5 Shop drawings and samples shall be submitted to the Architect, dated and marked to show the names of the project, Architect, Contractor, originating Sub-contractor, Manufacturer or Supplier, and separate Retailer if pertinent. Shop drawings shall completely identify Specification section and locations at which materials or equipment are to be installed. Reproductions of Contract Drawings are acceptable as Shop Drawings only when specifically authorized in writing by the Architect.

Submission of shop drawings and samples shall be accompanied by a transmittal letter containing Project name, Contractor's name, number of drawings and samples, titles and other pertinent data.

3.12.5.1 Each Contractor shall provide the necessary record drawing information in timely and efficient manner.

3.12.5.2 Submission of shop drawings for approval shall consist of five (5) prints. One (1) print will be returned to the Contractor marked per Paragraph 3.12.11.1 following.

3.12.5.3 Unless otherwise specified, the number of shop drawings and the number of samples which the Contractor shall submit for record is the number that the Contractor requires to be returned plus five (5) copies for drawings and three (3) for samples which will be retained by the Architect/Owner.

If the shop drawing affects the work of another contractor(s) the Contractor shall provide additional copies as directed by the Architect.

3.12.8.1 The Contractor shall conscientiously supply all information required when submitting Shop Drawings and Samples. Information pertaining to delivery and expediting will be part of his submittal. This data is vital to field performance; consequently, the submittal will be returned unless complete information is provided.

3.12.11 Grading of shop drawings shall be as follows:

A. No Exception Taken: No corrections, no marks.
B. Reviewed and Noted,: Minor amount of corrections; all items can be fabricated without further correction; checking is complete and all corrections are obvious without ambiguity.
C. Re-submit: Minor amount of corrections; noted items must not be fabricated without further corrections, checking is not complete, details of items noted by checker are to be further clarified before full approval can be given; items not noted to be corrected can be fabricated under this stamp.
D. Disapproved: Drawing or equipment is not in accordance with the contract. Submit new drawings covering equipment which meets specifications. Drawings will be returned unstamped with notification on letter of transmittal.

3.13 USE OF SITE

3.13.1 The control of the site will be by the Owner. The Contractor shall cooperate with him in all matters involving use of the site.

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

3.14 CUTTING & PATCHING

3.14.2 Where cutting of existing work is necessary, same shall be straight, true and of proper size. No excessive cutting will be permitted nor shall any piers or other structural members be cut without the consent of the Architect. The Contractor shall not endanger any work by cutting, excavating or otherwise and shall not cut or alter the work of any other Contractor without the consent of the Architect.

3.14.2.1 The cutting of all existing work shall be performed by the Contractor requiring same except that the cutting of openings shall be performed by workmen skilled relative to the material being cut.

3.14.2.2 The patching of all exposed work shall be performed by workmen skilled relative to the material being patched.

3.14.2.3 All patching shall be done in a neat, workmanlike manner with materials to match existing.

3.14.2.4 Where cutting or patching is required of one Contractor because of negligence of another Contractor then the cost for same shall be borne by the negligent Contractor.

3.15 CLEANING UP

3.15.2 If the Contractor fails to clean up within 7 days after receipt of notice by the Architect, the Owner may do so and the cost thereof shall be charged to the Contractor.

3.15.2.1 Each Contractor shall perform clean up of his own work including knocked down boxes and other containers. Debris shall not be buried on the site.

3.17 ROYALTIES, PATENTS AND COPYRIGHTS

3.17.1 The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of patent rights and shall hold the Owner and Architect harmless from loss on account thereof.

3.19 SUBSTITUTIONS

3.19.1 After the contract has been executed, the Architect will consider a formal request for substitution of products for those specified, under the following conditions:

A. The request is accompanied by complete data on the proposed substitution substantiating compliance with the Contract Documents including product identification and description, performance and test data, references and samples where applicable, and an itemized comparison or proposed substitution with the products specified or named by Addenda, with data relating to Contract time schedule, design and artistic effect where applicable, and its relationship to separate contracts.

B. The request is accompanied by accurate cost data on the proposed substitution in comparison with the product specified, whether or not modification of the Contract Sum is to be a consideration.

3.19.2 Requests for substitution based on Clause 3.19.1 above, when forwarded by the Contractor to the Architect, are understood to mean that the Contractor:

A. Represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified.

B. will provide the same guarantee for the substitution that he would for that specified.

C. certifies that the cost data presented is complete and includes all related costs under this contract, but excludes costs under separate contracts and the Architect's redesign costs, and that he waives all claims for additional costs related to the substitution which subsequently became apparent; and

D. will coordinate the installation of accepted substitute, making such changes as may be required for the work to be complete in all respects.

Substitutions will not be considered if:

A. They are indicated or implied on the shop drawings submissions without the formal request required in Clause 3.19 above; or

B. For their implementation they require a substantial revision of the Contract Documents in order to accommodate their use.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 THE ARCHITECT

4.1.1.1 Requests concerning interpretations during the construction period shall be made to the Landscape Architect. The term "Architect" means the Landscape Architect or the Landscape Architect's representative.

The Landscape Architect for this project is Foresite Design, Inc., 3269 Coolidge Highway, Berkley, MI 48072. (248) 547-7757.

4.5 MEDIATION

4.5.1 Binding mediation will be entered into only if mutually agreed upon by both the Owner and Contractor.

ARTICLE 6

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 Delete:

"…and waiver of subrogation."

6.1.3.1 A pre-construction conference will be held to review schedule, in the event separate contracts are issued all work must be completed as outlined in the

bidding documents. Contractor shall coordinate their Work with other trades in a manner that is in the best interest of the Owner and the overall project.

ARTICLE 7

CHANGES IN THE WORK

7.3 CONSTRUCTION CHANGE DIRECTIVES

7.3.10 Add:

"The following fees apply to Changes in the Work in accordance with Subparagraph 7.3.6:

a. 10 percent overhead and profit on the net cost of materials and labor done by the Contractor;
b. 5 percent overhead and profit on the net cost of materials and labor done by any Subcontractor.

ARTICLE 8

TIME

8.2 PROGRESS AND COMPLETION

8.2.4 During the course of the work, the Architect will condone reduced crew size or even total absence on the part of the Contractor, providing such reduced activity is mutually agreed to and will not slow down or interfere with the overall progress of the work. However, when work is available and is required to maintain the Construction Schedule or assist an interface situation, performance by the Contractor is mandatory. If performance is not maintained by the contractor, the Owner will give the Contractor two (2) forty-eight (48) hours notices before taking over completion of work as covered in Article 2.4.1.

8.2.4.1 The Contractor will keep accurate daily records of performance on all Contracts involved in the project. The comparison of these records with the Contractor's commitment to the Construction Schedule will determine his effort in pursuit or total project completion.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1.1 If a delay on the part of one Contractor directly affects the progress of others, then time extensions shall be granted to those directly affected. Necessarily, however, the granting of time extensions shall not increase the required working time span for any Contractor, only the completion date.

8.3.2 All claims for extension of time shall be made in writing to the Architect no more than seven (7) days after the occurrence of the delay; otherwise, they shall be waived. In the case of a continuing cause of delay, only one claim is necessary.

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

ARTICLE 9

PAYMENTS & COMPLETION

9.2 SCHEDULE OF VALUES

9.2.1 The Architect shall review the schedule of values, submitted by the Contractor. The schedule of values shall be prepared in such a manner that each major item of work and each subcontracted item of work is shown as a single line item on AIA Document G702, Application and Certificate for Payment, Continuation Sheet, G703.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Substitute the following:

No later than the 15th day of each month, the Contractor shall submit to the Architect an itemized Application for Payment, supported by such data substantiating the contractor's right to payment as the Owner and Architect may require. Payment by the Owner will be made on or before the 20th day of the following month.

9.3.1.3 Until final payment, the Owner will pay ninety percent (90%) of the amount due to the Contractor on account of progress payments. If the manner of completion of the work and its progress are, and remain, satisfactory to the Architect, and in the absence of other good and sufficient reasons and shown to be fifty percent (50%) or more complete in the Application retainage, on presentation by the Contractor of Consent of Surety for each application, the landscape architect shall certify any remaining progress payments to be paid in full.

9.3.1.4 The full contract retainage may be reinstated if the manner of completion of the work and its progress do not remain satisfactory to the Architect, or if the surety withholds his consent, or for other good and sufficient reasons.

9.3.1.5 The form of Application for Payment shall be AIA Document G702, Continuation Sheet, G703.

9.3.1.6 At the time the payment is submitted, the Contractor will present to the Architect in triplicate and original, a Sworn Statement and a Waiver of Lien in the amount of the payment. Waivers from Sub-contractors, and Suppliers representing major expenditures shall also be required. **If these documents are not attached, the pay application will not be processed.**

9.3.1.7 Final payment will be made within 30 days after the Contractor has achieved final completion as determined by Owner and supplied necessary submittals/ warranties/guarantees as may be required elsewhere in the contract document. 10% of value of Work completed and acceptable will be retained by Owner until final payment.

9.6 PROGRESS PAYMENTS

9.6.1 The Owner shall make payment to the Contractor on or before the twentieth (20th) day of the month following the Contractor's submission of Application for Payment and after the Architect has issued a Certificate for Payment.

SECTION 00 7300
SUPPLEMENTARY CONDITIONS

9.8 SUBSTANTIAL COMPLETION

9.8.1.1 The Architect will prepare a Certificate of Substantial Completion when he determines that the work of each individual Contract is substantially complete.

9.8.4.1 The Contractor shall finish all items on the list within thirty (30) days of the acceptance of the Certificate of Substantial Completion. If completion is not obtained within thirty (30) days, the Owner will give the Contractor two (2) forty-eight (48) hours notices before taking over completion of work as covered in Article 2.4.1.

9.10 FINAL COMPLETION AND FINAL PAYMENT

9.10.1.1 The Architect will issue a final Certificate for Payment after he finds the work acceptable under Contract Documents and the Contract fully performed.

9.10.2.1 Final payment, covering each individual Contract, will be made by the Owner to the Contractor thirty days after Substantial Completion of the work unless otherwise stipulated in the Certificate of Substantial Completion, provided the work has then been completed, the Contract fully performed, and a final Certificate for Payment has been issued by the Architect.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor shall adequately protect building, service drives, lawn, shrubs, trees etc. from damage, including water damage, during the process of performing required Work. Contractor shall repair or be responsible for the costs to repair, all property damaged during the performance of this Contract. Damages to the building will be addressed immediately and sent to Contractor in writing by Owner.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.8 Contractor shall be responsible for all means and methods as they relate to safety and shall comply with all applicable local, state and federal requirements that are safety related. Safety shall be the responsibility of the Contractors. All contractor related personnel shall be instructed daily to be ever mindful of the full time requirement to maintain a totally safe environment for the facilities' occupants including students, staff, visitors and the occurrence of the general public on or near the site.

ARTICLE 11

INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 In the first line following the word "maintain", insert the words "In a company or companies licensed to do business in the state in which the Project is located."

11.1.1.9 Liability insurance shall include all major divisions of coverage and be on a comprehensive basis including:

1. Premises - Operations (including X-C-U). (For underground work only)
2. Independent Contractor's protective
3. Products and completed operations
4. Contractual - including specified provisions for the Contractor's obligations under Paragraph 3.18.
5. Owned, non-owned and hired motor vehicles.
6. Broad form coverage for property damage.

Add the following:

11.1.2.1 Add the following minimum limits:

1. Worker's Compensation & Employers' Liability

A.	Each Accident	$	500,000
B.	Disease-Policy Limit	$	500,000
C.	Disease-Each Employee	$	500,000

2. Comprehensive General Liability

A. Bodily Injury

Each Person	$	500,000
Each Occurrence	$	1,000,000

B. Personal Injury

Each Person	$	500,000
Aggregate	$	2,000,000
General Aggregate	$	2,000,000

C. Property Damage

Each Person	$	500,000
Each Occurrence	$	500,000
Aggregate	$	2,000,000

3. Automobile Liability

A. Bodily Injury

Each Person	$	500,000
Each Occurrence	$	500,000

B. Property Damage

Each Occurrence	$	100,000

4. Independent Contractors
Same limits as above

5. Products and Completed Operations
Same limits as above

11.1.2.2 The Contractor will require all Sub-contractors to maintain similar insurance coverage.

11.1.2.3 In addition to the General Liability coverage required by Article 11.1.2.1, the Contractor will maintain during the period of this Contract Umbrella Liability Insurance covering the risk of losses of $ 1,000,000.00 in excess of the limits stated in Article 11.1.2.1.

11.1.3.1 Furnish one (1) copy of Certificates herein required for each copy of the Agreement; specifically set forth evidence of all coverage required by Subparagraph 11.1.1. and 11.1.2. Furnish the Owner copies of any endorsements that are subsequently issued amending coverage or limits.

11.1.3.2 All Certificates for insurance shall name the Owner and Architect as additionally insured.

11.1.3.3 **The following language shall be indicated on all certificates of insurance from successful bidder: Livonia Public Schools, its elected or appointed officials, employees and volunteers, Plante Moran Cresa, and Foresite Design, Inc. are included as insured with regards to damages and defense of claims arising from: (a) activities performed by or on behalf of the named insured, or (b) products and completed operations of the named insured, or (c) premises owned, leased, or used by the named insured".**

11.3 PROPERTY INSURANCE

11.3.5 Delete the last sentence in its entirety:

“All separate policies shall provide this waiver of subrogation by endorsement or otherwise.”

11.3.7 Delete this section in its entirety:

“*The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.”*

11.3.9 Add the following sentence:

In waiving rights of recovery under terms of this Subparagraph, the term "Owner" shall be deemed to include his employees, the Architect, and their employees as the Owner's representative as provided in the Contract Documents.

11.3.11 If the Owner finds it necessary to occupy or use a portion or portions of the work prior to Substantial Completion, such occupancy shall not commence prior to a time mutually agreed to by the Owner and the Contractor and concurred with by the insurance company or companies. This insurance shall not be canceled or lapsed on account of such partial occupancy.

11.5 OWNER'S PROTECTIVE INSURANCE

11.6.1 The Contractor shall provide Owner's Protective Insurance on same limits as specified in 11.1.1 and 11.1.2 above, naming the Architect as additionally insured.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.3 WRITTEN NOTICE

13.3.1 Written notice shall be deemed to have been duly served if delivered or sent via the telephone facsimile machine to the last known number to the party giving notice.

13.5 TESTS AND INSPECTIONS

13.5.1 The Owner shall pay for all testing.

13.8 NO SMOKING

13.8.1 No smoking is permitted in the building or on school grounds.

13.9 SECURITY

13.9.1 Contractors shall observe the following procedure when working in a school building, unless otherwise instructed:

1. Proceed to the office, identify yourself, state reason for being in the building, and receive visitors pass.

2. Complete work, then revisit the office to check out prior to leaving the building/premises.

13.10 ENVIRONMENTAL SAFETY/RESPONSIBILITY

13.10.1 It shall be the responsibility of the Contractor or sub-contractor to pay any and all costs incurred from the clean up related to any environmental hazard created by means of contamination caused by accident or neglect of the Contractor or sub- contractor.

It shall be the responsibility of the Contractor or sub-contractor to dispose of any environmentally hazardous product(s) and/or material in accordance with the EPA, DNR,

and local applicable laws and regulations.

It shall be the responsibility of the Contractor or sub-contractor, if required, to purchase permits and notify the proper authorities prior to commencing said project or, should a "release" take place, to notify proper authorities of any such release.

It shall be the responsibility of the Contractor or sub-contractor to maintain on site a blood borne pathogen plan and all necessary safety supplies associated with any spill or clean up that may occur.

13.11 RIGHT TO KNOW

13.11.1 In accordance with **MIOSHA** regulations pertaining to the **"Michigan Right to Know Law"** the owner has posted Material Safety Data Sheets for any hazardous chemicals in their workplace. The Contractor shall designate a coordinator to oversee the institution and maintenance of a similar program for the areas in which the construction work will take place. The program must encompass all **MIOSHA** Regulations with regards to the **"Michigan Right to Know Law"** for all hazardous chemicals which will be used on site during the course of construction.

13.12 ASBESTOS FREE CERTIFICATION

No asbestos containing material shall be purchased or installed as a part of this project. The Contractor shall be required to certify that no asbestos containing materials have been replaced in this project. **Approved certification shall be on file with the Owner prior to consideration for final payment.**

13.13 AFFIRMATIVE ACTION

Livonia Public Schools as an Equal Opportunity Affirmative Action Employer, Complies with the federal and state laws prohibiting discrimination, including Title IV and Title VII (with amendments) of the 1964 Civil Rights Act, Title IX of the Educational Amendment of 1972, Section 504 of the Rehabilitation Act of 1973 and Veterans Readjustment Act of 1974 as amended 38 USC20-12 and the Americans With Disabilities Act of 1990. It is the policy of the school board that no person, on the basis of race, sex, height, weight, color, religion, nation origin or ancestry, age, marital status, disability or veteran status, shall be discriminated against in employment, educational programs and activities, or admission.

END OF SECTION 00 7300

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SECTION 00 7400
AGREEMENT BETWEEN OWNER AND CONTRACTOR

The “Agreement between Owner and Contractor”, AIA Document A105-2017 is attached after this section.

END OF SECTION 00 7400

DRAFT

AIA® Document A105® – 2017

Standard Short Form of Agreement Between Owner and Contractor

AGREEMENT made as of the « » day of « » in the year «Two Thousand Twenty Four.»
(In words, indicate day, month and year.)

BETWEEN the Owner:
(Name, legal status, address and other information)

«Livonia Public Schools»
«15125 Farmington Road
Livonia, MI 48154 »

and the Contractor:
(Name, legal status, address and other information)

« »« »
« »
« »
«»

for the following Project:
(Name, location and detailed description)

«Livonia Public Schools - Sinking Fund Program»
«Athletic Fields Services including the New Turf Practice Field at Stevenson High School located at 33500 W. Six Mile Road, Livonia, Michigan 48152.»« »

The Architect:
(Name, legal status, address and other information)

«Foresite Design, Inc. »« »
3269 Coolidge Highway
Berkley, MI 48072»

The Owner and Contractor agree as follows.

ADDITIONS AND DELETIONS: The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

§1.1 The Contractor shall faithfully and competently complete the Work described in this Agreement, including all Exhibits or documents incorporated herein by reference (hereinafter collectively referred to as the "Agreement" or "Contract"), the Conditions of the Contract (General, Supplementary and other Conditions), the Request for Proposal dated _____, 20____ including any Addenda, as well as the Advertisement or Invitation to Bid, Instructions to Bidders, Drawings and Specifications and the Contract Documents for the Project, or as reasonably inferable as necessary or incidental, to produce the results intended by the Contract Documents (collectively "the RFP"), as well as in the Contractor's Proposal in response to the RFP dated _____, 20_____ including the Post-Bid interview documents dated _____, 20_____ (collectively the "Proposal"), which Proposal is incorporated herein by reference (except to the extent any exceptions contained in the Contractor's Proposal are not expressly accepted by the Owner in writing or incorporated into this Agreement). In the event of any inconsistency or ambiguity between this Agreement and the Contractor's Proposal, the terms that are more favorable to the Owner shall govern. The Contract Documents consist of:

.1 this Agreement signed by the Owner and Contractor;

.2 all the Drawings and Specifications prepared by the Architect for construction for the Project, attached hereto by this reference, and including (but not necessarily limited to) the following:
Drawings:

	Title	Date

Specifications:

Section	Title	Pages

.3 addenda, if any, prepared by the Architect as follows:

Number	Date	Pages

.4 written orders for changes in the Work, pursuant to Article 10, issued after execution of this Agreement; and

.5 other Contract Documents, if any, identified as follows:
Exhibit A – Schedule of Values
Exhibit B – Unit Prices
Exhibit C – Allowances included in the Contract Sum
Exhibit D - List of Subcontractors and Suppliers
Exhibit E – Project Preliminary Major Milestone Schedule
Exhibit F – Contractor's Certificate of Insurance and Bonds»

§1.2 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all. Work called for on the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both. Nothing in this Section 1.2, however, shall relieve the Contractor of any of its obligations under the Contract Documents. Other conflicts between or among the Contract Documents shall be resolved under the following rules of construction:

.1 the specific shall govern over the general;

.2 specified dimensions shown on the Drawings shall govern, even though they may differ from dimensions scaled on the Drawings, if any;

.3 Drawings of larger scale shall govern over those of smaller scale; any special Drawing details shall govern over standard detail;

.4 Specifications shall govern over Drawings in matters of material or equipment specified; Drawings shall govern over Specifications in matters of construction or installation detail;

.5 documents of later date shall always govern; except that the Agreement shall govern over all other documents, regardless of their dates; and

.6 in the event of any inconsistency or ambiguity between this Agreement and the Contract Documents, the terms that requires a higher standard of performance by the Contractor shall prevail.

§1.3 Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified. On certain Contract Documents, only a portion of the detail may be fully shown and the remainder indicated in outline, in which case the general detail shall be understood as also applying to other like portions of the Work.

§1.4 The organization of the Specifications into divisions, sections, and/or articles, and the arrangement of the Drawings, shall not dictate to the Contractor in any way how the Work is to be divided among Subcontractors, or establish the extent of Work to be performed by any trade. Similarly, the organization of the Contractor's duties into different phases or categories in the Agreement is for convenience only and shall not limit the generality of the Contractor's obligation to provide all of the services whenever necessary.

§1.5 All references in the Contract Documents to standards (such as commercial standards, federal specifications, trade association standards or similar standards), whether for materials, processes, assemblies, workmanship, performance or any other purpose, shall mean, unless otherwise noted, the most recent available published version of such standard as of the date of that part of the Contract Documents bearing the reference. All standards referred to, except as modified in the Contract Documents, shall have the same force and effect as though printed therein. These standards will not be furnished to the Contractor, as the Contractor and all members of the construction team are required to be familiar with their requirements.

§1.6 Whenever a provision of the Contract Documents conflicts with agreements or regulations in force among members of trade associations, unions or councils, which regulate or distinguish the portions of the Work which shall or shall not be performed by a particular trade, the Contractor shall make necessary arrangements to reconcile the conflict without delay, damage, cost or recourse to the Owner. Delays in the Work resulting from the failure of the Contractor to use its best efforts to reconcile any such conflicts shall not result in an extension of the Project Schedule and shall not result in the increase of the Contract Sum.

§1.7 The Contractor acknowledges that there may be items of the Work, which the Contractor is responsible to provide under the Agreement that are not drawn or specified in the Design but are necessary for the proper execution and completion of the Work and are consistent with and reasonably inferable from the Drawings and Specifications. All such items shall be provided as part of the Work without delay in its progress and without any increase in the Contract Sum.

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The Contract Time is the number of calendar days available to the Contractor to substantially complete the Work.

§ 2.2 Date of Commencement:

Unless otherwise set forth below, the date of the commencement of the Work shall be the date of this Agreement.
(Insert the date of commencement if other than the date of this Agreement.)
«Date of Commencement of the Work is _____.»

Notwithstanding the foregoing, Contractor may not commence the Work on the Project until after insurance certificates and bonds, if applicable, are delivered to the Owner.

§ 2.3 Substantial Completion:

Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion, as defined in Section 12.5, of the entire Work:
(Check the appropriate box and complete the necessary information.)

[« »] Not later than « » (« ») calendar days from the date of commencement.

[« X »] By the following date: «100% Completion for the Project described in this Agreement is to be no later than _____. »

§ 2.4 Liquidated Damages:
§ 2.4.1 - § 2.4.4 NOT USED

ARTICLE 3 CONTRACT SUM

§ 3.1 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work. Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

«The total Lump Sum amount is _____ and No/100 Dollars ($ _____.00). The total Lump Sum amount includes all Work and costs associated with such Work per this Agreement and as detailed in the RFP.

§ 3.2 For purposes of payment, the Contract Sum includes the Schedule of Values provided in **Exhibit A**, which is attached hereto and made a part of this Agreement, related to portions of the Work.

§ 3.3 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner.

§ 3.3.1 The following alternates are included in the Contract Sum:

Item	Price

§ 3.3.2 The Contract Sum does not include the following alternates, which are described in the Contract Documents and may be accepted by the Owner in writing; provided, however, that the Contractor shall furnish the Owner with not less than fourteen (14) days' prior written notice of the date upon which any of the alternates set forth below in this Section 3.3.2 must be accepted by the Owner in order for the Contractor to perform the Work covered by such alternates for the price set forth below in this Section 3.3.2 and without any adjustment to a milestone date or in the Contract Time.

Item	Price

§ 3.4 Allowances, if any, included in the Contract Sum are as follows:
(Identify each allowance.)

Description	Price

§ 3.4.1 Use of any Allowance shall be at the sole direction and written approval of the Owner. Costs allocated against an Allowance shall exclude overhead and profit; any overage on an Allowance, shall be calculated by adding the Contractor's Actual Cost for labor and material plus the Contractor's overhead and profit as defined in Section 10.1.

§ 3.5 Unit prices, if any, are set forth in the "Schedule of Unit Prices" attached hereto and made part of this Agreement as **Exhibit B**. Such Unit prices are considered complete and include: (i) all materials, equipment, labor, delivery, installation, overhead, and profit; and (ii) any and all other costs or expenses in connection with, or incidental to, the performance of that portion of the Work to which such unit prices apply.

ARTICLE 4 PAYMENTS

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12, as follows:

§ 4.1.1 The period covered by each Application for Payment shall be one (1) calendar month ending on the last day of the month.

§ 4.1.2 Provided that a complete Application for Payment is received by the Architect not later than the «last» day of a month, the Owner shall make payment of undisputed portions of the certified amount to the Contractor not later than the «last» day of the «following» month. If an Application for Payment is received by the Architect after the

application date fixed above, payment shall be made by the Owner not later than «forty-five» (45) days after the Architect certifies the Application for Payment.

§ 4.1.2.1 NOT USED

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

.1 Take that portion of the Contract Sum properly allocable to completed Work as determined by multiplying the percentage completion of each portion of the Work by the share of the Contract Sum allocated to that portion of the Work in the schedule of values, less retainage of «ten» percent («10»%). Pending final determination of cost to the Owner of changes in the Work, amounts not in dispute shall be included;

.2 Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing), less retainage of «ten» percent («10»%);

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

.4 Subtract amounts, if any, for which the Architect has withheld or nullified a Certificate for Payment.

§ 4.1.4 The progress payment amount determined in accordance with Section 4.1.3 shall be further modified under the following circumstances:

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

.2 Add, if final completion of the Work is thereafter materially delayed through no fault of the Contractor, any additional amounts payable.

§ 4.2 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate below, or in the absence thereof, at the legal rate prevailing at the place of the Project.
(Insert rate of interest agreed upon, if any.)
Zero percent (0%).

ARTICLE 5 INSURANCE AND BONDS

§ 5.1 The Contractor shall maintain the following types and limits of insurance at no extra cost to the Owner, until the expiration of the period for correction of Work as set forth in Section 14.2, subject to the terms and conditions set forth in this Section 5.1:

§ 5.1.1 Commercial General Liability insurance for the Project, written on an occurrence form, with policy limits of not less than the minimum coverages indicated in Section 5.1.7 below.

§ 5.1.2 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than the minimum coverages indicated in Section 5.1.7 below along with any other statutorily required automobile coverage.

§ 5.1.3 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided that such primary and excess or umbrella insurance policies result in the same or greater coverage as those required under Section 5.1.7 below, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ 5.1.4 Workers' Compensation at statutory limits.

§ 5.1.5 Employers' Liability with policy limits not less than the minimum coverages indicated in Section 5.1.7 below.

§ 5.1.6 The Owner shall purchase and maintain a property insurance written on a builder's risk "all-risk" or equivalent form in the amount and with deductibles determined by the Owner. Except as otherwise provided in the

Contract Documents, if the property insurance requires deductibles, the Contractor shall be responsible to pay costs, resulting from the acts or omissions of the Contractor and its subcontractors, not covered because of such deductibles.

§ 5.1.7 Other Insurance Provided by the Contractor (See Contractor's Insurance Certificate(s) attached hereto as Exhibit **F** and made a part of this Agreement)
(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
Workers' Compensation	Statutory
Employer's Liability:	
Bodily Injury by Accident:	$1,000,000.
Bodily Injury by Disease, Policy Limit	$1,000,000.
Bodily Injury by Disease, Each Employee	$1,000,000.
General Liability:	
Each Occurrence (Bodily Injury and Property Damage)	$1,000,000.
Personal & Advertising Injury	$1,000,000.
Medical Payments Coverage	$5,000.
Fire Damage Liability	$100,000.
General Aggregate	$2,000,000.
Products & Completed Operations Aggregate	$2,000,000.
Excess Umbrella Liability:	
Each Occurrence	$3,000,000.
General Aggregate	$3,000,000.
Automobile Liability:	
a. Bodily Injury - Each Person	$1,000,000.
Each Accident	$1,000,000.
b. Property Damage – Each Accident	$1,000,000.
or	
c. Combined Single Limit – Each Accident (Bodily Injury and Property Damage)	$2,000,000.
Professional Liability Insurance	
Each Wrongful Act	$2,000,000.
Policy Aggregate	$2,000,000.
Pollution Liability	
Each Pollution Event	$1,000,000.
Policy Aggregate	$2,000,000.

§ 5.1.8 Contractor shall name Owner, Architect, Plante Moran Realpoint, LLC and their respective directors, officers, and employees as additional insureds on General Liability, Umbrella / Excess Liability, and Automobile Liability policies.

§ 5.1.8.1 Contractor shall require all Subcontractors and/or their agents to name Owner, Architect, Plante Moran Realpoint, LLC and their respective directors, officers, and employees as additional insureds on General Liability, Umbrella / Excess Liability, and Automobile Liability policies.

§ 5.1.9 Insurance coverage and surety bond required under this Agreement shall be written with insurance and surety carriers authorized to do business in the State of Michigan. Insurance coverage and surety bonds shall be in a form and provided by an insurer acceptable to the Owner with an A.M. Best rating of A, XII or better.

§ 5.1.10 The Contractor shall furnish payment and performance bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source, and

the cost thereof shall be included in the Cost of the Work. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum. The Contractor shall deliver the required bonds to the Owner at least three (3) days before the commencement of any Work at the Project site. The Contractor shall only subcontract with Subcontractors that are trustworthy, financially able, and have a track record in successfully completing trade works of similar size and complexity.

§ 5.1.11 Except for any applicable Professional Liability Insurance coverages, Insurance coverages, shall be written on an occurrence basis, and shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents. If Professional Liability Insurance coverage is required under this Agreement, Contractor shall maintain its Professional Liability Coverage without interruption for a period of not less than the Statute of Limitation and Statute of Repose periods in the state where the Project is located after the Project's relevant Date of Substantial Completion or the last day service is rendered by the Contractor on the Project, whichever shall be the later. The Contractor shall notify the Owner any disruption in coverage occurs and shall provide "tail coverage" at no cost to the Owner.

§ 5.2 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance and shall provide property insurance to cover the value of the Owner's property. The Contractor is entitled to receive an increase in the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance, however, the Contractor shall be responsible to pay costs resulting from the acts or omissions of the Contractor and its subcontractors not covered because of any deductibles.

§ 5.3 The Contractor shall obtain an endorsement to its Commercial General Liability insurance policy to provide coverage for the Contractor's obligations under Section 8.12.

§ 5.4 Prior to commencement of the Work, the Contractor shall provide certificates of insurance showing its coverages. The Owner may require additional proof of coverage in the form of a true and accurate copy of the polices of insurance, themselves. The maintenance of the insurance in strict compliance with the requirement of this Agreement shall be condition precedent to Owner's obligation to make any payment under this Agreement.

§ 5.5 NOT USED

§ 5.6 The Contractor, its Subcontractors and each member of the construction team shall be solely responsible for insuring against any loss or damage to all owned, borrowed or rented property, including but not limited to tools, materials, supplies, equipment, forms, scaffolding, towers, staging, bunkhouses and other temporary structures including their contents, which do not form a permanent part of the Project. The Owner shall in no event be liable for any loss or damage to any of the aforementioned items, or the Work connected with the Contractor, or employees, agents or servants of same, which is not to be included in and remain a permanent part of the Project.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 The Contract

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 The Work

The term "Work" consists of all goods and services, such as labor, transportation, materials, tools, and equipment (i) to be incorporated into the Project (or the Contractor's portion of the Project if the Contractor is not responsible for the entire Project), (ii) required of the Contractor under the Contract Documents, or (iii) necessary or appropriate to fully construct, fixture, operate and maintain the Project (or the Contractor's portion of the Project if the Contractor is not responsible for the entire Project). The Work shall be performed in accordance with the Contract Documents. The Work may constitute the whole or a part of the Project. The term "Work" also shall include labor, materials, equipment and services provided or to be provided by Subcontractors, Sub-Subcontractors, material suppliers or any other entity for whom the Contractor is responsible under or pursuant to the Contract Documents.

§ 6.3 Intent
The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

§ 6.4 Consent, Approve, Satisfactory, Proper, and As Directed
The words "consent," "approved," "satisfactory," "proper," "as directed," any derivatives of them, or similar terms, mean written approval by the Owner, and may include approval of the Architect if the Owner so directs. Except where a different standard is specifically established, the Owner has the right to grant or withhold such approval in its sole discretion.

§ 6.5 Provide
The word "provide" and any derivatives thereof, and similar terms, mean to properly fabricate, complete, transport, deliver, install, erect, construct, test and furnish all labor, materials, equipment, apparatus, appurtenances, and all items and expenses necessary to properly complete in place, ready for operation or use under the terms of the Contract Documents.

§ 6.6 Knowledge
The terms "known," "knowledge," "recognize," "believe," and "discover," and any derivatives thereof and similar terms, when used in reference to the Contractor, shall mean that which the Contractor knows or should reasonably know, recognizes or should reasonably recognize, and discovers or should reasonably discover in exercising the care, skill, and diligence required of the Contractor by the Agreement. The expression "reasonably inferable" and similar terms mean reasonably inferable by a Contractor familiar with the Work and exercising the care, skill and diligence required of the Contractor by the Agreement.

§ 6.7 Including
The word "including" shall not be a word of limitation, but instead shall be construed as introducing one or more nonexclusive examples.

§ 6.8 Abbreviations
Words or abbreviations that are not defined but have well-known technical, trade or construction industry meanings, shall have those meanings ascribed to them. The singular shall include the plural and vice versa. Pronouns are interchangeable. The word "person" includes human beings and recognized legal entities. Unless the context clearly requires otherwise, reference to a Section shall include all subsections beneath it bearing identical introductory numbers.

§ 6.9 Ownership and Use of Architect's Drawings, Specifications and Other Documents
Documents prepared by the Architect are instruments of the Architect's service for use solely with respect to this Project. All plans, Drawings, Specifications, computations, sketches, data, surveys, models, photographs, renderings, and other like materials relating to the services ("Documents") shall become the property of the Owner at the conclusion of the Project, or termination of the services of the Contractor, whichever is earlier, and shall be delivered to the Owner clearly marked and identified in good order. The Owner may use the Documents in connection with the Project, including maintenance, repair, or expansion of the Project or as a reference for other projects, but the Contractor and the Contractor's Architect shall incur no liability for the Owner's use of the Documents other than in connection with the Project, and the Owner hereby releases the Contractor from any loss or damage, including attorneys' fees, incurred solely as a result of Owner's use of the Documents other than in connection with the Project, or as a reference for other projects, if and only if the Contractor and/or its Architect is not involved in such use.

§ 6.10 Access and Cooperation
§6.10.1 The Owner shall cooperate with the Contractor and shall provide the Contractor reasonable access to the Owner's site for the performance of the Contractor's Work and duties under this Agreement. Owner shall not intentionally interfere with the Work of the Contractor or any of its Subcontractors.

§6.10.2 Contractor shall provide the Owner in writing critical dates when Owner supplied materials and equipment are to be on the job site when Contractor is to install such materials and equipment. The Owner shall provide such materials on the job site by such dates. The Owner is responsible for the condition, performance, and warranty of Owner supplied materials. The Contractor shall be responsible for properly installing such materials and equipment in accordance with the manufacturer's specifications. The Contractor shall be responsible for the condition, performance and warranty of the materials and equipment if the Contractor damages or improperly installs such materials and equipment.

§6.10.3 If the Contractor will require use of the Owners' utilities during construction. The Owner shall bear the cost of utilities. The Contractor shall exercise reasonable care to protect and use of such utility services; and shall bear full responsibilities to damages caused due to Contractor's acts or omissions.

§6.10.4 The Contractor will place construction Project and safety signs at the Project to provide identification for resident and occupant safety, deliveries and subcontractors. The signs will meet OSHA and MIOSHA requirements and be removed upon completion and Owner taking occupancy of the Project.

§6.11 Deliveries. Contractor shall protect and secure materials and equipment delivered to and stored at the Project site and Work that are completed from theft, vandalism, fire etc. Contractor shall carry insurance for loss due to Contractor's failure to protect and secure materials and equipment on the job site or due to Contractor's acts or omissions.

§6.12 Subcontractors. At times Contractor may employ trade specialists, laborers, vendors, and other forces (Subcontractors) to perform various aspects of the Work. The Contractor shall, at all times, be fully responsible for the Work, conduct and acts or omissions of its Subcontractors.

§6.12.1 By written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound. Subcontracts shall include the following sentence: "Owner is an intended third-party beneficiary of this Subcontract." Sub-Subcontracts and Supply Contracts shall be subject to identical conditions, except: (i) suppliers that are not performing any Work on the Project Site are not subject to the insurance requirements described in Article 11; and (ii) Subcontractors and Sub-Subcontractors may satisfy the insurance requirements described in Article 5 by being named as an additional insured under the Contractor's insurance policies or, in the case of a Sub-Subcontractor, by being named as an additional insured under a Subcontractors' insurance policies.

§ 6.12.2 Upon request, the Contractor shall deliver a copy of any Subcontract, Sub-Subcontract or Supply Contract to the Owner.

ARTICLE 7 OWNER

§ 7.1 Information and Services Required of the Owner

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all required surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees under Section 8.7.1 that are the responsibility of the Contractor under the Contract Documents, the Owner shall obtain and pay for other necessary approvals, easements, assessments, and charges.

§ 7.1.3 NOT USED

§ 7.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work which is not in accordance with the Contract Documents, or fails to carry out the Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order is corrected, or correct the deficiencies with the Owner's own forces; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the

Owner to exercise this right for the benefit of the Contractor or any other person or entity. This right shall be in addition to and not in restriction or derogation of any other rights of the Owner under this Agreement. The Owner's right to stop the Work shall not relieve the Contractor of any of the Contractor's responsibilities or obligations under or pursuant to the Contract Documents.

§ 7.3 Owner's Right to Carry Out the Work

If the Contractor fails, defaults, or neglects to carry out the Work in accordance with the Contract Documents and fails within a three (3) day period after receipt of written notice from the Owner to commence and continue correction of such failure, default, or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, including any claim against the Contractor's Performance Bond, correct such deficiencies. In such case, the Contract Sum shall be adjusted to deduct the cost of correction from payments due the Contractor.

§ 7.4 Owner's Right to Perform Construction and to Award Separate Contracts

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

§ 7.5 Owner's Approval

Notwithstanding anything to the contrary contained in this Agreement, Owner's review and/or approval of any documents or other matters required herein shall be for the purpose of providing the Contractor or Architect with information as to Owner's objectives and goals with respect to the Project and not for the purpose of determining the accuracy and completeness of the Work. In no way should any review and/or approval Owner alter the Contractor's responsibilities under this Agreement.

ARTICLE 8 CONTRACTOR

§ 8.1 Review of Contract Documents and Field Conditions by Contractor

§ 8.1.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become familiar with local conditions under which the Work is to be performed, and correlated its observations with requirements of the Contract Documents.

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the Architect and the Owner.

§ 8.2 Contractor's Construction Schedule

The Contractor, promptly, but not more than thirty (30) days, after being awarded the Contract shall prepare and submit for the Owner's and Architect's information and acceptance Contractor's construction schedule or Project Schedule for the Work. The Project Schedule is the Critical Path Method ("CPM") schedule for construction of the Work submitted as part of the Contractor's Contract Sum Proposal, prepared by the Contractor and accepted by the Owner. The Project Schedule can be modified only by Change Order. Following any such modification, the term "Project Schedule" shall mean the most recent Owner-approved version. The Preliminary Project Milestone Schedule is attached hereto as **Exhibit E** and made a part of this Agreement.

§ 8.3 Supervision and Construction Procedures

§ 8.3.1 The Contractor shall employ and assign to the Project a competent and experienced superintendent to be on-site at all times to supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work. The Contractor shall inspect the Work of the trade contractors on the Project as it is being performed until final completion and acceptance of the Project by the Owner to ensure that the Work performed and the materials furnished are in accordance with the Contract Documents and that Work on the Project is progressing on schedule. In the event that the quality control testing should indicate that the Work, as installed, does not meet the requirements of this Project, including the Contract Documents, the Owner shall determine the extent of the Work that does not meet the requirements and the Contractor shall direct the trade contractors(s) to take appropriate corrective action, and advise the Owner of the corrective action.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner, through the Architect, the names of Subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any Subcontractor or supplier to whom the Owner or Architect have made a timely and reasonable objection.

§ 8.4 Labor and Materials

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

§ 8.4.2 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Contract Work. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

§ 8.5 Warranty

§ 8.5.1 The Contractor warrants to the Owner and Architect that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Any material or equipment warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 12.5.

§ 8.5.2 The Contractor shall provide a two (2) year limited warranty for all materials, equipment and work performed by the Contractor and/or its Subcontractors. Within the terms of the limited warranty, the Contractor shall remedy any defects due to faulty materials, workmanship, or negligence of the Contractor which are made known to the Contractor in writing, within two (2) years of the completion of the job. All materials are guaranteed for a minimum of two (2) years, or longer as specified, and all materials are warranted by the manufacturer and will be replaced according to the terms of their warranty by the Contractor without charge.

§ 8.5.3 Money being withheld for a warranty or disputed item shall not exceed twice the value of the warranty item (material and labor).

§ 8.5.4 Upon completion of any remedial work, the two (2) year warranty period in this Article 8 shall begin anew with respect to the materials, equipment and/or work requiring remedy.

§ 8.6 Taxes

The Contractor shall pay, and include in the Contract Sum, all sales, consumer, use, franchise, commercial activities, and similar taxes that are legally required when the Contract is executed. The Contractor shall pay all state and federal taxes levied on its business, income or property and shall make all contributions for social security and other wage or payroll taxes. The Contractor shall be solely responsible for such payments and shall indemnify the Owner and hold it harmless from any assessment and payment of the same.

§ 8.7 Permits, Fees, Licenses, and Notices

§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work or as required by the Contract Documents. The Contractor, and all its Subcontractors of any tier, shall maintain at all time the required licenses and registrations required to perform the Work.

§ 8.7.2 The Contractor shall strictly comply with and give notices required by agencies having jurisdiction over the Work. If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the Architect and the Owner in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

§ 8.8 Submittals
The Contractor shall promptly review, approve in writing, and submit to the Architect shop drawings, product data, samples, and similar submittals required by the Contract Documents. Shop drawings, product data, samples, and similar submittals are not Contract Documents.

§ 8.9 Use of Site
The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents, and the Owner.

§ 8.10 Cutting and Patching
§8.10.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 8.10.2 Only tradespersons skilled and experienced in cutting, fitting, and patching shall perform such Work. An appropriate member of the construction team shall do all cutting, fitting, or patching on the Work that may be required to make its several parts come together properly and fit the Work to receive or be received by work of other contractors shown by, or reasonably implied by, the Contract Documents for the completed Project. An appropriate member of the construction team shall repair or otherwise make good all such cutting, fitting, or patching after the required Work has been completed as the Architect may direct.

§ 8.10.3 The Contractor shall not cut or otherwise alter any portion of any structure of which the Work is a part or to which the Work is attached without in each instance having first submitted to the Owner Shop Drawings accurately locating each such cut or alteration. The Architect's approval of such Shop Drawings must be obtained prior to making any such cut or alteration.

§ 8.11 Cleaning Up
§ 8.11.1 General Clean Up. The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material; and shall properly dispose of waste materials.

§ 8.11.2 Final Clean Up.
§ 8.11.2.1 Unless the Contract Documents require a higher standard, the Contractor shall leave all Work installed or modified under the Agreement and all existing materials and surfaces affected by the Work and each area of the Project Site clean to the satisfaction of the Owner. This shall include at a minimum: complete dusting, sweeping, vacuuming, mopping, polishing, and other activities as necessary to remove all dust, dirt and other construction residues, and removal of all tools and equipment, construction debris, rubbish, and surplus materials.

§ 8.11.2.2 Immediately before turning any portion of the Project over to the Owner, the Contractor shall have all glass cleaned by professional window washers. Care shall be taken not to scratch any glass. Acid or other cleaning material which will injure or mar the surface or adjacent Work will not be allowed. Any damage resulting from glass cleaning shall be corrected by the Contractor, including the furnishing of new glass of same character and quality or the replacement of other Work damaged or disturbed.

§ 8.12 Indemnification

To the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the Owner, its Board of Education, its Board Members, in their official and individual capacities, its administrators, employees, agents, contractors, successors and assigns, from and against any and all claims, suits, debts, demands, actions, judgments, liens, costs, expenses, damages, losses, injuries and liabilities, expenses, including but not limited to actual attorneys' fees and actual expert witness fees, arising out of or in connection with Contractor's resulting from performance of the Work pursuant to this Agreement and/or from Contractor's violation of any of the terms of this Agreement, including, but not limited to: (i) the negligent acts or willful misconduct of the Contractor, its officers, directors, employees, successors, assigns, subcontractors, consultants and agents; (ii) any breach of the terms of this Agreement by the Contractor, its officers, directors, employees, successors, assigns, subcontractors, consultants and agents; (iii) any violation or breach of any applicable Federal, State or local law, rule, regulation, ordinance, policy and/or licensing and permitting requirements applicable to providing the services; or (iv) any breach of any representation or warranty by the Contractor, its officers, directors, employees, successors, assigns, subcontractors, consultants and agents under this Agreement. The Contractor shall notify the Owner by certified mail, return receipt requested, immediately upon actual knowledge of any claim, suit, action, or proceeding for which the Owner may be entitled to indemnification under this Agreement. This Section shall survive the expiration or earlier termination of this Agreement and shall not be limited by the Contractor's Insurance obligations contained in this Agreement.

In addition, to the fullest extent permitted by law, the Contractor shall indemnify, defend and hold harmless the Owner its Board of Education, its Board Members, in their official and individual capacities, its administrators, employees, agents, contractors, successors and assigns, from any claim, damage, loss, injury or expense, including but not limited to actual attorney fees, incurred by the Owner related to any Hazardous Material or potentially Hazardous Material, waste, toxic substance, pollution or contamination brought into the Project Site or caused by the Contractor or used, handled, transported, stored, removed, remediated, disturbed or dispersed of by Contractor.

ARTICLE 9 ARCHITECT

§ 9.1 The Architect will provide administration of the Contract as described in the Contract Documents. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The Architect will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor.

§ 9.5 The Architect shall make timely recommendations to the Owner regarding the rejection of Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect may require inspection or testing of the Work in accordance with the provisions of the Contract Document, whether or not such Work is fabricated, installed, or completed.

§ 9.6 The Architect will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.7 On written request from either the Owner or Contractor, the Architect will promptly interpret and decide matters concerning performance under, and requirements of, the Contract Documents.

§ 9.8 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from the Contract Documents, and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by the Contractor and will not be liable for results of interpretations or decisions rendered in good faith.

§ 9.9 The Architect's duties, responsibilities, and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions, and the Contract Sum and Contract Time shall be adjusted by Change Order accordingly, in writing. If the Owner changes the Contract Sum, the Owner shall pay the Contractor its actual cost plus reasonable overhead and profit as mutually agreed to by both parties in writing. Changes in the Work shall not be performed by Contractor without the Owner's authorization to proceed.

§ 10.2 Subject to the Owner's written approval, the Architect will have authority to order minor changes in the Work not involving changes in the Contract Sum or the Contract Time and not inconsistent with the intent of the Contract Documents. Such orders shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall carry out such orders promptly.

§ 10.3 Materially Different Conditions

§ 10.3.1 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to reasonable adjustment as mutually agreed to by both parties in writing.

§ 10.3.2 As a professional familiar and accustomed to Project complexity of the type of Work, the Contractor has inspected the Owner's premises and the Contract Documents prior to submitting its proposal and agreeing to the terms of this Agreement (including, but not limited to, terms regarding time and compensation). Upon discovery of conditions the Contractor believes materially differ from those in the Contract Documents, Contractor shall immediately notify the Architect and the Owner, in accordance with Article 10, if additional cost or time is required to remedy such conditions. Owner shall have the right to inspect the discovered hidden conditions, to determine if the Contractor should have reasonably anticipated such conditions before agreeing to a change order for additional work. Contractor will not be entitled to compensation for differing conditions that are removed which the Contractor failed to notify the Owner and offered the Owner opportunities to inspect/verify the condition.

§ 10.4 The Contractor shall not be entitled to any extension of time change to the Contract Sum unless it is included in an authorized change order signed by the Owner and Architect. The Contractor shall submit a written change order request within lesser of twenty-one (21) days after the Contractor discovers or the time the Contractor should have discovered, with the exercise of appropriate diligence, the cause giving rise to the potential change. The Contractor's failure to strictly comply with this Section 10.4 shall constitute a waiver of and shall forever bar any recover for additional time or compensation for the circumstances giving rise to the potential change.

§ 10.5 In no event shall the Contractor be entitled to receive, and the Contractor hereby waives the right to receive any payment or any extension of time for additional or changed work, whether partially or fully completed or simply proposed, unless such additional work is authorized by a written Change Order or Construction Change Directive signed by the Owner, nor shall the Contractor be obligated to proceed with any such Work. Only the Owner shall have the right to issue a written Change Order or Constructive Change Directive to the Contractor authorizing an addition, deletion or other revision in the scope of the Work and/or an adjustment in the Contract Sum or Contract Time.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment as mutually agreed to by both parties in writing.

§ 11.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.

§ 11.4 The Contractor shall provide notice in writing to the Owner of a potential claim for a delay related adjustment to the Contract Sum or Contract Time within five (5) days of start of any delay and shall request in writing all

changes to the Contract Time and Contract Sum within twenty-one (21) days after cessation of the delay. Changes to the Contract Sum shall be limited to Owner caused delays that impact the Project's Critical Path and limited to the to the costs set forth in Sections 11.5 and 11.6 resulting from the delay. The Contractor's failure to strictly comply with this Section 11.4 shall constitute a waiver of and shall forever bar any recover for additional time or compensation for the delay.

§ 11.5 No Damage for Delay. Except only as provided in Section 11.4, in no event shall the Contractor be entitled to any compensation or recovery of any damages in connection with any delay. In no event shall the Contractor be entitled to recover special, incidental, or consequential damages including without limitation, loss of anticipated profits, revenue, or use of capital.

§ 11.6 In the event of Owner Delay, the Contractor may be entitled to an equitable adjustment in the Contract Sum. This adjustment shall be based solely upon and limited to additional direct out-of-pocket expenses to the extent they are incurred directly as a result of the Owner Delay and shall be mutually agreed to by the Parties. Without limiting the generality of the foregoing, such out-of-pocket expenses shall be calculated on an "actual cost" basis, and shall exclude home office expense and other overhead, profit and the value of lost opportunities. However, the Contractor shall use its best efforts to avoid or reduce delay damages caused by Owner Delay.

§ 11.7 All float time in the Construction Schedule shall be shared by the Owner and Contractor or otherwise used for the benefit of the Project.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 Contract Sum

The Contract Sum stated in this Agreement, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 12.2 Applications for Payment

§ 12.2.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for Work completed in accordance with the values stated in this Agreement. The Application shall be supported by data substantiating the Contractor's right to payment as the Owner or Architect may reasonably require, such as evidence of payments made to, and waivers of liens from, Subcontractors and suppliers. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing. Payment to Contractor for materials stored off site is discouraged. Contractor shall prepare the Application for Payment using AIA Standard Form G-702 and G-703 accompanied by required conditional and unconditional lien releases from the Contractor, Subcontractors, suppliers, and delivered to the Architect for review and approval.

§ 12.2.2 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or other encumbrances adverse to the Owner's interests.

§ 12.2.3 Contractor's first Application of Payment is considered incomplete unless in addition to the requirements described in Sections 12.2.1 through 12.2.2, all of the following completed items are also included with the Application of Payment: (1) Performance and Payment Bonds, if required; (2) Certificate of Insurance, as required; (3) Affidavits that the surety and insurance company or companies meets the requirements in Article 5; (4) Construction schedule for the Project; (5) Completed Schedule of Value for the Project.

§ 12.2.4 In addition to the requirements described in Section 12.2.1 through 12.2.2, all Applications for Payment shall also include:

- **.1** a Schedule of Values that updated all approved Change Order amounts added and deducted, if applicable, since the last Application for Payment;
- **.2** an updated Project construction schedule that shows actual progress of the Work through the period covered by the current Application for Payment, and clearly identifying any portion of the Work that is behind schedule (if any portion of Work that is behind schedule, the Contractor shall also include with

the Application for Payment a schedule recovery plan to bring the Work back on schedule in the next thirty (30) days);

.3 a duly executed and acknowledged sworn statement in statutory form and acceptable to the Owner with all information provided, together with properly notarized sworn statements, current through the previous draw, from the Contractor and all of the Subcontractor; and

.4 except as otherwise provided, duly executed unconditional releases in the form required by the Owner establishing payment or satisfaction of all obligations as reflected on the sworn statements, provided, however, that the Contractor may furnish with each Application for Payment applicable waivers of lien or releases and properly notarized sworn statements covering the immediately preceding Application for Payment, as opposed to the current Application for Payment, (i.e., thirty (30) day lag), provided Final Payment shall not be forthcoming until final construction lien waivers, if applicable, or releases from all members of the Construction Team have been delivered.

§ 12.2.5 The Owner shall have the right to withhold sufficient amount from the Application for Payment for unacceptable, defective, deficient, or non-conforming Work ("Disputed Work") after notifying the Contractor. The Contractor shall promptly remedy the Disputed Work. Owner shall promptly render payment for such Disputed Work after the Contractor has cured and the Owner has accepted the remedied Disputed Work.

§ 12.3 Certificates for Payment

The Architect will, within seven (7) days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment with a copy to the Contractor for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part.

§ 12.4 Progress Payments

§ 12.4.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment for undisputed sums in the manner provided in the Contract Documents.

§ 12.4.2 The Contractor shall promptly pay each Subcontractor and supplier, upon receipt of payment from the Owner, an amount determined in accordance with the terms of the applicable subcontracts and purchase orders.

§ 12.4.3 Neither the Owner nor the Architect shall have responsibility for payments to a Subcontractor or supplier.

§ 12.4.4 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the requirements of the Contract Documents.

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

§ 12.4.6 Whenever the Owner reasonably determines, after notice to the Contractor, that there is a basis for concern that payments properly owing to any Subcontractor of any tier, supplier or laborer are not being made on a timely basis, the Owner may elect, but shall not be obligated, to make payments to the joint order of the Contractor and such Subcontractor, supplier or laborer with any such payments satisfying any payment obligation otherwise owing by the Owner to the Contractor. The Owner may also elect at any time to require that payments be made through a construction escrow, in which event the Contractor shall supply all customary forms and indemnities as may be required to satisfy the conditions to disbursement established by the applicable escrowee. All requirements relating to payments and retainages, and applicable submittals to be made by the Contractor, shall be subject to reasonable modification and approval of any lender of the Owner supplying funds to the Project.

§ 12.5 Substantial Completion

§ 12.5.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.

§ 12.5.2 When the Contractor believes that the Work or designated portion thereof is substantially complete, it will notify the Architect and the Architect will make an inspection to determine whether the Work is substantially complete. When the Architect determines that the Work is substantially complete, the Architect shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, establish the

responsibilities of the Owner and Contractor, and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 12.6 Final Completion and Final Payment

§ 12.6.1 Upon receipt of a final Application for Payment, the Architect will inspect the Work. When the Architect finds the Work acceptable and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment in accordance with the terms outlined in the Project Manual.

§ 12.6.2 Final payment shall not become due until the Contractor submits to the Architect releases and waivers of liens, if applicable, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests, or encumbrances arising out of the Contract.

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

§ 12.6.4 Amounts withheld from the final payment to cover any incomplete work are not considered retainage and shall not be paid to the Contractor until the Work is actually completed and accepted by the Owner. Such withholdings shall not be less than 150% of the estimated cost to the complete the Work.

§ 12.6.5 The Owner shall have the right to deduct from the Final Payment due the Contractor all costs, including additional fees paid to Owner's consultants, which the Owner incurred as result of and attributed to Contractor's failure to fully complete and/or closeout the Project within sixty (60) days following Substantial Completion.

§ 12.6.6 Unless otherwise agreed to by the Owner, in writing, the Owner shall not be responsible for costs incurred by the Contractor beyond sixty (60) days following Substantial Completion for the Contract Sum that is based on the Cost of the Work plus Contractor's Fee.

ARTICLE 13 PROTECTION OF PERSONS AND PROPERTY

§13.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury, or loss to employees on the Work and other persons who may be affected thereby, the Work and materials and equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, or by anyone for whose acts the Contractor may be liable.

§13.2 The Contractor shall take all necessary precautions to guard against and eliminate all possible fire hazards and to prevent fire damage to any construction work, building materials, equipment, temporary field offices, storage sheds, and all other property. The Contractor shall provide necessary personnel and fire-fighting equipment to effectively control fires resulting from welding, flame cutting, or other operations involving the use of flame, sparks, or sparking devices. During such operations, all highly combustible or flammable materials shall be removed from the immediate working area. If removal is impossible the same shall be protected with fire blankets or suitable non-combustible shields. The Contractor shall maintain free access to the building areas for fire-fighting equipment and shall at no time block off main roadways or fire aisles without providing adequate auxiliary roadways and means of entrance for fire-fighting equipment, including heavy fire department trucks, where applicable. The Contractor shall at all times cooperate with the Owner and keep the municipal fire department informed of the means of entrance and changes to roadways or fire aisles as needed to provide fire department access to or around to Project site. The Contractor shall maintain during construction an appropriate number of fire extinguishers to meet Factory Mutual (FM) requirements. Fire extinguishers shall be in good working order, conveniently located, clearly visible, and readily accessible for proper protection of the Work.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement, and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of two (2) years after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Assignment of Contract

§15.1.1 Neither party to the Contract shall assign the Contract as a whole without written consent of the other.

§ 15.1.2 The Contractor shall not assign the whole or any part of the Agreement, or any monies due or to become due, without the express written consent of the Owner. If the Contractor, with the Owner's consent, assigns all or any part of the Agreement or any monies due or to become due, the instrument of assignment shall contain a clause satisfactory to the Owner and stating that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to the prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the Work called for in the Agreement.

§ 15.2 Tests and Inspections

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the Architect requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections, or approvals that do not become requirements until after the Contract is executed.

§ 15.3 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules.

§ 15.4 Program Management Software. The Owner plans to utilize a web-based collaborative program management project software to assist in the efficient communication of all Project information to pertinent team members. The selected e-Builder platform will be utilized for storage of all pertinent Project correspondence (Meeting Minutes, RFIs, Submittals, Drawing set issuances, Bulletins, etc.), as well as for payment application and invoice processing, and change management approvals. The Contractor will be required to participate in e-Builder platform training and subsequent utilization of the software for their role and information transfer throughout the Project. The Owner will pay for up to two (2) collaborative licenses for the Contractor.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 Suspension by the Owner and Termination by the Contractor

The Owner may suspend the Work at any time for any reason. If the Work is suspended for more than twenty one (21) consecutive days, the Contractor shall be entitled to an equitable adjustment in the Contract Sum, subject to mutual agreement of the parties. If the Architect fails to certify payment as provided in Section 12.3 for a period of thirty (30)days through no fault of the Contractor, or if the Owner fails to make payment as provided in Section 12.4.1 for a period of thirty (30) days, the Contractor may, upon thirty (30) additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit on the portion of the Work completed to the date of termination.

§ 16.2 Termination by the Owner for Cause

§ 16.2.1 The Owner may terminate the Contract if the Contractor

- **.1** refuses or fails to supply enough properly skilled workers or proper materials;
- **.2** fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
- **.3** disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- **.4** is otherwise guilty of substantial breach of a provision of the Contract Documents.

§ 16.2.2 When any of the above reasons exist, the Owner, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may

.1 take possession of the site and of all materials thereon owned by the Contractor, and

.2 finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished and determination of the sum due pursuant to Section 16.2.4.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of this Agreement.

§ 16.2.5 If the Owner erroneously or improperly terminates the Contractor for cause, then the Owner's action shall be deemed to be a termination for convenience, subject to the provisions of Section 16.3.

§ 16.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause. The Contractor shall be entitled to receive payment for Work properly executed prior to termination.

§16.4 In the event of any termination, the Contractor's and Subcontractor's obligations related to insurance, indemnity, and confidentiality shall survive.

ARTICLE 17 OTHER TERMS AND CONDITIONS

(Insert any other terms or conditions below.)

§ 17.1 The Contractor shall inspect the Work as it is being performed until final completion and acceptance of the Project by the Owner to assure that the Work performed and the materials furnished are in accordance with the Contract Documents and that Work on the Project is progressing on schedule. In the event that the quality control testing should indicate that the Work, as installed, does not meet the requirements of this Project, the Architect shall determine the extent of the Work that does not meet the requirements and the Contractor shall direct the trade contractors(s) to take appropriate corrective action, and advise the Owner of the corrective action.

§ 17.2 The Contractor shall provide daily full-time, on-site field supervision during the entire Construction Phase. The Contractor agrees to assign the following listed Project team members, as listed in their respective capacities to the Project:

Staff Name Assignment Contact Information – Mobile Phone & e-Mail

Additionally, any Subcontractors or suppliers whose subcontract value is $10,000 or more, Contractor has listed those Subcontractors/suppliers in **Exhibit D**, which is attached hereto and made a part of this Agreement. Contractor shall promptly notify the Owner if services of any one of the listed team members become unavailable due to circumstances beyond the Contractor's control – e.g., extended illness or disability, death, or termination of employment, etc. No substitution of any of the above listed project team members shall be made without the prior written consent of the Owner; and before any such substitution the Contractor shall submit to the owner a detailed justification supported by the qualification of any proposed replacement. Owner shall have the right to interview and select alternate team member(s) employed by the Contractor to replace the unavailable team member. Contractor shall agree to provide the services of the alternate team member(s) selected by Owner. Contractor is not entitled to additional compensation for any such substitution(s) of the Project team members. The Owner reserves the right to require the replacement of any or all of the above listed team members for cause; and the Contractor shall provide suitable replacement or replacements upon two (2) weeks' notice, subject to interview and acceptance by the Owner.

§ 17.3 As part of Contract Sum, the Contractor shall conduct a post-occupancy audit eleven (11) months and twenty three (23) months following the Date of Substantial Completion and thereafter provide call-back services for a period of twenty four(24) months.

§ 17.4 Notwithstanding anything regarding hazardous materials, the Contractor acknowledges and fully understands that the scope of this Work includes the proper removal and proper disposal of all hazardous materials, including but not limited to any construction debris containing asbestos, PCBs, etc., as required by applicable federal, state, and local laws, rules, regulations and directives by governmental agencies having jurisdiction over the Project and Project site.

§ 17.5 If any provision of this Agreement shall be held to be illegal, invalid or otherwise unenforceable by law, the remainder of this Agreement shall not be affected thereby and each provision, term, covenant or condition of this Agreement shall be enforced to the fullest extent permitted.

§ 17.6 The Contractor shall comply with the Owner's Policies and Procedures, which will be made available to the Contractor upon request, while on the Project site.

§ 17.7 Dispute Resolution

§ 17.7.1 Alternative Dispute Resolution

Within ten (10) business days of receipt of a written notice of Claim, the parties to a Claim shall attempt in good faith to resolve it promptly by escalating the Claim to persons who have authority to settle the controversy and who are at a higher level of management than the persons with direct responsibility for administration of this Agreement (Negotiation). If the parties agree on the method of resolving such claim, such method shall be embodied in a written agreement signed by the Owner and the Contractor. Any Claim, dispute, or other matter in question arising out of or related to this Agreement and not resolved by Negotiation shall be subject to Alternative Dispute Resolution (ADR) as a condition precedent to binding dispute resolution, pursuant to Section 17.7.1.3.

§ 17.7.1.2 On those occasions when Negotiation does not resolve the Claim, the parties to this Agreement shall be compelled to seek an alternative means of resolving the dispute as a condition precedent to litigation. Therefore, the parties agree to the following terms and conditions:

- **.1** The parties shall designate, by mutual agreement, an independent mediator who shall convene a meeting of the parties within a period of fourteen (14) days of the later of the initial meeting between the parties or the date notice was given pursuant to Section 17.7.1.1. The mediator shall render his/her decision within fourteen (14) days of said meeting;
- **.2** The purpose of the mediation is to attempt to resolve the dispute between the parties. The mediator shall not be empowered with the authority to render a binding opinion or award; the confidentiality of mediation shall be governed by the Michigan Court Rules and the Michigan Rules of Evidence;
- **.3** In the event the independent mediator's attempt to resolve the dispute between the parties fails, then each party will be free to pursue recovery of claims at law;
- **.4** During the pendency of this alternative dispute resolution process, the parties agree that the statute(s) of limitations applicable to all Claims that are the subject of this process shall be tolled.
- **.5** Should a party's claim also concern claims against or by the architect then Owner may include the Architect in the alternative dispute resolution process.
- **.6** The Contractor shall continue providing all services during any dispute, including during the alternative dispute resolution process.

§ 17.7.1.3 The parties shall share the mediator's fee. The Alternative Dispute Resolution shall be held in the place where the Owner is located, as indicated on page one of this Agreement, unless another location is mutually agreed upon.

If the parties do not resolve a dispute through Negotiation or Alternative Dispute Resolution pursuant to this Article 17, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[« »] Arbitration pursuant to Section 21.6 of this Agreement

[« X »] Litigation in a court of competent jurisdiction, unless otherwise mutually agreed to by the parties.

[« »] Other (Specify)

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, claims will be resolved in a court of competent jurisdiction.

§ 17.7.2 NOT USED

§ 17.7.3 NOT USED

§ 17.7.4 In the event the parties resort to a court, and to the extent permitted by law, the parties hereby:

- **.1** Irrevocably consent and submit to the jurisdiction of any Federal, state, county or municipal court sitting in the State of Michigan, County of Wayne, in respect to any action or proceeding brought therein concerning any matters arising out of or in any way relating to this Agreement;
- **.2** Expressly waive any rights pursuant to the laws of any other jurisdiction by virtue of which exclusive jurisdiction of the courts of any other jurisdiction might be claimed;
- **.3** Irrevocably waive all objections as to venue and any and all rights it may have to seek a change of venue with respect to any such action or proceeding;
- **.4** Agree that any final judgment rendered in any such action or proceeding shall be conclusive and may be entered in any other jurisdiction by suit on the judgment or in any other manner provided by law and expressly consent to the affirmation of the validity of any such judgment by the courts of any other jurisdiction so as to permit execution thereon.

§ 17.8 Notice

§ 17.8.1 All notices or other communications hereunder to either party shall be (1) in writing, and, if mailed, shall be deemed to have been given on the earlier of actual receipt by the intended recipient or on the third business day after the date when deposited in the United States mail by registered or certified mail, postage pre-paid, or by personal delivery, Federal Express or other recognized and reputable overnight courier, addressed as hereinafter provided, and (2) addressed as follows:

§ 17.8.2 If to the Owner:
The Owner's Designated Representative:
(Name, address, email address, and other information)

«Phillip Francis, Assistant Superintendent of District Services
«Livonia Public Schools»
«15125 Farmington Road
Livonia, MI 48154 »

With a copy to the Owner's Representative Consultant:
The Owner has engaged Plante Moran Realpoint, LLC (PMR) as an Owner's Representative Consultant and on the Project. The Contractor shall keep the Owner and Owner's Representative Consultant informed in matters regarding the Project. Unless otherwise provided in this Agreement specifically authorized by the Owner, the Owner's Representative Consultant is not authorized to commit the Owner in matters regarding the Work, regarding changes in the Work, Construction Schedule, or grant approval on behalf of the Owner. The Owner reserves for itself the sole right to make decisions in matters regarding the Project. The following individual, subject to change upon written notification to the Contractor, shall be primary contact for the Owner's Representative Consultant:

«Collin Frink »
«Plante Moran Realpoint, LLC »
«3000 Town Center; Suite 100
Southfield, MI 48075
Collin.frink@plantemoran.com; (248) 223-3144»

§ 17.8.3 If to the Contractor:
The Contractor's representative:
(Name, address, email address, and other information)

« »
« »
« »
« »

§ 17.8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten (10) days' prior notice to the other party.

§ 17.9 The Contractor shall notify the Owner in the event of a potential or actual: (a) material change in ownership of the Contractor; (b) intent to dissolve; or (c) intent to otherwise cease active participation in the Project's local marketplace (collectively a "Material Change in Circumstances"). A Material Change in Circumstances shall include any other change that could reasonably give rise to concern on behalf of the Owner regarding the Contractor's ability or willingness to fulfill any of its obligations under this Agreement. In the event of a Material Change in Circumstances, the Contractor shall provide any reasonable assurance or guarantee requested by Owner. Owner shall have the right to terminate this agreement for cause in the event of a Material Change in Circumstances.

§ 17.10 NOT USED

§ 17.11 The Owner, being a public body, shall render required decisions within a reasonable time after being requested to do so by the Contractor. The Contractor, assisted by the Architect, shall prepare and submit all recommendations for which approval is required by Owner as soon as reasonably possible unless another schedule is agreed to by the Owner, in writing. The Contractor shall not cause unreasonable delays in the orderly progress of Work.

§ 17.12 The Contractor shall develop a plan and to administer an effective labor relations program for the Project in order to ensure labor harmony and to avoid labor disputes during construction. The Owner does not and cannot require the Contractor to employ union labor on the Project. Therefore, if it is necessary that the Contractor enters into a project labor agreement to ensure labor harmony and avoid labor dispute during construction, the Contractor shall have the discretion to do so.

§ 17.13 NOT USED

§ 17.14 NOT USED

§ 17.15 GOVERNMENT AGENCY'S IMMUNITY FROM TORT LIABILITY. Notwithstanding any provisions within the Contract Documents, no provisions shall be deemed a waiver of any immunity granted the Owner, being a governmental unit, by statute, including, without limitation. (MCL 691.1407 / ORC 2743.02)

This Agreement entered into as of the day and year first written above.
(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

LIVONIA PUBLIC SCHOOLS,	_____,
OWNER *(Signature)*	**CONTRACTOR** *(Signature)*
«Phillip Francis, Director of Operations»«	« »« »
(Printed name and title)	*(Printed name and title)*
(date)	*(date)*

FILE TRANSFER AGREEMENT

Project: LIVONIA STEVENSON HIGH SCHOOL AUXILIARY TURF FIELD

Project Number:

Specific Type of Work:

FORESITE DESIGN, INC. (FDI) AGREEMENT FOR THE TRANSFER OF INSTRUMENTS OF SERVICE (ELECTRONIC FILES) TO _____.

As per your request, we will provide electronic files for your convenience and use in preparing for your specific work related to the above referenced project, subject to the following terms and conditions:

Hard Copy Instruments
These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. We make no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents prepared by us and the electronic files, the signed or sealed hard-copy documents shall govern. You are responsible for determining if any conflicts exist. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

If addendums, bulletins, construction change directives, change orders, and/or any other change is formally issued to the contract documents, it is your responsibility to request updated CAD files if so needed. FDI will not automatically forward the updated files to you.

Electronic Data Transfer
Our electronic files are compatible with: AutoCAD Release 2010 and 2004. We make no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced specifications. Other software programs may have been used in the development of the drawings and design of the project. FDI will not release any of this associated software for use with the electronic files.

Because information presented on the electronic files can be modified, unintentionally or otherwise, we reserve the right to remove all indicia of ownership and/or involvement from each electronic display.

Data contained on these electronic files are part of our instruments or service and shall not be used by you or anyone else receiving these data through or from you for any purpose other than as a convenience in preparing your work for the above referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to us. You agree to make no claim and thereby waive, to the fullest extent permitted by law, any claim or

cause of action of any nature against us, our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold us harmless against all damages. Liabilities or costs, including reasonable attorneys' fees and defense costs, arising out of or resulting from your use of these electronic files.

Computer Viruses
Computer viruses are a real and serious threat to all computer users. FDI takes steps to detect and eliminate computer viruses from our system and the diskettes that are made available to our clients and colleagues. Since computer viruses can attach at any time, FDI strongly urges its clients and colleagues to back-up their important data frequently and to take steps to detect viruses from any of the files that we make available. Even though FDI takes prudent steps to prevent the attachment of computer viruses to its electronic media, we cannot guarantee this.

If an electronic file is requested and provided by FDI, it is specifically understood and agreed that use of electronic media provided by FDI is done so at the sole risk of the user and the user is responsible for testing for and eliminating computer viruses from any files provided by FDI.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by us, and we make no warranties, either expressed or implied, of merchantability and fitness for any particular purpose. In no event shall we be liable for any loss of profit or any consequential damages as a result of your use or re-use of these electronic files.

Architect:	Agreed by: (signing below indicates that we have read and agree to both pages of this agreement)
Foresite Design, Inc.	_____ Company Name
_____ Michael Sims President	_____ Authorized Signature and Title
Date: _____	Date: _____

SECTION 01 2300
ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for alternates as proposed by the Landscape Architect. The bidder proposes the following Voluntary Alternates for the sums to be deleted from the Base Bid as stated below:

1. Voluntary Alternates or Substitutions proposed by Bidders will not form the Base Bid Proposal Price

B. VOLUNTARY ALTERNATE NO. 1:

_____

_____

_____

Which would save the Owner:

_____ ( ) Dollars

C. VOLUNTARY ALTERNATE NO. 2:

_____

_____

_____

Which would save the Owner:

_____ ( ) Dollars

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Proposal Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment or installation methods described in the Contract Documents.

1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into the work, No other adjustments are made to the Contract

Sum.

B. Voluntary Alternate: Bidders proposing voluntary alternates and substitutions will not be recognized as part of the Base Bid Price. Owner may review voluntary proposal with the successful Bidder.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into the project.

1. Include as part of each alternate, miscellaneous products, equipment, and similar items incidental to or required for a complete installation whether or not indicated as part of the alternate.

B. Notification: Immediately following award of Contract, notify each party involved of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 SCHEDULE OF ALTERNATES

A. Alternate No. 1: Install endzone lettering on the field.

END OF SECTION 01 2300

SECTION 01 2619
CLARIFICATION REQUEST

DUE (5) DAYS PRIOR TO BID DUE DATE
NO LATE CLARIFICATION REQUESTS WILL BE ACCEPTED

Date: _____ Foresite Design Clarification Request #: _____

Project Name: _____

To: 3269 Coolidge Hwy.
Berkley, MI 48072
Office: (248) 547-7757
Attn: **FDI Contact Person & Email**

From: _____
Company Name

_____
Contact Name

_____
Email Address

_____
Phone #

Proposal / Bid Division & Name: _____

Reference Specification: _____

Drawing #: _____ Detail or Item #: _____

ITEM(S) FOR CLARIFICATION: (Use additional forms as required): Please review and respond to the following item(s) for clarification:
RESPONSE:

Architect Response by: _____
Signature Date

END OF SECTION 01 2619

SECTION 01 3523
SAFETY REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Safety is the responsibility of each individual Contractor. Each Contractor shall comply with all local safety ordinances and MI-OSHA regulations and requirements while performing the Work.

B. Each Contractor is required to submit Material Safety Data Sheets (MSDS) to the Construction Manager, to be used for reference only, prior to transporting the material/chemical on site. In addition, it is the responsibility of each Contractor to maintain and accessible MSDS file for their employees, subcontractors, and suppliers on site.

C. Each Contractor shall submit evidence of an Employer Safety Program that complies with current MI-OSHA regulations and requirements prior to beginning any contract Work.

D. The Contractor and their Sub-Contractor(s) and suppliers shall take all necessary precautions to ensure the safety of the public and of workers on the job, and to prevent accidents or injury to any persons, on about, or adjacent to the premises where the Work is being performed. The Contractor and the Sub-Contractor(s) and suppliers shall comply with Federal or State OSHA regulations and all other laws, codes, ordinances, and regulations relative to safety and the prevention of accidents.

E. The Contractor shall designate a responsible representative at the job site as a Safety Representative who shall be responsible for the promotion of safety and prevention of accidents, and shall enforce all applicable laws, ordinances, codes, rules, regulations and standards pertaining to safety and prevention of accidents.

F. Each Contractor shall submit their Experience Modification Rating (EMR) to the Construction Manager. In addition, the Contractor is responsible to provide to the Construction Manager a listing of any MIOSHA violations or citations they have received in the past 5 years.

G. Upon award of Contract, Contractor must provide Construction Manager with a ‘Safety Manual”. Record copy of safety manuals will be retained onsite. Safety Manual shall include the following, but not limited to:
   - Loss Control Program
   - Hazard Communication Program
   - Respiratory Protection Program
   - Necessary Forms Needed to Adequately Perform Job

END OF SECTION 01 3523

SECTION 01 3523
SAFETY REQUIREMENTS

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SECTION 01 4100
REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 PERMITS AND INSPECTION FEES

A. The Contractor will secure and pay for all general building permits.

B. All soil erosion and DEQ permits, mechanical, and electrical permits shall be applied for, secured, and paid for by the Contractor requiring such permits.

C. Any other specialized permits or inspection fees (i.e. utility taps or fees) shall be applied for, secured, and paid by the Contractor requiring such permits.

1.2 INSPECTIONS

A. Any Contractor requiring special inspection by the State or other agency shall arrange and schedule the inspection and give a minimum of 48 hour notice to the Construction Manager, Architect, or Engineer.

B. Partial occupancy permits may be applied for by the Owner. All Contractors will cooperate and assist in securing and maintaining partial occupancy permits.

C. Mechanical and electrical Contractors shall review their specifications to comply with all special testing and inspections.

D. Where the Contract Documents require inspections, tests or approvals of the Work to be made by an independent testing agency or laboratory or an independent professional consultant, the independent testing agency or laboratory or independent professional consultant shall be satisfactory to the Architect, Engineer and Construction Manager.

E. Each contractor shall inspect work of others which will receive or is adjacent to their work before commencing their work. Do not proceed until conditions which would result in a less than satisfactory installation are corrected. Commencing work shall constitute as acceptance of the work or others by the contractor as satisfactory to receive their work.

END OF SECTION 01 4100

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SECTION 01 56 00
CLEANING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Each Contractor shall, throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

B. Related Work:

1. Documents affecting work of this Section include, but are not limited to, General Conditions, Supplementary Conditions, and Section in Division 1 of these Specifications
2. In addition to Standards described in this Section, comply with requirements for cleaning as described in other pertinent Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.1 CLEANING MATERIALS AND EQUIPMENT

A. Each Contractor shall provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

B. Portable toilets are to be provided by the contractor for use by their employees.

2.2 COMPATIBILITY

A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

3.1 PROGRESS CLEANING

A. General; the Contractor shall:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing protection of materials from weather.
2. Not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work either inside the building nor on the property surrounding the work site.
3. At least once a week, and more often if necessary completely remove all scrap, debris, and waste material from the building and facility. If a dumpster is required for this work, it shall be

paid for by the Contractor(s).

4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often if necessary, inspect the site and pickup all scrap, debris, and waste material. Remove items to the place designated for their storage. Contractor shall dry sweep street(s) affected by construction traffic as directed, for the duration of the construction.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restack, tidy or otherwise service arrangements to meet the requirements as noted above. Contractor shall water/wet sweep street(s) affected by construction traffic once a week, for the duration of the construction.
3. Maintain the site in a neat and orderly condition at all times.

C. Structures:

1. Weekly, and more often if necessary, sweep sidewalks, City roads, as directed.
   a. “Clean: for the purposes of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort, hand-held broom, and heavy-duty vehicle sweeper.
2. Protect existing structures, finishes and materials. Should work occur near existing structures or finishes, Contractor shall ensure materials are left clean. Any damage caused by the Contractor shall be repaired or replaced by Contractor as directed by the Architect, at no additional cost to the Owner.
   a. “Clean”, for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finished material.

3.2 FINAL CLEANING

A. “Clean” for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality equipment and materials.
B. Prior to completion of Work, remove from the job site, all tools, surplus materials, equipment, scrap, debris and waste. Location of surplus materials for Owner use shall be coordinated with Owner prior to Contractor leaving site.

END OF SECTION 01 4100

SECTION 01 7100
SITE EXAMINATION & PREPARATION

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. The work under this Division consists of furnishing all labor, materials and equipment required for:

1. Construction of synthetic turf auxiliary field
2. Construction of gravel drive around new field
3. Installation of vinyl chainlink fence

C. Bidders shall visit the site before submitting proposals and fully inform themselves as to the job and site conditions and other conditions under which the work of this section must be conducted. Verify themselves with the soil conditions at the site and familiarize themselves with the existing conditions that may be adjusted for this project. Submission of proposals implies that the Bidder has visited the site and is fully aware of these conditions.

D. A pre-construction conference shall be held on the job site with all intended Contractors and Sub-contractors prior to the start of any work.

PART 2 - PRODUCTS

N/A

PART 3 - EXECUTION

3.1 SURVEY REQUIREMENTS

A. The Contractor shall provide all survey work required to locate lines and grades for the construction of this project as herein specified and shown on drawings. The Contractor shall employ a registered engineer or surveyor for this layout.

B. The Contractor upon entering the site and before any other work is underway, shall establish and set control points as indicated on the drawings and verify all finish grades.

C. Existing survey as shown on the drawings is based on information provided for the generating of the enclosed construction drawings and accurate at time taken. Contractor shall verify field conditions and notify the Landscape Architect or Owner before bid date of any discrepancies found in the survey or site conditions.

D. The Contractor shall provide a complete "as built" survey of the site within the site limits, noting all grades, locations, etc. if final constructed project should vary from bid documents.

E. All work under this section shall be coordinated with the Landscape Architect so as to verify their understanding of the plans and intended layout.

SECTION 01 7100
SITE EXAMINATION & PREPARATION

END OF SECTION 31 1000

SECTION 01 7301
FIELD ENGINEERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 WORK INCLUDED

A. Upon receipt of contract award, contractors are responsible to provide and pay for additional field engineering services required including all survey work.

B. All survey work related to the project shall be completed by one (1) Surveyor.

1.3 QUALIFICATIONS

A. Registered Professional Surveyor, acceptable to Owner, Construction Manager and Engineer.

1.4 SURVEY/ EXISTING CONDITIONS PLAN

A. Survey documents provided are based on past survey work and historic drawings and field verification. Contractor shall field verify horizontal and vertical site conditions. Any discrepancies in documents shall be immediately reported to Owner's Representative, Construction Manager, and Engineer prior to the start of construction.

1.5 SURVEY REFERENCE POINTS

A. Contractor shall establish control points prior to starting site work. Contractor shall protect and preserve all control and reference points during construction.

B. Make no changes or relocation without prior written notice to Owner's Representative, Construction Manager, and Engineer.

C. Report to Owner's Representative, Construction Manager, and Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

D. Contractor shall be required to replace project control points which may be lost or destroyed.

1.6 RECORDS

A. Maintain a complete, accurate log of all control and survey work as it progresses.

1.7 SUBMITTALS

A. Submit name and address of Surveyor to Construction Manager.

B. On request of Construction Manager, Owner's Representative or Engineer, submit documentation to verify accuracy of field engineering work.

C. Submit certificate signed by Registered Surveyor certifying that elevations and locations of improvements are in conformance, or non-conformance, with Contract Documents.

D. Provide “As-Built” drawings reflecting any changes illustrated on the contract documents.

PART 2 – PRODUCTS – Not Applicable

PART 3 – EXECUTION – Not Applicable

END OF SECTION 01 7301

SECTION 01 7700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

A. Comply with requirements stated in Conditions of the Contract and in the Specifications for administrative procedures in closing out the work.

1.2 SUBSTANTIAL COMPLETION

A. Refer to General Conditions of the Contract for Construction.

B. When the Project is determined by the Landscape Architect to be sufficiently complete to permit utilization for the intended use, the Landscape Architect will issue a Certificate of Substantial Completion.

C. To receive the Certificate of Substantial Completion, Contractor shall perform the following:

1. Submit to the Architect a notice declaring that work is believed to be substantially complete.
2. Submit a list of work items that remain to be completed or corrected and the date this work will be accomplished.

D. Architect will visit the project to evaluate the request for issuance of Certificate of Substantial Completion.

1. If the Architect concurs that the Project is substantially complete, the Architect will deliver a Certificate of Substantial Completion and a list of work items necessary for completion or correction prior to the request for inspection for final completion.
2. If the Architect determines that the work is not substantially complete, the Architect will deliver to the Contractor a written statement including reasons.
3. Complete work on the items required by the Architect for achieving substantial completion and make additional written requests for issuance of Certificate of Substantial Completion until the Architect determines that sufficient work has been performed.

1.3 CLOSEOUT SUBMITTALS

A. When the Architect has determined and the Construction Work is acceptable under the Contract Documents and the Contract fully performed, prepare and submit final Application for Payment to the Architect together with the (1) copy of the following:

1. A letter recommending acceptance of Project and indicating all punch list items are complete.
2. Project Record Documents, Warranties and Bonds
3. Sworn Statements and Waivers

B. Architect will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.

1.4 FINAL APPLICATION FOR PAYMENT

A. Submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.

SECTION 01 7700
PROJECT CLOSEOUT

END OF SECTION 01 7700

SECTION 01 7823
OPERATING, MAINTENANCE AND WARRANTY DATA

PART 1 - GENERAL

1.1 SUMMARY

A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under the Contract.

B. Prepare operating, maintenance and warranty data as specified in this Section and as referred in other pertinent sections of Project Manual.

C. Instruct Owner's personnel in the maintenance of products and in the operation of equipment and systems.

D. Related Sections:

1. Specification Section 01 7800 Project Closeout
2. Specification Section 01 7839 Project Record Documents

1.2 QUALITY ASSURANCE

A. Preparation of data shall be done by personnel with the following qualifications:

1. Trained and experience in maintenance and operation of the described products.
2. Completely familiar with requirements of this Section.
3. Skilled as a technical writer to the extent required to communicate essential data.
4. Skilled as a draftsman competent to prepare required drawings.

1.3 FORM OF SUBMITTALS

A. Prepare data in the form of an instructional manual for use by the Owner's personnel.

B. Format shall conform to the following:

1. Size: 8-1/2" x 11"
2. Paper: 20 pound minimum, white for typed pages
3. Text: Manufacturer's printed data, or neatly typewritten
4. Drawings:
    a. Provide reinforced punched binder tab, bind in with text
    b. Fold larger drawings to the size of the text pages
5. Provide fly-leaf for each separate product, or each piece of equipment.
    a. Provide typed description of product, and major component parts of equipment.
    b. Provide indexed tab.
6. Cover: Identify each volume with typed or partial title "OPERATING, MAINTENANCE AND WARRANTY INSTRUCTIONS". List:
    a. Title of Project
    b. Identity of separate structure as applicable
    c. Identity of general subject matter covered in manual

SECTION 01 7823
OPERATING, MAINTENANCE AND WARRANTY DATA

1.4 CONTENT OF MANUAL

A. Arrange neatly typewritten table of contents for each volume, in the following systematic order:

1. Contractor, name of responsible principal, address and telephone number
2. A list of each product required to be included, indexed to the content of volume.
3. List, with each product, the name, address and telephone number of:
    a. Contractor or installer
    b. Maintenance contractor, as appropriate
    c. Identify the area of responsibility of each
    d. Local source of supply for parts and replacement
    e. Include warranty information as specified
4. Identify each product by product name and other identifying symbols such as set in Contract Documents.

1.5 SUBMITTAL SCHEDULE

A. Submit one copy of completed data in final form within thirty days of substantial completion, Copy will be returned with comments.

B. Submit two copies of approved data in final form within ten (10 days after comments are received.

END OF SECTION 01 7823

SECTION 01 7839
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Fully cooperate with the Architect to accomplish the following.

B. These requirements supplement the requirements set forth in the General Conditions.

C. Maintain at each site one record copy, as applicable, of:

1. Drawings and data with addenda marked in.
2. Specifications with addenda marked in.
3. Addenda
4. Change Orders and other modifications to the Contract.
5. Architect/Engineer Supplemental Instructions, Proposal Requests or written instructions.
6. Approved shop drawings, product data and samples.
7. Field test records.

1.2 MAINTENANCE OF RECORD DOCUMENTS AND SAMPLES

A. Store record documents and samples in Contractor’s field office in files and racks. Provide locked cabinet or secure storage space for storage of samples.

B. Maintain record documents in a clean, dry, legible condition and in good order. Do not use documents for construction purposes.

C. Make record documents and samples available at all times for inspection by Architect or Owner.

1.3 RECORDING

A. Label each document “PROJECT RECORD” in neat large printed letters.

B. Continuously record information and changes.

C. Drawings: Legibly mark to record actual construction.

1. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
2. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
3. Field changes of dimension and detail.
4. Changes made by Field Order or by Change Order.
5. Details not on original contract drawings.

D. Specifications and Addenda: Legibly mark each section to record:

1. Manufacturer, trade name, catalog number, and Supplier of each Product and item of equipment actually installed.
2. Changes made by Field Order or Change Order.

SECTION 01 7839
PROJECT RECORD DOCUMENTS

E. Shop Drawings and Submittals: Label each set by corresponding specification section. At the completion of the project, provide the Owner with one complete set, reviewed and stamped by Architect, organized by Specification Section in the following formats:

1. Paper (various sizes) folded to 8-1/2” x 11” and boxed with project name and completion data clearly labeled on exterior.
2. Scanned PDF copy on a compact disk, ordered by specification section.

1.4 SUBMITTAL

A. Deliver Record Documents to the Owner at contract close-out.

B. Accompany submittal with transmittal letter in duplicate, containing:

1. Date
2. Project Title
3. Title and number of each Record Document

END OF SECTION 01 7839

SECTION 02 3208
SOIL BORINGS

I. Disclaimer

A. This information is not part of the contract documents and is being made available to bidders with the understanding that it represents the best available information regarding existing conditions and that no warranty or guaranty of such existing conditions is intended.
B. The Owner and the Landscape Architect do not warrant conditions below the depths of the boring or that strata logged are necessary typical of the entire site, or that proportions of the various materials will not vary from those indicated.

II. On-Site Investigation

A. Contractor shall visit site prior to bidding acquainting himself with site conditions
B. Prior to bidding, Contractor may make his own sub-surface investigations to satisfy himself with site and sub-surface conditions, as his basis for bidding.
C. Rock and debris excavation will be incidental with no direct compensation being made.
D. The Contractor must contact and clear arrangements with the Owner prior to entering the premises.

III. Cores of Existing Asphalt

Coring data will not be guaranteed by either Owner or the Engineer. There is also no guarantee that the conditions revealed at the actual boring locations will be continuous over the entire site. The information is correct only for the time and place taken and is offered as general information only.

Cores of existing bituminous asphalt have been taken with the following results:

END OF SECTION 02 3208

CONSULTING GROUP

Report on Geotechnical Investigation

Proposed LPS Stevenson High School Turf Field
33500 6 Mile Road
Livonia, Michigan 48152

Latitude 42.417206° N
Longitude -83.382296° W

Prepared for:

Livonia Public Schools
33500 6 Mile Road
Livonia, Michigan 48152
G2 Project No. 233838
April 8, 2024

g2consultinggroup.com

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CONSULTING GROUP

April 8, 2024

Livonia Public Schools
33500 6 Mile Road
Livonia, Michigan 48152
c/o Collin Frink (Plante Moran Realpoint)

Re: Report on Geotechnical Investigation
Proposed LPS Adlai E. Stevenson High School Turf Field
33500 6 Mile Road
Livonia, Michigan 48152
G2 Project No. 233838

To whom it may concern:

We have completed the geotechnical investigation for construction of the proposed artificial turf fields to be constructed within the existing Livonia Public Schools (LPS) Adlai E. Stevenson high school campus located at 33500 6 Mile Road in Livonia, Michigan. This report presents the results of our observations, analyses, and recommendations related to earthwork, subgrade preparation, synthetic turf construction, and in-situ infiltration, as well as related construction considerations.

We appreciate the opportunity to be of service to you and look forward to discussing the recommendations presented herein. In the meantime, if you have any questions regarding the report or any other matter pertaining to the project, please call us.

Sincerely,

G2 Consulting Group, LLC

Tyler Hesse

Tyler S. Hesse, P.E.
Project Engineer

Jason B. Stoops

Jason B. Stoops, P.E.
Associate / Project Manager

TSH/JBS/jbs

Enclosures

EXECUTIVE SUMMARY

We understand that the project consists of constructing improvements to the existing athletic facilities within the existing Livonia Public Schools (LPS) Adlai. E. Stevenson high school campus located at 33500 6 Mile Road in Livonia, Michigan. More specifically, we understand that new synthetic turf fields will be constructed to the east and west of the existing football field.

Approximately 2 to 12 inches of sand topsoil is present at the ground surface within the soil boring locations. Very loose to medium compact granular fill soil consisting of sand, clayey sand, and sandy silt underlies the topsoil within soil borings B-01 through B-09, and B-12, extending to approximate depths ranging from 3-1/2 to 9 feet below existing grades. The fill soils contain intermixed topsoil, as well as wood, glass, brick, plastic, and trash debris, and have organic matter contents ranging from 0.5 to 25.5 percent. Very loose to medium compact native granular soil consisting of sand and silty sand underlie the fill soils within B-01 through B-06, B-08, B-09, and B-12, and the topsoil within B-10, B-11, and B-13 extending to depths ranging from 9-1/2 feet to the explored depth of 10 feet below existing grades. Stiff to very stiff native cohesive soils consisting of silty clay and sandy clay underlies the native granular soils within B-06 and the fill soils within B-07 extending to the explored depth of 10 feet below existing grades.

Groundwater observations were made during and upon completion of drilling operations. During drilling operations, groundwater was encountered at depths ranging from 3-1/2 to 9 feet below existing grades (Elevation 657-1/2 to 677-1/4 feet) within the soil boring locations. Upon completion of drilling operations, groundwater was measured at depths ranging from 4-1/2 to 9 feet below existing grades (Elevation 657-1/2 to 676-3/4 feet) within the soil boring locations.

Granular fill soils consisting of sand, clayey sand, and sandy silt is present within soil borings B-01 through B-09, and B-12, extending to approximate depths ranging from 3-1/2 to 9 feet below existing grades. The fill soils contain intermixed topsoil, as well as brick, wood, glass, plastic, and trash debris, and have organic matter contents ranging from 0.5 to 25.5 percent. More specifically, the eastern most borings (B-03, B-05, and B-08) have organic matter contents ranging from 2.7 to 25.5 and the remainder of the borings generally have organic matter content ranging from 0.5 to 5.5 percent. If excessive settlement cannot be tolerated, we do not recommend that the turf field be constructed within the vicinity of B-03, B-05, and B-08, due to the high organic matter contents.

We anticipate some subgrade instability may be encountered within the influence of the proposed eastern turf field, due to deep fill soils with low relative density and intermixed organic matter. As such, the subgrade may be required to be improved via cement stabilization or by incorporating geogrid.

We anticipate that the synthetic turf fields will include drain tiles that are meant to capture and redirect stormwater to an underground storage system. We understand that is desired to detain the captured stormwater until is it released into the underlying soil by means of subsurface infiltration. It was reported to us that the desired invert elevation for the proposed underground stormwater management system will be approximately 8 feet below existing grade (Elevation 672-1/4 feet). However, due to a shallow groundwater depths of approximately 8 feet, infiltration testing was performed at a depth of 5-1/2 feet below existing grade (Elevation 674-3/4 feet) adjacent to soil boring B-12. The resulting observed infiltration rate was 2-1/4 inches per hour. The proposed BMP may be constructed; however, it should be designed accordingly to accommodate the relatively low observed infiltration rate.

We anticipate the proposed underground stormwater management system will have approximate invert depths ranging from 5-1/2 to 8 feet below finished grades. We anticipate caving and/or sloughing of the native granular and/or granular fill soils during excavation operations. As such, the earthwork contractor should be prepared to bench or slope back excavations.

We anticipate that groundwater will be encountered within excavations extending below a depth of 6 feet below existing grades. We anticipate surface water runoff and groundwater intrusion can be lowered by 1 to 2 feet with a properly constructed system of sumps and pumps.

Do not consider this summary separate from the entire text of this report, with all the conclusions and qualifications mentioned herein. Details of our analysis and recommendations are discussed in the following sections and in the Appendix of this report.

PROJECT DESCRIPTION

We understand that the project consists of constructing improvements to the existing athletic facilities within the existing Livonia Public Schools (LPS) Adlai. E. Stevenson high school campus located at 33500 6 Mile Road in Livonia, Michigan. More specifically, we understand that new artificial turf fields will be constructed to the east and west of the existing football field. Furthermore, we understand that associated utilities will be constructed in conjunction with this project.

Based on the provided topographical survey, existing surface grades within the influence of the proposed western turf field range from elevation 680 feet to 682 feet. At the time of this report, the exact location of the eastern turf field was unavailable. Based on the provided topographical survey, existing grades within the general vicinity of the proposed eastern turf field range from elevation 666 feet to 683 feet. At the time of this report, a grading plan indicating finished grades within the proposed turf fields was unavailable at the time of this report. It is assumed that finished grades will be within one (1) foot of existing grades.

If information related to existing and final site grades becomes available or changes, G2 Consulting Group, LLC (G2) should be notified in order to re-evaluate the recommendations provided herein. The purpose of our exploration is to determine and evaluate the general subsurface conditions at the site and to develop recommendations for earthwork, subgrade preparation, artificial turf field construction, and in-situ infiltration considerations, as well as related construction considerations as they relate to the geotechnical conditions on site.

SCOPE OF SERVICES

The field operations, laboratory testing, and engineering report preparation were performed under direction and supervision of a licensed professional engineer. Our services were performed according to generally accepted standards and procedures in the practice of geotechnical engineering in this area. Our scope of services for this project is as follows:

1. We performed a total of thirteen (13) soil borings throughout the LPS Adlai E. Stevenson high school campus. Soil borings B-01 through B-08 and B-09 through B-13 were performed within the vicinity of the proposed eastern and western artificial turf field(s), respectively, extending to a depth of 10 feet each.

2. We performed one (1) downhole infiltration testing adjacent to soil boring B-12.

3. We performed laboratory testing on representative samples obtained from the soil borings. Laboratory testing included visual engineering classification, natural moisture content, organic matter content, and unconfined compressive strength determinations.

4. We prepared this engineering report. The report includes recommendations regarding earthwork, subgrade preparation, artifical turf field construction, and in-situ infiltration considerations.

FIELD OPERATIONS

Plante Moran Realpoint, in conjunction with G2, selected the number, depth, and location of the soil borings. The soil boring locations were determined in the field by a G2 representative using GPS assisted mobile technology and conventional taping methods by measuring from known surface features prior to the soil boring operations. The approximate soil boring locations are shown on the Soil Boring Location Plans, Plate Nos. 1 and 2. Existing ground surface elevations at the soil boring locations were estimated by using the spot elevations and by interpolating between the elevation contours presented on the provided topographical survey. The resulting elevations are presented on the Soil Boring Logs, Figure Nos. 1 through 13.

The soil borings were drilled using an all-terrain vehicle (ATV) mounted rotary drilling rig. Continuous flight 2-1/4 inch inside diameter hollow-stem augers were used to advance the borehole to the explored depths. Soil samples were obtained at 2-1/2 foot intervals. The samples were obtained by the Standard Penetration Test method (ASTM D 1586), which involves driving a 2-inch diameter split-spoon sampler into the soil with a 140-pound weight falling 30 inches. The sampler is generally driven three successive 6-inch increments with the number of blows for each increment recorded. The number of blows required to advance the sampler the last 12 inches is termed the Standard Penetration Resistance (N). The blow counts for each 6-inch increment and the resulting N-value are presented on the soil boring logs.

The soil samples were placed in sealed containers and brought to our laboratory for testing and classification. During field operations, the driller maintained logs of the subsurface conditions, including changes in stratigraphy and observed groundwater levels. The final boring logs are based on the field boring logs supplemented by laboratory soil classification and test results. The boreholes were backfilled with auger cuttings upon completion of drilling operations.

In-situ infiltration testing was performed adjacent to soil boring B-12. The infiltration test was performed in general conformance with the falling head permeability test using a modified testing apparatus. The setup consisted of a 5-1/2-foot deep borehole fitted with PVC casing. The PVC casing was filled with water and the rate at which the water dropped within the casing was measured over the course of three (3) hours. Once the infiltration testing was complete, the PVC casing was removed, and the associated borehole was backfilled with the excavated spoils.

LABORATORY TESTING

Representative soil samples were subjected to laboratory testing to determine soil parameters pertinent to site preparation and synthetic turf construction. An experienced geotechnical engineer classified the samples in general conformance with the Unified Soil Classification System (USCS). Laboratory testing was conducted in conformance with the following ASTM Test Methods:

- "Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass" (ASTM D2216); and
- "Standard Test Method for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils (ASTM D2974).

The unconfined compressive strengths were determined using a spring-loaded hand penetrometer. The hand penetrometer estimates the unconfined compressive strength to a maximum of 4-1/2 tons per square foot (tsf) by measuring the resistance of the soil sample to the penetration of a calibrated spring-loaded cylinder.

The results of the moisture contents, organic matter contents, and unconfined compressive strengths are indicated on the Soil Boring Logs, Figure Nos. 1 through 13, at the depths the samples were obtained. We will hold the soil samples for 60 days from the date of this report, after which time they will be discarded. If you would like the samples, please let us know.

SITE DESCRIPTION

The existing Adlai E. Stevenson High School campus is located at 33500 Six Mile Road in Livonia, Michigan. The campus is bounded by residential developments / wooded areas to the north, east, and west, and by Six Mile Road to the south.

The campus consists of single-story high school building with associated bituminous and Portland cement concrete (PCC) pavements, two (2) baseball diamonds with associated dugout structures, a synthetic turf football field with an associated perimeter running track, ticket booth structures, and grandstands, and a grass athletic field. The remainder of the campus is grass covered and includes several mature trees and vegetation.

Based on the provided topographical survey, existing surface grades within the proposed turf fields range from 666 feet to 683 feet. In general, existing grades slope downward from northwest to southeast.

SOIL CONDITIONS

Approximately 2 to 12 inches of sand topsoil is present at the ground surface within the soil boring locations. Granular fill soil consisting of sand, clayey sand, and sandy silt underlies the topsoil within soil borings B-01 through B-09, and B-12, extending to approximate depths ranging from 3-1/2 to 9 feet below existing grades. The fill soils contain intermixed topsoil, as well as wood, glass, brick, plastic, and trash debris, and have organic matter contents ranging from 0.5 to 25.5 percent. Native granular soil consisting of sand and silty sand underlie the fill soils within B-01 through B-06, B-08, B-09, and B-12, and the topsoil within B-10, B-11, and B-13 extending to depths ranging from 9-1/2 feet to the explored depth of 10 feet below existing grades. Native cohesive soils consisting of silty clay and sandy clay underlies the native granular soils within B-06 and the fill soils within B-07 extending to the explored depth of 10 feet below existing grades.

The granular fill soils are very loose to medium compact in relative density, with standard penetration test (SPT) N-values ranging from 1 to 27 blows per foot (bpf). The native granular soils are very loose to medium compact in relative density with SPT N-values ranging from 4 to 23 bpf. The native cohesive soils are stiff to very stiff in consistency, with natural moisture contents ranging from 24 to 27 percent, and unconfined compressive strengths ranging from 2,000 psf to 4,500 psf.

The stratification depths shown on the soil boring logs represent the soil conditions at the specified locations. Variations may occur between and away from the soil boring locations. Additionally, the stratigraphic lines represent the approximate boundaries between soil types. The transition may be more gradual than indicated. We have prepared the soil boring logs on the basis of the field logs of the soil conditions encountered supplemented by laboratory classification and testing.

The Soil Boring Location Plans, Plate Nos. 1 and 2, and Soil Boring Logs, Figure Nos. 1 through 13, are presented in the Appendix. The soil profiles described above are generalized descriptions of the conditions encountered at the soil boring locations. General Notes Terminology defining the nomenclature used on the soil boring logs and elsewhere in this report are presented on Figure No. 14.

GROUNDWATER CONDITIONS

Groundwater observations were made during and upon completion of drilling operations. During drilling operations, groundwater was encountered at depths ranging from 3-1/2 to 9 feet below existing grades (Elevation 657-1/2 to 677-1/4 feet) within the soil boring locations. Upon completion of drilling operations, groundwater was measured at depths ranging from 4-1/2 to 9 feet below existing grades (Elevation 657-1/2 to 676-3/4 feet) within the soil boring locations.

Fluctuations in perched and long-term groundwater levels should be anticipated due to seasonal variations and following periods of prolonged precipitation. It should also be noted that groundwater observations made during drilling operations in predominantly cohesive soils are not necessarily indicative of the static groundwater level. This is due to the low permeability of such soils and the tendency of drilling operations to seal off the natural paths of groundwater flow.

SITE PREPARATION

We anticipate earthwork operations will consist of complete removal of topsoil, trees, and vegetation within the footprint of the proposed artificial turf fields, demolition of the existing PCC pavements within the influence of the proposed fields, proof-compacting and stabilizing the exposed subgrade, excavating for the proposed BMP and drainage tile, and preparing subgrade for artificial turf field support. We recommend all earthwork operations be performed in accordance with comprehensive specifications and be properly monitored in the field by qualified personnel under the direction of a licensed professional

engineer.

At the start of earthwork operations, any existing topsoil, trees, or vegetation should be removed in their entirety within the footprint of the proposed artificial turf fields. After site stripping, the exposed subgrade is anticipated to consist of granular fill and/or native granular soils. Where granular soils are encountered, soils should be proof-compacted with a heavy smooth-drum vibratory roller and should be visually evaluated for instability and/or unsuitable soil conditions by a qualified geotechnical engineer or technician. We recommend 10 passes in two perpendicular directions during the proof-compaction operations. Any resulting undercut excavations should be backfilled with engineered fill. We recommend the vibratory setting be turned off within 25 feet of any existing structures.

Based on the provided topographical survey, existing surface grades within the influence of the proposed western synthetic turf field range from elevation 680 feet to 682 feet. At the time of this report, the exact location of the eastern synthetic turf field was unavailable. Based on the provided topographical survey, existing grades within the general vicinity of the proposed eastern synthetic turf field range from elevation 666 feet to 683 feet. At the time of this report, a grading plan indicating finished grades within the proposed turf fields was unavailable at the time of this report. It is assumed that finished grades will be within one (1) foot of existing grades.

Granular fill soils consisting of sand, clayey sand, and sandy silt is present within soil borings B-01 through B-09, and B-12, extending to approximate depths ranging from 3-1/2 to 9 feet below existing grades. The fill soils contain intermixed topsoil, as well as brick, wood, glass, plastic, and trash debris, and have organic matter contents ranging from 0.5 to 25.5 percent. More specifically, the eastern most borings (B-03, B-05, and B-08) have organic matter contents ranging from 2.7 to 25.5 and the remainder of the borings generally have organic matter content ranging from 0.5 to 5.5 percent. If excessive settlement cannot be tolerated, we do not recommend that the turf field be constructed within the vicinity of B-03, B-05, and B-08, due to the high organic matter contents. The remainder of the surficial fill soils are marginally suitable for support of the proposed turf fields, provided passing a proof-compaction evaluation.

We anticipate some subgrade instability may be encountered within the influence of the proposed eastern turf field, due to deep fill soils with low relative density and intermixed organic matter. As such, the subgrade may be required to be improved via cement stabilization or by incorporating geogrid. For cement stabilization, the area should be rough graded, scarified, and pulverized, at which point cement binder would be added to the soil. Once the cement binder is placed, the area should be graded, compacted, and allowed to cure. If cement stabilization is not feasible, we recommend utilizing geogrid. This would consist of placing a TENSAR Tri-Ax geogrid (Type III) or equivalent on the exposed subgrade followed by 12-inches of a MDOT 21AA dense-graded aggregate. The aggregate should be placed in an engineered manner and compacted to a minimum of 95 percent of the maximum dry density. The geogrid should extend to a minimum of 5 feet beyond the edges of the unstable area.

We anticipate engineered fill may be required to raise/balance grades within the vicinity of the two (2) proposed turf fields. Engineered fill should be free of organic matter, frozen soil, clods, or other harmful material. The fill should be placed in uniform horizontal layers that are not more than 9 inches in loose thickness. The engineered fill should be compacted to achieve a density of at least 95 percent of the maximum dry density as determined by the Modified Proctor compaction test (ASTM D 1557). All engineered fill material should be placed and compacted at approximately the optimum moisture content. Frozen material should not be used as fill, nor should fill be placed on a frozen subgrade. In order to economically conduct earthwork operations at the site, imported fill, adhering to the aforementioned requirements, should consist of low plasticity clays or well-graded aggregates. Low plasticity clays, having a plasticity index less than 20 percent, should be placed within +3 or -1 percent of the optimum moisture content as determined by the Modified Proctor Test (ASTM D1557). For well-graded aggregates, such as MDOT Class II Sand, we recommend the engineered fill be placed at ±2 percent of the optimum moisture content as determined by ASTM D1557.

ARTIFICIAL TURF FIELD RECOMMENDATIONS

We understand that new artificial turf fields will be constructed to the east and west of the existing football field. At the time of this report, the exact footprint/location of the eastern turf field was unknown.

Approximately 3 to 12 inches of sand topsoil is present at the ground surface within the vicinity of the proposed eastern turf field (B-01 through B-08. The topsoil is underlain by 3-1/2 to 9 feet of granular fill soils. The fill soils have intermixed topsoil, as well as glass, brick, wood, and glass debris, and organic matter contents ranging from 0.6 to 25.5 percent. More specifically, the fill soils to the east and west of the existing PCC sidewalk have organic matter contents ranging from 2.7 to 25.5 percent and 0.6 to 5.5 percent, respectively.

Approximately 2 to 10 inches of sand topsoil is present at the ground surface within the vicinity of the proposed western turf field (B-09 through B-13). The topsoil is underlain by 4 to 5-1/2 feet of granular fill soils within B-09 and B-12. The fill soils have intermixed topsoil, as well as glass and brick debris, and an organic matter content of 0.5 percent.

The existing topsoil within the influence of the proposed turf fields should be completely removed. Due to the high organic matter contents, we do not recommend that the proposed eastern turf field be constructed to the east of the existing PCC sidewalk. The granular fill soils within the remainder of the eastern field borings (B-01, B-02, B-04, B-06, and B-07) and western field are marginally suitable for support for the proposed artificial turf fields, provided passing a proof-compaction evaluation. We anticipate the exposed subgrade within the two (2) turf fields will consist of granular fill, native granular soils, or engineered fill.

Any undercuts performed within the proposed artificial turf field should be backfilled in an engineered manner as discussed in the SITE PREPARATION section of this report. We recommend undercut areas be drained with drain tile such that water cannot pool within the undercut backfill material.

After any undercuts are performed and backfilled, we recommend placing drainage tiles consisting of 8-inch diameter pipes supported on a gravel bed and backfilled with a gravel drainage layer spaced 20 feet apart. The drainage tiles must be connected to an outlet pipe. In addition, we recommend the turf system include a minimum of 12-inches of open-graded drainage stone to provide turf stability and to promote subsurface drainage within the proposed artificial turf system. The field subgrade soils should be crowned the same as the proposed field to promote subsurface drainage to the sides of the field.

INFILTRATION CONSIDERATIONS

We anticipate that the artificial turf fields will include drain tiles that are meant to capture and redirect stormwater to an underground storage system. We understand that is desired to detain the captured stormwater until is it released into the underlying soil by means of subsurface infiltration.

It was reported to us that the desired invert elevation for the proposed underground stormwater management system will be approximately 8 feet below existing grade (Elevation 672-1/4 feet). Upon completion of drilling operations, groundwater was measured at a depth of 8 feet (Elevation 672-1/4 feet). Per the Wayne County guidelines, infiltration testing must be performed a minimum of 2-feet below the existing groundwater table. As such, a test depth of 8 feet was not feasible, and infiltration testing was performed adjacent to soil boring B-12 at a depth of 5-1/2 feet below existing grade (Elevation 674-3/4 feet).

The following table provides the results of our observations during field operations:

Borehole ID	Ground Surface Elevation (Feet)[1]	Groundwater Elevation (Feet)[2]	Test Elevation (Feet)	Soil Type (USCS[3])	Observed Infiltraiton Rate
B-12	680.25	672.25	674.75	SP	2-1/4

Notes:
1. Estimated based on provided topographical survey
2. Estimated at completion of drilling operations
3. Description in general accordance with Visual-Manual Unified Classification System
4. Represents infiltraiton rate for duration of final trial

Please note, the observed infiltration rates presented in the above table have not been reduced using a factor-of-safety. The stormwater system engineer-of-record should use an appropriate factor of safety based on their experience with the design, construction, and performance of similar systems. In general, it is recommended that the observed infiltration rates be reduced by a factor of safety equal to 2.0 for use in design.

The complete results of the infiltration testing are presented in the Appendix as Figure No. 15. As shown in the above table, the resulting observed infiltration rate was 2-1/4 inches per hour. The proposed BMP may be constructed; however, it should be designed accordingly to accommodate the relatively low observed infiltration rate.

CONSTRUCTION CONSIDERATIONS

We anticipate the proposed underground stormwater management system will have approximate invert depths ranging from 5-1/2 to 8 feet below finished grades. We anticipate caving and/or sloughing of the native granular and/or granular fill soils during excavation operations. As such, the earthwork contractor should be prepared to bench or slope back excavations.

We anticipate that groundwater will be encountered within excavations extending below a depth of 6 feet below existing grades. We anticipate surface water runoff and groundwater intrusion can be lowered by 1 to 2 feet with a properly constructed system of sumps and pumps.

We recommend maximum slope inclinations of 2 horizontal unit to 1 vertical unit (2H:1V) within the very loose to loose granular soils, 1-1/2H:1V within the medium compact granular soils, 1H:1V within the stiff cohesive soils, and 3/4H:1V within the very stiff cohesive soils for excavations extending below a depth of 5 feet. Where seepage from excavation cuts is observed, the slopes will need to be flattened sufficiently to achieve stability, but in no case left steeper than 3H:1V at and below the seepage level.

All excavations should be safely sheeted, shored, sloped, or braced in accordance with MI-OSHA requirements. If material is stored or equipment is operated near an excavation, lower angle slopes or stronger shoring must be used to resist the extra pressure due to the superimposed loads.

GENERAL COMMENTS

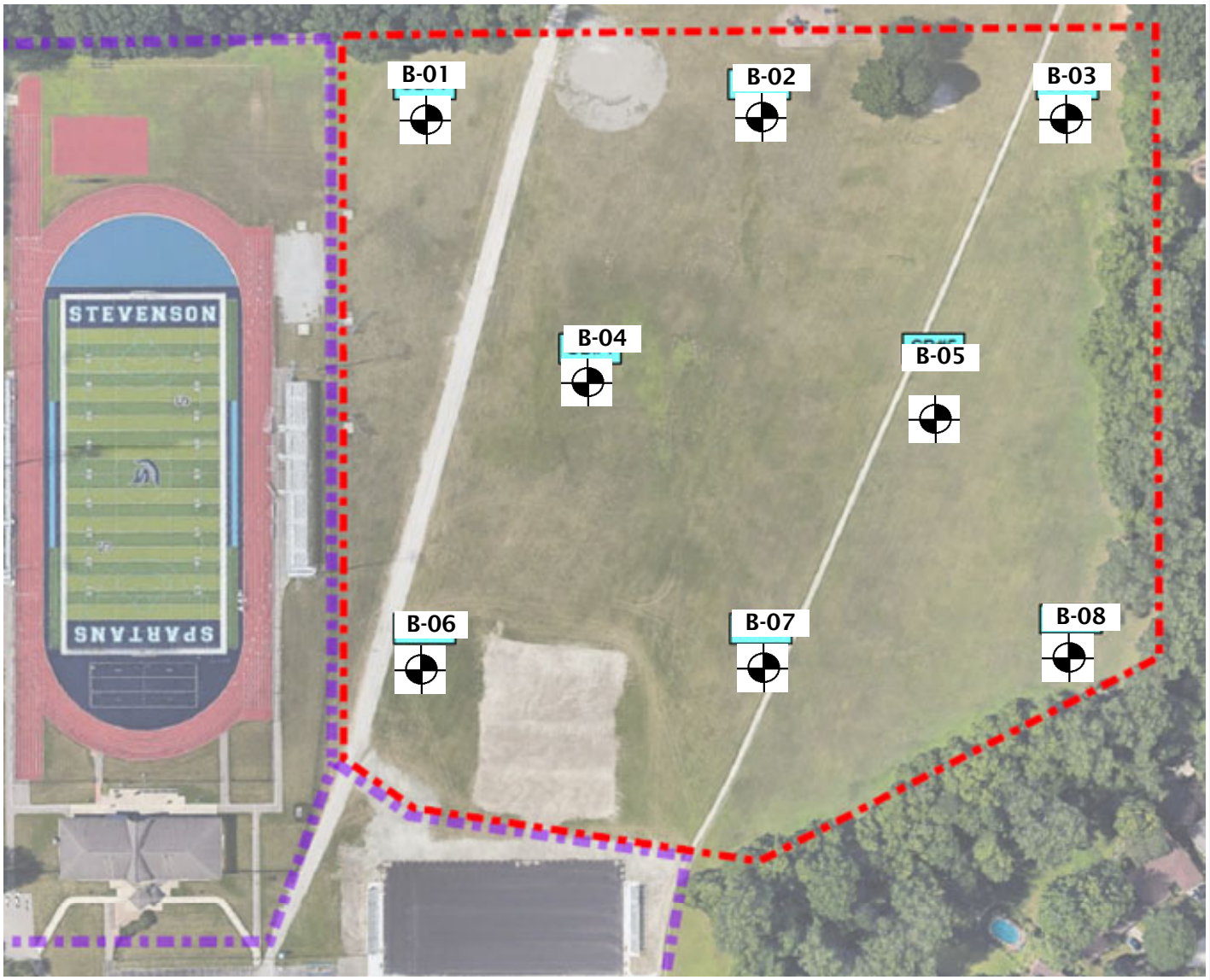
We have formulated the evaluations and recommendations presented in this report relative to site preparation on the basis of data provided to us relating to the project location, type of structure, and surface grade for the proposed site. Any significant change in this data should be brought to our attention for review and evaluation with respect to prevailing subsurface conditions. Furthermore, if changes occur in the design, location, or concept of the project, conclusions and recommendations contained in this report are not valid unless G2 Consulting Group, LLC reviews the changes. G2 Consulting Group, LLC will then confirm the recommendations presented herein or make changes in writing.

The scope of the present investigation was limited to evaluation of subsurface conditions for the support of proposed synthetic turf field(s) and other related aspects of the development. No chemical, environmental, or hydrogeological testing or analyses were included in the scope of this investigation.

We base the analyses and recommendations submitted in this report upon the data from the soil borings performed at the approximate location shown on the Soil Boring Location Plans, Plate Nos. 1 and 2. This report does not reflect variations that may occur between and away from the actual boring locations and the actual turf field location(s). The nature and extent of any such variations may not become clear until the time of construction. If significant variations then become evident, it may be necessary for us to re-evaluate our report recommendations.

We recommend G2 Consulting Group, LLC observe all geotechnical related work, including subgrade preparation and engineered fill placement. G2 Consulting Group, LLC will perform the appropriate testing to confirm the geotechnical conditions given in the report are found during construction.

APPENDIX



Legend

Soil borings performed by Strata Drilling, Inc. on March 11, 2024

Notes

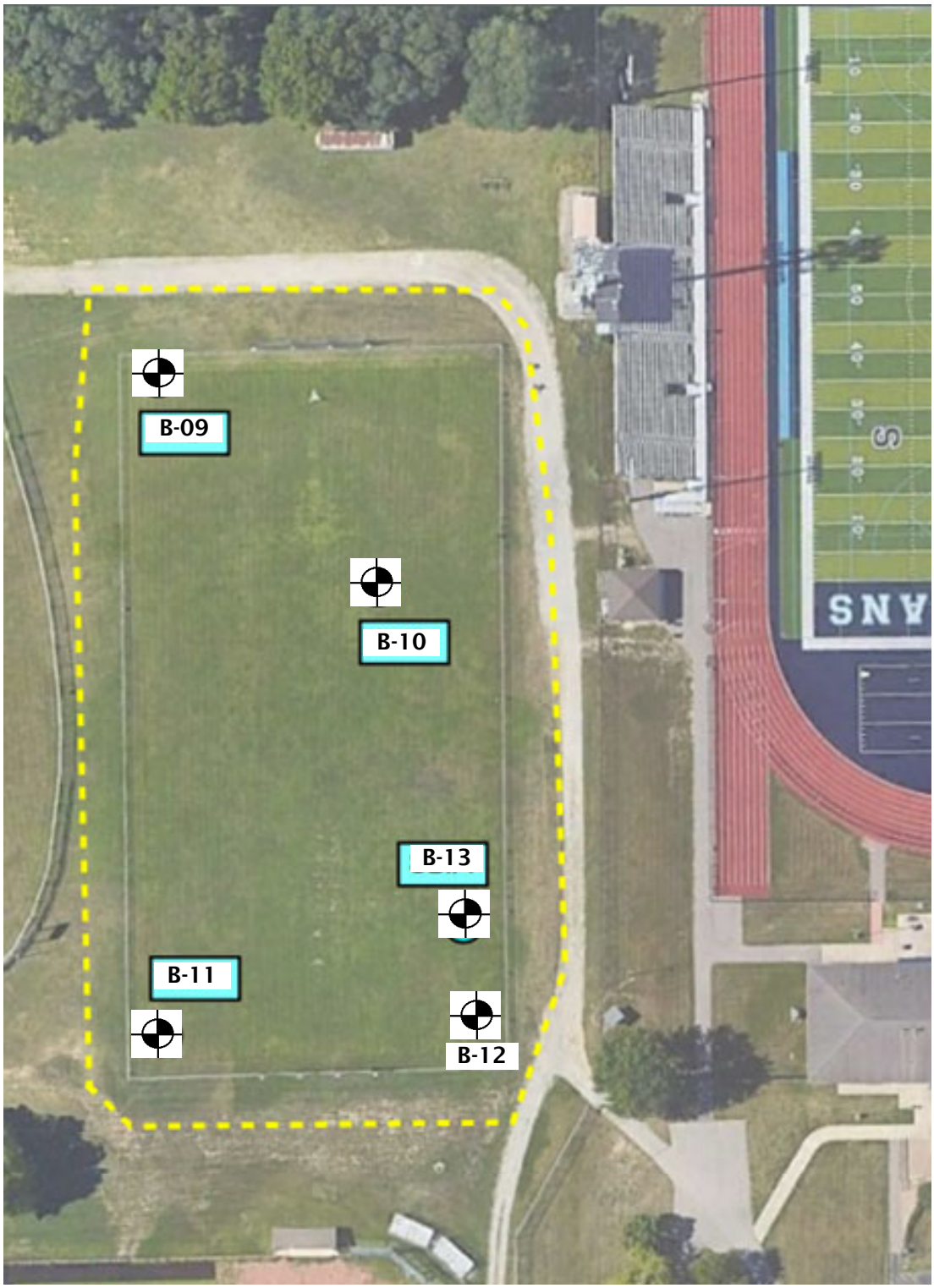
1. Soil borings B-01 through B-13 drilled to a depth of 10 feet each.

Proposed Soil Boring Location Plan

Proposed LPS Stevenson High School Turf Field
33500 6 Mile Road
Livonia, Michigan 48152

2G CONSULTING GROUP

Project No. 233838	
Drawn by: TSH	
Date: 3/14/24	Plate No. 1
Scale: NTS	



Legend

Soil borings performed by Strata Drilling, Inc. on March 11, 2024

Notes

1. Soil borings B-09 through B-13 drilled to a depth of 10 feet each.

Proposed Soil Boring Location Plan

Proposed LPS Stevenson High School Turf Field
33500 6 Mile Road
Livonia, Michigan 48152

2G CONSULTING GROUP	Project No. 233838
	Drawn by: TSH
	Date: 3/14/24
	Scale: NTS
	Plate No. 2

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.417206° Longitude: -83.382296°

Soil Boring No. B-01

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 682.8 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (10 inches)							
		0.8							
		Fill: Loose Brown Sand with trace silt and gravel		S-01	3 3 2	5			
		3.5							
677.8			5	S-02	3 5 8	13			
		Medium Compact Brown Sand with trace silt		S-03	2 5 6	11			
672.8		10.0	10	S-04	3 5 11	16			
		End of Boring @ 10 ft							
667.8			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
7 feet during and upon completion of drilling operations

Notes:
Borehole collapsed at 7 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 1

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.417247° Longitude: -83.380992°

Soil Boring No. B-02

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 681.5 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (12 inches)							
		1.0							
		Fill: Medium Compact Brown Sand with trace silt and gravel		S-01	5 6 7	13			
		3.5							
676.5			5	S-02	2 3 3	6			
		Loose Brown Sand with trace silt		S-03	2 4 5	9			
671.5		10.0	10	S-04	3 5 5	10			
		End of Boring @ 10 ft							
666.5			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
6-1/2 feet during drilling operations; 7 feet upon completion

Notes:
Borehole collapsed at 7 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 2

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.417228° Longitude: -83.379955°

Soil Boring No. B-03

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 679.0 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (12 inches)							
		1.0							
				S-01	2 2 3	5			
		Fill: Loose to Medium Compact Dark Brown Clayey Sand with trace silt and gravel; intermixed glass, brick, and trash debris (Organic Matter Content = 3.1% to 8.8%)							
674.0			5	S-02	4 5 6	11			
		6.0							
				S-03	6 8 10	18			
		Medium Compact Brown Sand with trace silt							
669.0		10.0	10	S-04	5 11 11	22			
		End of Boring @ 10 ft							
664.0			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
6 feet during drilling operations; 6-1/2 feet upon completion

Notes:
Borehole collapsed at 6-1/2 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 3

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.416406° Longitude: -83.381676°

Soil Boring No. B-04

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 678.0 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (10 inches)							
		0.8							
				S-01	3 2 3	5			
		Fill: Loose Brown Sand with trace silt; intermixed topsoil (Organic Matter Content = 0.6% to 1.1%)							
673.0			5	S-02	3 3 5	8			
		6.0							
				S-03	4 7 9	16			
		Medium Compact Brown Sand with trace silt							
668.0		10.0	10	S-04	6 9 12	21			
		End of Boring @ 10 ft							
663.0			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
4 feet during drilling operations; 6 feet upon completion

Notes:
Borehole collapsed at 6 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 4

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.416349° Longitude: -83.380339°

Soil Boring No. B-05

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 675.0 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (11 inches)							
		0.9							
		Fill: Loose Brown to Dark Brown Clayey Sand with trace gravel; intermixed topsoil and glass debris (Organic Matter Content = 2.7%)		S-01	5 3 3	6			
		4.5							
670.0			5	S-02	2 2 1	3			
		Fill: Very Loose to Loose Dark Brown Sandy Silt with trace clay; intermixed topsoil and wood debris (Organic Matter Content = 6.9% to 21.0%)		S-03	20 4 4	8			
		8.5							
		Medium Compact Brownish Gray Sand with trace silt							
665.0		10.0	10	S-04	5 7 8	15			
		End of Boring @ 10 ft							
660.0			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
4-1/2 feet during drilling operations; 7 feet upon completion

Notes:
Borehole collapsed at 7 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 5

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415632° Longitude: -83.382233°

Soil Boring No. B-06

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 676.3 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (12 inches)							
		1.0							
		Fill: Loose Dark Brown Clayey Sand with trace gravel; intermixed topsoil (Organic Matter Content = 2.7% to 5.5%)		S-01	2 2 3	5			
671.3			5	S-02	1 3 4	7			
		6.5							
		Medium Compact Brownish Gray Silty Sand		S-03	7 11 12	23			
		9.5							
666.3		Stiff Gray Sandy Clay with trace silt	10	S-04	3 3 2	5	23.9		2000*
		10.0							
		End of Boring @ 10 ft							
661.3			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
6-1/2 feet during drilling operations; 6 feet upon completion

Notes:
Borehole collapsed at 6 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 6

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415708° Longitude: -83.380956°

Soil Boring No. B-07

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 671.5 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (6 inches) 0.5							
				S-01	WOH/12" 1	---			
		Fill: Very Loose Brown and Dark Brown Clayey Sand with trace gravel; intermixed wood and glass debris							
666.5			5	S-02	2 1 1	2			
		6.0							
				S-03	2 3 4	7	25.4		4500*
		Very Stiff Mottled Gray and Brown Silty Clay with trace sand							
661.5		10.0	10	S-04	4 4 7	11	27.1		4500*
		End of Boring @ 10 ft							
656.5			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
3-1/2 feet during drilling operations; 8-1/2 feet upon completion

Notes:
Borehole collapsed at 8-1/2 ft after auger removal
* Calibrated Hand Penetrometer

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 7

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415699° Longitude: -83.379828°

Soil Boring No. B-08

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 666.5 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (3 inches) 0.3							
				S-01	2 3 6	9			
661.5		Fill: Very Loose to Loose Dark Brown Clayey Sand with intermixed topsoil and wood and trash debris (Organic Matter Content = 5.4% to 25.5%)	5	S-02	5 1 3	4			
				S-03	3 2 1	3			
		9.0							
656.5		Loose Brownish Gray Sand with trace silt 10.0	10	S-04	2 4 5	9			
		End of Boring @ 10 ft							
651.5			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
9 feet during and upon completion of drilling operations

Notes:
Borehole collapsed at 9 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 8

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.416022° Longitude: -83.384904°

Soil Boring No. B-09

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 681.3 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (2 inches) 0.2							
		Fill: Medium Compact Brown Sand with trace silt and gravel		S-01	16 14 13	27			
		4.0							
676.3			5	S-02	4 5 4	9			
		Loose to Medium Compact Brown Sand with trace silt		S-03	4 5 7	12			
671.3		10.0	10	S-04	5 6 7	13			
		End of Boring @ 10 ft							
666.3			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
4 feet during drilling operaitons; 4-1/2 feet upon completion

Notes:
Borehole collapsed at 4-1/2 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 9

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.384524° Longitude: -83.384524°

Soil Boring No. B-10

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 681.3 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (10 inches)							
		0.8							
				S-01	2 2 3	5			
		Loose Brown Sand with trace gravel							
676.3			5	S-02	3 3 4	7			
		5.5							
				S-03	4 7 7	14			
		Medium Compact Brown Sand with trace silt							
671.3		10.0	10	S-04	5 6 7	13			
		End of Boring @ 10 ft							
666.3			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
5-1/2 feet during drilling operations; 5-3/4 feet upon completion

Notes:
Borehole collapsed at 6 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 10

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415088° Longitude: -83.384883°

Soil Boring No. B-11

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 680.5 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (3 inches) 0.3							
				S-01	4 6 8	14			
675.5		Loose to Medium Compact Brown Sand with trace silt	5	S-02	5 5 5	10			
				S-03	2 5 7	12			
670.5		10.0	10	S-04	4 8 9	17			
		End of Boring @ 10 ft							
665.5			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
6-1/2 feet during drilling operations; 7 feet during drilling operations

Notes:
Borehole collapsed at 7 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 11

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415095° Longitude: -83.384292°

Soil Boring No. B-12

CONSULTING GROUP

SUBSURFACE PROFILE

SOIL SAMPLE DATA

ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 680.3 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (2 inches) 0.2							
		Fill: Loose to Medium Compact Brown to Dark Brown Silty Sand with trace gravel; occasional glass and brick debris (Organic Matter Content = 0.5%)		S-01	4 8 11	19			
675.3			5	S-02	3 2 4	6			
		5.5							
		Medium Compact Brown Sand with trace silt (Observed Infiltration Rate = 2-1/4 iph)		S-03	4 5 9	14			
670.3		10.0	10	S-04	5 9 8	17			
		End of Boring @ 10 ft							
665.3			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
8-1/2 feet during drilling operations; 8 feet upon completion

Notes:
Borehole collapsed at 8 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 12

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

Project Name: Proposed LPS Stevenson High School Turf Field

Project Location: 33500 6 Mile Road
Livonia, Michigan

G2 Project No. 233838

Latitude: 42.415382° Longitude: -83.384268°

Soil Boring No. B-13

CONSULTING GROUP

SUBSURFACE PROFILE				SOIL SAMPLE DATA					
ELEV. (ft)	PRO-FILE	GROUND SURFACE ELEVATION: 680.5 ft	DEPTH (ft)	SAMPLE TYPE-NO.	BLOWS/ 6-INCHES	STD. PEN. RESISTANCE (N)	MOISTURE CONTENT (%)	DRY DENSITY (PCF)	UNCONF. COMP. STR. (PSF)
		Topsoil: Dark Brown Sand (10 inches) 0.8							
				S-01	3 2 3	5			
675.5			5	S-02	2 2 2	4			
		Loose to Medium Compact Brown Sand with trace silt							
				S-03	3 4 5	9			
670.5		10.0	10	S-04	4 5 7	12			
		End of Boring @ 10 ft							
665.5			15						

Total Depth: 10 ft
Drilling Date: March 11, 2024
Inspector:
Contractor: Strata Drilling, Inc.
Driller: J. Haynor

Drilling Method:
2-1/4 inch inside-diameter hollow-stem auger

Water Level Observation:
6-1/2 feet during drilling operations; 7 feet upon completion

Notes:
Borehole collapsed at 7 ft after auger removal

Excavation Backfilling Procedure:
Borehole backfilled with auger cuttings

Figure No. 13

SOIL / PAVEMENT BORING 233838.GPJ 20150116 G2 CONSULTING DATA TEMPLATE.GDT 3/20/24

CONSULTING GROUP

GENERAL NOTES TERMINOLOGY

Unless otherwise noted, all terms herein refer to the Standard Definitions presented in ASTM 653.

PARTICLE SIZE

Boulders		- greater than 12 inches
Cobbles		- 3 inches to 12 inches
Gravel	- Coarse	- 3/4 inches to 3 inches
	- Fine	- No. 4 to 3/4 inches
Sand	- Coarse	- No. 10 to No. 4
	- Medium	- No. 40 to No. 10
	- Fine	- No. 200 to No. 40
Silt		- 0.005mm to 0.074mm
Clay		- Less than 0.005mm

CLASSIFICATION

The major soil constituent is the principal noun, i.e. clay, silt, sand, gravel. The second major soil constituent and other minor constituents are reported as follows:

Second Major Constituent (percent by weight)	Minor Constituent (percent by weight)
Trace - 1 to 12%	Trace - 1 to 12%
Adjective - 12 to 35%	Little - 12 to 23%
And - over 35%	Some - 23 to 33%

COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, clay becomes the principal noun with the other major soil constituent as modifier, i.e. sandy clay. Other minor soil constituents may be included in accordance with the classification breakdown for cohesionless soils, i.e. silty clay, trace sand, little gravel.

Consistency	Unconfined Compressive Strength (psf)	Approximate Range of (N)
Very Soft	Below 500	0 - 2
Soft	500 - 1,000	3 - 4
Medium	1,000 - 2,000	5 - 8
Stiff	2,000 - 4,000	9 - 15
Very Stiff	4,000 - 8,000	16 - 30
Hard	8,000 - 16,000	31 - 50
Very Hard	Over 16,000	Over 50

Consistency of cohesive soils is based upon an evaluation of the observed resistance to deformation under load and not upon the Standard Penetration Resistance (N).

COHESIONLESS SOILS

Density Classification	Relative Density %	Approximate Range of (N)
Very Loose	0 - 15	0 - 4
Loose	16 - 35	5 - 10
Medium Compact	36 - 65	11 - 30
Compact	66 - 85	31 - 50
Very Compact	86 - 100	Over 50

Relative Density of cohesionless soils is based upon the evaluation of the Standard Penetration Resistance (N), modified as required for depth effects, sampling effects, etc.

SAMPLE DESIGNATIONS

AS - Auger Sample – Cuttings directly from auger flight
BS - Bottle or Bag Samples
S - Split Spoon Sample - ASTM D 1586
LS - Liner Sample with liner insert 3 inches in length
ST - Shelby Tube sample - 3 inch diameter unless otherwise noted
PS - Piston Sample - 3 inch diameter unless otherwise noted
RC - Rock Core - NX core unless otherwise noted

STANDARD PENETRATION TEST (ASTM D 1586) - A 2.0 inch outside-diameter, 1-3/8 inch inside-diameter split barrel sampler is driven into undisturbed soil by means of a 140-pound weight falling freely through a vertical distance of 30 inches. The sampler is normally driven three successive 6-inch increments. The total number of blows required for the final 12 inches of penetration is the Standard Penetration Resistance (N).

G2 Consulting Group, LLC

Encased Falling Head Infiltration Test (WCWRC 2016)

Project:	LPS Stevenson	Job No.:	233838		
Location of Project:	Livonia, MI	Test Pit No.	B-12	Depth (in)	120
Description of Soil:	Brown Sand with trace silt	Depth of Test (in):	66		
Tested By:	T. Hesse	Date of Testing:	2/13/2024		
Casing Diameter (in):	4	Casing Embedment (in):	6		
Initial Head of Water (in):	12	Pre-Soak Time (min):	--		

Reading No.	Trial 1		Trial 2		Trial 3		
	Elapsed Time (min)	Depth Reading (in)	Elapsed Time (min)	Depth Reading (in)	Elapsed Time (min)	Depth Reading (in)	
1	0	0	0	0	0	6/16	←
2	10	8/16	10	6/16	10	14/16	
3	20	1	20	14/16	20	1	
4	30	1 4/16	30	1 2/16	30	1 6/16	
5	40	1 12/16	40	1 8/16	40	1 14/16	
6	50	2 2/16	50	2	50	2	←
7	60	2 14/16	60	2 4/16	60	2 4/16	
8							
9							
10							
11							
12							
13							

Reading No.	Trial 1	Trial 2	Trial 3
	Infiltration Rate (in/hr)	Infiltration Rate (in/hr)	Infiltration Rate (in/hr)
1	---	---	---
2	3.00	2.25	3.00
3	3.00	3.00	0.75
4	1.50	1.50	2.25
5	3.00	2.25	3.00
6	2.25	3.00	0.75
7	4.50	1.50	1.50
8	---	---	---
9	---	---	---
10	---	---	---
11	---	---	---
12	---	---	---
13	---	---	---

Elapsed Time (min)	Head Drop (in)	Observed Infiltration Rate (iph)	Design Infiltration Rate (iph)
60	2 4/16	2.25	1.13

Notes:

1. Refer to "Rules and Guidelines - Procedures & Design Critera for Stormwater Management Systems", WCWRC, Rev. Oct. 2016.
2. ← = Used in Calculating Infiltration Rate
3. Design Infiltration Rate includes FOS = 2.

Figure No. 15

SECTION 02 4110
SALVAGE & RELOCATION OF FIELD ITEMS

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 Sections:

1. Section 31 1000 Site PreparationSection 31 2010 Earthwork
2. Section 03 3000 Cast In Place Concrete

C. Work Includes Salvage & Relocation of the Following Items:

1. Existing net system poles, netting and hardware.
2. Existing topsoil.

1.2 SCOPE

A. The work under this section of the specifications shall consist of the relocation of all items as indicated on the drawings. Contractor shall furnish all labor, materials and equipment to complete the work according to the drawings and specifications.

B. All other facilities and items that are indicated shall remain and be protected from construction damage.

PART 2 - PRODUCTS

N/A

PART 3 - EXECUTION

3.1 EXECUTION

A. General

1. Contractor shall relocate items shown on drawings. Locations shall be within District boundaries.
2. Methods to be used in relocating items to be determined by the Contractor and approved by the Owner. Equipment damaged during relocation shall be replaced or repaired at the Contractor’s expense.
3. All work to be performed shall be under applicable Government Codes.
4. All items requiring electrical or water will be attached to existing sources and left in working condition.
5. All underground electric wiring shall be installed in PVC Conduit (with exception to 24 volt electrical irrigation wire).
6. Demolish existing footings to a depth of 24” below proposed finish grade.
7. Restoration of all existing equipment locations shall be performed by Contractor.

B. Removal of Debris

1. Prompt removal of demolished items (i.e., concrete footings, slabs, etc.) from the site. Legally

dispose of debris/material, including obtaining permission from applicable regulatory authority for disposal of debris/material to proper waste disposal site.

END OF SECTION 02 4110

SECTION 03 3000
CAST IN PLACE CONCRETE

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 Sections:

1. Section 31 2010 Earthwork

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to construct cast-in place concrete pavement for parking lots, curbs and gutters, sidewalks, and wheel stops.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):

a. ASTM C 94-97 – Standard Specification for Ready Mixed Concrete
b. ASTM C 171-69 (1975) - Standard Specification for Sheet Materials for Curing Concrete
c. ASTM C 309-74 - Standard Specification for Liquid Membrane Forming Compound for Curing Concrete
d. ASTM D 1751-73 - Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Non-extruding and Resilient Bituminous Types).

2. MDOT current Standard Specifications for Construction

1.4 SUBMITTALS & TEST REPORTS

A. Submit aggregate and concrete mix designs proposed for review. Contractor is to confirm that materials provided meet the required specifications and are to provide material certification to the Architect. Material certifications shall indicate that products meet or exceed the specified requirements indicated on the plans and the regulating authority.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be experienced with at least five (5) years in business who has completed concrete pavement work similar to the design, materials and requirements indicated for this project.

B. Manufacturer Qualifications: Manufacturer of ready-mix concrete products complying with ASTM C94 requirements for production facilities and equipment and approved by governing jurisdictions for State Department of Transportation.

1. Manufacturer must be certificated according to the National Ready Mix Concrete Association’s Plant Certification Program.

C. Testing Agency Qualifications: The independent testing agency shall be qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from a single source.

1.6 ENVIRONMENTAL REQUIREMENTS AND PROJECT CONDITIONS

A. Allowable concrete temperatures

1. Cold Weather: Maximum and minimum, ASTM C94

2. Hot Weather: Maximum concrete temperature - 90 degrees F. (23 degrees C.)

B. Do not place concrete during rain, sleet or snow.

PART 2 - PRODUCTS

2.1 FORMS

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

1. Use flexible or curved forms for conditions that require curved finishes.

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

2.2 STEEL REINFORCEMENT

A. Reinforcement Bars: ASTM A 615/A, 615M, Grade 60, deformed billet steel, unfinished.

B. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated flat sheets, unfinished.

C. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60 deformed bars, assembled with clips.

D. Epoxy-Coated Reinforcement Bars: ASTM A 775/A 775M. with ASTM A 615/A 615M, Grade 60 deformed bars.

E. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends squared and free of any burrs.

F. Tie Bars: ASTM A 615/A 615M, Grade 60 deformed.

G. Epoxy Coated Joint Dowel Bars: ASTM A 775/A 775M. with ASTM A 615/A 615M, Grade 60, plain steel bars.

H. Bar Supports: Bolsters, chairs, spaces, and other devices necessary for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRS'I's Manual of Standard Practice from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength that concrete.

I. Epoxy Repair Coating: Liquid two-part epoxy repair coating, compatible with epoxy coating on reinforcement.

2.3 MATERIALS

A. Use the same brand and type of cementitious material from the same manufacturer through the entire project. All material to meet current MDOT specifications.

2.4 CONCRETE MIXES

A. Prepare mix design, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by lab trial mixes.

B. Use a qualified testing agency for preparing and reporting proposed mix designs for the testing batch.

C. Provide mixes for sidewalks, curbs, gutters, and roads meeting the following properties:

1. Compressive Strength (28 days): 3500psi, unless indicated otherwise

2. Maximum Water to Cement Ratio: 45 percent by weight

3. Maximum Aggregate Size: 1.5 inches (38mm)

D. Cementitious Material: Limit percentages, by weight of cementitious materials other than portland cement according to current ACI 301 requirements for concrete exposed chemicals used for de-icing.

E. Air-entraining admixtures shall be used at manufacturer’s prescribed rates to result in concrete at point of placement, with an air content of 5.0 to 8.5 percent.

F. Slump: two (2) to three (3) inches

2.5 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements and ASTM C94 and ASTM C1116

1. When air temperature is between 85 degrees F and 90 degrees F, reduce mixing and delivery time from 75 minutes to 90 minutes; when air temperature is above 90 degrees F, reduce mixing and delivery time to 60 minutes.

B. Project Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C94. Mix concrete materials in appropriate drum-type batch machine mixer.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify the earthwork is completed to correct line and grade. Notify the Owner/Landscape Architect of any incomplete work by previous contractors.

B. Check that sub-grade is smooth, compacted, and free of frost or excessive moisture.

C. Do not commence work until conditions are satisfactory.

3.2 WEATHER PROTECTION

A. Cold weather: When the mean daily air temperature is 40 degrees F. or below, provide suitable protection for concrete work to maintain a minimum concrete temperature of 50 degrees F. for five (5) days (or 70 degrees F. for three (3) days). After the protection period, do not let concrete cool more than 20 degrees F. in each successive day

B. Hot weather: Place concrete according to recommendations in ACI 305R when hot-weather conditions exist.

C. Wet weather: Unless adequate protection is provided, do not place concrete in rain, sleet or snow.

3.3 JOINTS

A. Construct all joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles, unless noted otherwise.

B. At locations where new concrete abuts existing concrete, building walls and slabs, place expansion joint material and joint sealants.

C. Expansion Joints: Place 1 inch wide expansion joints at maximum 40 foot intervals, if not indicated on drawings. Joints to be full depth of pavement and joint sealant placed at all expansion joints.

D. Install all dowel bars and support assemblies at joints if indicated on the plans. Coat one-half of dowel length to prevent concrete bonding to one side of the joint.

E. Contraction Joints: form any weakened plane contraction joints, sectioning concrete into areas. Construct ¼ inch wide contraction joints for a depth equal to one-third of the concrete thickness. Maximum spacing of the joints shall be 8’-0”.

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with tool to a 3/8” radius. Repeat any grooving of joint after application of surface finishes.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond blades. Joint cuts not to exceed 1/8 inch wide, when cutting will not tear or damage the surface and develop a contraction cracks.

3. Doweled Contraction Joints: install dowel bars and support assemblies at joints where indicated.

F. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after floating with an edging tool at a 3/8 inch radius.

3.4 INSTALLATION

A. Contractor shall install the first section of sidewalk as a quality sample in place. Upon approval of sample by Landscape Architect, further installation can proceed.

B. The sub-grade upon which concrete is to be placed shall be prepared by excavation or filling with suitable earth to such depth below the finished grade line, that when tamped or rolled until smooth, firm and hard, the sub-grade will be uniform and at the required depth below finished grade line.

C. Unsuitable sub-grade soils shall be replaced as directed.

D. Gravel backfill, when specified in the drawings, shall be constructed to the required depth and thoroughly compacted.

E. Cast in Place Concrete

1. Set forms to line and grade

2. Install forms over full length of walk and oil before use.

3. Forms shall be set accurately to line and grade. If the forms are set more than 0.01 foot (3mm) above or below grade or more than 0.01 foot (6mm) from prescribed alignment, they shall be corrected before any concrete is placed

4. Flexible or curved forms of proper radii shall be used on all curves having a radius of 100 feet or less.

5. Form contraction joints by tooling.

6. Install expansion joint material behind walks at abutment curbs and adjacent structures with expansion joints every 100 feet (30m) or as detailed. Retaining wall shall have expansion joints every 25 feet.

7. Provide sawcuts in concrete every 10 lineal feet. Sawcut depth shall be no more 3/4" deep and 1/8" in width.

8. Place top of expansion joint material flush with walk surface, unless noted otherwise on plans.

9. Place concrete with mechanical vibrators.

10. Consolidate concrete with mechanical vibrators.

11. Round edges of walks at top with finishing tool, 1/4" to 3/8" radius. 1" radius for retaining wall.

12. Finished exposed walk surfaces with wood float followed by brushing with broom, smooth band of 12", unless otherwise shown on drawings.

13. Apply plastic sheeting or curing material and cure for seven (7) days.

14. Apply plastic sheeting or curing material

15. Do not allow free drop of more than five (5) feet. Use elephant trunk when necessary.

F. Slip form concrete to the same quality standards as cast in place.

1. Construct concrete curb with slip form curb machine.

2. Apply curing material and cure for seven (7) days.

3. Saw expansion and contraction joints after concrete has sufficiently hardened.

3.5 FIELD QUALITY CONTROL

A. Slump Tests: Make slump tests whenever concrete is being poured at the direction of the Owner.

B. Compression Tests: Prepare standard test cylinders during the placing of concrete in accordance with ASTM 31 and ASTM 172. One set (three (3) cylinders) is required for each day's pour.

C. Maintain two (2) cylinders at 50 to 70 degrees F. and protect from loss of moisture at the job site for a period of not over 48 hours, then deliver to the laboratory for curing and testing at seven (7) and twenty-eight (28) days, respectively. Place third cylinder near the in place concrete and cure completely at the job in the same manner as the in place concrete. Deliver this cylinder to the laboratory for testing at twenty-eight (28) days. Cure and test cylinders in accordance with ASTM C31, C39 and C192. Submit test reports to the Landscape Architect in duplicate

3.6 PAVING TOLERANCES

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

1. Elevation variation: 1/4 inch
2. Thickness: Plus 3/8 inch, minus 1/4 inch
3. Surface Variation: gap below 10 foot long, unleveled straightedge not to exceed 1/4 inch.
4. Maximum cross slope for walks, ramps, or platforms: 2%
5. Maximum longitudinal walk slopes not requiring landings and handrails: 5%
6. Maximum longitudinal ramp slopes: 8.33% (1 on 12 slope)

3.7 PROTECTION OF FINISHED SURFACES

A. All finished surfaces of concrete shall be protected so as to prevent damage. Marking temporary nailing or other damaging use of surfaces will be prohibited.

3.8 PATCHING

A. Patch to match material, color and texture of surrounding area.

B. Replace defective work if patching is not acceptable to the Landscape Architect.

3.9 REPAIR/REPLACE

A. Within first year of placement, concrete will be replaced at no additional cost to the Owner, if horizontal and/or vertical cracks exceed 1/8” in width.

B. Hairline cracks do not qualify for concrete replacement.

3.10 CLEAN-UP

A. The Contractor shall remove excess excavated material from the site of the work. Spread and finish grade within five (5) feet of pad edge. Finish grading is incidental to pad installation. Contractor shall clean up and dispose of rubble and construction satisfactory to the Owner and Landscape Architect.

END OF SECTION 03 3000

SECTION 03 3053
CONCRETE TURF ANCHOR

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 Sections:

1. Section 03 3000 Cast-in-Place Concrete
2. Section 06 1050 Turf Wood Nailer

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to install new concrete turf anchor.

1.3 QUALITY ASSURANCE

A. Materials and methods of construction shall comply with the following standards:

1. American Society for Testing and Materials, (ASTM).
2. American Concrete Institute (ACI).

B. Maintain field records of time, date of placing, curing, and removal of forms of concrete in each portion of work.

1.4 SUBMITTALS

A. Submit concrete mix designs. Obtain approval before placing concrete.

B. Product data:

1. Submit complete materials list of items proposed for the work. Identify materials source.
2. Submit admixture, curing, compound, retarder, and accessory item product data.
3. Submit materials certificates for aggregates, reinforcing, and joint filler

C. Submit concrete delivery tickets. Show the following:

1. Batch number.
2. Mix by class or sack content with maximum size aggregate.
3. Admixtures.
4. Air content.
5. Slump.
6. Time of loading.

D. Submit concrete test reports.

1.5 PROJECT CONDITIONS

A. Work notifications: Notify Landscape Architect at least 24 hours prior to installation of concrete.

B. Establish and maintain required lines and grade elevations.

C. Do not install concrete work over wet, saturated, muddy, or frozen subgrade.

D. Do not install concrete when air temperature is below 40 degrees F. Use of calcium chloride, salt, or any other admixture to prevent concrete from freezing is prohibited.

E. Protect adjacent work.

F. Provide temporary barricades and warning lights as required for protection of project work and public safety.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland cement: ASTM C150, Type 1, natural color.

B. Aggregate: Provide ASTM C33 normal weight aggregates, 1" maximum size, clean, uncoated crushed stone or gravel coarse aggregate free of materials which cause staining or rust spots; fine aggregate shall be clean natural sand.

C. Water: Clean, fresh, and potable.

D. Air-entraining admixture: ASTM C260.

E. Water-reducing admixture: ASTM C494.

2.2 MIXES

A. Provide ASTM C94 ready-mixed concrete. Batch mixing at site not acceptable.

1. Strength: 3,500 psi minimum at 28 days.
2. Slump range: 2" to 4" maximum.

B. Provide an approved water-reducing admixture in all concrete.

C. Provide an air-entraining admixture in all concrete. Air content 5% to 7%.

D. Indicate water added to mix at job site on each delivery ticket. Show quantity of water added. Site water tempered mixes exceeding specified slump range will be rejected as not complying with specification requirements.

2.3 ACCESSORIES

A. Granular base: AASHTO M43, #6 (3/8" to 3/4") uniformly graded, clean crushed stone or gravel.

B. Forms: Wood or metal of sufficient strength to resist concrete placement pressure and to maintain horizontal and vertical alignment during concrete placement. Provide forms straight, free of defects and distortion, and height equal to full depth of concrete work.

1. Provide 2" nominal thickness, surfaced plank wood forms for straight sections. Use flexible metal, 1" lumber or plywood forms to form radius bends.
2. Synthetic turf anchoring curb system: Forms shall be prefabricated metal forms to produce tongue and groove joint. Automated self propelled curb-and-gutter equipment shall not be allowed.

C. Joint filler: ASTM D1751, premolded non-extruding asphalt-impregnated fiberboard, thickness indicated.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine subgrades and installation conditions. Do not start concrete work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Proof roll the subgrade and do all necessary rolling and compacting to obtain firm, even subgrade surface. Fill and consolidate depressed areas. Remove uncompactable materials, replace with clean fill and compact to 100% of the maximum dry density in accordance with ASTM D698 Standard Proctor Method.

B. Remove loose material and debris from base surface before placing concrete.

C. Install, align, and level forms. Stake and brace forms in place. Maintain following grade and alignment tolerances:

1. Top of form: Maximum 1/8" in 10'-0".
2. Vertical face: Maximum 1/4" in 10'-0".

D. Coat from surfaces in contact with concrete with form release agent. Clean forms after each use and cost with form release agent as necessary to assure separation form concrete without damage.

3.3 INSTALLATION

A. Concrete placement:

1. Comply with ACI 304 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as specified.
2. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placing, and curing. In cold weather comply with ACI 306, "Recommended Practice for Cold Weather Concreting". In hot weather comply with ACI 305, "Recommended Practice for Hot Weather Concreting".
3. Moisten base to provide a uniform dampened condition at the time concrete is placed. Verify manholes or other structures are at required finish elevation and alignment before placing concrete.
4. Place and spread concrete to the full depth of the forms. Use only square-end shovels or concrete rakes for hand-spreading and consolidating concrete. Exercise care during spreading and consolidating operations to prevent segregation of aggregate and dislocation of

reinforcement.
5. Place concrete in a continuous operation between expansion joints. Provide expansion joints when sections cannot be placed continuously.
6. Place concrete in one course, monolithic construction, for the full width and depth of concrete work.
7. Provide curb profiles indicated.

B. Joints:

1. Construct control, expansion, and construction joints properly aligned with face perpendicular to concrete surface.
2. Tooled control joints, sectioning concrete into areas indicated. Tool joints to depth equal to not less than ½” depth.
3. Sawcut control joints every 10’ LF. Sawcut depth shall be no more 3/4" deep and 1/8" in width.
4. Provide expansion joints using premolded joint filler at concrete work abutting curbs, walls, structures, walks, and other fixed objects.
   a. Protect the top edge of the joint filler during concrete placement.
   b. ½” width expansion joints every 100 LF

C. Concrete finishing:

1. Perform concrete finishing using mechanical or hand methods as required.
2. Upon completion of floating, and after bleed water has disappeared and concrete can sustain foot pressure with nominal indentation, cut concrete away from forms. Work edges with an edging tool. Round edges to 1/2" radius.
3. Install control joints at indicted locations during edging operations.

D. Curing:

1. Cure concrete with a non-staining liquid membrane-forming compound. Spray apply in accordance with manufacturer's recommended coverage rate. Apply curing compound immediately after completing surface finish.

3.4 FIELD QUALITY CONTROL

A. Provide field quality control testing and inspection during concrete operations.

B. Contractor shall provide adequate notice, cooperate with, provide access to the work, obtain samples, and assist test agency and their representatives in execution of their function.

C. Testing:

1. Provide slump test on first load of concrete delivered each day and whenever requested due to changes in consistency or appearance of concrete.
2. Provide air indicator tests and air meter tests for all air-entrained concrete.
   a. Perform air indicator test with a "Chase" AE 35 or equal air indicator, and air meter test in accordance with ASTM C231 or C173. Test first load of concrete delivered each day.
   b. Furnish copies of field records and tests reports as listed for strength tests.
3. Strength testing:
   a. Provide 1 set of 3 test specimens for each 50 CY placed in any one day. Secure samples in accordance with ASTM C172 and mold specimens in accordance with ASTM C31.
   b. Test 1 specimen at 7 days and 2 specimens at 28 days in accordance with ASTM C39.

c. Furnish copies of field records and test reports as follows:
1 copy to Contractor
1 copy to Ready Mix Supplier

4. Record the exact location of the concrete in the work represented by each set of cylinders and show on test reports.
5. Provide an insulated moist box for protection of the test cylinders until shipped to the laboratory.

3.5 PROTECTION

A. Protect concrete work from damage due to construction and vehicular traffic until final acceptance. Exclude construction and vehicular traffic from concrete pavements for at least 14 days.

3.6 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from concrete operations.

B. Sweep concrete sidewalks and pavement, wash free of stains, discoloration, dirt, and other foreign material immediately prior to final acceptance.

END OF SECTION 03 3053

SECTION 06 1050
TURF WOOD NAILER

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 Sections:

1. Section 03 3000 Cast In Place Concrete
2. Section 03 3053 Concrete Turf Anchor

1.2 SCOPE

A. Provide all material, labor, and equipment necessary to install the timber and cleanup as detailed on the drawings and herein.

PART 2 - PRODUCTS

2.1 TIMBER EDGING

A. Southern Pine or Douglas Fir pressure preservative treated with alkaline copper quaternary (ACQ) or Copper Azole (CA) preservatives in accordance with American Wood Preservers Associates (AWPA) standard C17 for ground contact use. Provide lumber sizes as indicated on drawings.

B. All hardware shall meet a minimum requirement established ASTM standard A153 and ASTM standard A653 (Class G-185).

2.2 WOODEN NAILER FASTENERS

A. Approved items for Wood Nailer Installation:

1. Nails 16 d Hot Dipped Galvanized
2. ¼ x 2 ¾" Stainless Steel Tapcon Masonry Screws
3. DEC-King Exterior Wood Screw with Climacoat
4. Wood to-Metal TEKS with Grey Spex
5. Tapcon Concrete Anchor with Blue Climaseal and White Ultrashield
6. Roofgrip with Spex or Blue Climaseal
7. GYP-FAST Nail with Climacoat
8. Maxi-set Tapcon White UltraShield
9. Ramguard Drive Pin

PART 3 - EXECUTION

3.1 DEMOLITION, EXCAVATION AND REMOVALS

A. Strip all existing topsoil, infield mix, etc. from work area. Stockpile sufficient material for restoration of perimeter area. Legally dispose of excess material off site.

3.2 GRADING

A. Grade area to elevations and slopes as indicated on the drawings. Grade shall be such that when finished grade is established, the work area and the perimeter shall be free of standing water.

3.3 INSTALLATION OF TIMBER EDGING

A. Install wood nailer using only the specified fasteners listed in Section 2.2 above.

B. Fasteners shall be placed in the middle (vertical) of nailer board. Fastener shall be no closer than 6” from end of board.

C. Fasteners spacing shall not be more than 2.5’

D. Contractor shall maximize use of treated lumber and minimize cuts to corners.

3.4 RESTORATION AND CLEAN UP

A. Clean-up all excess materials and remove from site. Adjoining areas to be the same as prior to construction, and properly graded to allow water to drain away from surface.

END OF SECTION 06 1050

SECTION 11 6834
FOOTBALL GOAL POSTS

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. Furnish all labor, materials, and equipment necessary to install to install new football goal posts.

B. Related Sections include the following:

1. Specification Section 03 3000 Cast In Place Concrete
2. Specification Section 31 2010 Earthwork

1.3 QUALITY ASSURANCE

A. Manufacturers shall warrant that the product or materials specified herein meet all applicable grade trademarks or conform to industry standards and inspection requirements.

B. Installer Experience:

1. Installer should have a minimum of five (5) football goal post installations of similar experience in the last three (3) years.

C. Warranty Guarantee:

1. The completed system shall be guaranteed to be free from all defects for a period of one (1) year from the date of final acceptance, or the manufacturer's specific warranty related to the product or service, whichever is greater. Any defects or system malfunctions identified shall be immediately corrected at no cost to the Owner for the warranty/guarantee period.

D. Product Testing:

1. All material installed under this specification shall be subject to testing by Owner at his expense. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

E. General: Comply with NCAA and NFHSA specifications.

1.4 SUBMITTALS

A. Manufacturer's Product Data:

1. Provide manufacturers literature, identifying the particular item to be installed. Manufacturer information should include catalog cut sheets, applicable technical information.
2. Provide manufacturers cut sheets, color samples, and digital artwork data related to the football goalpost pad.

B. Shop Drawings

1. Provide drawings of the manufacturers recommended installation and foundation requirements prior to actual field installation work

1.5 PRODUCT DELIVERY AND STORAGE

A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported to the Owner's representative. Replacements, if necessary, shall be immediately re-ordered. Sound materials shall be stored above ground under protective cover or indoors for proper protection.

PART 2 - PRODUCTS

2.1 FOOTBALL GOAL POSTS

A. Football goal posts shall:

1. Be formed with an aluminum pipe capable of supporting the horizontal cross bar 8'-0" in front of the vertical upright. Cross bar shall be an aluminum structural tube 10'-0" above field level.
2. Upright shall be supported in a concrete footing and secured with an anchor pin or anchor bolts. Concrete footing size and depth shall be determined by goalpost manufacturer.
3. Uprights shall be 4" O.D. aluminum structural tube extending 20'-0" above horizontal cross bar. Uprights and cross bar shall be capped with zinc plated formed metal caps. Upright metal caps shall incorporate nylon wind directional flags, manufacturer's standard in color.
4. Goalpost shall be powder-coated White.

B. Goal posts shall be from one of the following manufacturers:

1. AAE - No. ASG-HS/8, (800) 523-5471
2. Sportsfield Specialties - No. GP820HS, (888) 975-3343
3. UCS - No. 751-6120, (800) 526-4856
4. SportsEdge – No. SEF305P, (800) 334-6057

1. Sportsfield Specialties – No. GP4380RH, (888) 975 3343 (ROTATING/HINGED)

C. Provide one (1) set of "professional" style goalpost pads made from 6" thick high-impact polyurethane foam. Foam cylinder shall have a rear cut-out and be completely covered in a polyester reinforced vinyl cover concealed with a factory sewn hook and loop velcro closure flaps for ease of installation and removal.

1. Goalpost Pad Minimum Requirements:
   a. Dimensions: 18" Outside Diameter, 7" Inside Diameter, 6'-0" height
   b. Vinyl material shall allow for high UV Resistance
   c. Total Weight: minimum 16 oz./yd²
   d. Rot, Mildew and Fungus Resistant: Yes
   e. Color to be selected by Owner from manufacturers standard colors.

2. Manufacturer shall include custom high-resolution graphics on the goalpost pads.
   a. Letters and logos shall be digitally printed onto the vinyl goalpost pad with a maximum of ten (10) letters and (1) 10"x10" logo per pad.
   b. The Contractor shall supply a color sample or swatch to the Owner for color selection for the pads and lettering.
   c. Custom logos and/or font styles can be provided to manufacturer in vector format if required.

f. Goal post pads shall be from one of the following manufacturers:

1. AAE - No. GP6R
2. Sportsfield Specialties - No. GPPR
3. UCS - No. FBGPP
4. SportsEdge – No. SEF302L
5. Pioneer Athletics – No. GPP618ESQ

g. Pre-manufactured goalpost access box shall be from one of the following manufacturers:
1. Sportsfield Specialties – Model No.: GPAFIT (1’-10” x 1’-10”, 8” box ht.)
2. SportsEdge – No. SEF304
3. AAE – No. FBC-GA

2.2 CONCRETE

A. Concrete shall conform to Section 03 3000 Cast In Place Concrete.

B. Concrete reinforcement materials and concrete foundation sizes, to be determined by manufacturer. Concrete foundation design shall be the responsibility of the manufacturer based on local soil conditions and building codes or manufacturer’s standard footing design, whichever is more stringent.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not install goal posts until site grading is complete.

3.2 INSTALLATION

A. All goalposts and accessories shall be installed as recommended per the manufacturer’s written instructions and as indicated on drawings. Refer to Manufacturer’s installation cut sheets for exact location bolt template.

B. Posts shall be set and centered to the lines shown on the drawings, with the posts centered in the concrete bases.

C. Holes shall be filled with concrete to 6” below grade. See detail sheet as per installation of the remaining 6” to grade.

D. Concrete shall cure a minimum of 72 hours prior to installation of goal post.

E. All posts shall be set plumb.

3.3 CLEAN UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape Architect and Owner. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION 11 6834

SECTION 11 6836
PORTABLE SOCCER & LACROSSE GOALS

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.

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to furnish and install complete portable soccer goals. Includes, but not limited to goal nets, wheel kits, and safety anchoring system.

1.3 QUALITY ASSURANCE

A. Portable soccer goals shall be part of a combination package with the football goal posts. All football and soccer goals and accessories shall be from one manufacturer.

B. Warranty Guarantee: The Contractor and any Sub-contractors hereunder guarantee their respective work against defective materials or workmanship for a period of two (2) years from the date of filing notice of completion and an acceptance by the Owner.

C. Product Testing: All material installed under this specification shall be subject to testing by Owner at his expense. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

D. General: Comply with NCAA and NFHSA specifications.

1.4 SUBMITTALS

A. Submit manufacturer literature, identifying the particular items to be installed. Manufacturer information should include photographs, and applicable technical information, and other data required to demonstrate compliance with specified requirements for all athletic equipment.

PART 2 - PRODUCTS

2.1 SOCCER GOALS

A. Full size round soccer goals complete with nets, wheel kits and safety anchoring system, shall be from one of the following manufacturers:

1.	Aluminum Athletic Equipment Co. (AAE)	800-523-5471
2.	Sportsfield Specialties	888-975-3343
3.	SportsEdge	800-334-6057
4.	United Canvas Swing (UCS)	800-526-4856

B. Components:

1. Frame: 8’H x 24’W x 4’B x 10’D.
   a. 4” Round aluminum tubing.
   b. White powder coat finish.
2. Ground Bar: Aluminum
3. For Infill Turf Fields: Include safety anchor system to attach to football goal gooseneck.

4. Nets: 4mm braided polypropylene, 5.5” square mesh.

	Manufacturer	Product	Model No.	Type
1.	AAE	Goal	SGR-P/I	Round
		Net	Included	Color TBD
		Wheels	Included	
		Safety Anchor	SGAB-GP	
2.	SportsEdge	Goal	SE700R	Round
		Net	SE755	Color TBD
		Wheels	SE751	
		Safety Anchor	SEF390	
3.	Sportsfield Specialties	Goal	SG824R	Round
		Net	Standard	Color TBD
		Wheels	SGMKR	
		Safety Anchor	SG2SGP	
4.	UCS	Goal	900-8024	Round
		Net	Included	Color TBD
		Wheels	Included	
		Safety Anchor	751-1000	

5. Contractor shall provide a minimum two sets of four(4) sand bag weights by the selected manufacturer for temporary anchoring. Sand bags are to be provided in addition to the manufacturer’s safety anchoring system.

2.2 LACROSSE GOALS

A. BASIS OF DESIGN – Model# LG-50 (1 Set)

Jaypro Sports
Waterford, CT
p. 800-243-0533

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not install goals until site grading is complete.

3.2 INSTALLATION

A. Assembled as per manufacturer’s cut sheets.

3.3 CLEAN UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape Architect and Owner. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION 11 6836

SECTION 31 1000
SITE CLEARING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. CAD files will be made available for use in construction staking. Contact the engineer regarding applicable fee and requirements for signing of the CAD File Transfer Agreement.

1.2 SUMMARY

A. This Section includes the following:

1. Protecting existing trees, shrubs and other vegetation to remain.

2. Removing existing trees, shrubs and other vegetation.

3. Clearing and grubbing.

4. Stripping and stockpiling topsoil.

5. Removing above-grade and below-grade site improvements.

6. Disconnecting, capping or sealing, and abandoning site utilities in place or removing site utilities.

7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:

1. Division 31 2000 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.

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.

SECTION 31 1000
SITE CLEARING

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 unless otherwise noted on the plans.

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 Closeout Procedures.

1. Identifying and accurately locating capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.6 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site.

1.7 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 owner or authorities having jurisdiction.

B. Improvements on Adjoining Property: Authority for performing site clearing indicated on property adjoining Owner's property will be obtained by Owner before award of Contract. Contractor is to confirm that this authority has been obtained before beginning work on adjoining property.

C. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

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

E. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

SECTION 31 1000
SITE CLEARING

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 2000 Section "Earth Moving."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site. Contractor is responsible for doing an independent earthwork computation and including all necessary import and/or export of materials in their bid.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction. If said points will be disturbed, establish new points prior to removal.

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 the sediment and erosion control drawings, whichever is more stringent.

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

C. Remove erosion and sedimentation controls only after all areas are restored and stabilized.

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.

SECTION 31 1000
SITE CLEARING

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

C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

1. Cover exposed roots with burlap and water regularly.

2. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.

3. Coat cut faces of roots more than 1-1/2 inches in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.

4. Backfill with soil as soon as possible.

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

3.4 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

1. Arrange with utility companies to shut off indicated utilities.

2. Owner will arrange to shut off indicated utilities when requested by Contractor.

B. 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 Engineer not less than two days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's written permission.

C. Excavate for and remove underground utilities indicated to be removed.

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.

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. Stockpile topsoil material in locations approved by the Owner or Engineer.

3.7 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

B. Remove slabs, paving, curbs, gutters, and aggregate base as indicated.

1. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut length of existing pavement to remain before removing existing pavement. Saw-cut faces vertically.

2. Paint cut ends of steel reinforcement in concrete to remain to prevent corrosion.

3.8 DISPOSAL

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

1. Burning of materials on project property is prohibited.

END OF SECTION 31 1000

SECTION 31 1012
FINE GRADING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Attention is directed to Bidding and Contract Requirements, and General and Supplemental Requirements which are hereby made a part of this section.

B. CAD files will be made available for use in construction staking. Contact the engineer regarding applicable fee and requirements for signing of the CAD File Transfer Agreement.

1.2 SUMMARY

A. Work included: All labor, materials, necessary equipment and services to complete the Fine Grading work, as indicated on the drawings, as specified herein or both, except as for items specifically indicated as not in contract on the plans.

1.3 SITE INSPECTION

A. The Contractor shall visit the site and acquaint himself with all existing conditions. The Contractor shall be responsible for his own subsurface investigations, as necessary, to satisfy requirements of this Section. All subsurface investigations shall be performed only under time schedules and arrangements approved in advance by the landscape Engineer or Owner's Representative.

1.4 UTILITIES

A. Before starting site operations verify that the earlier Contractors have disconnected all temporary utilities which might interfere with the fine grading work.

B. Locate all existing, active utility lines traversing the site and determine the requirements for their protection. Preserve in operating condition all active utilities adjacent to or transversing the site that are designated to remain.

C. Observe rules and regulations governing respective utilities in working under requirements of this section. Adequately protect utilities from damage, remove or relocate as indicated, specified or required. Remove, plug or cap inactive or abandoned utilities encountered in excavation. Record location of active utilities.

D. Contact “Miss Dig” for existing utilities survey confirmation.

1.5 QUALITY ASSURANCE

A. Requirements of all applicable building codes and other public agencies having jurisdiction upon the work.

B. Primary emphasis should be given to the aesthetic appearance and functioning of berming and swales, as directed by the Landscape Engineer or Owner's Representative. The Contractor shall

employ skilled personnel and any necessary equipment to insure that finish grading is smooth, aesthetically pleasing, drains well and is ideal for receiving sod and plant materials.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Existing Soil:

1. Strip existing topsoil for new construction unless otherwise directed by Owner's Representative, free from debris, sod, biodegradable materials and other deleterious materials. The Contractor shall insure that all existing soil has sufficient percolation and surface drainage to support grasses and plant material and that extreme compaction occurs only in areas to receive paving.

2. In areas to receive seed, verify that soil is scarified to depth of 3 inches and that soil contains enough organic matter to support and encourage rooting of seeded lawn.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Job Conditions

1. Dust control: Use all means necessary to prevent dust from construction operations from being a nuisance to adjacent property owners and from damaging finish surfaces on adjacent building, paving, etc. Methods used for dust control are subject to approval by the Engineer or Owner's Representative.

2. Burning: On-site burning will not be permitted.

3. Protection: Use all means necessary to protect curbs, gutters, sprinklers, utilities and vegetation designated to remain, and, in the event of damage, immediately make all repairs, replacements and dressings to damaged plants necessary to the approval of the Landscape Engineer. Contractor shall incur all cost for the replacement of damaged objects and vegetation.

3.2 SCHEDULING

A. Schedule all work in a careful manner with all necessary consideration for adjoining property owners and the public.

B. Coordinate schedule with other Contractors to avoid conflicts with their work.

3.3 EXCAVATION

SECTION 31 1012
FINE GRADING

A. Excavate where necessary to obtain subgrades, percolation and surface drainage as required.

B. Materials to be excavated are unclassified.

C. Remove entirely any existing obstructions after approval by the Engineer's or Owner's Representative.

D. Remove from site and dispose of debris and excavated material not required.

3.4 GRADING

A. The Contractor shall establish finished grades as shown on the construction plans and as directed by the Engineer, including areas where the existing grade has been disturbed by other work.

B. Finished grading shall be smooth, aesthetically pleasing, drain well and ready to receive sod and other plant material to full satisfaction of the Owner's Representative, Engineer and Construction Manager.

3.5 COMPACTION

A. Compact each layer of fill in designated areas with approved equipment to achieve a maximum density at optimum moisture, AASHTO T 180 - latest edition.

1. Under buildings, roadways, curbs, walks and other paved areas: compaction shall be to 95% of maximum density.

2. Under landscaped area, compaction shall not exceed 85% of maximum density.

B. No backfill shall be placed against any masonry or other exposed building surface until permission has been given by the Owner's Representative, and in no case until the masonry has been in place seven days.

C. Compaction in limited areas shall be obtained by the use of mechanical tampers or approved hand tampers. When hand tampers are used, the materials shall be deposited in layers not more than four inches thick. The hand tampers used shall be suitable for this purpose and shall have a face area of not more than 100 square inches. Special precautions shall be taken to prevent any wedging action against masonry or other exposed building surfaces.

3.6 CORRECTION OF GRADE

A. Bring to required grade levels areas where settlement, erosion or other grade changes occur. Adjust grades as required to carry drainage away from buildings and to prevent ponding around the buildings and on pavements.

B. Remove all rock or objectionable material larger than one inch in any direction prior to commencing landscaping.

SECTION 31 1012
FINE GRADING

C. Contractor shall be responsible for stabilizing grades by approved methods prior to landscaping, and shall be responsible for correction of grades as mentioned above, and clean up of any wash outs or erosion.

END OF SECTION 31 1012

SECTION 31 1018
SOIL EROSION CONTROL

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

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

B. CAD files will be made available for use in construction staking. Contact the engineer regarding applicable fee and requirements for signing of the CAD File Transfer Agreement.

1.2 SUMMARY

A. The work under this Section includes, but not limited to all work necessary for effective soil erosion control in conformance with Part 91, Act 451, PA 1994, the Soil Erosion and Sedimentation Control Act, Michigan Department of Natural Resources Environmental Protection Act guidelines and all pertinent local enforcing agency rules and regulations, having jurisdiction.

1.3 STANDARDS

A. General: Perform all work under this Section in accordance with all pertinent rules and regulations, including, but not necessarily limited to those mentioned above and these Specifications.

B. Conflicts: Where provisions of pertinent rules and regulations conflict with these Specifications, the more stringent provisions shall govern.

PART 2 - PRODUCTS

2.1 SEED, FERTILIZER, MULCH

A. Refer to other Specification Section in Part 3.

PART 3 - EXECUTION

3.1 GENERAL

A. Standards: Provide all materials and promptly take all actions necessary to achieve effective erosion control in accordance with the Soil Erosion and Sedimentation Control Act, Michigan Department of Natural Resources guidelines, local enforcing agency guidelines and these Specifications.

B. Site evaluation: Prior to start of the Work, conduct a field evaluation of the site along with representatives of the Engineer and the local enforcing agency.

SECTION 31 1018
SOIL EROSION CONTROL

C. Permits: Contractor is responsible for obtaining all pertinent permits including a Soil Erosion Control Permit if required from the county or local enforcing agency. Submit the NPDES Notice of Coverage when the soil erosion permit is received if not already done.

3.2 SEEDING AND MULCHING

A. General

1. All bare soil, unless otherwise required by the Contract Documents, shall be seeded, fertilized and mulched to create a protected condition. Use seed mix as indicated on the plans (if different seed mixes are indicated on the civil and landscape plans, the mix indicated on the landscape plans shall override). Critical areas shall be sodded as approved by the Engineer and as shown on the plans.

2. Seeding and mulching shall be performed immediately upon completion of a phase or section of the Work or as approved by the Engineer.

3. In all cases, seeding and mulching shall be performed within thirty (30) calendar days from the time the area was first disturbed.

4. During any period of time which the soil is unprotected, provide erosion control structures as necessary to minimize erosion and to keep any eroded soils on the site and out of ditches, rivers, storm sewers and wetlands.

5. Refer to the plans for notes regarding the use of turf reinforcement matting and/or mulch blankets (on all slope exceeding 1 vertical to 10 horizontal).

B. Seed: Seed shall be applied uniformly at a minimum rate of 48 pounds per acre.

C. Fertilizer: Fertilizer shall be applied uniformly at a minimum rate of 250 pounds per acre.

D. Mulch: Mulch shall be uniformly applied at a rate of two (2) tons per acre, or equal, on all seeded areas that have a slope of less than 1 vertical to 10 horizontal. Refer to note A5. above for additional slope stabilization requirements.

3.3 DITCH AND RIVERS

A. When reasonably possible, banks of ditches and rivers disturbed under this Work shall be protected within 24 hours of disturbance, but in no case shall banks be left unprotected more than 7 calendar days.

3.4 STEEP SLOPES

A. Emulsion

1. On slopes greater than 10%, use erosion control blankets or turf reinforcement matting to hold seed in place. Refer to plan notes.

SECTION 31 1018
SOIL EROSION CONTROL

B. Other methods: Chemical self-adhering mulch and other mulch anchoring methods may be used as approved by the Engineer.

3.5 SITE IMPROVEMENTS CONSTRUCTION

A. During construction of the site improvements conform to the following general rules:

1. Minimize the amount of earth disturbed at any one time.

2. Establish a construction sequence which includes adequate erosion control.

3. Provide ground cover, even if only temporary, so as to stabilize an area and minimize erosion.

4. As much as practicable, direct storm water away from the construction area. Direct diverted storm water to any stable area.

5. Collect runoff from the site in sediment basins, traps or through filters.

6. Establish an inspection and maintenance schedule, paying special attention to the beginning of the various stages of construction. Employ a certified storm water operator and keep a log of the soil erosion and sedimentation control measures in accordance with the NPDES requirements.

7. Keep in mind that the primary objective is to keep the soil on the site.

8. Once final stabilization of the site is complete, and the governing agency has granted its approval, remove all temporary erosion control structures.

9. Control site runoff during all periods of site construction to ensure that excess surface runoff does not reach adjacent properties. This is especially critical during stages when the land has been stripped but not yet graded.

3.6 CLEANING

A. Perform cleaning of all areas affected by work under this section and leave the site in a neat and tidy state. Contractor shall keep Adjacent Roads clean and free of debris.

END OF SECTION 31 1018

SECTION 31 2000
EARTH MOVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

B. All earthwork operations shall confirm to the current Michigan Department of Transportation standards and specifications.

C. CAD files will be made available for use in construction staking. Contact the engineer regarding applicable fee and requirements for signing of the CAD File Transfer Agreement.

1.2 SUMMARY

A. This Section includes the following:

1. Excavation and backfill for utility trenches.

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

B. Base Course: Layer placed between the subbase course and asphalt paving.

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

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

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Engineered Fill: Fill placed and compacted to densities specified herein, in a controlled manner using lift thickness limited herein, monitored and tested by the Testing Agency or independent Geotechnical Inspector.

G. Excavation: Removal of material encountered above subgrade elevations.

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

I. Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material 3/4 cu. yd. (0.57 cu. m) or more in volume.

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EARTH MOVING

J. 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.

K. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

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

M. Undercutting: Necessary excavation of poor quality soils which occur below the existing

Topsoil and any uncontrolled fill soils as described in the Geotechnical Investigation.

N. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Drainage fabric if required for the project .

2. Separation fabric if required for the project.

B. Test Reports: Testing Agency shall submit the following reports directly to the Engineer and shall copy the contractor:

1. Analysis of soil materials, whether procured on or off site, and including fill, backfill, and borrow materials.

2. In-place density test reports.

3. Moisture-density relationship test reports.

4. Compressive strength or bearing test reports.

C. Material Test Reports: Interpreting test results for compliance of the following with requirements indicated:

1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.

1.5 QUALITY ASSURANCE

A. Testing Agency Services

SECTION 31 2000
EARTH MOVING

1. The Owner will secure and pay for the services of a qualified, independent geotechnical engineer to classify existing soil materials, to recommend and to classify proposed borrow materials when necessary, to verify compliance of materials with specified requirements, and to perform required field and laboratory testing. Geotechnical engineer shall be acceptable to the Engineer and the owner and shall be licensed to practice in the state in which the project is located.

B. Pre-excavation Conference: Conduct conference at Project site.

1.6 PROJECT CONDITIONS

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

1. Notify Engineer and Owner not less than three (3) calendar days in advance of proposed utility interruptions.

2. Do not proceed with utility interruptions without Engineer's or Owner’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 without additional cost to Owner when sufficient satisfactory soil materials are not available from excavations. Contractor is responsible for doing an independent earthwork calculation and including any import of appropriate fill material required to bring the site to the proposed grades.

B. Satisfactory Soil Material (ASTM D 2487): Free of stones larger than 2 inches in any dimension, trash, debris, organic material, other objectionable material and classified as follows:

1. GP (poorly graded gravel).
2. GM (silty gravel).
3. GC (clayey gravel).
4. SW (well-graded sand).
5. SP (poorly graded sand).
6. SM (silty sand).

C. Unsatisfactory Soil Material (ASTM D 2487):

1. SC (clayey sand).

2. CL (lean clay).

3. ML (silt).

4. OL (organic clay).

5. OL (organic silt).

6. CH (fat clay).

7. MH (elastic silt).

8. OH (organic clay).

9. OH (organic silt).

10. PR (peat).

D. Backfill and Fill: Satisfactory soil materials.

E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; Generally either an MDOT Class II sand or 21AA gravel will meet this requirement.

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; Generally either an MDOT Class II sand or 21AA gravel will meet this requirement.

G. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; Generally either an MDOT Class II sand or 21AA gravel will meet this requirement.

1. Clean granular fill meeting MDOT Class II grading requirements.

2. On-site granular deposits within the excavation can be used as engineered fill if approved by the geotechnical engineer and if selective excavation procedures are employed to manage existing clay deposits.

3. Import fill as required to make-up volumes necessary to raise the building site.

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; Generally either an MDOT 3G, 5G, 6A, or 34R will meet this requirement. Bedding requirements of the agencies having jurisdiction over the utility installation take precedence over these specifications.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; Generally either an MDOT 6A or 34R will meet this requirement. Refer to the plans for specific requirements.

J. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.2 ACCESSORIES

A. Drainage Fabric: Nonwoven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; with minimum properties determined according to ASTM D 4759 and referenced standard test methods.

B. Separation Fabric: Woven geotextile, specifically manufactured for use as a separation geotextile; made from polyolefins, polyesters, or polyamides; with minimum properties determined according to ASTM D 4759 and referenced standard test methods.

PART 3 – EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

C. Provide erosion-control measures approved by agency having jurisdiction to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 EXPLOSIVES

A. Explosives: Explosives are prohibited for use on the Project site.

3.4 EXCAVATION, GENERAL

A. General: Excavation includes the removal of any materials necessary to achieve the required subgrade elevations and includes reuse or disposal of such materials.

B. Unnecessary Excavation: The expense of excavation of materials outside of limits indicated or ordered in writing by the Engineer and the correction thereof to the satisfaction of the Engineer shall be borne by the contractor.

1. Unnecessary excavation under footings: Either deepen footings to bear on actual subgrade elevation without changing top elevations or place concrete fill up to required elevation, as required by the Engineer.

2. Unnecessary excavation other than under footings: Either place compacted fill or otherwise correct conditions, as required by the Engineer.

C. Approval of Subgrade: Notify the Testing Agency when required elevations have been reached.

1. When required by the Engineer due to the unforeseen presence of unsatisfactory materials or other factors, perform additional excavation and replace with approved compacted fill material in accordance with the Engineer's or geotechnical engineer's instructions.

2. Payment for unforeseen additional work will be made in accordance with established unit prices or, if none, in accordance with provisions for changes in the work. No payment will be made for correction of subgrades improperly protected against damage from freeze-thaw or accumulation of water, or for correction of otherwise defective subgrades.

D. Excavation Stabilization: Slope faces of excavations to maintain stability in compliance with requirements of governing authorities. Do not use shoring and bracing where faces can be sloped.

3.5 EXCAVATION FOR STRUCTURES

A. Do not proceed with excavations for building structures until Subgrade Preparation operations are complete and tested.

B. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). 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 from 6 to 12 inches (150 to 300 mm) 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 (25 mm). Do not disturb bottom of excavations intended for bearing surface.

C. Coordinate excavations with Dewatering operations as required to allow construction of foundations to dry.

3.6 EXCAVATION FOR WALKS AND PAVEMENTS

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

3.7 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.

C. Trench Bottoms: Excavate and shape trench bottoms in accordance with the plans and standard details. Excavate trenches a minimum 4 inches (100 mm) deeper than bottom of pipe elevation to allow for bedding course (excavate deeper as required by the regulating agency). Hand excavate for bell of pipe. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches a minimum 4 inches (100 mm) deeper than bottom of pipe elevation to allow for bedding course (excavate deeper as required by the regulating agency). Hand excavate for bell of pipe. Remove projecting stones and sharp objects along trench subgrade. Provide bedding course per the plan notes and/or details.

3.8 SUBGRADE PREPARATION AND INSPECTIONS

A. Perform mass earthwork operations to remove all existing topsoil and other organic materials in their entirety within the footprint of the proposed building and pavement areas. Buried objects should be removed in their entirety.

B. Notify Testing Agency when excavations have reached required subgrade elevations.

C. Proof-roll subgrade in the presence of the Testing Agency 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 the first direction. Limit vehicle speed to 3 mph.

2. Proof-roll subgrade with heavy pneumatic-tired equipment or loaded 10-wheel, tandem-axle truck weighing not less than 15 tons.

3. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by the Testing Agency, and replace with engineered fill as directed.

D. If Testing Agency determines that unsatisfactory soil is present, continue excavations and replace with compacted backfill or fill materials as directed.

1. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.

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 may be used at no additional cost to the Owner.

3.10 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile 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, dampproofing, waterproofing, and perimeter insulation.

2. Surveying locations of underground utilities for record documents.

3. Inspecting and testing 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.

3.12 UTILITY TRENCH BACKFILL

SECTION 31 2000
EARTH MOVING

A. 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.

B. Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit. All pipe backfill to be done according to the details shown on the plans or the requirements of the regulating agency.

C. Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.

3.13 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills.

B. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. 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 engineered fill.

3. Under steps and ramps, use engineered fill.

4. Under building slabs, use engineered fill.

5. Behind walls, use engineered drainage fill.

6. Under footings and foundations, use engineered fill.

7. Over excavated areas, use engineered fill or lean concrete.

3.14 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within two (2) percent of optimum moisture content.

1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

3.15 COMPACTION OF BACKFILLS AND FILLS

SECTION 31 2000
EARTH MOVING

A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698 and ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill material at 95 percent.

2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 95 percent.

3. Under lawn or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill material at 88 percent.

3.16 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

1. Provide a smooth transition between 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 plus or minus 1 inch.

C. Grading Inside Grading Lines: Finish subgrade to a tolerance of ½ inch, when tested with a 10 foot straight-edge.

D. Contractor shall confirm that the proposed grades shown on the plans will not create a ponding water condition (i.e. an unintended low spot or pavement grades of less than 1%).

3.17 SUBSURFACE DRAINAGE

A. Drainage Piping: Drainage pipe is specified in Division 33 Section 4100.

B. Subsurface Drain: Place a layer of drainage fabric around perimeter of drainage trench. Place a 6 inch course of filter material on drainage fabric to support drainage pipe. Encase drainage in a minimum of 12 inches of filter material and wrap in a drainage fabric, overlapping sides and ends at least 6 inches.

1. Compact each course of filter material to 95 percent of maximum dry unit weight according to ASTM D 698.

C. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade. Overlay drainage backfill with one layer of drainage fabric, overlapping sides and ends at least 6 inches.

1. Compact each course of filter material to 95 percent of maximum dry density according to ASTM D 698.

3.18 SUBBASE AND BASE COURSES

A. If indicated on the plans or deemed necessary by the geotechnical engineer, install separation fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

B. Under pavements and walks, place subbase course on separation fabric according to fabric manufacturer's written instructions if fabric is called for on the plan or deemed necessary by the geotechnical engineer.

C. Under pavements and walks, place base on prepared subbase or subgrade as follows:

1. Place base course material over subbase (or subgrade if subbase is not indicated).

2. Compact subbase and base courses 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 1557.

3. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

D. Pavement Shoulders: Place shoulders along edges of subbase and base course to prevent lateral movement. Construct shoulders, at least 12 inches wide, of satisfactory soil materials and compact simultaneously with each subbase and base layers to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.19 DRAINAGE COURSE

A. Under slabs-on-grade, if indicated on the plans, place drainage fabric on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.

B. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:

1. Compact drainage course to required cross sections and thickness to no less than 95 percent of maximum dry unit weight according to ASTM D 698.

2. When compacted thickness of drainage course exceeds 6 inches, place materials in equal layers, with no more than 6 inches thick or less than 3 inches thick when compacted.

3.20 FIELD QUALITY CONTROL

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

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

C. 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.

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

3.21 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 becomes eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Protect all existing trees, bushes, plants, etc. indicated to remain during construction activities.

3.22 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Unless otherwise indicated on the drawings, remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of it off the Owner’s property.

1. Do not burn materials on the Owner’s property.

END OF SECTION 31 2000

SECTION 31 2010
EARTHWORK - TURF

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 provisions of the other parts.

B. Related Sections:

1. Section 32 9227 General Lawn Restoration
2. Section 33 4615 Subdrainage Systems

C. Section Includes:

1. Excavation and backfill for site balance, utility trenches, footings, etc.
2. Preparing subgrades for pavements, slabs-on-grade, synthetic turf, lawns, and plantings.
3. Base course for asphalt or concrete paving.

1.2 SCOPE

A. Furnish approved labor, materials, equipment, transportation, and services required to complete all earthwork as indicated on the drawings and specified herein The Base Bid includes all earthwork and grading to provide a subgrade for other improvements. Adjustment of grades will be permitted, providing the overall grading concept and the positive drainage swales are maintained.

1.3 QUALITY ASSURANCE

A. Excavation team shall be established and experienced with a minimum of 5 years experience constructing athletic fields.

B. Testing Agency Services

1. The Owner shall secure and pay for the services of a qualified, independent geotechnical engineer to classify existing soil materials, to recommend and to classify proposed borrow materials, when necessary, to verify compliance of materials with specified requirements, and to perform required field and laboratory testing. Geotechnical engineer shall be acceptable to the Architect and the Owner and shall be licensed to practice in the State in which the projected is located.

1.4 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation

B. Base Course: Layer placed between the subbase course and asphalt paving.

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

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

E. Drainage Course: Layer supporting slab-on-grade or subbase for synthetic turf surfacing, used to minimize capillary flow of pore water.

F. Engineered Fill: Material placed and compacted to densities specified, in a controlled manner, using lift

thickness limited herein, monitored and tested by the Testing Agency or Independent Geotechnical Engineer.

G. Excavation: Removal of material encountered above subgrade elevations.

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

I. Structures: Buildings, footings, foundations, retaining walls, curbs, slabs, utility components, or other man-made features above grade.

J. Subbase Course: Layer placed between the subgrade and base course for asphalt paving or concrete pavement.

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. Undercutting: Necessary excavation or poor quality soils which occur below the existing topsoil and any uncontrolled fill soils as described in the Geotechnical Report.

M. Utilities: Includes underground pipes, conduits, ducts, and cables, irrigation lines, data and fiber optic, and underground services within buildings.

1.5 EXAMINATION OF SITE

A. The contractor is expected to visit the site to determine all conditions to be encountered, protect improvements on adjoining properties, as well as those on the owner's property, and to restore any improvements damaged by his work to their original condition, as acceptable to the owner or other parties or authorities having jurisdiction.

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

1. Notify Architect and Owner not less than three (3) calendar days in advance of proposed utility interruptions.
2. Do not proceed with utility interuuptions without Archtiect’s or Owner’s written permission.
3. Contact both public and private utility locator services for area where is Project is located before excavating.

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

1.6 SAFETY CODES AND STANDARDS

A. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction.

1.7 DEWATERING

A. The contractor shall perform all work so as to permit the site to be free draining at all times and to prevent ponding. Contractor shall provide positive drainage for the entire site during the course of construction to eliminate standing water in excavated areas.

1.8 PROTECTION

A. Protect newly graded areas from traffic: pedestrian or construction, freezing, and erosion. Keep free of trash and debris.

B. Protect all existing trees, bushes, etc. indicated to remain during construction activities.

C. Repair and/or reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, or settled due to subsequent construction activities or weather conditions.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide soil materials without additional costs to Owner, when sufficient satisfactory soil materials are not available from excavations. Contractor is responsible for doing performing an independent earthwork calculation and including any import of appropriate fill material required to bring the site to the proposed elevations.

2.2 BACKFILL AND FILL MATERIALS

A. General: Backfill shall be excavated soil material, free of rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable matter, organic matter, and other deleterious matter. Existing materials may be used for backfill, provided no silt is mixed with material. Backfill consists of placement of acceptable soil material in layers, in excavations, to required subgrade elevation, for each area classification listed below.

B. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural/crushed sand. Generally, either MDOT Class II Sand or 21AA gravel will meet this requirement. Refer to plans and/or Geotechnical Engineer’s recommendation as to whether the use of 21AA crushed concrete is an acceptable material.

C. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural/crushed sand. Generally, either MDOT Class II Sand or 21AA gravel will meet this requirement. Refer to plans and/or Geotechnical Engineer’s recommendation as to whether the use of 21AA crushed concrete is an acceptable material.

D. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural/crushed sand. Generally, either MDOT Class II Sand or 21AA gravel will meet this requirement. Refer to plans and/or Geotechnical Engineer’s recommendation as to whether the use of 21AA crushed concrete is an acceptable material.

1. All materials shall meet MDOT Class II requirements and shall be clean granular fill.
2. The use of on-site materials as engineered fill shall be approved by the Geotechnical Engineer prior to excavation and placement. Coordinate excavation protocols with Geotechnical Engineer to manage existing clay deposits.
3. Import all fill materials as required to achieve volumes necessary to meet proposed elevations.

E. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural/crushed sand. Generally, either MDOT 3G or 6A will meet this requirement. Bedding

materials used for utility installation shall meet the requirements of the local municipal jurisdiction.

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, washout, or undermining caused by earthwork operations.

B. Provide erosion-control measures to prevent erosion or contamination of soils and discharge of water runoff or airborne dust to adjacent properties, walkways, or bodies of water.

3.2 EXCAVATION GENERAL

A. Unnecessary Excavation: the expense of excavation of materials outside the limits indicated or administered in writing by the Architect shall be the responsibility of the contractor.

1. Unnecessary excavation under footings: either deepen footings to bear on actual subgrade elevation without changing top elevations or place concrete fill up to required elevation.
2. Unnecessary excavation other than under footings: place either compacted fill or otherwise correct conditions, as required by the Architect.

B. Subgrade Approval:

1. Notify the Testing Agency when required elevations have been reached.
2. Should the presence of unforeseen or unsatisfactory materials or factors exist, perform additional excavation and replace with approved compacted fill material in accordance with Geotechnical Engineer or Architect’s instructions.
3. Compensation for unforeseen additional work will be made in accordance with established unit prices or, if none, in accordance with provisions for changes in the work. No payment will be made for correction of subgrades improperly protected against damage from contractor neglect, freeze-thaw or accumulation of water, or for correction of otherwise defective subgrades.

C. Coordinate excavations with Dewatering operations as required to allow for construction during dry/workable conditions.

D. Stability: Slope sides of excavations over five feet (5') deep to angle of repose of material excavated; otherwise shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in a safe condition until completion of backfill by scaling, benching, shelving, or bracing. Take precautions to prevent slides or cave-ins when excavations are made in locations adjacent to backfill excavations, and when sides of excavations are subjected to vibrations from vehicular traffic or the operation of machinery or any other source. Remove soft or unstable soil below finish grade elevations and backfill such voids with compacted fill material.

E. Excavation consists of removal of material encountered to obtain required subgrade elevations.

1. Excavation for Trench: Cut trench to cross-sections and grades as shown. Deposit excavated materials a sufficient distance from the edge of trench to prevent cave-ins or material from sliding into ditch. Keep trench free of leaves, sticks, and other debris until final acceptance of work.

a. Excavate trenches to provide a uniform working clearance width of each side of pipe or conduit.
b. Trench walls shall be excavated vertically from top to bottom to 12 inches higher than top of pipe or conduit, unless noted otherwise.

2. Trench Bottoms:

a. Excavate and shape trench bottoms in accordance with details. Excavate trenches a minimum 4 inches deeper than bottom of pipe to allow for bedding course. Remove all projecting objects or foreign debris along trench subgrade.
b. Place backfill materials and to compacted densities as noted herein.

3.3 SUBGRADE PREPARATION

A. Perform mass earthwork operations to remove all existing topsoil and other organic materials in their entirety within the footprint of the proposed pavement and athletic field areas. Refer to Geotechnical Report for additional recommendations for site excavations. Buried objects should be removed in their entirety and backfilled.

B. Contractor shall notify Testing Agency or Landscape Architect when excavations have reached the required subgrade elevations.

C. Proof-roll subgrade in the presence of the Testing Agency and Landscape Architect to identify any areas of excessive yielding or soft conditions. Do not perform proof-roll on wet or saturated surfaces.

1. Perform proof roll of subgrade with heavy pneumatic-tired equipment or loaded 10-wheel tandem axle truck weighing not less than 15 tons.
2. Completely perform proof-roll of subgrade in one direction, repeating in a direction perpendicular to the first direction. Perform any additional proof roll operations deemed necessary by the Testing Agency in order to identify unsatisfactory ground conditions.
3. As determined by and at the direction of the Testing Agency, excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting. Replace material with engineered fill as directed.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or improper construction activities.

3.4 MATERIAL STORAGE

A. Export and dispose of all excavated materials classified as deemed unsatisfactory by the Testing Agency.

B. Stockpile any imported materials and satisfactory excavated soil materials. Do not intermix new with excavated materials unless deemed allowable by the Testing Agency. Place, grade, and shape stockpiles to drain surface water and keep away from edge of excavations. Cover materials as necessary to prevent water or wind erosion of materials.

3.5 BACKFILL GENERAL

A. Contractor shall ensure the following items have been completed prior to placement and compaction of backfill materials:

1. Survey locations of underground utilities for record documents.

2. Inspect and test underground utilities as necessary.
3. Remove concrete form work.
4. Remove trash and debris.

3.6 SITE PREPARATION

A. Remove vegetation, debris, unsatisfactory soil materials, obstruction and deleterious materials from ground surface prior to placement of fills.

B. Plow, scarify, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

C. Place and compact fill materials in layers to required elevations as follows:

1. Under grass, planted, and landscape areas: use satisfactory soil material.
2. Under walks and pavements: use satisfactory soil material as long as the Gentechnical Engineer deems material to be suitable and compactions requirements can be achieved.
3. Under steps and ramps: use engineered fill
4. Behind retaining walls: use engineered fill
5. Under footings and foundations: use engineered fill
6. Over excavated areas: use engineered fill

3.7 MOISTURE CONTROL

A. Do not place backfill or fill material on surfaces that are muddy, or frozen, or contain frost or ice.

B. Uniformly moisten or aerate subgrade and each subsequent fill or backfill later before compaction to within two (2) percent of optimum moisture content.

3.8 COMPACTION

A. Place backfill materials in layers not more than eight inches (8") 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. Thoroughly compact all fill and backfill by rolling each layer, following spreading, as closely as possible. Roll the areas in equal amounts in two directions. Provide compaction equipment or type best suited to achieve the desired results with the type of soil. In general, use sheeps foot and/or tamping type rollers on soils of a cohesive type; pneumatic wheeled or vibrating rollers on granular fill material, all as approved by the Landscape Architect. Operate compacting equipment on each layer until the entire area has been thoroughly and uniformly compacted to the required density.

C. Compact soil to not less than the following percentages of maximum dry density weight according to ASTM D1557 and ASTM D698

1. Under lawn or unpaved areas, scarify and recompact top six (6) inches below subgrade and compact each layer at eighty-five percent (85%).
2. Under walkways, scarify and recompact top six (6) inches below subgrade and compact each layer at ninety-five percent (95%).
3. Under structures, building slabs, steps, and pavements, scarify and recompact top twelve (12) inches of existing subgrade and compact each layer at ninety-five percent (95%).

3.9 GRADING

A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with all compaction requirements and grade to cross-section, lines, not more than 0.10 feet above or below a subgrade elevation.

1. Provide a smooth transition between existing grades and new grades.
2. Fine grade sub-soil systematically to eliminate uneven areas and low spots and trim high spots. Remove debris, roots, branches, stones, etc., in excess of two inches (2") in size.
3. Contractor shall confirm that the proposed grades shown on the plans will not create a ponding water condition (i.e. an unintended low spot of less than 1%).

3.10 LINES AND DRAINAGE SWALES

A. Synthetic Turf: the plans indicate lines, grades and elevations of the finish work. In general, areas to be turfed shall be excavated, filled, and graded to the bottom elevations of drainage aggregate.

3.11 FIELD QUAILTIY CONTROL

A. Testing Agency: The Owner shall engage a qualified independent Geotechnical Engineering Testing Agency to perform quality-control testing as identified.

B. Allow Testing Agency to inspect and to test subgrades and each fill or backfill layer. Contractor may proceed with subsequent earthwork only after test results for previously completed work has been have authorized to allow to proceed.

C. When Testing Agency reports that subgrades, fills, or backfills have not achieved required compaction, scarify and moisten or aerate and remove/replace soil to depth required. Recompact and retest until specified compaction has been achieved.

3.12 DEBRIS

A. Unless noted otherwise, all debris is to be disposed off Owner’s property. This includes surplus satisfactory soil or waste materials and unsatisfactory trash or debris. Burning of materials on the Owner’s property is strictly prohibited.

END OF SECTION 31 2010

SECTION 31 3219
GEOTEXTILE FABRIC

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.

1.2 SCOPE

A. The work under this section shall consist of furnishing all labor, materials and equipment for the installation of the geotextile fabric.

1.3 SUBMITTALS

A. Manufacturer's Literature: Furnish to Landscape Architect, when required, copies of manufacturer's specifications, and installation instructions for geotextile fabric. Include photographs, catalogue cuts, samples as may be required to show compliance with these specifications.

PART 2 - PRODUCT

2.1 GEOTEXTILE FABRIC

A. The product shall be AMOCO CEF2006, Mirafi - 600x, LINQ Industrial Fabrics - GTF-300, CSI Geoturf - W315 or an approved equivalent.

B. The geotextile shall be of woven construction and consist of long-chain polymeric yarns. The yarns must be composed of at least 95% propylene or ester polymers. The fibers shall be produced in a manner which achieves a stable network. The geotextile shall conform to the mechanical and hydraulic property requirements listed below:

MINIMUM AVERAGE

PROPERTY	VALUE	UNIT	TEST PROCEDURE
Grab Tensile Strength	315	lbs.	ASTM D-4632
Grab Tensile Elongation	15	%	ASTM D4632
Wide Width Tensile	175/175	lbs/in	ASTM D4595
Wide Width Elongation	15/8	%	ASTM D4595
Mullen Burst	600	Psi	ASTM D3786
Puncture	145	lbs	ASTM D4833
Trapezoidal Tear	120	lbs	ASTM D4533
UV Resistance	70	% @ 500 hr	ASTM D4355
Apparent Opening Size (max)	40	AOS	ASTM D4751
Permitivity	.055	1/sec	ASTM D4491
Flow Rate	4.0	gpm/ft2	ASTM D4491

PART 3 – EXECUTION

3.1 INSTALLATION

A. The geotextile fabric shall be furnished and stored in a wrap which will protect the geotextile fabric from

ultraviolet radiation and abrasion. The geotextile fabric shall be covered with the appropriate soil cover within two weeks of its placement.

B. Should the geotextile fabric be damaged during construction, the torn or punctured section shall be repaired by placing a piece of fabric that is sufficiently large enough to cover the damaged area plus two feet (2') of adjacent undamaged geotextile fabric in all directions.

C. Fabric shall be installed on dry soil as per manufacturer.

D. Overlap the fabric as recommended by the manufacturer.

E. Installation and Unit Price shall include overlap quantities.

END OF SECTION 31 3219

SECTION 32 1123
AGGREGATE DRAINAGE LAYER

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 Sections:

1. Section 31 2010 Earthwork – Turf

1.2 SCOPE

A. The work under this section of the specification shall consist of furnishing all labor, materials and equipment to produce, place, spread, compact and finish to proper grade and cross section all aggregate base courses according to the drawings and specifications.

1.3 QUALITY ASSURANCE

A. Reference Standards: American Society for Testing and Materials (ASTM):

C117	Method for Materials Finer than 75-m (No. 200) Sieve in Mineral Aggregates by Washing
C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
F1551	Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials
F2898-11	Standard Test Method for Permeability of Synthetic Turf Sports Field Base Stone and Surface System by Non-confined Area Flood Test Method

B. Contractor shall have previously installed twelve (15) artificial infill turf bases for turf fields larger than 80,000 square feet in the last three (3) years.

1. The contractor is responsible for fine grading, installation of the perimeter nailing system (as necessary), and installation of the dynamic stone base.

C. Firms must have been in business under the same ownership for at least five (5) years and shall have been installing similar sports fields for that entire period.

D. Contractor shall provide a sieve analysis prior to placement for every 150 ton of stone delivered to site. Material should be tested by a third-party construction testing firm administered through the project.

E. Contractor will be required to provide product pit tickets to designated Owner's Representative for each load of material brought to and intended for job to ensure conformance to the approved Sieve Analysis. Material non-compliant with approved submittal shall be rejected.

E. The synthetic turf manufacturer/installer shall perform an inspection of the field base onto which the synthetic turf system is to be installed to examine the finished surface for required compaction, permeability and grade tolerances. Earthwork contractor is responsible for correcting deficient items noted by the turf manufacturer/installer prior to acceptance. The turf installer will accept the aggregate stone base in writing when the Owner's representative provides test results for compaction, permeability and planarity that are in compliance with the project plans and specifications. After any discrepancies between the required materials, application and tolerance requirements noted have been corrected, the synthetic turf installer should submit a written certification of acceptance of the base for installation of synthetic turf system.

1.4 SUBMITTALS

A. Submit to the Landscape Architect a sieve analysis of the proposed stone to be installed. Sieve analysis shall be dated within 14 days of submission.

1.5 ACCEPTABILITY OF THE WORK

A. Grade: Grade conformance tests shall be conducted on the entire surface. The surface shall have positive drainage of 0.50% inclination.

B. Planarity: After completion of the compacting operations, the compacted aggregate base shall be tested with a 10' straightedge. Measurements shall be made perpendicular to and across the field at a distance not to exceed 25' feet. The grade will not vary by 1/8" from proposed grades, elevations and slopes provided.

C. The grade of the aggregate base shall be evaluated with a "string test".

D. Aggregate shall be tested as per ASTM F1551-09 or ASTM 2898-11 at a minimum of 8 locations after final grade as been achieved and accepted.

E. Foresite Design commits to being onsite for a maximum 3 hours during string check. Any additional time required will be billed as an Additional Service to be compensated by the Base Contractor or Construction Manager. Hourly rates are between $125 - $150 depending on which personnel are present.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Aggregate base material shall conform to specifications for 100% crushed 100% limestone and shall be placed and compacted to the minimum depth shown on plans. Crushed concrete, slag, etc. shall not be allowed. DOT standard classifications do not conform. Modifications of standard DOT aggregate classification maybe required to meet specification. On-site mixing will not be an acceptable method for providing this material.

Aggregate Sieve Analysis	Percent Passing	
	Base Material	Finishing Stone (Not to exceed 1" compacted depth)
1 1/2"	90-100	
1"	75-100	
¾"	65-95	100
3/8"	40-75	85-100
¼"	25-65	75-100
No. 4	15-60	60-90
No. 8	0-40	35-75
No. 16	0-20	10-55
No. 30	0-7	0-40
No. 60	0-5	0-15

No. 100	0-3	0-8
No. 200	0-2.0	0-2.0
LBW	Maximum 2.5	Maximum 2

B. The hydraulic conductivity of the aggregate shall be such that is capable of draining the entire synthetic surface at a minimum of 10”/hr for the carpet and 14”/hr including aggregate drainage stone with perforated under drain system acting as the main water displacement conductor. The aggregate shall maintain its finished grade elevations. Migration of fines and subsequent loss of finished tolerances will not be accepted.

C. Material shall be tested by a testing agency selected by the Owner to ensure compliance with the submitted documentation (ASTM D422 particle size analysis and ASTM 2898 or F1551-09/DIN 18-035:6, permeability to water). A minimum of 8 tests shall be performed at random locations selected by Owner’s representative.

PART 3 - EXECUTION

3.1 SUB-GRADE CONSTRUCTION

A. The sub-grade shall be so constructed as to have uniform stability for a width at least equal to that of the proposed improvements plus of the proposed anchoring system. It shall be brought to an elevation and cross section such that, after being rolled, the surface will be at the required elevation. At the time the sub-grade is prepared, the fill area shall have been constructed to the full width and to at least the elevation of the finished sub-grade.

B. The material present in the next six (6) inches below the elevation of the sub-grade shall be scarified, mixed and recompacted, or otherwise treated to produce a uniform condition. Stones over four (4) inches in size shall be removed from the loosened portion of the sub-grade and disposed as directed by the project representative.

C. Depressions that develop during the following shall be filled with suitable material, and the rolling shall continue until the sub-grade is uniformly firm, properly shaped and substantially true to grade and cross section. It shall be so maintained until the pavement is place.

D. Material, other than sand, which will not compact readily under roller shall be removed and replaced with material which will compact readily and that portion of the sub-grade shall be rolled again.

E. The rolling of the sub-grade shall extend for at least twelve (12) inches outside of each edge of the proposed turf boundaries when possible. Piles or ridges of earth or material that would seriously interfere with the operations of finishing the pavement shall not be left on the shoulders.

F. During the process of construction sub-grade, the soil shall be maintained in a condition sufficiently moist to facilitate compaction and produce a firm, compact surface.

G. If, in the preparation of the sub-grade, it becomes necessary to excavate below the elevation of the earth shoulders, ditches or drains shall be provided at frequent intervals to permit ready drainage of surface water from sub-grade to side ditches.

H. If ruts or other objectionable irregularities form in the sub-grade during construction, the Contractor shall reshape and re-roll the sub-grade before the drainage course is laid. The material used for filling ruts or other depressions shall be of such character as to make it equally desirable for sub-grade purposes as the material presented in the sub-grade.

I. When the sub-grade is being prepared for placement as an aggregate base course, the elevation of the most finished surface, at the time the next layer is placed, shall not vary by more than 0.02 foot above or below the prescribed elevation at any point where measurement is made.

3.2 AGGREGATE DRAINAGE COURSE

A. Base course construction shall proceed as follows only after the qualified testing firm has approved the sub-grade construction and the gravel tests.

B. The base shall be constructed in layers of not more than three (3) inches (75mm) compacted thickness when conventional rolling equipment is used.

C. If vibratory or other approved special equipment is used, the thickness of every compacted layer may be increased to a maximum of eight (8) inches (200mm).

D. The finished surface of any aggregate drainage layer shall not vary more than 1/8” from the elevations, grades and cross sections on the drawings.

E. Compacted full profile aggregate drainage stone base dimensions shall be a minimum of 8”. The thickness of the finishing stone shall not exceed one (1) inch of compacted depth.

F. It shall be the contractor’s responsibility to maintain a uniform consistent stone base gradation during the installation process. This shall include but not limited to keeping aggregate base at optimum moisture content (5%, ± 1%) and/ or providing, placing, and compacting a ½ “ layer of stone chips.

G. Installation shall be accomplished using automated laser grade control, equipment, with dual-slope capabilities.

H. Prior to calling for grade verification from Landscape Architect, the contractor shall have a registered land surveyor establish and set PK nails at the following locations:

1. Back of end zone.
2. Goal line.
3. Every 5 yard line.
4. Football side line
5. Soccer touch line

I. PK nails, or equivalent, shall be placed on turf nailer system. Do not set flush into nailer. Allow enough to loop grade line onto nail for grade verification. String Check.

J. Contractor shall have on-site, prior to Landscape Architect arrival, the following equipment:

1. One (1) ton steel drum rover – rubber tired equipment not acceptable.
2. 50 ton 3/8” stone chips.
3. Topdresser – to distribute 3/8” stone chips.
4. Two (2) 48”/38” aluminum landscape rakes.
5. 24” wide broom.
6. There must be enough personnel to operate all equipment simultaneously.

K. It will be the contractor’s obligation and responsibility to have all of the above items in place prior to grade verification by Landscape Architect.

3.3 COMPACTION REQUIREMENTS

A. Sub-grade shall be compacted to not less than ninety-two percent (92%) of maximum density at not less than seventy-five percent (75%) of optimum moisture content.

B. Aggregate drainage layer shall be compacted to not less than eighty-five percent (85%) of maximum density. Using conventional rolling equipment, moisture content shall not be less than ninety percent (90%) nor more than one hundred-ten percent (110%) of optimum moisture content. Using vibrating equipment, moisture content shall not be less than seventy-five (75%) of optimum moisture content.

C. Maximum density shall be determined in accordance with AASHO Modified Method of Test for the Compaction and Density of Soil, Designation T-180, and the optimum moisture content shall be that corresponding to the maximum density in the above test.

D. Contractor shall maintain optimum moisture content during the installation, (placement, grading, compacting, etc.) of the aggregate base materials.

3.4 ROLLERS

A. Smooth steel-wheeled rollers shall be self-propelled and have a total weight not less than 8 tons. The compression (driving) roller shall exert a pressure of not less than 250 lbs. per inch width of the roller.

B. Pneumatic-tire rollers shall have a compacting width of sixty (60) inches (1.5m) or more and shall be capable of varying the weight from 100 to 250 lbs. per inch of rolling width.

END OF SECTION 32 1123

SECTION 32 1216
HOT-MIX ASPHALT 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.

B. All paving materials and construction methods shall conform to the current standards and specifications of the Michigan Department of Transportation. Where these specifications are less stringent than the requirements of MDOT, the MDOT standards shall govern

1.2 SUMMARY

A. This Section includes installation of the following:

1. Hot-mix asphalt concrete paving.

1.3 DEFINITIONS

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

B. MDOT: Michigan Department of Transportation.

1.4 REQUIREMENTS

A. Provide hot-mix asphalt paving according to materials, workmanship, and other applicable requirements of MDOT'S most current Standard Specifications for Construction. Where notes in this specification section differ from the MDOT standards, the MDOT standards shall govern.

B. Do not place asphalt when ambient air or base surface temperature is less than 40 degrees F (4 degrees C), or surface is wet or frozen.

C. Place bitumen mixture when temperature is not more than 15 F degrees (8 C degrees) below bitumen supplier's bill of lading and not more than maximum specified temperature.

1.5 SUBMITTALS

A. Submit aggregate and bituminous mix designs for review. Contractor shall confirm that the materials provided meet the required specifications, and provide material certification to the engineer. Material certification shall state that the products meet or exceed the requirements indicated on the plans and the requirements of the regulating authority.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer.

1. Manufacturer shall be a paving-mix manufacturer registered with and approved by authorities having jurisdiction or the DOT of the state in which Project is located.

B. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated, as documented according to ASTM E 548.

C. Regulatory Requirements: Comply with (MDOT) Michigan Department of Transportation's current Standard Specification for Construction for asphalt paving work.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp or if the following conditions are not met:

1. Prime and Tack Coats: Minimum surface temperature of 60 deg F.
2. Slurry Coat: Comply with weather limitations of ASTM D 3910.
3. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
4. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Apply pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F (10 deg C) for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Asphalt Cement: ASTM D 946.

B. Aggregate for Base Course: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

C. Aggregate for Leveling Course: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

D. Aggregate for Wearing Course: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

E. Fine Aggregate: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

F. Mineral Filler: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

G. Tack Coat: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

2.2 ASPHALT MATERIALS

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A. Asphalt Binder: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

B. Asphalt Cement: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

C. Prime Coat: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

D. Prime Coat: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

E. Tack Coat: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards.

2.3 AUXILIARY MATERIALS

A. Paving Geotextile: AASHTO M 288, nonwoven polypropylene; resistant to chemical attack, rot, and mildew; and specifically designed for paving applications.

B. Joint Sealant: ASTM D 3405 or AASHTO M 301, hot-applied, single-component, polymer-modified bituminous sealant.

C. Pavement-Marking Paint: Refer to section 32 1415 “Pavement Marking”.

1. Color: As indicated on Drawings or in accordance with MDOT.

D. Wheel Stops (if indicated): Precast, air-entrained concrete, 2500-psi minimum compressive strength, 6 inches high by 9 inches wide by 84 inches long. Provide chamfered corners and drainage slots on underside and holes for anchoring to substrate.

1. Dowels: Galvanized steel, 3/4-inch diameter, 10-inch minimum length.

2.4 ASPHALT MIX DESIGNS

A. Hot-Mix Asphalt: Conform with requirements of agency having jurisdiction. If paving is not subject to local review, conform with DOT standards:

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that compacted subgrade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction. Proof-roll as indicated in “Earth Moving” section 31 2000.

C. Verify that gradients and elevation of base are correct. Retain first subparagraph below, if applicable.

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3.2 REPAIRS

A. Leveling Course: Install and compact leveling course consisting of hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.

1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

B. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a depth of 1/4 inch minimum or as indicated.

1. Use hot-applied joint sealant to seal cracks and joints. Fill flush with surface of existing pavement and remove excess.

3.3 SURFACE PREPARATION

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

B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd.

3.4 HOT-MIX ASPHALT CONCRETE 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.
3. Spread mix at minimum temperature of 250 deg F.
4. Install work in accordance with Michigan Department of Transportation (MDOT).
5. Compact pavement by rolling to density specified. Re-roll as necessary to achieve even and smooth finish without roller marks.

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

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

3.5 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 as described in AI MS-22, "Construction of Hot Mix Asphalt Pavements."

3.6 COMPACTION

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

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

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness.

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.
2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 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. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.7 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

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

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

C. Confirm minimum 1% slopes on asphalt pavement surfaces. Notify engineer prior to asphalt placement if minimum 1% slope is not met in any areas.

3.8 PAVEMENT MARKING

SECTION 32 1216
HOT-MIX ASPHALT CONCRETE PAVING

A. Refer to pavement markings specification section.

3.9 FIELD QUALITY CONTROL

A. Testing and inspecting: Owner may secure a testing firm to perform and determine compliance with specified requirements and AI MS-2.

3.10 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 excavated materials to accumulate on-site.

END OF SECTION 32 1216

SECTION 32 1313
CEMENT CONCRETE PAVEMENTS, CURBS AND GUTTERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. All paving materials and construction methods shall conform to the current standards and specifications of the Michigan Department of Transportation. Where these specifications are less stringent than the requirements of MDOT, the MDOT standards shall govern.

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. Sidewalks and platforms.

5. Wheel stops.

1.3 PERFORMANCE REQUIREMENTS

A. Refer to MDOT’s current Standard Specifications for Construction.

1.4 SUBMITTALS

A. Submit aggregate and concrete mix designs for review. Contractor shall confirm that the materials provided meet the required specifications, and provide material certification to the engineer. Material certification shall state that the products meet or exceed the requirements indicated on the plans and the requirements of the regulating authority.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer with at least three (3) years in business who has completed pavement work similar in material, design, and extent to that indicated for this Project.

B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment and approved by authorities having jurisdiction or the DOT of the state in which Project is located.

1. Manufacturer must be certified according to the National Ready Mix Concrete Association's Plant Certification Program.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.

1.6 PROJECT CONDITIONS

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

B. Do not place concrete when base is wet or frozen. Protect concrete pavement from damage by rain or inclement weather.

C. Protect the concrete from freezing until it attains a compressive strength of at least 1,000 PSI. Do not place concrete pavement until the ambient air temperature away from artificial heat is at least 25 degrees Fahrenheit and rising. At the time of concrete placement, ensure a concrete temperature from 45 degrees Fahrenheit to 90 degrees Fahrenheit.

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 curved conditions.

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

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated flat sheets, unfinished.

B. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed billet steel, unfinished.

C. Epoxy-Coated Reinforcement Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, deformed bars.

D. Steel Bar Mats: ASTM A 184/A 184M; with ASTM A 615/A 615M, Grade 60, deformed bars; assembled with clips.

E. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

F. Epoxy-Coated Joint Dowel Bars: ASTM A 775/A 775M; with ASTM A 615/A 615M, Grade 60, plain steel bars.

G. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.

H. Hook Bolts: ASTM A 307, Grade A, internally and externally threaded. Design hook-bolt joint assembly to hold coupling against pavement form and in position during concreting operations, and to permit removal without damage to concrete or hook bolt.

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

J. Epoxy Repair Coating: Liquid two-part epoxy repair coating, compatible with epoxy coating on reinforcement.

2.3 CONCRETE MATERIALS

A. General: Use the same brand and type of cementitious material from the same manufacturer throughout the Project. All material to meet current MDOT specifications.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry where indicated on Contract Documents.

B. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

C. White Membrane Curing Compound: ASTM C 309, Type 2.

2.5 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

1. Thickness: ½ inch minimum and thicker where indicated.

B. Coloring Agent: Where indicated, ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

1. Color: n/a

C. Wheel Stops (use only if indicated on the plans): Precast, air-entrained concrete; 2500-psi minimum compressive strength; approximately 6 inches high, 9 inches wide, and 84 inches

long. Provide chamfered corners and drainage slots on underside, and provide holes for dowel-anchoring to substrate.

1. Dowels: Galvanized steel, diameter of 3/4 inch, minimum length 18 inches.

D. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery with emery aggregate containing not less than 50 percent aluminum oxide and not less than 25 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

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

F. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements.

2.6 CONCRETE MIXES

A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes.

B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.

C. Concrete mix design shall meet the current MDOT requirements, with compressive strength, maximum water-cementitious materials ratio, slump limit, and air content per MDOT specifications. Maximum aggregate size in coarse aggregate gradation shall be 1.5 inches.

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

E. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 5.0 to 8.5 percent.

F. Use appropriate treatment per MDOT specifications where concrete will be placed under freezing conditions. Obtain approval of Engineer prior to placing concrete in freezing conditions. Concrete accelerators may be used in cold temperatures as noted below:

1. In concrete with steel reinforcement, a non-chloride accelerating admixture may be used. Admixture product shall be approved by MDOT per their current Qualified Products List (QPL) and the dosage shall be per manufacturer’s instructions. Admixtures containing calcium chloride shall not be used in concrete containing steel reinforcement.

2. In concrete without steel reinforcement, calcium chloride concrete accelerators may be used and shall meet the requirements of MDOT Specification Section 903.04.

G. Coloring Agent: Where indicated, add coloring agent to mix according to manufacturer's written instructions.

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.

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.

B. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

PART 3 - EXECUTION

3.1 PREPARATION

A. Proof-roll prepared subbase surface to check for unstable areas and verify need for additional compaction and repair as required.

B. Verify that grades are correct.

3.2 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.

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

3.3 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.

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

C. Install welded wire fabric 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.

D. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 2-inch overlap to adjacent mats.

3.4 JOINTS

SECTION 32 1313
CEMENT CONCRETE PAVEMENTS, CURBS AND GUTTERS

A. General: Construct 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.

B. At all locations where new concrete abuts existing concrete, building wall, or supported slabs, place expansion joint and joint sealant.

C. 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. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

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

1. Terminate joint filler 1 inch below finished surface to allow placement of joint sealant.

2. Joint sealant is required for all projects even if not indicated on the plans.

E. Expansion Joints: Place 1 inch (25 mm) wide expansion joints at maximum 40 foot intervals, if not indicated on drawings. Joints to be full depth of pavement. Place joint sealant at all expansion joints.

F. Install dowel bars and support assemblies at joints if indicated on the plans. Lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

G. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas. Construct ¼ inch wide contraction joints for a depth equal to at least one-third of the concrete thickness. Maximum spacing of contractions joints shall be 8’.

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with grooving tool to a 3/8-inch (10-mm) radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.

2. 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.

3. Doweled Contraction Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

H. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to the following radius.

1. Radius: 3/8 inch (10 mm).

3.5 CONCRETE PLACEMENT

A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, 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. Do not add water to concrete during delivery, at Project site, or during placement.

D. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.

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

F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R when hot-weather conditions exist.

3.6 CONCRETE FINISHING

A. General: Wetting of concrete surfaces during screeding, initial floating, or finishing operations is prohibited.

B. Float Finish: 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.

1. Area Paving: Light broom, texture perpendicular to pavement direction.

2. Curbs and Gutters: Light broom, texture parallel to pavement direction.

3. Direction of Texturing: Parallel to pavement direction.

4. Inclined Vehicular Ramps: Heavy broomed perpendicular to slope.

5. Place sealer on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer’s instructions.

C. Provide detectable warning surface at all handicap ramps to meet ADA requirements in accordance with ANSI sections 406.13 and 705.

3.7 CONCRETE PROTECTION AND CURING

SECTION 32 1313
CEMENT CONCRETE PAVEMENTS, CURBS AND GUTTERS

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions.

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

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

a. Water.

b. Continuous water-fog spray.

c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions.

3.8 PAVEMENT TOLERANCES

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

1. Elevation Variation: 1/4 inch.

2. Thickness: Plus 3/8 inch, minus 1/4 inch.

3. Surface Variation: Gap below 10-foot- long, unleveled straightedge not to exceed 1/4 inch.

4. Maximum cross slope for walks, ramps, platforms: 2%

5. Maximum longitudinal walk slopes not requiring landings and handrails: 5%

6. Maximum longitudinal ramp slopes: 8.33% (1 on 12 slope)

3.9 PAVEMENT MARKING

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

B. Allow concrete pavement to cure for 28 days and be dry before starting pavement marking.

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

D. Apply paint with mechanical equipment to produce 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. If indicated on the plans, spread glass beads uniformly into wet pavement markings at a rate of 6 lb/gal.

3.10 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified.

B. Testing Services: Testing shall be performed according to the following requirements:

1. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.

2. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.

C. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

D. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.

3.11 REPAIRS AND PROTECTION

A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements as directed by the Engineer.

B. Remove and replace concrete sidewalks and/or ramps that do not comply with maximum slopes indicated in Section 3.8A above.

C. Protect concrete from damage. Exclude traffic from pavement for at least fourteen (14) calendar days after placement.

SECTION 32 1313
CEMENT CONCRETE PAVEMENTS, CURBS AND GUTTERS

END OF SECTION 32 1313

SECTION 32 1415
PAVEMENT MARKINGS

2-PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. These specifications apply to private, on-site pavement marking. All pavement markings within public rights-of-way must comply with the standards of the regulating agency.

1.2 SUMMARY

A. The work under this section includes, but is not necessarily limited to the furnishing and installation of all materials necessary for placing pavement markings as indicated on drawings and specifications.

1. Markings on concrete pavement areas.
2. Markings on asphalt pavement areas.
3. Markings on existing concrete or asphalt areas.
4. Markings on resurfaced existing pavements.

1.3 QUALITY ASSURANCE

A. MDOT Specifications: Unless otherwise indicated on drawings or herein specification, all work under this section shall be performed in accordance with the current MDOT Standard Specifications for Highway Construction.

B. Physically Handicapped: All marking shall be done in accordance with ADA Requirements.

C. Paint Containers: Each paint container shall be plainly marked, with a durable, weather-resistant marking, showing the name and address of manufacturer or vendor, description of material, batch number, date of packaging and volume and weight of contents.

D. Use only personnel completely trained and experienced in installation of materials and equipment.

1.4 SUBMITTALS

A. Product Data, shop drawing submittals are not required. Contractor shall confirm that the materials provided meet the required specifications, and provide material certification to the engineer. Material certification shall state that the products meet or exceed the requirements indicated on the plans and the requirements of the regulating authority.

1.5 PRODUCT HANDLING

A. Protection: Use all means necessary to protect materials before, during and after installation and to protect the installed work and materials of all other trades.

SECTION 32 1415
PAVEMENT MARKINGS

B. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the architect at no additional cost to owner.

PART 2 - PRODUCTS

2.1 GENERAL

A. All materials and products for work under this section shall conform to current MDOT Standard Specifications for Highway Construction.

2.2 PAVEMENT MARKING PAINT

A. Pavement marking paint shall be fast dry and comply with MDOT's current Standard Specifications for Highway Construction. Material shall be selected from MDOT's current Qualified Products List per spec section 811.03D1: Waterborne, Liquid Pavement Marking Material.

B. Provide required colors for all physically handicapped markings, complying with governing agencies having jurisdiction.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection: Prior to all work of this section, carefully inspect installed work of all trades and verify all such work is complete to the point where installation may properly commence. Verify all pavement markings may be installed in accordance with all pertinent codes and regulations, authorities having jurisdiction and referenced standards.

B. Discrepancies: In the event of discrepancy, immediately notify the architect. Do not proceed with installation in areas of discrepancies until all have been fully resolved.

3.2 SURFACE PREPARATION

A. Cleaning: Prior to application of pavement marking, it shall be marking contractor's responsibility that pavement surfaces are clear, dry and free of all foreign materials.

B. New pavement curing: new bituminous wearing surface shall be in place for period of not less than fourteen days prior to application of Fast Dry pavement markings.

3.3 CONSTRUCTION METHODS

A. Application: Pavement markings shall be solid 4" wide yellow lines and laid out as indicated on drawings. Paint shall be applied uniformly at a minimum rate of sixteen gallons per mile for single 4" solid line. Markings shall be applied so that they adhere adequately to surface.

B. Protection of wet paint shall be responsibility of contractor. Markings obliterated by traffic shall be retraced at contractor's expense.

3.4 DEFECTIVE WORK

A. Improper location: Improperly located markings shall be removed at contractor's expense in a manner acceptable to architect and reapplied in correct locations at contractor's expense.

B. Material shortage: Markings which are applied with material shortages shall be properly reapplied at contractor's expense.

3.5 CLEAN UP

A. Upon completion of the work of this section, remove all rubbish, trash and debris resulting from work of this section. Leave site in neat and orderly condition.

END OF SECTION 32 1415

SECTION 32 1817
SYNTHETIC TURF

PART 1 - GENERAL

1.1 SUMMARY

A. This Section is a part of the entire set of Contract Documents, including General and Supplementary Conditions. Drawings shall be coordinated with the applicable provisions of the other parts.

B. Related Sections:

1. Section 32 1123 Aggregate Drainage Layer

1.2 SCOPE OF WORK

A. The work under this section includes the following:

1. Furnish all labor, materials and equipment, necessary for the complete installation of a multi-purpose synthetic turf system.

2. Procure and install infill material

3. Pre and Post Installation Testing

4. Warranty Guarantees

5. Maintenance Equipment

6. Installation of synthetic grass surfacing system shall include all incidental work required to complete the work described herein, as shown on the Drawings, and included in related Specifications.

7. Attic Stock

1.3 REFERENCES

A. Reference herein to any technical society, organization, group, or regulation are made in accordance with the following abbreviations, and unless noted or specified otherwise, all work under this Section shall conform to the latest edition as applicable.

B. American Society for Testing and Materials (ASTM):

D418	Standard Test Method for Testing Pile Yarn Floor Covering Construction
D789	Yarn Melting Point
D1335	Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
D1577	Standard Test Method for Linear Density of Textile Fiber
D1682	Standard Method of Test for Breaking Load and Elongation of Textile Fabrics
D2256	Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method (breaking Strength and Elongation)
D2859	Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
D3218	Standard Test for Fiber Thickness (Microns)
D4491	Water Permeability of Geotextiles by Permittivity
D5034	Standard Test Method of Breaking Strength and Elongation of Textile Fabrics (Grab Test)

D5035	Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)
D5848	Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Covering
F355	Standard Test Method for Impact Attenuation of Playing Surface Systems and Materials
F1015	Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
F1551	Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials
F1936	Standard Specification for Impact Attenuation of Turf Playing Systems as Measured in the Field
F2117	Standard Test Method for Vertical Rebound Characteristics of Sports Surface/Ball Systems; Acoustical Measurement
F2765	Standard Specification for Total Lead Content in Synthetic Grass Fibers

C. Federation Internationale de Football Association (FIFA)

FIFA 09/EN 13672	Simulated Wear/Abrasion Resistance
EN ISO 20105-A02	Artificial Weathering (3,000 hours UVA)
EN 13864	Artificial Weathering (3,000 hours UVA) Pile Yarn Tensile Strength

D. National Collegiate Athletic Association (NCAA)

E. National Federation of State High School Associations (NFHS)

F. Michigan High School Athletic Association (MHSAA)

G. Synthetic Turf Council (STC)

H. American Sports Builders Association (ASBA)

1.4 QUALITY ASSURANCE

A. In the event conflicts exist between information contained in this Specification and in other parts of the Contract documents, Bidder shall assume that the more stringent and highest performing solution is required.

B. Following acceptance of bids and evaluation of all product related information submitted with bid and requested additionally, the Owner reserves the right to award based on factors other than low bid.

C. Manufacturer Qualifications:

1. Have not had a Surety or Bonding Company finish work on any contract within the last five (5) years.

2. Have not been disqualified or barred from performing work for any public Owner or contracting entity.

3. Shall have documented financial strength to fully service and warrant the systems installed. An audited financial statement for the past fiscal year shall be provided upon the request of the Owner or Landscape Architect.

4. Must be a member in good standing of the Synthetic Turf Council (STC) and/or American

Sports Builders Association (ASBA). Prospective bidder shall employ one ASBA Synthetic Turf Certified Field Builder.

5. All products and installation methods shall meet or exceed the current guidelines of the NFHS, NCAA, all applicable ASTM State and Federal Standards, and all current guidelines set forth by the Synthetic Turf Council.

6. Prospective bidder must be experienced in the manufacturing of infilled synthetic turf systems. Turf Manufacturer/Installer shall have fifty (50) fields in the last (5) five years of the same synthetic turf system being proposed with the same manufacturer, product and infill proposed for this project. This includes the fiber, backing, the secondary backing and installation method.

7. Product shall meet the following criteria:
   a. Have a NCAA Division 1 football field installed with parallel slit or monofilament fiber product.
   b. Have a football field of 85,000 sq. ft. or more of the exact specified material, including the infill material and fiber, in play for at least two years with the same turf manufacturer and company proposed for this field.
   c. Verification that provider meets these requirements shall be included with Bid.

D. Installer Qualifications:

1. The Turf Contractor must provide competent workmen skilled in the installation of synthetic turf material, including, but not limited to, gluing or sewing seams, gluing inlays, proper installation of the infill material, and competency in installing performance shock pads (if required). The Installer shall have a representative onsite to certify the installation and warranty compliance.

2. The assigned designated Supervisory Personnel on the project must be certified, in writing by the Turf Manufacturer, as competent in the installation of the proposed material. Should there be a change in the assigned designated Supervisory Personnel, the Owner and/or Landscape Architect shall be notified in writing within 48 hours of change.

3. Supervisory Personnel shall remain onsite at all times during the installation.

4. The installer shall provide documentation for the following: Fifteen (15) reference projects consisting of Synthetic Multi-Sport Grass Fields of 75,000 square-feet or larger within the past three (3) years which details the following criteria:

   a. Project Name and Location
   b. Project Scope
   c. Construction timeline
   d. Construction Cost
   e. Reference name, title, affiliation, and contact information

E. Pre-Installation Field Verification:

1. Base Acceptance:

   a. The synthetic turf manufacturer and/or installation contractor shall perform an inspection of the field base onto which the synthetic turf system is to be installed and to examine the finished surface for required compaction, permeability and grade tolerances.
   b. Upon correction of any discrepancies between the required materials, application and

tolerance, the Owner's representative shall provide test results for compaction, permeability and planarity that are in compliance with the project plans and specifications. The turf installer shall accept the aggregate stone base via a written certification of acceptance of the base for installation of subsequent layers of the synthetic turf system.

c. The acceptance of the base construction should be included in the certification for warranty validation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Properly store all materials in accordance with manufacturer's recommendations.

1. Deliver products in original, unopened packaging with manufacturer's identification clearly legible. All products shall be received by Contractor.

2. All materials shall be stored in a location directed by the Owner and acceptable to the Contractor.

3. Protect materials from puncture, dirt, grease, water, moisture, mechanical abrasion, excessive heat or cold, or other damaging circumstances.

B. Upon delivery and prior to installation of synthetic turf system and materials, Contractor shall inspect the materials as follows:

1. For damaged or defective items.

2. Measure synthetic turf roll lengths, perforations, and uniformity of product and color.

3. Adhesives and seaming tape shall arrive is sealed dry containers or packaging and shall be kept in adequate temperatures per manufacturers written requirements.

4. Rubber infill shall arrive in sacks or bags without any tears or loose material. Rubber shall arrive dry and loose: no rubber will be accepted that is bulked or solid.

5. Sand Infill:

a. Bagged Material: shall arrive without any tears and shall be free from contamination of site materials.
b. Bulk Material: deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. Onsite stockpiling locations shall be coordinated with the Owner. Stockpile only in areas free of debris and away from drainage routes and structures. Cover all materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.

6. Any material(s) that does not meet minimum specified criteria is grounds for rejection.

C. At time of delivery, lot numbers for each carpet roll shall be provided to Construction Manager or Owner's Representative to validate carpet supplied. Lot numbers shall be provided as part of close-out documentation.

1.6 SUBMITTALS

A. Bid Submittals

1. Proposal package shall include the following information to assist in the preliminary review process:

    a. Manufacturer qualifications/references as noted herein.
    b. Installer qualifications/references as noted herein.
    c. Samples of non-infilled turf product for all colors required, minimum 8”x8” in size. Bidders may elect to submit a color roll of standard manufacturer colors with their bid in lieu of individual samples.
    d. Fiber manufacturer’s name, type of fiber and composition of fiber.
    e. Product being bid meets or exceeds pre-manufacturer testing
    f. Sample Manufacturer’s Warranty and Third-Party Insured Warranty
    g. Sample insurance policy for the Third-Party Insured Warranty

2. The following letters, on the submitting company’s letterhead and signed by a company officer, shall be submitted with the Bid:

    a. A letter confirming that the Bid Documents have been completely reviewed by qualified representatives of the submitting company acknowledging that the materials and system proposed are adequate for the applications shown and will not impact the system warranty.
    b. The Bidder shall provide written documentation that system for which they are bidding, does not violate any known or pending patents for specified products.

B. Post-Award Submittals

1. Shop Drawings – Submit the following for approval:

    a. Complete scaled and dimensional drawing, in full color, showing all field lines, markings, inlays, and boundaries in specified colors required for project. All markings shall be tufted in the factory or field inlaid, unless noted otherwise. Custom logos can be provided by Landscape Architect in AutoCad format to expedite shop drawing process.
    b. Roll/seaming layout Plan
    c. Details on field construction, noting any details that may deviate from the Drawings or Specifications including, but not limited to: edge detail, goal post detail, covers for access to subsurface structures, etc.

2. Provide certified copies of independent (third-party) laboratory testing reports per section 1.7 Quality Control Testing.

3. Fiber manufacturer’s name, type of fiber and composition of fiber.

4. Proposed infill composition, including pounds of sand and pounds of rubber per square foot. Provide (3) one-pound samples of sand and rubber (in separate bags).

5. Rubber, with certification of availability, from supplier guaranteeing product supply reserved for the Stevenson High School Auxiliary Field. Certification shall include:

    a. Type and origin of raw material (certify that it comes from tires)
    b. Production facility
    c. Production method (cryo or ambient)
    d. Fiber content (%)
    e. CRI sieve/gradation analysis
    f. The provider the of CRI shall provide in writing that they maintain an ongoing Quality Control program meeting all the standards of the STC Guidelines for CRI Used in

Synthetic Turf Fields and capable of meeting all the specifications described herein.

6. Maintenance Equipment: Submittals shall include: product data specifications, operational instructions, etc.

1.7 QUALITY CONTROL TESTING

A. All testing services shall be the responsibility of and paid for by the submitting or awarded Contractor, unless noted otherwise. All testing noted herein shall be performed by a third-party testing agency that is ISO 17025 certified and approved by the Landscape Architect.

B. Testing by independent laboratory must be for current materials and testing not older than twelve (12) months from project Bid Date.

C. Any material tested and found non-compliant with the specifications may be rejected. The Contractor shall be required to submit material that is compliant with the specifications.

D. The Owner, or the Landscape Architect on the Owner's behalf, reserves the right to independently test any material. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible to bear the cost of any testing of product found to be non-compliant. Contractor will bear the cost of all retesting as required by the Owner.

E. Pre-Manufacturing Testing: Contractor shall submit to Landscape Architect a copy of the test results certified by the independent Testing Laboratory prior to manufacturing of the synthetic turf for the project. Testing data required is as follows:

SYNTHETIC GRASS YARN		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Pile Height	ASTM D 5823	± 1/8" of specification
Pile Weight	ASTM D 5848	± 5% of specification
Total Weight	ASTM D 5848	± 5% of specification
Tuft Bind (w/o infill)	ASTM D 1335	> 8 lbs
Melting Point	ASTM D 789	> 235 degrees F
Denier	ASTM D 1907	± 10% of specifications
Pill Burn Test	ASTM D2859	8 Passed / 0 Failed
Microns	ASTM D3218	± 10% of specifications
Breaking Strength (length)	ASTM D 5034	> 283 lbs./ft
Breaking Strength (width)	ASTM D 5034	> 200 lbs./ft
Fiber Abrasiveness Index	ASTM F 1015	< 35
Lead Content	ASTM F 2765-09	< 50 ppm
Artificial Wearing (3,000 hours UVA) Turf Color Change	EN ISO 20105-A02	> Gray Scale 3
Artificial Wearing (3,000 hours UVA) Pile Yarn Tensile Strength	EN 13864	< 50% reduction

SYNTHETIC GRASS BACKING MATERIALS		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Primary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Secondary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification

SYNTHETIC GRASS INFILL MATERIALS

PROPERTY	TEST METHOD	REQUIREMENT
Safety of Toys Part 3	EN 71-3	Pass
Safety of Synthetic Turf Infill	ASTM F 3188	Pass
Infill Size Gradation	EN 933	
Infill Bulk Density	EN 1097	
Artificial Weathering (3,000 hours UVA) Infill Color Change	EN ISO 20105-A02	> Gray Scale 3

SYNTHETIC GRASS SYSTEM		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Lisport Simulated Wear	EN 13672	> 50,000 passes without splitting

F. Post Manufacturing/Pre-Shipment Testing: Contractor shall submit to Landscape Architect a copy of the test results certified by the Independent Testing Laboratory prior to shipping of the synthetic turf product. Any test result not meeting specifications is grounds for rejection of product, in whole or in part. Testing requirements are as follows:

1. Test sample shall be from five random rolls manufactured for this project. Proof of documentation must be provided upon delivery of the carpet to the job site.

2. Test results to identify manufacturer, date of test(s), lab technician, project, lot number, etc.

SYNTHETIC GRASS SURFACING CARPET		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Tuft Bind (w/o infill)	ASTM D 1335	> 8 lbs
Stitch Gauge	ASTM D 5793	< 1/2"
Pile Height	ASTM D 5823	± 1/8” of specification
Pile Weight	ASTM D 5848	± 5% of specification
Total Weight	ASTM D 5848	± 5% of specification
Perforations	Visual	> 3/16” dia., spaced 4” o.c.
Denier	ASTM D 418 or 1907	± 10% of specification
Primary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Secondary Backing Weight	ASTM D 5848	± 2 oz./yd2 of specification
Breaking Strength (length)	ASTM D 5034	> 283 lbs./ft
Breaking Strength (width)	ASTM D 5034	> 200 lbs./ft
Pill Burn Test	ASTM D2859	8 Passed / 0 Failed
Lead Content	ASTM F 2765-09	< 50 ppm

SYNTHETIC GRASS SURFACING SYSTEM (carpet, infill)		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Water Infiltration Rate	ASTM F 1551	> 16 in./hr.
Infill Depth Measurement	EN 1969	± 10% of specification (1/2” exposed fiber)
Impact Attenuation	ASTM F 1936	< 165 G’s

G. Post Installation Testing: Upon substantial completion, the Contractor shall perform a one-time test of the items listed below. Contractor shall submit to Landscape Architect, a copy of these test results, certified by the independent Testing Agency.

1. Testing shall be completed on-site within five (5) days upon completion of the installation.

2. Following field testing, it shall be the Contractor's responsibility to correct any part of the system deemed non-compliant with the specifications.

SYNTHETIC GRASS SURFACING SYSTEM (carpet, infill)		
PROPERTY	**TEST METHOD**	**REQUIREMENT**
Infill Depth Measurement	EN 1969	± 10% of specification (1/2" exposed fiber)
Impact Attenuation (min. 10 locations)	ASTM F 1936	< 165 G's (individual, not average results)

3. Any testing desired after the initial testing shall be the responsibility and obligation of the Owner.

1.8 WARRANTY GUARANTEE

A. Synthetic Turf System Warranty:

1. The Contractor shall be responsible to provide a Pre-Paid and non-prorated Manufacturer/Installer Warranty Guarantee (referred to herein as "Warranty") for the synthetic grass system for a minimum non-prorated period of eight (8) years from the date of Certificate of Substantial Completion. Synthetic grass system refers to synthetic turf materials, infill materials, installation materials and installation workmanship.

2. $5,000,000.00 per each insured warranty and $15Million dollar annual aggregate for all warranties issued during each 12-month period of the 8-Year warranty.

3. Infill material shall be warrantied against breakdown of material outside of project specifications and failure to adhere to EN 71-3 and ASTM F3188 Testing Requirements.

4. The Turf Manufacturer's Warranty must be underwritten by a third-party Best "A" Rated (or better) Insurance Carrier listed in the A.M. Best Key Rating Guide. Warranty shall be guaranteed to cover the items set forth in this Specification for the full eight (8) year period.

5. Insured Warranty coverage must be provided in the form of one (1) single policy.

6. Policies that include self-insurance or self-retention clauses shall not be considered.

7. Policy cannot include any form of deductible amount nor should the Owner be responsible for any deductible.

8. A sample policy shall be provided at the time of Bid to prove that policy is in force. A letter from an agent of sample Certificate of Insurance will not be acceptable.

9. The artificial grass field turf must maintain an ASTM 1936 G-max between 110-165 for the life of the Warranty.

B. Warranty Requirements:

1. The materials utilized in the synthetic turf system shall be guaranteed for the designated usage:

   a. Football, Rugby, Soccer, Baseball, Softball, Lacrosse, Field Hockey
   b. Marching Band

c. Physical Education and Intramural Sports Programs
d. Physical Education exercises and other similar uses
e. Pedestrian traffic
f. Pneumatic rubber-tired maintenance and service equipment, designated for use on athletic fields and golf courses
g. Shot put and discus throwing events compliant with manufacturer recommendations
h. Graduations and Ceremonies compliant with manufacturer recommended floor protection

2. Warranty Coverage on Materials:

a. General wear and damage caused from UV degradation
b. Excessive fiber wear weathering
c. Wrinkling, panel movement, or panel shrinkage
d. Seam integrity
e. Drainage (of Carpet and Infill only)
f. Flammability

3. Warranty Coverage on Workmanship:

a. Warranty shall cover defects in the installation workmanship for full warranty period. Workmanship includes, but not limited to, seam installation (glued and sewn), inlay installation, proper installation of infill materials, and securing of turf system to nailer board.
b. The Turf Manufacturer shall verify that Supervisory Personnel have inspected the installation and that the work conforms to the manufacturer's requirements.

4. Warranty Replacement:

a. The warranty shall specifically exclude acts of vandalism and acts of God beyond the control of the Owner or the Manufacturer.
b. All items covered by the Warranty are to be replaced or repaired with new materials, including installation at the sole expense of the warrantying manufacturer for the life of the warranty period. Replacement or repair of affected areas shall include all necessary materials, labor, and transportation costs to complete repairs.
c. Must have a provision to either make a cash refund or repair/replace such portions of the installed materials that are no longer serviceable to maintain a playable surface.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All components and their installation method shall be designed and manufactured for use on outdoor athletic fields. The finished surface shall resist abrasion and cutting from normal use.

B. The materials and turf system should be able to withstand full climatic exposure and shall be resistant to insects, rot, fungus, mildew, ultraviolet light degradation, heat degradation, and shall be non-allergenic and non-toxic.

C. The turf system shall consist of an artificial grass-like surface pile, which shall be tufted into a primary backing and coated with a secondary backing to lock in the tufted fibers. The turf system shall be constructed to maximize dimensional stability and to resist damage and normal wear and tear from its designated uses.

D. The entire turf system shall have the basic characteristics of flow-through drainage, allowing free movement of surface runoff through the turf system where such water may flow to the sub-base and field drainage system. The Turf System shall remain free-draining at all times before, during, and after the infill materials are installed.

E. Turf fibers shall be a proven athletic caliber yarn designed specifically for outdoor use and shall resemble natural grass appearance, texture and color. Streaks, discoloration, or different dye lots shall not be accepted and may be grounds for product rejection. The turf fiber shall provide good traction in all types of weather with the use of conventional sneakers type shoes, composition mold sole athletic shoes, baseball spikes, and screw-on football cleats.

F. In addition to the tufted lines, inlaid lines and logos, the pile surface shall be suitable for both temporary and permanent line markings using paint specifically developed for this use and as recommended by the turf manufacturer.

G. The Turf Fabric surface shall be constructed and installed in minimum roll widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with finished roll assembly.

H. All adhesives used in bonding the inlaid markings to the adjacent carpet shall be resistant to moisture, bacteria and fungus attacks, and resistant to ultraviolet radiation. Adhesives used shall be as recommended by the Turf Manufacturer.

2.2 PRODUCTS

A. Synthetic Turf Products: Provide and install a blended parallel slit, monofilamant polyethylene turf carpet with thatch layer, infill system shall be recyclable SBR rubber and silica sand.

1. The synthetic turf material and resilient infill shall be in accordance with the following:

Physical Properties	Minimum Specification Requirements
Pile Height	2.0”
Fiber Composition	Polyethylene, Parallel-Slit and Monofilament Blend
Pile Ribbon Weight	52 oz./sy
Primary Backing Weight	8 oz./sy
Secondary Backing Weight	26 oz./sy
Total Product Weight	86 oz./sy
Denier – Parallel Slit	10,000
Denier – Monofilament	11,000
Denier - Thatch	5,000
Fiber Thickness – Parallel Slit	>100 microns
Fiber Thickness – Monofilament	>230 microns
Primary Backing Material	Polypropylene
Secondary Backing Material	Polyurethane
Turf Bind	> 8 lbs w/o infill
Approved Yarn Suppliers	Tencate XP Blade Plus Polytex (Duramax Minimum) Proprietary fiber shall be pre-approved by Architect
Grab Tear Strength – Width	300 lbs/force
Grab Tear Strength – Length	180 lbs/force
Stitch Gauge	< 1/2"

**Note: Exceptions to Specifications shall be outlined within Proposal

B. Carpet Backing:

1. The primary backing shall consist of a one part, three component polyester/polypropylene backing and treated with UV inhibitors.

2. The secondary backing shall consist of an application of porous polyurethane, heat activated to permanently lock fibers in place. Products using latex based secondary backings will not be acceptable.

3. Perforations:
   a. Synthetic turf surfacing shall be perforated to provide vertical drainage or the secondary backing can be applied to the tufted fiber rows. Complete synthetic grass system shall drain in excess of 10” per hour.
   b. Perforations shall be uniformly spaced at 4 inches, in both directions.
   c. Perorations shall be tested by passing a 3/8” drill bit through the holes with no more than 7 lbs. pressure.

C. Turf Panels, Markings and Logos

1. The carpet shall be delivered in 15-foot wide rolls with the four 4 inch white, 5-yard lines tufted into the end of each roll.

2. The rolls shall be of sufficient length to go from sideline to sideline. The perimeter white line shall be tufted into the individual sideline rolls. Head seams between the sidelines of the football field will not be acceptable.

3. All field lining, marking, field boundary system with the team area limits, logos, etc. shall be the same material (yarn, infill, and backing) as the playing field system.

4. Lines, logos, and graphics to be installed per the design documents and approved shop drawings are to be tufted in the factory to the maximum extent practical. Those not tufted in the factory shall be inlaid in the field.

5. Logos and inlays shall be true and shall not vary more than 1/2" from specified width and location.

6. The primary fiber color of the playing field shall be alternating panels of Field Green and Lime Green.

7. Primary Field Markings and Lines:
   a. Football: 4” White
   b. Soccer: 4” Gray
   c. Unified Lacrosse: 4” Lagoon Blue

D. Infill Materials:

1. Infill Materials shall be uniformly filled to a depth which leaves no more than 1/2” of exposed pile after settlement.

   a. Infill materials shall be new material and consist of a homogeneous non-compacting mixture of uniformly sized ambient and/or cryogenic SBR crumb rubber and silica sand.
   b. For installations over aggregate stone base (no shock pad), the crumb rubber content shall be approximately 60-70% by weight and the sand content shall be 30-40% by weight. Manufacturer shall provide proposed infill ratios based on pre-installation testing.

2. Crumb Rubber:

a. The CRI used in artificial turf fields shall be derived from used whole vulcanized automobile, SUV, and truck tires (DOT tires for over the road). Buffing's, bladders and tubes shall not be used as feedstock for CRI. No factory tires rejects are allowed.
b. The Crumb Rubber shall have a specific gravity range from 1.1 minimum to 1.2 maximum as determined by ASTM D 297.
c. Shall be free of all metal and produced with 100% recycled automobile or truck tires. The material shall have a size not to exceed 10 mesh nor smaller than 20 mesh.
d. The fine particles shall not exceed 10% and shall have no visible evidence of steel particles present in the final synthetic turf surfacing.
e. Crumb rubber shall be UV stable and resistant to heat degradation.
f. Rubber Mesh

*Mesh (ASTM E-11)

Sieve Size	Percent Retained
8	
12	1.3%
16	58.8%
20	38.2%
30	1.0%
40	0.0%
50	0.0%
PAN	Not-to-exceed 0.004%

3. Silica Sand:

a. Round, uniformly-sized pure silica sand
b. Sized between US Sieve 20 to 40

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall perform all work in strict accordance to the Contract Drawings, Approved Shop Drawings and manufacturer's written specifications and instructions.

B. The Contractor shall be responsible for the inspecting, verifying, and completing all installed work of this section.

C. Environmental Conditions: The Contractor shall not perform any work if the conditions for working are:

1. Ambient air temperatures are below 45 degrees F.

2. Material temperatures are below 45 degrees F.

3. Surfaces are wet or damp.

4. Rain is imminent or falling.

5. Conditions exist or are imminent, which will be unsuitable to installation requirements of the systems specified herein. Humidity levels will be inside the limits recommended by the adhesive manufacturer to obtain optimum bonding characteristics of the surfaces.

3.2 EXAMINATION

A. Acceptance of Base Construction: Upon completion of the base and drainage work, a written “Certification of Acceptance of the Base Construction" is required from the synthetic turf manufacturer and/or installation contractor (referred to herein as “Surfacing Contractor”) prior to proceeding with any installation work under this section of the specifications.

B. The Certification shall include but not be limited to the acceptance of the following:

1. Surfacing Contractor has reviewed the base construction finish surface and is accepting the construction is acceptable for application of work under this Section.

2. Surfacing Contractor has been provided testing results of water permeability and accepts the results to place the synthetic turf material.

3. The materials and method of installation for the aggregate stone base construction is in conformance with the manufacturer's current recommendations for the application of the turf to be installed under this section.

4. Surfacing Contractor has reviewed the base construction with representatives of the Site Contractor and Landscape Architect and all parties are satisfied with the compaction and planarity of the surface.

5. The base construction finish surface is clean and free of contaminants.

6. Continuing with the installation of the synthetic turf materials without issuance of a Certification of Acceptance Letter shall be considered as an approval of the base by the Turf Contractor.

C. All discrepancies between the required materials, application and tolerance requirements noted by the installer shall be brought immediately to the attention of the Contractor and Landscape Architect. Failure to immediately inform the Site Contractor and Landscape Architect of any prior work which does not meet the required specifications for installation of the artificial turf surfacing system shall be considered an acceptance by the installer of the non-conforming work.

3.3 INSTALLATION OF TURF AND COMPONENTS

A. GENERAL:

1. All installation shall be done in strict accordance with the manufacturer's current written installation instructions approved by the Landscape Architect.

2. The synthetic turf shall be staged and unrolled as necessary for a daily installation. No material shall be allowed to remain unrolled for a period of 24 hours prior to installation.

3. In the event of damage during delivery, staging, or installation, immediately make all repairs and replacements necessary to the approval of the Landscape Architect and at no additional cost to the Owner.

4. The pile lay of the turf shall be installed facing the home bleacher side of the field, unless noted otherwise. During the turf panel installation process, the Contractor shall continuously check the field layout dimensions in all directions.

B. SEAMS

1. All panel seam spacing shall be held to a minimum of 15 feet in width unless prior approval of seaming diagram indicates a lesser panel width.

    a. For fields with football yardlines, all seams shall be adjacent to 4” white yardline. Yardlines placed in the middle of the carpet roll will not be permitted. See Section 2.2, C. #1, this Specification.

2. The mechanical or adhesive bonding of all system material components shall provide a permanent, tight, secure and hazard free athletic playing surface.

3. All panel seams are to be held to the absolute minimum and as approved by Landscape Architect. Ridges or tenting of seams is not acceptable. Gaps greater that 1/8” are not acceptable.

4. Seams within the body of the field and traverse seams shall be securely glued and shall lay flat after infill installation.

5. A minimum of 5” of seaming tape and glue shall extend on either side of the seam

C. LINES, MARKINGS, AND INLAYS

1. Lines and markings shall be tufted in the factory to the greatest extent possible during manufacturing.

2. Lines and markings not tufted in the factory are to be field cut, inlaid and glued with manufacturer approved adhesive or hot-melt. Shaving and gluing of inlays is not a permitted method of installation.

3. All lines and markings shall be installed and verified prior to installation of infill material.

4. All inlays shall have a 12” wide manufacturer approved seaming tape, which is fully coated with adhesive.

    a. Bonding surfaces shall be clean, dry and free from grease, oil, wax, or other contaminants.

5. All seams and inlays shall be thoroughly brushed or picked before infill materials are installed.

6. All seams and inlays shall be fully fastened with no loose areas. At no time should pulling of

    section allow for separation of the turf from the seaming tape. Gaps greater that 1/8” are not acceptable.

7. Install turf as required to boxes/lids as shown on plans.

D. TURF EDGES AND TERMINATION

1. The perimeter of the field shall be firmly secured to the wood nailer edge, for the life of the warranty and as detailed, using stainless steel or hot dipped galvanized fasteners, minimum 1” in length. Fastener spacing shall not exceed 12 inches on-center.

2. Final infill level shall be flush with adjacent anchor curb or track surfacing.

E. INFILL INSTALLATION

1. No infill materials shall be installed until the synthetic turf system is fully installed with all lines, markings, and logos. Infill level on box covers/lids shall be flush with adjacent turf infill.

2. The infilling operation shall only take place with dry material, dry field conditions, and no forecasted threat of rain or snow.

3. Open utility grates and drains shall be covered by turf installer prior to placing infill.

4. The synthetic turf surface shall be thoroughly brushed prior to installation of infill materials to remove any wrinkles.

5. The infill shall be installed at a rate determined by the manufacturer. Infill material shall be thoroughly raked and brushed into the turf fibers during each pass of the broadcasting unit.

6. The infill shall not leave more than 1/2” exposed fiber after settlement.

3.4 CLEANING

A. Contractor shall be responsible for clean up of all materials utilized on a daily basis. Upon completion of installation, all surrounding areas, including turf area, shall be clean and in “game” condition.

B. Contractor shall utilize magnetic bar to remove any metal objects within the field prior to infill and after infill, before final acceptance.

C. Final grooming of the field should include application of an antistatic agent.

D. Contractor shall be responsible to neatly place attic stock on pallets and deliver to a suitable location as directed by Owner.

E. All excess infill outside of the playing surface shall be properly removed and disposed of and deemed acceptable to Owner and Landscape Architect.

3.5 ACCEPTANCE, MAINTENANCE, AND PROJECT CLOSE-OUT

A. ACCEPTANCE

1. Should any imperfections develop in the surface areas prior to the final acceptance of the work and deemed to not have been vandalism or an Act of God, they shall be removed and replaced with new materials. All such repair work shall be done at no additional cost to the Owner.

2. Final acceptance will be issued to the Contractor as described and issued with a formal “Certificate of Substantial Completion”. The Owner or Landscape Architect will not be responsible for any additional acceptance requirements by the Contractor or their subcontractors.

B. MAINTENANCE

1. Following turf system installation, the Turf Contractor shall be responsible for training the Owner’s personnel in necessary maintenance of the turf system. Prior to conducting training, Contractor shall assemble and test all maintenance equipment. Equipment should be fully

functional and ready to use at the time of training.

2. Owner Training shall include review and demonstration of the following items:

   a. Daily / Weekly fiber, infill and seam inspections
   b. Hand grooming low infill and techniques for placing infill
   c. Emergency seam repair
   d. Proper methods for field sweeping and grooming: including demonstration of hook-up, detachment, transporting, and use of all equipment.
   e. Field Snow Plowing (as applicable)
   f. Protection of surface for events
   g. Procedure for Warranty Claims

3. Maintenance training shall take place no later than fourteen (14) days after “Quality Control/Post-Installation Testing” is completed.

C. PROJECT CLOSE-OUT

1. Contractor shall furnish three (3) copies of Maintenance Manuals, which shall include all necessary instructions for the proper care and preventative maintenance of the turf system, including painting, markings, small repair procedures, and cleaning.

2. Maintenance Manual shall include list of procedures required to maintain surface condition and activities to be avoided, including static and dynamic load limits, snow clearing, etc.

3. Provide Project Record Documents: Record actual locations of seams, utility boxes, or other pertinent information.

4. Provide sample Maintenance Log Book and proposed Testing Schedule for all required testing during Warranty Period.

5. Attic Stock Materials:

   a. The Contractor shall supply and deliver (1) bag (+/- 2,000lbs) of additional rubber infill and +/- 500 pounds of silica sand, in original packaging.
   b. Green Turf Fabric: provide minimum 500sf for each green color used, which shall include two (2) pieces that are 15’ x 10’.
   c. Colored Turf Fabric: provide minimum 150sf for each non-green color used.
   d. Line Striping: provide 100lf of 4” White line striping

END OF SECTION 32 1817

SAMPLE SYNTHETIC TURF WARRANTY

1.1 Warranty

A. System Installer/Manufacturer ("_____") hereby warrants to Livonia Public Schools subject to the limitations and conditions set forth below, that its entire synthetic turf installation described as _____ , is free from defects in material workmanship, meets or exceeds the specifications, and shall (for a period of EIGHT (8) YEARS from the date of final acceptance) remain acceptable for multiple sports activities.

B. System Installer/Manufacturer warrants to Livonia Public Schools that its synthetic turf system shall not unevenly fade, shall not fail, shrink, expand, flood, tear, bubble and shall not reflect unusual excessive wear and shall meet specified Gmax values, for a period of EIGHT (8) YEARS from the date of Certificate of Substantial Completion. In the event that the synthetic turf shall unevenly fade, fail, shrink, expand, flood, tear, bubble or reflect excessive water, System Installer/Manufacturer shall repair and/or replace such areas of the synthetic turf that are affected.

C. System Installer/Manufacturer warrants to Livonia Public Schools that the installation of the entire synthetic turf and all associated turf components (i.e. Inlays and seams) shall be performed in a professional manner under the supervision of highly-trained employees familiar in the installation of their tufted synthetic turf system. The supervisor and key installers shall have installed synthetic turf systems for at least three (10) previous system installations.

D. System Installer/Manufacturer warrants that the finished synthetic turf system shall have an initial G-max (shock attenuation) value of approximately 110 G's and shall not become harder than 165 G's over the life of the system at any point on the field of play. The manufacturer shall make only the necessary repairs if, at any time during the warranty period, the G-max force at any point exceeds the specified 165 G's.

E. The term "not fade" in the context of this warranty shall mean that the synthetic grass material remain a uniform shade of green or the other colors installed with no significant loss of color as defined by not greater than 20% loss or shade reduction.

F. The term "not fail" or "excessive wear" as used in the context of this warranty shall mean that the length and weight of the face yarn or pile material in the synthetic grass surface shall not have been decreased by more than 6% per year according to ASTM D418, nor exceed 20% during the warranty period.

G. System Installer/Manufacturer shall warrant seams against separation, puncturing, bubbling, etc., for any reason.

H. This warranty does not cover any defect, failure, damage or undue wear in or to the synthetic turf system caused by or connected with abuse, neglect, deliberate act, Act of God, casualty, static or dynamic loads exceeding recommended levels, footwear having metal cleats, spikes, or similar projections (other than conventional football, baseball, soccer or rugby shoes having cleats of not more than ½" in length).

I. System Installer/Manufacturer shall be allowed to examine the synthetic turf system regarding any claim which Livonia Public Schools makes, to be present at and to analyze the results of all tests conducted by Livonia Public Schools or others, and to conduct such tests incurred by Livonia Public Schools or others with respect to such tests.

J. All claims made by Livonia Public Schools under this warranty must be made in writing to System Installer/Manufacturer.

K. This warranty, when signed and notarized by all parties, shall constitute a contract made in the State of Michigan and shall be governed by the laws thereof.

L. Contractor shall provide an independent 3rd party insurance policy to cover all items identified above.

OWNER: Livonia Public Schools DATE: _____

BY: _____

CONTRACTOR: DATE: _____

BY: _____

MANUFACTURER: DATE: _____

BY: _____

SECTION 32 3130
CHAINLINK FENCE - VINYL

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 Sections:

1. Section 03 3000 Cast In Place Concrete

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary for a new black vinyl chainlink fence system as indicated herein and on the Contract Documents. Work shall include but not limited to footings, posts, fabric, rails, gates and all related hardware.

1.3 QUALITY ASSURANCE AND WARRANTY GUARANTEE

A. American Society for Testing and Materials (ASTM):

1. ASTM A53 – Standard Specification for Pip, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
2. ASTM A90 – Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
3. ASTM C94 – Standard Specification for Ready-Mixed Concrete
4. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
5. ASTM F626 – Standard Specification for Fence Fittings
6. ASTM F668 – Standard Specification for Polymer Coated Chainlink Fence Fabric
7. ASTM F900 – Standard Specification for Industrial and Commercial Swing Gates
8. ASTM F934 – Standard Practice for Standard Colors for Polymer Coated Chainklink
9. ASTM F1043 – Standard Specification for Strength and Protective Coatings on Steel Industrial Chainlink Fence Framework
10. ASTM F1083 – Standard Specification for Pipe, Hot-Dipped Zinc-Coted (Galvanzied) Welded, for Fence Structures

B. Weights and tolerances to conform to Federal Specification RR-F-191G dated January 25, 1974.

C. The Contractor and any Sub-Contractor hereunder guarantee their respective work against defective materials or workmanship for a period of one (1) year from the date of filing Certificate of Substantial Completion and as accepted by the Owner.

D. All material installed under this specification shall be subject to testing by the Owner. Any material so inspected and found to be not in strict conformance with this specification shall be promptly removed and replaced by the Contractor at his expense.

1.4 SUBMITTALS

A. Shop drawings showing plan layout, spacing of components, post foundation dimensions, hardware, gates and schedule of components.

B. Product Data: Submit product data on fabric pattern, posts, accessories, fittings and hardware.

C. Samples: Color selection for vinyl finishes. If requested, samples of materials (e.g., fabric, wires, and accessories).

D. Mill Certificates conforming to ASTM F1043 (06), Part 8.1.4 – Adhesion Testing

1. Test Results shall be provided before material is shipped to site.
2. Minimum (3) random tests for each post size specified.

E. At the request of the Architect, provide Material Certificates confirming product provided is Domestic pipe.

1.5 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacturing of products specified in this section with a minimum of ten (10) years experience

B. Installer: Company specializing in performing work of this section with a minimum of five (5) years experienced. Must have a minimum of two in-house fence installation crews.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chainlink fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver fence fabric and accessories in packed cartons or firmly tied rolls.

B. Identify each package with manufacturer’s name.

C. Store fence fabric and accessories in a secure and dry place.

1.8 WARRANTY

A. Special Warranty: Manufacturer’s standard form in which Installer agrees to repair or replace components of chainlink fences and gates that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, deterioration of metals, metal finishes, and other materials beyond normal weathering.
2. Warranty Period: 15 years from date of Substantial Completion

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Framework, posts, rails, fabric and fittings for chainlink fence system shall be domestic pipe manufactured and supplied by the following:

1. Merchants Metals – Color Bond Product:
   Phone: (888) 260-1600

2. Master Halco – Permafused Product
   Phone: (888) 643-3623

2.2 VINYL CLAD CHAINLINK FENCE

A. This specification covers chain link fabric made from galvanized steel wire which has been coated with polyvinyl chloride compound hereinafter designated as "vinyl." The base metal shall be steel of such quality and purity that, when drawn to the size of wire specified and coated with vinyl, the finished fencing shall be of uniform quality and have the properties and characteristics as prescribed in the specification. Wire used for the manufacture of this fabric shall be capable of being woven into fabric without the vinyl coating voiding, cracking or peeling. Vinyl shall be plasticized and thoroughly compounded.

B. Thermal Fused Vinyl: The thermally fused vinyl coated wire shall consist of vinyl thermally fused to primed zinc coated wire. The zinc coating shall be in accordance with ASTM A641, .30 oz. per square foot. The vinyl adhesion shall be greater than the cohesive strength of the vinyl material itself.

C. Physical Properties of Coating

1. Accelerated Aging: PVC coated wire from which the fabric is woven shall withstand exposure for 1000 hours without failure at a black panel temperature of 145°F, Type BH apparatus described in ASTM G155 shall be used for the test. The product shall be construed to have failed the test if:

   a. The wire fails to withstand the Mandrel Bend Test described below.
   b. Shrinkage of the PVC coating is greater than 1/16” per foot of wire.
   c. There is a significant change in color or gloss of the PVC surface as determined by visual inspection.

2. Mandrel Bend Test: PVC coated wire when subjected to a single bend at -20°F around a mandrel no larger than ten times the diameter of the wire shall not exhibit breaks or cracks in the PVC coating. The Mandrel Bend Test shall be performed on an individual piece of wire removed from the fabric. This specimen may be any length of wire over 12“and shall include both bends and straight sections, but shall not include either twists or knuckles.

3. Color of Coatings:

Hue	Black
Tolerance	2.0 G
Value	3.02
Chroma	2.35

D. Workmanship: Vinyl coated chain link fabric shall be produced by methods recognized as good commercial practices. Careful inspection shall be made to determine the quality of vinyl coating. Coatings not free from pinholes, bubbles or voids, rough or blistered surfaces shall provide a basis for rejection. An apparent mismatch of color readily discernible by visual inspection shall be cause for rejection.

E. Weight of Zinc Coating: The weight of coating shall be determined on individual pieces of wire removed from the fabric. The specimens may be of any continuous length of 12 inches, but preferably about 24 inches long. The weight of coating shall be determined in accordance with tests for weight of coating described in ASTM A90. The weight of zinc coating shall be determined after removing the vinyl coating from the fabric.

2.3 VINYL CLAD FRAMEWORK

A. General: The framework consists of all line, corner, terminal posts, horizontal rails and gate frame materials which shall be coated with a polyvinyl chloride coating 10 to 12 mils in thickness over galvanized steel or aluminum. These surfaces shall be thermally fused to the metal surface with an appropriate sured primer. The PVC shall be plasticized and thoroughly compounded so that all pigments, stabilizers and other ingredients are fully dispersed.

B. Color of Framework: The color of framework shall match the fabric.

C. Fabric: The wire used in the vinyl coated fences shall possess a minimum breakload of 850 pounds. The coated size of the thermally fused vinyl fence wire shall be 9 gauge core, 8 gauge finish (Class 2B). Vinyl coated fabric shall be woven to form a 2" mesh. The size of mesh shall be determined by measuring the minimum clear distance between the wires forming the parallel sides of the mesh, measured in either direction. The tolerance in the size of mesh shall be +/- 1/8" inch. The thickness of the vinyl coating shall be 0.007".

D. Framework Materials: Framework materials shall be, before coating with PVC, either Type I Schedule 40 pipe with 1.8 ounce per square foot zinc coating before resin coating, or Type II pipe manufactured from steel conforming to the Standard Specification for Black and Hot-Dipped Zinc Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses, ASTM A53; or TYPE II pipe manufactured from steel conforming to ASTM A1011, Cold-Rolled, Electric welded and Triple Coated with 1.0 ounce, +/- 0.1 ounce zinc per square foot. The internal surface shall have corrosion protection by a zinc-rich based organic coating with 87% minimum zinc powder loading, with the capability of withstanding 350 hours when subjected to Salt Spray Test ASTM B117, with a 5% minimum Red Rust.

E. Line Posts: Shall be one of the following vinyl coated materials: Type I, 2.375“ O.D. round steel posts weighing 3.65 lbs. per lineal foot; or, alternately, Type II 2.375“ O.D. round steel pipe weighing 2.78 lbs. per foot or roll-formed "c" section posts measuring 2.25 inches by 1.70” weighing 2.73 lb. per lineal foot. Posts shall not be splice welded in such a manner that the weld appears above the grade line. The chain link fabric shall be tied to the line posts with vinyl coated clips or tie wires with a minimum steel diameter of 0.132” and spaced on 15” maximum centers.

F. Terminal and Gate Posts: Terminal and gate posts shall be one of the following vinyl coated materials: two and one-half inch (2 1/2") square tubing weighing 5.10 lbs per lineal foot, or alternately, Type I, 2.875” OD steel round posts weighing 3.66 lbs. per lineal foot, or Type II 2.875” OD steel round posts weighing 4.64 lbs per lineal foot. Posts shall not be splice welded in such a manner that the weld appears above the grade line.

G. Terminal and Gate Post Fittings: Terminal and gate post fittings, including tension bands, brace connections and top rail connections, shall be 14 gauge, hot-dipped galvanized, cold-rolled, carbon steel. Top rail, brace and truss bands shall not be less than ¾” wide, secured by 5/16” diameter carriage bolts. Tension bars shall not be less than 2” shorter than the nominal height of the fabric with which they are to be used. One tension bar shall be provided for each end and gate post, and two for each corner and pull post.

H. All fixed component parts such as post tops, bands, connectors, and rail ends shall be vinyl coated on visible surfaces of a color to match the fabric and framework. Non-visible portions of parts may be uncoated in the case of aluminum components. Non-visible portions of steel or iron components not vinyl coated must be coated with zinc as per ASTM A153. All hardware shall come vinyl coated or shall be coated in the field with a vinyl base compound after installation. Aerosol spray paint to match the color of vinyl fencing will not be accepted.

I. All hardware and caps shall be made in the USA.

J. Top, Intermediate and Bottom Rail: Top, intermediate and bottom rails (where applicable) shall be vinyl coated Type I, 1.660" O.D. round steel pipe weighing 2.27 lbs. per lineal foot, or Type II, 1.660" O.D. round steel pipe weighing 1.59 lbs. per lineal foot. An outside sleeve type coupling measuring not less than 6" in length shall be provided at each interval of twenty-one feet. The chain link fabric shall be tied to the rails at intervals of 24" with vinyl clad tie wires, 13 gauge for double wrap ties or 9 gauge for single wrap ties. Wrap ties shall have a minimum of two (2) loops at each end. Intermediate rails shall be fastened between posts with vinyl clad boulevard type connectors or bands and rail end caps. The terminal ends of all top, bottom, mid and bracing rails shall utilize rail end cups and boulevard hardware that prevents insects from gaining access into top rails.

K. Bottom Tension Wire: Bottom tension wire shall be No. 6 gauge galvanized steel coil, vinyl coated tension wire, high carbon or hard drawn, Class II, Aluminum Coated, fastened to the chain link fabric at intervals of twenty-four inches (24") with No. 11 gauge galvanized steel hog rings. Hog rings shall be closed 100%.

L. Brace Rail for Terminal and Gate Posts: Vinyl coated terminal and gate posts shall be strengthened and reinforced by vinyl coated braces meeting the same specifications as above. Braces shall be installed midway between top rail and court surface and extend from each terminal post to the first adjacent line post. Braces shall be securely fastened to posts by vinyl coated heavy pressed steel connections and also be trussed from line post back to terminal post with a 5/16" vinyl coated round truss rod complete with tightening turnbuckle.

M. Posts Spacing and Settings: Line and terminal posts shall be set in concrete foundations not less than 12" in diameter and not less than 42" in depth. The concrete shall have a design mix of 3500 PSI. Spacing of posts in the line of fence shall be uniform and no more than eight feet (8'). The smaller side of a "C" post shall be touching the chain link fabric and all open slots shall be facing in the same direction.

N. Post Tops: Tops of line posts shall be of a vinyl coated steel or aluminum casting capable of providing a through passage for top rail. Terminal post tops shall be of a vinyl coated steel or aluminum casting and be designed so as to exclude all moisture from the terminal post. Post caps at terminal posts shall be securely fastened to prevent removal.

O. Gates: Gate openings shall not be less than 4 feet wide and constructed and hung as detailed on drawings. Frame shall be assembled from vinyl coated 2" square aluminum, alloy 6063-T6 or 6061-T6, weighing 0.940 lbs. per foot, Type I pipe weighing 2.72 lbs. per foot, or Type II, 1.90" O.D. round steel pip weighing 2.28 lbs. per foot. Gate frames shall be welded or alternately shall utilize corner fittings of compressed or riveted type. A diagonal truss rod not less than 5/16" diameter shall be used on frames utilizing corner fittings. Color or the gate frame materials shall match the fence framework and component parts.

1. Fabric matching the fence fabric shall be installed in the frame by means of tension bars and

hook bolts or bands. Galvanized gate frame and gate post hinges shall be furnished of adequate strength for the gate size specified and to allow for a 180° swing. Gates shall be equipped with a positive strong arm latching device that will accommodate padlocking. A plunger rod, catch and semi-automatic outer catch shall be installed on drive gates so as to secure gates in an open position. Hinges, latches and catches shall be approved by the Landscape Architect.

P. Hardware

1. All hardware requiring nuts and bolts should have no more than ½" of the threaded bolt extending beyond the nut.
2. Gate hinges shall be Bulldog Hinges
3. Gate latches shall be commercial grade Strong Arm gate latches
    a. Fork & collar not approved

Q. Driven Post Caulk

1. Contractor is responsible to caulk around all driven fence posts.
2. Caulk shall be supplied from the following manufacturer:
    a. Sportmaster "Courtflex Crack Sealant"
    Phone: 800-395-7325
    b. Color: Neutral

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance of the Work.

1. Do not begin installation before final grading is completed unless permitted by Architect.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

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

3.2 INSTALLATION

A. All posts shall be set plumb and in accordance with the following table (unless specified otherwise):

1. Corner/Terminal and Bracing Post - General Fence

Fabric Height	Post Depth	Diameter of Foundation	Foundation Depth	Maximum Spacing
0' - 6'-0"	36"	12" min	42"	10'-0"
6'-1" - 12'-0"	36"	12" min	42"	10'-0"

2. Line posts shall be pneumatically driven into the ground using the following chart*:

Fabric Height	Pipe Below Grade	Total Length of Post
4’	4’	8’
6’	5’	11’
8’	6’	14’
10’	7’	17’
12’	8’	20’

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

C. Post Setting: Set posts in concrete at indicated spacing into firm, undisturbed soil.

1. Verify that posts are set plumb, aligned and at correct height and spacing, and hold position during setting with concrete or mechanical devices.
2. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.

D. Fence posts shall be installed with maximum 6 inches clear opening from end posts to buildings, fences, property lines or other structures.

E. Install gates level, plum and secure for full opening without interference. Attach hardware using tamper-resistant or concealed means. Adjust hardware for smooth operation and lubricate where necessary.

F. The fabric shall be installed on the court/playing side of posts. Bottom of fence fabric shall be 3/4" (+/-1/4") above the finished court surface. Fabric shall be furnished with selvage knuckled on both ends.

G. Top of concrete footing shall be left down and topped with surrounding pavings as detailed. Cold patch is not acceptable.

3.3 CLEAN UP AND DISPOSAL

A. Remove dirt, concrete and tags from all posts and rails.

B. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape Architect, Owner. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION 32 3130

SECTION 32 9119
TOPSOIL

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 Sections:

1. Section 31 2010 Earthwork
2. Section 32 9227 General Lawn Restoration

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary to place and spread topsoil to required depths as indicated on Contract Documents.

B. Contractor shall make all attempts to salvage and stockpile usable topsoil from site.

1.3 QUALITY ASSURANCE

A. Testing and inspection: At the discretion of the Landscape Architect, Contractor shall employ a qualified independent testing laboratory, specializing in soils engineering. Testing facility, or lab, shall have American Association of Laboratory Accreditation (AALA).

1. Provide and pay for testing and inspection during topsoil operations. Laboratory, inspection services and Soils Engineer shall be acceptable to the Landscape Architect.
2. Test representative material samples for proposed use.
3. Topsoil: (Supplied by Landscape Contractor).
   a. pH factor.
   b. Mechanical analysis.
   c. Percentage of organic content.
4. Recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting.
5. Test reports shall be made available to the Owner and Landscape Architect.

1.4 PROJECT CONDITIONS

A. Underground and surface utility lines are to be located in field prior to construction.

B. Protect existing trees, plants, lawns and other features designated to remain as part of the landscaping work. Protect existing trees to drip line.

C. Promptly repair damage to adjacent facilities caused by topsoil operations. Cost of repair at Contractor's expense.

D. Promptly notify the Landscape Architect of unexpected sub-surface conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Natural, friable fertile soil characteristic of productive soil in the vicinity, reasonably free of stones larger than 1", clay lumps, roots and other foreign matter.

1. Proposed topsoil material for shall be screened and acceptable to Landscape Architect.
2. Utilize and screen on-site stockpiled topsoil as required to complete the work.

B. Provide topsoil as required to complete job. Topsoil must meet testing criteria results specified. All processing, cleaning and preparation of this stored topsoil to render it acceptable for use is the responsibility of this Contractor.

C. Supplied topsoil, shall be fertile, friable and representative of local productive soil, capable of sustaining vigorous plant growth and free of clay lumps, subsoil, noxious weeds or other foreign matter such as stones, roots, sticks and other extraneous materials: not frozen or muddy.

1. Ph of soil to range between 5.0 and 7.5.
2. Mechanical Analysis
    a. Sand 70-85%
    b. Silt 10-20%
    c. Clay 10-15%

D. Provide earth crowning where indicated on drawings.

E. Crowning/mounding to be free flowing in shape and design, as indicated, and to blend into existing grades gradually so that toe of slope is not readily visible. Landscape Architect to verify final contouring before planting.

F. Regardless of finish grading elevations indicated, it is intended that grading be such that proper drainage of surface water will occur and that no low areas created to allow ponding. Contractor to consult with Owner or Landscape Architect regarding minor variations in grade elevations before rough grading is completed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine rough grades and installation conditions performed by General Contractor. Do not start topsoil work until unsatisfactory conditions are corrected and site is accepted by Landscape Contractor.

3.2 PREPARATION

A. Establish extent of grading by area and elevation. Designate and identify datum elevation and project engineering reference points. Set required lines, levels and elevations.

B. Do not cover or enclose work of this Section before obtaining required inspections, tests, approvals and location recording.

C. Use of equipment of excessive weight or excessive travel over grade will not be permitted.

3.3 SITE GRADING

A. Perform grading within contract limits, including adjacent transition areas, to new elevations, levels, profiles, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes between new elevations and existing grades.

B. Contractor shall utilize low pressure ground track equipment or flotation tires for moving soil, to prevent compaction and/or damage to the soil structure during construction.

C. Grade surfaces to assure areas drain away from structures and to prevent ponding and pockets of surface drainage. Provide subgrade surfaces free from irregular surface changes and as follows:

1. Rough grading: Plus or minus 0.10 ft. subgrade tolerance. Finish required will be that ordinarily obtained from either blade-grader or scraper operations.
2. Provide subgrade surface free of exposed boulders or stones exceeding 4" in greatest dimension in paved areas; 2" lawn areas.
3. Lawn and planting areas: Allow for 4" average depth of topsoil at lawn areas, except as otherwise indicated on the drawings.

3.4 FINISH GRADING

A. Uniformly distribute and spread stockpiled topsoil. Provide 4" average depth at lawn areas, 12" at planting areas. Provide additional imported topsoil as required to complete the work. Use loose, dry topsoil. Do not use frozen or muddy topsoil. Place during dry weather.

B. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain levels, profiles, and contours of subgrades.

C. Remove stones, roots, weeds, and debris while spreading topsoil materials. Rake surface clean of stones 1" or larger in any dimensions and all debris. Provide surfaces suitable for soil preparation provided under lawn and planting work.

D. Manually install topsoil at trees to remain. Avoid damage to root systems.

E. Maintenance:

1. Protect finish graded areas from traffic and erosion. Keep free of trash and debris. Repair and re-establish grades in settled, eroded, and damaged areas.
2. Where completed areas are disturbed by construction operations or adverse weather, scarify, re-shape, and compact to required density.

3.5 DISPOSAL OF WASTE MATERIALS

A. Stockpile, haul from site, and legally dispose of waste materials, including excess excavated materials, rock, trash, and debris.

B. Maintain disposal route clear, clean, and free of debris.

3.6 CLEANING

A. Upon completion of earthwork operations, clean areas within contract limits, remove tools and equipment. Provide site clear, clean, free of debris, and suitable for site work operations.

END OF SECTION 32 9119

SECTION 32 9227
GENERAL LAWN RESTORATION

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 Sections:

1. Section 31 1018 Slope Protection and Erosion Control
2. Section 31 2010 Earthwork
3. Section 32 9119 Topsoil

1.2 SCOPE

A. The work under this section of the specifications shall consist of furnishing all labor, materials and equipment necessary for restoring disturbed lawn areas and maintaining lawns until final acceptance.

1.3 QUALITY ASSURANCE AND WARRANTY GUARANTEE

A. Grass seed shall meet the tolerance for germination and purity of the Official Seed Analysis of North America.

B. Submit all seed tags after completion of seeding.

C. The Contractor, and its Subcontractors, shall provide a staff adequate to coordinate and expedite the work properly and shall maintain competent supervision of its own work to insure compliance with contract requirements.

D. Contractor responsible for seeding and fertilizing shall inspect the finish grade for acceptability prior to application. Areas of discrepancy shall be indentified and Landscape Architect or Owner’s Representative shall be notified.

E. It is the responsibility of the Contractor to establish a dense lawn of permanent grasses, free from lumps, depressions and settlement. Any part of the area that fails to show a uniform germination shall be re-seeded and such re-seeding shall continue until a dense lawn is established. Damage to seeded areas resulting from erosion and through no fault of the Owner shall be repaired by the Contractor, at his expense.

1. Guarantee shall extend for one year from the date of acceptance.

1.4 SUBMITTALS

A. Submit product data for seed and fertilizer to Landscape Architect for approval, prior to application.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver grass seed in original containers showing analysis of seed mixture, percentage of pure seed, year of production, net weight, date of packaging and location of packaging. Damaged packages are not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

PART 2 - PRODUCTS

2.1 SEED

A. Seed shall be provided from one of the following suppliers

- EcoGreen Supply- 616-877-5326
- Site One Landscapes - (800) 347-4272
- Target Specialty – (248) 437-1427
- BFG – (800) 243-4769- closed
- Rhino Seed & Supply - (800) 482-3130
- Lacrosse Seeds - (800) 647-8873

B. Contractors shall seed all areas disturbed during construction and not otherwise developed or indicated to be sodded. Topsoiling, finish grading and fertilization is to remain the same. *Seed shall be new crop, cleaned, and comprising of the following varieties:

1. Athletic Field Seed blend shall consist of a minimum of 3 of the listed bluegrass varieties and one of the listed ryegrass varieties. Blend shall be 80% Kentucky Bluegrass and 20% Perennial Ryegrass by weight. Only Elite bluegrasses (according to NTEP characteristics ratings) will be allowed on Athletic surfaces. No “named common” types will be accepted. Elite varieties coated with XALT will be allowed at same seeding rates.
2. General Seeding Areas: “Varieties Named” blend shall be 50-60% Kentucky Bluegrass and 40-50% Perennial Ryegrass by weight for irrigated fields. A “Varieties Named” blend of 60-70% bluegrass, 30-40% perennial ryegrass for non-irrigated fields, and a blend of 20-40% bluegrass, 20-40% perennial rygrass and 20-30% creeping red fescue for general turf areas.(VNS-varieties not stated- blends will not be accepted)
3. Athletic Fields

Seed Varieties	Purity	Germination
Shannon Kentucky Bluegrass	95%	85%
Lunar Kentucky Bluegrass	95%	85%
SPF 30 Kentucky Bluegrass	95%	85%
Fullback Kentucky Bluegrass	95%	85%
Midnight Kentucky Bluegrass	95%	85%
Hampton Kentucky Bluegrass	95%	85%
Gaelic Kentucky Bluegrass	95%	85%
Jumpstart Kentucky Bluegrass	95%	85%
Bewitched Kentucky Bluegrass	95%	85%
Lunar Kentucky Bluegrass	95%	85%
BlueBank Kentucky Bluegrass	95%	85%
Noble Kentucky Bluegrass	95%	85%
Touchdown Kentucky Bluegrass	95%	85%
Spark Perennial Ryegrass	95%	85%
Majesty Perennial Ryegrass	95%	85%
Gallop Perennial Ryegrass	95%	85%
Salinas Perennial Ryegrass	95%	85%
Gray Star Perennial Ryegrass	95%	85%
Sox Fan Perennial Ryegrass	95%	85%

4. General Seeding Areas

Seed Varieties	Purity	Germination
Shannon or Bluestar Kentucky Bluegrass	95%	85%
Gaelic or Corsair Kentucky Bluegrass	95%	85%
Lunar or Avalanche Kentucky Bluegrass	95%	85%
Yellowstone Kentucky Bluegrass	95%	85%
Gray Star or Salinas Perennial Ryegrass	98%	85%
SoxFan or Showtime Perennial Ryegrass	98%	90%
Expedite Perennial Ryegrass	95%	90%
Xcelerator Perennial Ryegrass	95%	90%
Charger 2 Perennial Ryegrass	98%	90%
Oracle Creeping Red Fescue	98%	85%
Fairmont Chewings Fescue	95%	85%
Marvel Creeping Red Fescue	95%	85%
Sword Hard Fescue	95%	85%
Minimus Hard Fescue	95%	85%

2.2 COMMERCIAL FERTILIZER

A. Fertilizer shall be uniform in composition, free-flowing and suitable for application with approved spreader, granular or pelleted with 50 percent (50%) of total nitrogen derived from a synthetic or natural organic material, delivered in original unopened containers with the analysis, type and trade name attached to each container. The composition shall be:

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

Fertilizer "B": applied 3-4 weeks after seeding at 50 lbs. per 8,000-10,000 square feet.
22-16-6 (6.3% Ammoniacal Nitrogen, 15.7% Urea Nitrogen, 16% Phosphorus, 6% Soluble Potassium).

Fertilizer “C” for enhanced establishment program (seed in lieu of sod)
Healthy Grow 4-2-2 CPM(2.15% Ammoniacal Nitrogen, 1.85% Water Insoluble Nitrogen, 2% Phosphoric Acid, 2% Sulfate of Potash, 8% Calcium. 0.8% Sulfur, endo and ecto mycorrhizae, sea plant meal, molasses meal, yucca).

Fertilizer “D” for enhanced establishment program (seed in lieu of sod)
Healthy Grow 8-3-5 CPM(4.5% Ammoniacal Nitrogen, 3.5% Water Insoluble Nitrogen, 3% Phosphoric Acid, 5% Sulfate of Potash, 5% Calcium. 1.0% Iron, 0.3% Magnesium).

B. Complete Soil testing for both fertility (including micronutrients, CEC, pH) and particle size is required on all new establishment sites

C. A critical establishment fertilizer application comes at planting whereas fertilizer in a ratio of 2-4-1 is applied directly adjacent to the seed to compensate for the seeds inability to extract phosphorus and other nutrients out of the soil Usually approx. 1lb. of P205 is applied with ½ lb. of N and ¼- ½ lb of K20 is applied. An analysis of 16-32-4 would be an example. Fertilizer ingredients with lower chloride index are preferred at seeding, such as Ammonium Sulfate and Sulfate of Potash.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect existing underground improvements from damage.

B. Remove all foreign materials, plants, roots, stones, and debris larger than 1" in any dimension from site. Do not bury foreign material.

C. Loosen soil to a depth of four inches (4") in lawn areas by approved method of scarification and grade to remove ridges and depressions. Remove all stones or foreign matter from top two inches (2") of soil.

D. If above steps have had rain in sufficient quantity to cause soil to recompact, entire steps are to be done prior to seeding.

E. Where no grades are shown, areas shall have a smooth and continual grade between existing or fixed controls and elevations shown on plans. Roll, scarify, rake and level as necessary to obtain true, even lawn surfaces. All finish grades shall meet approval of the Owner.

F. Grade lawn areas to finish grades, filling as needed or removing surplus dirt and floating areas to a smooth, uniform grade. All lawn areas shall slope to drain.

3.2 PREPLANT FERTILIZING

A. Broadcast spread fertilizer “A” (or Alternates “C” and “D”) after seeding at a rate of 2 lbs. of Phosphorus per 1000 square feet. (Apply Alternate “C” at 50 lbs. per 5000 square feet and Alternate “D” at 50 lbs. per 10,000 square feet.)

3.3 SEEDING

A. Dates of Seeding:

1. Grass seed shall be sown in the fall from August 15th until October 15th or in the spring between March 1st and May 15th or at such other times as approved by the Landscape Architect. All seeding is to be done in dry or moderately dry soil and at times when the wind does not exceed a velocity of five (5) miles per hour.
2. If special conditions exist, which may warrant a variance in the above dates, submit a written request to the Landscape Architect stating the conditions and proposed variance. Permission for the variance will be given if, in the opinion of the Landscape Architect, the variance is warranted.

B. Seed Application:

1. Immediately before sowing the seed, the earth surface shall be re-worked until it is a fine, pulverized, smooth seedbed, showing not more than 1/4" variance from grade.
2. Apply seed mixture, as specified, at a rate of two and one half to four (2.5-4) lbs/1000 sq. ft. Apply seed in two directions where possible at a rate of 1.25-2 lbs. /1000 sq. ft. in each direction with seeder, using a cultipacker type seeder such as Brillion (or equal) mounted on tractor. Seed shall be uniformly spread over the previously fine graded and fertilized topsoil. The surface shall be dry when seed is planted. Hand sew seed around each irrigation system head. Hydro-seeding is not acceptable.
3. Mulching: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a

photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150mm) long.

4. Contractor shall return to site six (6) weeks after installation to evaluate germination. If germination of seed exceeds 70%, Contractor to remove mesh. If germination of seeds is less than 70%, mesh shall remain and Contractor shall reevaluate in ten (10) days.

C. Summer Seeding:

1. If seeding is authorized between June 1 and August 15, annual rye shall be sown separately in addition to specified seed mix. Sow at the rate of (one) 1 lbs./1000 sq. ft.
2. Cultipacker or approved similar equipment may be used to cover the seed and to firm the seed bed in one operation. In areas inaccessible to cultipacker, the seeded ground shall be lightly raked and rolled in two directions with a water ballast roller. Extreme care shall be taken during seeding and raking to insure that the seed in not raked from one spot to another.
3. The seeded areas are to be protected, watered, mowed and otherwise maintained until Owner Acceptance.

D. Post Seeding Fertilizer: Supply fertilizer "B" when grass reaches height of one (1) inch or 3 weeks after seeding at .75-1 lbs Phosphorus per 1000 square feet.

E. Maintenance

1. Maintenance of all lawns consist of mowing, watering and repairing erosion. Maintenance of lawns shall commence when any portion of the seeding has been completed. Seeded lawns shall never reach a height of three (3) inches prior to a cutting and shall be cut to a height of two (2) inches.
2. If, for reasons beyond the Sub-contractor's control, the height of the grass has exceeded three (3) inches, the mower blades shall be raised so that at no time will more than 1/3 of the grass leaf surface be removed.
3. Contractor shall notify the Owner through the Landscape Architect in writing one (1) week in advance of the final lawn cutting to allow the Owner and the Landscape Architect to inspect the lawns and schedule his maintenance work. The Owner will accept the lawns after a minimum of three (3) cuttings if a uniform cover of grass is established and is acceptable to Owner and Landscape Architect. **If a uniform stand of grass is not established, contractor shall continue maintenance and cutting until lawn is accepted.**
4. If an infestation of weeds or crab grass develops prior to acceptance of the lawn, the Contractor shall treat the infestation by hand weeding or chemical control. The chemical control shall be furnished and installed by the contractor as recommended by the manufacturer and approved by the Landscape Architect. At least two weeks shall elapse after chemical control is applied before a request or inspection for acceptance is made to the Landscape Architect.

3.4 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Architect:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over a 10 square foot and bare spots not exceeding 5 by 5 inches.
2. Use specified materials to reestablish turf that does not comply with the requirements and continue watering and maintenance until turf is satisfactory.
3. If the lawn is not acceptable after 18 months, the owner shall contract with an independent contractor, of their choosing, to complete the work.

3.5 CLEAN UP AND DISPOSAL

A. Remove from the site all equipment, materials, and debris resulting from construction work including this section. Leave work area neat and clean and in a condition acceptable by the Landscape

Architect and School District. All work shall be complete, ready for use, at the time of final acceptance.

END OF SECTION 32 9227

SECTION 33 4100
STORM SEWERS, UNDERDRAINS AND DRAINAGE STRUCTURES

4PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to work of this section. Where these specifications differ from the local or City's standard detail sheets, the detail sheets shall govern.

1.2 SUMMARY

A. The work under this Section includes, but is not necessarily limited to, the furnishing and installation of all storm sewers, underdrains and drainage structures and leads and connections as indicated on the Drawings, herein specified and as necessary for the proper and complete performance of this Work for foundations and underslab areas. Contractor shall note that new manholes and catch basins are not intended to be part of the project, but these specifications are provided in the event that any structures need replacement.

1. Storm Sewer Pipe
2. Perforated Underdrain Pipe
3. Castings
4. Manhole Sections and Steps
5. Catch Basin
6. Brick and Concrete Block Masonry

1.3 QUALITY ASSURANCE

A. Use only personnel completely trained and experienced in installation of the materials.

B. Compliance to City/Township Codes and all other agencies having jurisdiction shall govern material and installation procedures.

1.4 SUBMITTALS

A. Shop Drawings: Shop drawing submittals are not required for storm sewer materials. Contractor is expected to conform to the plans, specifications, and details for this work. Submit material certificates in lieu of shop drawings. Material certificates shall be signed by manufacturer and contractor certifying that each material item complies with or exceeds requirements.

1.5 PRODUCT HANDLING

SECTION 33 4100
STORM SEWERS, UNDERDRAINS AND DRAINAGE STRUCTURES

A. Protection: Use all means necessary to protect the materials before, during and after installation.

B. Replacements: In the event of damage, immediately make all necessary repairs and replacements acceptable to the Engineer and at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 STORM SEWER PIPE

A. General: Storm sewer pipe material shall be as indicated on the plans. If indicated on the plans, pipe materials shall conform to the following requirements.

B. Reinforced Concrete Pipe

1. Reinforced concrete pipe shall conform to ASTM C-76.72A, Type III & Type IV.

2. Joints shall be premium rubber joint as acceptable to the Engineer unless otherwise specified on the drawings.

C. Corrugated Polyethelene Tubing (CPT)

1. Corrugated Polyethelene Tubing (CPT) shall conform to ASTM F405 and shall be perforated with sock where indicated on the plans.

2. Joints shall be secured with a factory made snap-on or screen-on coupler for 4" and 6" diameter. Joints for 8" diameter and larger shall be a factory made coupler ties, bolts or screws on.

D. Smooth Lined Corrugated Polyethylene Pipe (SLCPP)

1. Corrugated polyethylene pipe shall have a smooth interior wall, Manning's "n" of 0.012 or better and shall conform to AASHTO M294.

2. Joints shall be secured with a tied or bolted polyethylene coupler or shall be a factory made coupler which can be screw turned on to the end corrugations.

3. Corrugated polyethylene pipe shall be Advanced Drainage Systems N-12, Hancor HiQ or accepted equal.

2.2 PERFORATED UNDERDRAIN PIPE (PE or CPP)

A. General

1. Perforated underdrain pipe shall be perforated, corrugated polyethelene pipe.

2. The pipe shall have a factory installed geotextile pipe wrap.

3. Perforation shall meet the requirements of AASHTO M 278.

B. Polyethylene Pipe (PE): Polyethylene pipe and fittings shall be standard strength and conform to ASTM F 405 and AASHTO M 252.

C. Polyvinyl Chloride Pipe (PVC): Polyvinyl Chloride pipe and fitting shall be standard strength and conform to ASTM F 800.

D. Geotextile Pipe Wrap: Geotextile pipe wrap shall weigh at least 3.5 ounces per square yard and shall conform to AASHTO M 288. It shall not be ripped or torn. The minimum tensile strength shall be 100 pounds.

2.3 CASTINGS

A. General: All castings shall be of cast iron, conforming to ASTM A 48 unless otherwise indicated. Conform to details and notes indicated on the plans. Where details or notes are not indicated, conform with the following requirements.

B. Manhole frames and covers: Material shall be MDOT Type A with perforated covers.

C. Catch basins and inlet castings: Catch basin and inlet castings shall be MDOT Type K when located in curbs and gutter, MDOT Type E in non-paved locations, and MDOT Type A when located in paved areas.

2.4 MANHOLE SECTIONS

A. Manhole walls

1. Standard manhole walls shall be Precast concrete units conforming to ASTM C 478, or be concrete block masonry.

B. Manhole bases: Manhole bases shall be precast concrete units of the dimensions indicated on the Drawings.

2.5 MANHOLE STEPS

A. Manhole steps shall be of cast iron conforming to ASTM A 48 or equal, and shall meet pertinent safety rules and regulations.

2.6 CATCH BASINS

A. Construct catch basins of brick, block, masonry, or Precast units. Precast concrete catch basin units, if used, shall have reinforcing steel conforming to ASTM C 76 II, Wall B.

2.7 INLETS

A. Construct inlets of brick, block, masonry, or Precast units. Precast inlet units, if used, shall have

reinforcing steel conforming to ASTM C 76 II, Wall B.

2.8 CLEANOUTS

A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.9 MORTAR

A. Mortar for brick masonry or plastering manholes shall be made of one part Portland cement to two parts sand.

2.10 BRICK

A. Brick Work shall meet the requirements of Medium Brick of ASTM C 13.

2.11 CONCRETE BLOCK MASONRY

A. Concrete block masonry shall conform to ASTM C 139.

2.12 OTHER MATERIALS

A. All other materials not specifically described but required for a complete and proper installation of the work of this Section, shall be new, first quality of their respective kinds, and as selected by the Contractor subject to review by the Engineer.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Inspection

1. Verify that all work under this Section may be installed in accordance with all pertinent codes and regulations, the original design and the reference standards.

2. All materials shall be inspected immediately before installation, and if found defective, immediately removed from the site.

B. Discrepancies

1. In the event of discrepancy, immediately notify the Engineer.

2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.2 EARTHWORK

SECTION 33 4100
STORM SEWERS, UNDERDRAINS AND DRAINAGE STRUCTURES

A. All earthwork required for the performance of the work of this Section shall be installed in accordance with earthwork specifications.

3.3 INSTALLATION

A. General: Install all pipe and fittings in strict accordance with the manufacturer's recommendations as acceptable to the Engineer and other authorities having jurisdiction.

B. Handling

1. Distribute pipe and materials at the site as required, care to prevent damage to the pipe and materials.

2. Use proper tools and implements for safely handling and installing the pipe and other materials.

3. Protect the pipe and other materials from falling to the ground or into the trench.

4. Protect distributed pipe and materials from the public and passing vehicles.

C. Laying pipe

1. Lay all pipe true to line and grade with pipe ends abutting each other and the bell end facing the direction of laying.

2. Use laser alignment equipment to establish and maintain proper line and grade, unless otherwise directed.

3. Correct any deviation from line and grade at no additional cost to the Owner.

4. Protect workers at all times from cave-in and other hazardous conditions.

D. Joints: Inspect each joint immediately after being completed and, if defective, shall be corrected before any more pipe is laid.

E. Concrete encasement

1. Place concrete encasements in locations and to the form and dimensions indicated.

2. Concrete for encasements shall be Class SE with that below the pipe dry mixed.

3. Take particular care to place the concrete under the pipe, and lay pipe in fresh concrete so that a complete support of the pipe will be made. Encasement at the sides and top may be placed after the concrete under this pipe has been set.

F. Manholes

1. Construct manholes as indicated on the Drawings and Specifications.

2. Take special care in forming the channels in the concrete bottom and use wooden templates or half sewer pipe for this work.

3. Plaster masonry work and castings as indicated on the Drawings.

4. In precast concrete manholes, the bottom section shall have cast openings of sufficient size to receive the sewer pipe. If such openings are not provided, the bottom portion may be constructed of masonry work from the concrete base to at least 6" above the top of the largest pipe entering the manhole and Precast sections placed from the masonry to the desired top elevation.

5. All the annular space between the sewer pipe and the opening in the manhole section shall be filled with brick and/or masonry to provide a waterproof seal.

6. Place the manhole casting on a minimum of 3 courses of masonry brick and a maximum of 5 courses of manhole brick. Install bricks radially. Precast concrete adjusting rings may be used in place of brick.

7. Mortar joints have to be smooth tooled joints.

G. Catch basins and inlets

1. Construct catch basins and inlets as indicated on the Drawings and Specifications.

2. Place catch basin and inlet castings on a minimum of 3 courses of manhole brick and a maximum of 5 courses of manhole brick. Install brick radially. Precast concrete adjusting rings may be used in place of brick.

H. Trench bracing: Install trench bracing in accordance with safety and other pertinent rules and regulations, and Division 31 Section “Earth Moving.”

I. Erosion control and sedimentation: Contractor to provide erosion control to minimize introduction of sedimentation into the system.

3.4 CLEANING

A. Prior to acceptance of storm sewers, underdrains, manholes and drainage structures, thoroughly clean those structures and remove all dirt and debris of whatever nature from inside sewer pipes, manholes and the like, and leave the site in a neat and clean condition.

END OF SECTION 33 4100

SECTION 33 4416
UTILITY TRENCH DRAIN SYSTEM

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 Sections:

1. Section 03 3000 Cast In Place Concrete

1.2 SCOPE

A. The work under this section of the specifications shall include all materials, labor and equipment necessary to install a pre-cast, chemical-resistant polyester concrete trough drainage systems as specified, and as shown on the Contract Documents.

1.3 QUALITY ASSURANCE

A. Manufacturer shall certify that the polymer concrete used meets the strength values of Section 2.1 B.

1.4 SUBMITTALS

A. Manufacturer will submit, when required, shop drawings showing a schematic plan of the total drainage system listing all parts being provided with exact center-line dimensions suitable for installation. Copies of the manufacturer's recommended method of installation, and assembly shall be submitted for review. Contractor shall obtain arc radius units where they apply.

B. Manufacturer shall submit a list of projects installed locally during the past five years.

PART 2 - PRODUCTS

2.1 TROUGH DRAIN

A. Manufacturer shall be one of the following or (approved equal):

Manufacturer:	Model:
1. ACO Polymer Products, Inc. Chagrin Falls, Ohio (216) 247-2033	System 4000 Grate Color: Black
2. SportsField Specialities Delhi, NY (888) 975-3343	Sport 4000 Grate Color: Black
3. SportsEdge Troutman, NC (800) 334-6057	Pro “S” Trench Drain Grate Color: Black

B. Product shall be a one piece polymer concrete grated drain incorporating anti-slip, ADA compatible locking grate. Trench drain channels shall be pre-cast, and interlocking, incorporating either

polyester or vinyl ester resins and formulated aggregate.

Overall Width	-	6.1 in
Internal Width	-	4.0 in
Unit Depth	-	6.0 in (nominal)
Compressive Strength	-	14,000 - 14,500 PSI
Flexural Strength	-	3,600 - 4,500 PSI
Tensile Strength	-	1,500 PSI

PART 3 - EXECUTION

3.1 SITE PREPARATION

A. Excavate the area for channel placement wide and deep enough to accommodate the channel size and a minimum of 4 inch concrete encasement (channels require a minimum of 4 inches of concrete support and top of grate must be evenly aligned to the surface of the surrounding slab) on both sides as well as underneath the channel.

3.2 INSTALLATION

A. Channel sections are installed from the outlet end of the system, working from either catch basins or other outlets. Insert channels to interlock ends. Channel sections shall be placed on brick, rebar basket, or low slump concrete slurry, to obtain correct finished elevation. Cutting will be made if required, by masonry or concrete saw. Saw cut relief joints at every third (3rd) section channel (±10). Install drain system in strict accordance with manufacturer's recommendations and shop drawings.

3.3 CONCRETE PLACEMENT

A. Protect the top of the channel against the concrete or other abutting materials during setting. Place concrete in a manner that will not dislodge the channels. Concrete shall be at finished level with the top of the grate to ensure efficient drainage and adequate grate edge protection.

3.4 FINISHING AND CLEAN-UP

A. Following final set of concrete, remove channel protection, if used.

END OF SECTION 33 4416

SECTION 33 4615
SUBDRAINAGE SYSTEMS – TURF DRAINTILE

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 Sections

1. Section 31 2010 Earthwork (Turf)
2. Section 31 3219 Geotextile Fabric
3. Section 32 1817 Synthetic Turf

1.2 SCOPE

A. The work under this section consists of furnishing all labor, materials and equipment to install the drainage system, couplings and accessories for the artificial turf subdrainage system.

1.3 QUALITY ASSURANCE

A. Reference Standards:

1. American Society for Testing and Materials (ASTM):
   a. ASTM D2729 – Standard Specification for Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
   b. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
2. American Association of State Highway and Transportation Officials (AASHTO):
   a. AASHTO M294 – Standard Specification for Corrugated Polyethylene Pipe

1.4 SUBMITTALS

A. Manufacturer's Literature: Furnish to Landscape Architect, copies of manufacturer's specifications, maintenance, and installation instructions for each item specified herein. Include photographs, catalogue cuts, and other data as may be required to show compliance with these specifications.

PART 2 - PRODUCTS

2.1 DRAINTILE - GENERAL

A. High Density corrugated polyethylene (HDPE), tubular-style perforated type, pipe and fittings.

B. Hancor "HI-Q", ADS N-12, or approved equal.

C. Diameter of systems lateral and collector lines as shown on plans.

2.2 DRAINTILE - FLAT DRAIN

A. AdvanEDGE pipe with geotextile sock manufactured by Advanced Drainage Systems, Inc. (800) 733-9554. Size as indicated on Drawings.

B. Multi-Flow manufactured by Varicore Technologies, Inc., (800) 978-8007. Size as indicated on Drawings.

2.3 TRENCH MATERIAL

A. Filter Aggregate: Evenly graded mixture of ¾" diameter clean crushed stone.

PART 3 - EXECUTION

3.1 INSTALLATION FOR CORRUGATED POLYETHYLENE TUBING

A. Hand trim excavating to required elevations. Do not over excavate. Remove large stones or other hard matter which could damage drain tile.

B. Place a two inch (2") thick bed of filter aggregate.

C. Install the drainage tile on the filter aggregate bed.

D. Ensure complete connection to storm sewer using perforated pipe.

E. Cover the pipe with filter aggregate to top of trench and compact to 90% Modified Proctor.

3.2 INSTALLATION FOR "FLAT DRAIN" PIPE

A. Install flat drain pipe horizontally, being sure to allow for a minimum of 8" of stone below turf material.

B. Joints shall be made using manufacturers couplers prior to placing flat drain on subgrade. Use 2 coupling pins for each coupler. Couplers shall be placed under the fabric at the joint to prevent backfill infiltration. To accomplish this, split the fabric seam and lay back the fabric approximately 8". Install the coupler with 2 pins. Replace fabric over the coupler and secure the fabric with suitable tape.

C. End caps shall be used at all termination points to prevent soil infiltration into system.

D. Compact stone to appropriate modified proctor density value.

END OF SECTION 33 4615