PROJECT MANUAL:

ASHEVILLE HIGH SCHOOL
TRACK REPLACEMENT

Asheville, NC
Buncombe County

January 12, 2023

Client:

Buncombe County

30 Valley Street | Asheville, NC 28801
Telephone: (803) 250-4235

I. NOTICE TO BIDDERS

INVITATION TO BID

FOR THE CONSTRUCTION OF
ASHEVILLE HIGH SCHOOL TRACK REPLACEMENT

ASHEVILLE, NORTH CAROLINA

SEALED BIDS for construction of the Asheville High School Track Replacement will be received by Buncombe County. The work of this contract includes but is not limited to site demo, grading, erosion control, seeding, asphalt and concrete paving, storm drainage systems, fencing, track and field construction, and sports equipment.

Written, sealed bids should be delivered and accepted in person to Ronald Lunsford, Buncombe County Project Manager, and clearly marked "Asheville High School Track Replacement." Bids are due by **4:00 pm on Thursday, February 16, 2023** at 30 Valley Street, Asheville, NC 28801**.** Bids will be publicly opened and read aloud at this time in the Board Room. Please note that the terms of the bid documents and your response thereto will be incorporated into the terms of the final contract if your firm is the selected contractor.

The entire Bid Package may be obtained online at the Buncombe County website. All costs of printing bid documents shall be the responsibility of the Bidder.

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

A non-mandatory, pre bid meeting will be held on Wednesday, January 25, 2023 at 1:00pm on site at the track located at 419 McDowell Street, Asheville, NC 28803. Any questions regarding this meeting should be directed to Dan Dodd, PLA via email only at dan@fitfields.com.

Site visits are allowed by appointment only. All inquiries about site visits should be directed to Dan Dodd, PLA via email only at dan@fitfields.com.

All questions must be received by Tuesday, February 7, 2023 before 5:00pm. All questions should be directed to Dan Dodd, PLA via email only at dan@fitfields.com.

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

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STANDARD FORM FOR SINGLE PRIME CONSTRUCTION PROJECTS

NORTH CAROLINA
COUNTY OF BUNCOMBE

GENERAL CONDITIONS OF THE CONTRACT

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ARTICLE 1 - DEFINITIONS

a. The **contract documents** consist of the Request for Proposal (RFP); General Contractor's formal response to the RFP; General Conditions of the Contract; special conditions if applicable; the drawing and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the contract; the performance bond; the payment bond; insurance certificates. All of these items together form the contract.

b. The **Owner** is Buncombe County Government.

c. The **designer** or **project designer** means the firm or firms of architects or engineers or both (and their consultants) which have undertaken to design the project pursuant to a contract with the Owner, (hereinafter, the "design contract").

d. Intentionally left blank for sequential numbering purposes.

e. A **subcontractor**, as the term is used herein, shall be a trade contractor, a general, mechanical, electrical, plumbing, specialty contractor, or a trade contractor, who has entered into a direct contract with a GC, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.

f. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.

g. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor as supervised by the GC.

h. The **project** is the total construction work to be performed under the contract documents.

i. Intentionally left blank for sequential numbering purposes.

j. **Change order**, as used herein, shall mean a written order to the GC subsequent to the signing of the contract authorizing a change in the contract. The change order shall be signed by the GC, designer and the Owner, in that order (Article 19).

k. **Field Order,** as used herein, shall mean a written approval for the GC to proceed with the work requested by Owner prior to issuance of a formal Change Order. The field order shall be signed by the GC, designer, and Owner.

l. **Field Change,** as used herein shall mean a written approval from the Owner for the GC to proceed with work requested by the Owner.

m. **Time of Completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed, or such other date as may be established herein (Article 23).

n. **Liquidated damages,** as stated in the contract documents, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the GC to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the GC, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused solely by the GC (e.g., if a multi-phased project-subsequent phases, delays in start of other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).

o. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the GC, and which engages to be responsible for the GC and his acceptable performance of the work.

p. **Routine written communications between the Designer and the General Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications cannot be identified as "request for information".

q. **Clarification or Request for information (RFI)** is a request from the GC seeking an interpretation or clarification by the Designer relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the GC's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.

r. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work.

s. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.

t. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of the designer and owner.

u. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve

competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the designer and owner.

v. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.

w. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.

x. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.

y. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.

z. **Designer Final Inspection** is the inspection performed by the design team to determine the completeness of the project in accordance with approved plans and specifications. This inspection occurs prior to final inspection.

aa. left blank for numbering purposes

bb. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the local Authority Having Jurisdiction (AHJ). Life safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.

cc. **Final Acceptance** is the date in which the Owner accepts the construction as totally complete. This includes the local AHJ and certification by the designer that all punch lists are completed.

ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS

a. The drawings and specifications are complementary, one to the other. That which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Form of Contract, specifications, large-scale detail drawings, small- scale drawings.

b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.

c. The GC shall execute each copy of the response to RFP, contract, performance bond and payment bond as follows:

1 If the documents are executed by a sole Owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.

2 If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.

3 If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.

4 If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole Owner, partnership or corporation, whichever form is applicable to each particular member.

5 All signatures shall be properly witnessed.

6 If the General Contractor's license is held by a person other than an Owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.

7 The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.

8 Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.

9 The seal of the bonding company shall be impressed on each signature page of the bonds.

10 The GC's signature on the performance bond and the payment bond shall correspond with that on the contract.

ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS

a. In such cases where the nature of the work requires clarification by the designer, such clarification shall be furnished by the designer with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.

b. The GC and the Designer shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The Designer shall furnish drawings or clarifications in accordance with that schedule. The GC shall not proceed with the work without such detail drawings and/or written clarifications.

ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS

The Designer or owner shall furnish free of charge to the GC electronic copies of plans and specifications. If requested by the GC, up to 3 paper copies of plans and specifications will be provided free of charge, plus a clean set of black line prints on white paper of all appropriate drawings, upon which the GC shall clearly and legibly record all work-in-place that is at variance with the contract documents. Additional sets shall be furnished at cost, including mailing, to the GC at the request of the GC.

ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA

a. Within fifteen (15) consecutive calendar days of the notice to proceed, a schedule for anticipated submission of all shop drawings, product data, samples, and similar submittals shall be prepared by the GC and provided to the designer. This schedule shall indicate the items, relevant specification sections, other related submittal data, and the date when these items will be furnished to the designer.

b. The GC shall review, approve and submit to the Designer all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the GC's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Designer to retain up to three (3) copies of each submittal for his own use plus additional copies as may be required by the GC. Submittals shall be presented to the Designer in accordance with the schedule submitted in paragraph (a) so as to cause no delay in the activities of the Owner.

c. The Designer shall review required submittals promptly, noting desired corrections if any, and retaining three (3) copies (1 for the Designer, 1 for the owner) for his use. The remaining copies of each submittal shall be returned to the GC not later than twenty (20) days from the date of receipt by the Designer, for the GC's use or for corrections and resubmittal as noted by the Designer. When resubmittals are required, the submittal procedure shall be the same as for the original submittals.

d. Approval of shop drawings by the designer shall not be construed as relieving the GC from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such error has been called to the attention of the designer in writing by the GC.

ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE

a. The GC shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the Designer or his authorized representative, and the owner.

b. The GC shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the GC and submitted to the designer upon project completion and no later than thirty (30) days after acceptance of the project.

c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS

All drawings and specifications are instruments of service and remain the property of the Owner. The use of these instruments on work other than this contract without permission of the Owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the Owner upon request after completion of the work.

ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES

a. The GC shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, scaffolding and incidentals necessary for the completion of his work, and to install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same. The GC shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied there from, all in accordance with the contract documents.

b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.

c. Upon notice, the GC shall furnish evidence as to quality of materials.

d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the GC may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the GC has the option of using any product and manufacturer combination listed. However, the GC shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. The GC shall be responsible for reviewing all substitution requests from their subcontractors prior to submission to the Project Designer and Owner and shall track & monitor all such requests. Requests for substitution of materials, items, or equipment shall be submitted to the Project Designer for approval or disapproval; such approval or disapproval shall be made by the designer prior to the opening of bids. Alternate materials

may be requested after award if it can clearly be demonstrated that it is an added benefit to the owner and the designer and the owner approves.

e. The GC shall obtain written approval from the designer for the use of products, materials**,** equipment**,** assemblies or installation methods claimed as equal to those specified. Such approvals must be obtained as soon after contract awards as possible and before any materials are ordered.

f. The Designer is the judge of equality for proposed substitution of products, materials or equipment.

g. If at any time during the construction and completion of the work covered by these contract documents, the conduct of any workman of the various crafts be adjudged a nuisance to the Owner or Designer, or if any workman be considered detrimental to the work, the GC shall order such parties removed immediately from grounds.

ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The GC shall protect and save harmless the Owner against suit on account of alleged or actual infringement. The GC shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS

a. The GC shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the GC observes that the drawings and specifications are at variance therewith, he shall promptly notify the Designer in writing. Any necessary changes required after contract award shall be made by change order in accordance with Article 19. If the GC performs any work or authorizes any work to be performed knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer, he shall bear all cost arising there from. Additional requirements implemented after bidding will be subject to equitable negotiations.

b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the GC unless otherwise specified.

c. Projects constructed by Buncombe County or a subdivision thereof are subject to inspection by appropriate county or municipal authorities and building codes. The GC shall cooperate with the county and/or municipal authorities by obtaining building permits. Permits shall be obtained at GC's cost.

d. Projects involving local funding (Community Colleges) are also subject to county and municipal building codes and inspection by local authorities. The GC shall pay the cost of these permits and inspections unless otherwise specified.

ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC

a. The GC shall be responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the Owner or designer, and by laws or ordinances governing such conditions. The GC shall be responsible for any damage to the Owner's property or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. The GC shall be responsible for and pay for any damages caused to the Owner. The GC shall have access to the project at all times.

b. The GC shall be responsible to cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the Owner.

c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the Designer.

d. The GC shall ensure that all trees and shrubs designated to remain in the vicinity of the construction operations are protected in accordance with the requirements of the plans and specifications. All walks, roads, etc., shall be barricaded as directed by the designer to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

e. The GC shall develop and implement a project safety plan that provides all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. The GC shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. The GC shall insure that protection is provided against damage or injury resulting from falling materials and that all protective devices and signs be maintained throughout the progress of the work.

f. The GC shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by N.C.G.S. 95-126 through 155.

g. The GC shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract. The name of the safety inspector shall be made

known to the designer and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.

h. In the event of an emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the GC is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage. Any compensation claimed by the GC on account of such action shall be determined as provided for under Article 19(b).

i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973

a. Any land-disturbing activity performed by the GC in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).

b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the GC shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.

c. The GC shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.

d. To the fullest extent permitted by law, the GC shall indemnify and hold harmless the Owner, the designer and the agents, consultants and employees of the Owner and designer, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

ARTICLE 13 - INSPECTION OF THE WORK

a. It is a condition of this contract that the work shall be subject to inspection during normal working hours by the designer, designated official representatives of the Owner and those persons required by state law to test special work for official approval. The GC shall therefore provide safe access to the work at all times for such inspections.

b. All instructions to the GC will be made only by or through the designer or his designated project representative. Observations made by official representatives of the Owner shall be conveyed to the designer for review and coordination prior to issuance to the GC.

c. The GC shall perform quality control inspections on the work of Principal Trade and Specialty Contractors to guard the Owner against defects and deficiencies in the work and shall coordinate this activity with the on-site duties of the Project Designer. The GC shall advise the Project Designer of any apparent variation and/or deviation from the intent of the Contract Documents and shall take the necessary action to correct such variations and deviations.

d. All work shall be inspected by designer, special inspector prior to being covered by the contractor. The GC shall give a minimum of two week notice unless otherwise agreed to by all parties. If inspection fails, after the first re-inspection all costs associated with additional re-inspections shall be borne by the GC.

e. Where special inspection or testing is required by virtue of any state laws, instructions of the designer, specifications or codes, the GC shall give adequate notice to the Project Designer of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the Project Designer. Such special tests or inspections will be made in the presence of the Project Designer, or his authorized representative, and it shall be the GC's responsibility to serve ample notice of such tests.

f. All laboratory tests shall be paid by the Owner unless provided otherwise in the contract documents except the GC shall pay for laboratory tests to establish design mix for concrete and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.

g. Should any work be covered up or concealed prior to inspection and approval by the Project Designer such work shall be uncovered or exposed for inspection, if so requested by the Project Designer in writing. Inspection of the work will be made promptly upon notice from the GC. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the GC.

ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE

a. On-site representatives of the GC shall manage the work and coordinate the work with the activities of the Owner and Project Designer to complete the project with the Owner's objectives of cost, time and quality. Throughout the progress of the work, the GC shall maintain a competent and adequate full-time staff approved by the Owner and Project Designer. It is understood that the designated and approved on-site representative of the GC will remain on the job and in responsible charge as long as those persons remain employed by the GC unless otherwise requested or agreed to by the Owner. The GC shall establish an on-site organization with appropriate lines of authority to act on behalf of the GC. Instructions, directions or notices given to the designated on-site authority shall be as

binding as if given to the GC. However, directions, instructions, and notices shall be confirmed in writing.

b. The GC shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.

c. The GC shall call and preside over monthly job site progress conferences. The GC shall require attendance from other subcontractors and material suppliers who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. The GC shall be prepared to assess progress of the work and to recommend remedial measures for correction of progress as may be appropriate. The GC with assistance from the Designer shall be the coordinator of the conferences and shall preside as chairman. The GC shall turn over a copy of his daily reports to the Designer and Owner at the job site progress conference. Owner will determine daily report format.

d. The GC, if necessary, shall employ an engineer or a land surveyor licensed in the State of North Carolina to lay out the work and to establish a bench mark nearby in a location where same will not be disturbed and where direct instruments sights may be taken.

e. Intentionally left blank for sequential numbering purposes.

f. The CPM schedule shall be a complete computer generated network analysis showing the complete sequence of construction activities, identifying the work of separate stages and other logically grouped activities, indicating early and late start and early and late finish dates, float duration and a complete logic. Monthly updates will show the estimated completion of each activity.

g. Intentionally left blank for sequential numbering purposes.

h. The GC shall maintain the project CPM schedule, making monthly adjustments, updates, corrections, etc., which are necessary to finish the project within the time allotted by the contract. In doing so, the GC shall keep the designer fully informed as to all changes and updates to the schedule. The GC shall submit to the Project Designer a monthly report of the status of all work activities. The monthly status report shall show the actual work completed to date in comparison with the original amount of work scheduled. If the work is behind schedule, the GC must indicate in writing what measures are being taken to bring the work back on schedule and ensure that the contract completion date is not exceeded. If the work is greater than thirty (30) days behind schedule and no legitimate requests for time extensions are in process, then the GC shall prepare and submit to the Project Designer a recovery schedule for review and approval. Failure of the GC to abide by the directives

in this paragraph will give the Owner cause to exercise the remedies set forth in Article 29 of the General Conditions and pursue any other legal remedies allowed it by law.

ARTICLE 15 – {NOT USED}

ARTICLE 16 – {NOT USED}

ARTICLE 17 – {NOT USED}

ARTICLE 18 - DESIGNER'S STATUS

a. The Project Designer shall provide liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the Owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to stop work or to order work removed, or to order corrections of faulty work where such action may be necessary to assure successful completion of the work.

b. The Project Designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the Owner and the GC, taking sides with neither.

c. Should the Project Designer cease to be employed on the work for any reason whatsoever, then the Owner shall employ a competent replacement who shall assume the status of the former Project Designer.

d. The Project Designer will make periodic inspections of the project at intervals appropriate to the stage of construction. He will inspect the progress, the quality and the quantity of the work.

e. The Project Designer and the Owner shall have access to the work whenever it is in preparation and progress during normal working hours. The GC shall provide facilities for such access so the Designer may perform his functions under the contract documents.

f. Based on the Project Designer's inspections and evaluations of the project, the Project Designer shall issue interpretations, directives and decisions as may be necessary to assist the GC in the administration of the project. His decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract. The GC’s decisions, however, relating to means and methods, and administration of the contracts the GC holds are final.

ARTICLE 19 - CHANGES IN THE WORK

a. The Owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the GC from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.

b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer, countersigned by the owner authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed.

   A field order, transmitted by email, fax, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.

   In the event of emergency endangering life or property, the County may direct the GC to proceed on a time and material basis whereupon the GC shall proceed and keep accurately on such form as may be required, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.

c. In determining the values of changes, either additive or deductive, the GC is restricted to the use of the following methods:

   1 Where the extra work involved is covered by unit prices quoted in the proposal, the value of the change shall be computed by application of unit prices based on quantities estimated or actual as agreed of the items involved, except is such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.

   2 The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.

d. Under Paragraph “b” and Methods "c(2)" above, the allowances for overhead and profit combined for a Principal Trade or Specialty Contractor and all multi-tier subcontractors shall not exceed fifteen percent (15%) of **net cost** of the work. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%***)*** profit, but no allowances for overhead.

e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:

   1 The actual costs of materials and supplies incorporated or consumed as part of the project;

   2 The actual costs of labor expended on the project site;

   3 The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions;

worker's compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;

4 The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the project;

5 The actual costs of premiums for bonds, insurance, permit fees and sales or use taxes related to the project. Overtime and extra pay for holidays and weekends shall not be incurred by the Owner as a cost item or otherwise.

f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change shall be arrived at by one of the foregoing methods. All change orders shall be supported by a breakdown showing method of arriving at net cost as defined above.

g. In all change orders, the procedure will be for the Project Designer to request proposals for the change order work in writing. The Project Designer shall verify correctness. Within fourteen (14) days after receipt of the GC's proposal**,** the Project Designer shall prepare the change order and forward to the GC for his signature or otherwise respond, in writing, to the GC's proposal. Within seven (7) days after receipt of the change order executed by the GC, the Project Designer shall, certify the change order by his signature, and forward the change order and all supporting data to the Owner for the Owner's signature. The Owner shall execute the change order for final approval**,** within seven (7) days of receipt. Copies will be sent to the Project Designer for distribution to the GC and the surety. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.

h. At the time of signing a change order, the GC shall be required to certify as follows:

"I certify that my bonding company will be notified forthwith that my contract has been changed by the amount of this change order, and that a copy of the approved change order will be mailed upon receipt by me to my surety."

i. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.

j. If, during the progress of the work, the Owner requests a change order and the GC's terms are unacceptable, the Owner**,** may require the GC to perform such work on a time and material basis in accordance with paragraph "b" above. Without prejudice, nothing in this paragraph shall preclude the Owner from performing or to have performed that portion of the work requested in the change order.

ARTICLE 20 - CLAIMS FOR EXTRA COST AND DISPUTE RESOLUTION

a. Should the GC consider that as a result of any instructions given in any form by the designer, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The GC shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation will be considered unless the claim is so made. The Designer shall render a written decision within seven (7) days of receipt of claim.

b. The GC shall not act on instructions received by him from persons other than the Project Designer, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The Project Designer will not be responsible for misunderstandings claimed by the GC of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.

c. To prevent disputes and litigation, it is agreed by the parties that any claim or dispute between the Owner and the Design Consultant, that any claim, dispute, or other matter in question arising out of or related to this Agreement shall be subject to voluntary non-binding mediation as a condition precedent to the institution of legal or equitable proceedings by either party. If the parties are unable to agree upon a certified mediator to hear their dispute, the President of the Buncombe County Bar Association shall name a mediator to hear the matter. During the pendency of any dispute and after a determination thereof, the parties to the dispute shall act in good faith to mitigate any potential damages including utilization of construction schedule changes and alternate means of construction. The costs of the process shall be divided equally between the parties to the dispute.

d. The mediation session shall be private and shall be held in Buncombe County, North Carolina or in another North Carolina County agreed upon by both parties. Mediation under this Article 11 shall not be the cause for a delay of the Project which is the focus of the dispute.

e. If, as a result of mediation, a voluntary settlement is reached and the parties to the dispute agree that such settlement shall be reduced to writing, the Mediator shall be deemed appointed and constituted an arbitrator for the sole purpose of signing the mediated settlement agreement. Such agreement shall be, and shall have the same force and effect as an arbitration award, and judgment may be entered upon it in accordance with applicable law in any court of competent jurisdiction.

f. If the disputed issue cannot be resolved in mediation or either party disagrees with the results of the mediation, the parties may seek resolution in the General Court of Justice in the County of Buncombe and the State of North Carolina. If a party fails to comply in strict accordance with the requirements of this Article, the non-complying party specifically

waives all of its rights provided hereunder, including its rights and remedies under State law.

ARTICLE 21 - MINOR CHANGES IN THE WORK

The Project Designer will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order, and shall be binding on the Owner and the GC.

ARTICLE 22 - UNCORRECTED FAULTY WORK

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the Owner and the Project Designer, the Owner shall be reimbursed by the GC. A change order will be issued to reflect a reduction in the contract sum.

ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME

a. The final completion date will be as determined by the Owner, Designer and GC during the pre-construction phase of the project and will be incorporated into the contract for construction services between the Owner and the GC.

b. The GC shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the Project Designer and shall fully complete all work hereunder within the time of completion specified. For each day in excess of the above number of days, the GC shall pay the Owner the sum stated as liquidated damages reasonably estimated in advance to cover the loses to be incurred by the Owner by reason of failure of the GC to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

c. If the GC is delayed at any time in the progress of his work by any act or negligence of the Owner or the Project Designer, or by any employee of either; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer and Owner determine may justify the delay, then the contract time may be extended by change order for the time which the designer and Owner may determine is reasonable.

   Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the GC reflecting the effect of the weather on progress of the work and initialed by the designer's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved

updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer caused delays in the case of concurrent delays.

d. Request for extension of time shall be made in writing to the designer, copies to the owner, within twenty (20) days following cause of delay. In case of continuing cause for delay, the GC shall notify the designer copies to the owner, of the delay within twenty (20) days of the beginning of the delay and only one claim is necessary.

e. The GC shall notify his surety in writing of extension of time granted.

f. No claim shall be allowed on account of failure of the Project Designer to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY

a. The Owner may desire to occupy or utilize all or a portion of the project when the work is substantially complete.

b. Should the owner request a utilization of a building or portion thereof, the designer shall perform a designer final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer final inspection punch list and the designer has verified, then the designer shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner and contractor(s). If beneficial occupancy is granted, in such areas the following will be established:

    1. The beginning of guarantees and warranties period for the equipment necessary to support in the area.

    2. The owner assumes all responsibilities for utility costs for entire building.

    3. Contractor will obtain consent of surety.

    4. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.

    5. The Owner shall have the right to exclude the GC from any part of the project which the Project Designer has so certified to be substantially complete, but the Owner will allow the GC reasonable access to complete or correct work to bring it into compliance with the contract.

6. Occupancy by the Owner under this article will in no way relieve the GC from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The designer may prorate liquidated damages based on the percentage of project occupied.

ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT

a. Upon notification from the GC that the project is complete and ready for inspection, the Project Designer shall make a designer final inspection to verify that the project is complete and ready for final inspection. Prior to final inspection, the GC shall ensure that all items requiring corrective measures noted at the designer final inspection are complete. The Project Designer shall schedule a final inspection at a time and date acceptable to the Owner and the GC.

b. At the final inspection, the designer and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the final inspection, the designer and Owners' representative shall make the following determinations:

    1. That the project is completed and accepted.

    2. That the project is accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of final inspection or the Owner may invoke Article 28, Owner's Right to Do Work.

    3. That the project is not complete and another date for a final inspection will be established.

c. Within fourteen (14) days of acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the Project Designer shall certify the work and issue applicable certificate(s) of compliance.

d. Any discrepancies listed or discovered after the date of final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42.

e. The date of acceptance will establish the following:

    1. The beginning of guarantees and warranties period.

    2. The date on which the GC's insurance coverage for public liability, property damage and builder's risk may be terminated.

    3. That no liquidated damages (if applicable) shall be assessed after this date.

    4. The termination date of utility cost to the GC (if applicable).

f. **Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.**

ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT

a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer shall be promptly removed from the work site by the GC, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the Owner. Work or property of the Owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the GC.

b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the Project Designer, and shall make satisfactory progress until completed.

c. Should the GC fail to proceed with the required corrections, then the Owner may complete the work in accordance with the provisions of Article 28.

ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee**.** Neither the final certificate, final payment, occupancy of the premises by the Owner, nor any provision of the contract, nor any other act or instrument of the Owner, nor the Project Designer, shall relieve the GC from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. The GC shall correct or make good any defects due thereto and repair any damage resulting therefrom, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The Owner will report any defects as they may appear to the GC and establish a time limit for completion of corrections by the GC. The Owner will be the judge as to the responsibility for correction of defects.

ARTICLE 28 - OWNER'S RIGHT TO DO WORK

If, during the progress of the work or during the period of guarantee, the GC fails to prosecute the work properly or to perform any provision of the contract, the Owner, after seven (7) days written notice sent by certified mail, return receipt requested, to the GC from the designer, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the GC, such action and cost of same having been first approved by the Project Designer. Should the cost of such action of the Owner exceed the amount due or to become due the GC, then the GC or his surety, or both, shall be liable for and shall pay to the Owner the amount of said excess.

ARTICLE 29 - ANNULMENT OF CONTRACT

If the GC fails to begin the work under the contract within the time specified, or the progress of the work is not maintained on schedule, or the work is not completed within the time above specified, or fails to perform the work with sufficient workmen and equipment or with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall discontinue the prosecution of the work, or if the GC shall become insolvent or be declared bankrupt or commit any act of bankruptcy or insolvency, or allow any final judgment to stand against him unsatisfied for a period of forty-eight (48) hours, or shall make an assignment for the benefit of creditors, or for any other cause whatsoever shall not carry on the work in an acceptable manner, the Owner may give notice in writing, sent by certified mail, return receipt requested, to the GC and his surety of such delay, neglect or default, specifying the same, and if the GC within a period of seven(7) days after such notice shall not proceed in accordance therewith, then the Owner shall, declare this contract in default, and, thereupon, the surety shall promptly take over the work and complete the performance of this contract in the manner and within the time frame specified. In the event the surety shall fail to take over the work to be done under this contract within seven(7) days after being so notified and notify the Owner in writing, sent by certified mail, return receipt requested, that he is taking the same over and stating that he will diligently pursue and complete the same, the Owner shall have full power and authority, without violating the contract, to take the prosecution of the work out of the hands of said GC, to appropriate or use any or all contract materials and equipment on the grounds as may be suitable and acceptable and may enter into an agreement, either by public letting or negotiation, for the completion of said contract according to the terms and provisions thereof or use such other methods as in his opinion shall be required for the completion of said contract in an acceptable manner. All costs and charges incurred by the Owner, together with the costs of completing the work under contract, shall be deducted from any monies due or which may become due said GC and surety. In case the expense so incurred by the Owner shall be less than the sum which would have been payable under the contract, if it had been completed by said GC, then the said GC and surety shall be entitled to receive the difference, but in case such expense shall exceed the sum which would have been payable under the contract, then the GC and the surety shall be liable and shall pay to the Owner the amount of said excess.

ARTICLE 30 – GENERAL CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT

a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the GC, or if the Owner should fail or refuse to make payment on account of a certificate issued by the designer within forty-five (45) days after receipt of same, then the GC, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the Owner and the designer, may suspend operations on the work or terminate the contract.

b. The Owner shall be liable to the GC for the cost of all materials delivered and work performed on this contract plus ten (10) percent overhead and profit and shall make such payment. The designer shall be the judge as to the correctness of such payment.

ARTICLE 31 - REQUEST FOR PAYMENT

a. Not later than the fifth day of the month, the GC shall submit to the designer a request for payment for work done during the previous month. The request shall be in the form agreed upon between the GC and the designer, but shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:

    1. Total of contract including change orders.

    2. Value of work completed to date.

    3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the GC's work has been satisfactorily completed on schedule, with approval of the owner and written consent of the surety, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.

    4. Less previous payments.

    5. Current amount due.

b. Prior to submitting the first payment request, the GC shall prepare a schedule showing a breakdown of the contract price. This schedule of values will be submitted to & approved by the designer and Owner within 30 days of the Notice to Proceed. The schedule of values shall be prepared in such form and supported by such data to substantiate its accuracy as the designer and Owner may require.

c. Applications for payment shall be in a form agreed upon by the GC, designer and Owner and shall be prepared and supported by such data to substantiate the accuracy of the request as the designer may require.

d. Intentionally left blank for sequential numbering purposes.

e. Intentionally left blank for sequential numbering purposes.

f. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the GC regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the GC, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the GC desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the designer and owner and located as close to the site as possible. The warehouse selected must be approved by the GC's bonding and

insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer. Upon approval by the designer and owner of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the GC. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the designer may approve storage of materials at the point of manufacture, which conditions shall be approved by the designer and the owner prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the County absolute right to possession of the materials at any time. Bond, security and insurance protection shall continue to be the responsibility of the GC.

g. In the event of beneficial occupancy, retainage of funds due the GC may be reduced with the approval of the Owner to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the GC's bonding company.

ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

a. Within five (5) days from receipt of request for payment from the GC, the designer shall issue and forward to the Owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer. If the certificate is not approved by the designer, he shall state in writing to the GC and the Owner his reasons for withholding payment.

b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the Owner except:

    1. Claims arising from unsettled liens or claims against the GC.

    2. Faulty work or materials appearing after final payment.

    3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.

    4. As conditioned in the performance bond and payment bond.

c. The making and acceptance of final payment shall constitute a waiver of all claims by the GC except those claims previously made and remaining unsettled (Article 20(c)).

d. Prior to submitting request for final payment to the designer for approval, the GC shall fully comply with all requirements specified in the “project closeout” section of the specifications. These requirements include but not limited to the following:

    1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or

Approval from agencies having jurisdiction. (The designer must approve the Manuals prior to delivery to the Owner).

2. Transfer of required attic stock material and all keys in an organized manner.

3. Record of Owner's training.

4. Resolution of any final inspection discrepancies.

5. Granting access to Contractor's records, if Owner's internal auditors have made a request for such access pursuant to Article 52.

e. The GC shall forward to the designer, the final application for payment along with the following documents:

1. List of minority business subcontractors and material suppliers showing breakdown of contracts amounts and total actual payments to subcontractors and material suppliers.

2. Affidavit of Release of Liens.

3. Affidavit from GC of payment to material suppliers and subcontractors. (See Article 36).

4. Consent of Surety to Final Payment**.**

5. Certificates of state agencies required by state law.

f. The designer will not authorize final payment until the work under contract has been certified by Project Designer, certificates of compliance issued, and the GC has complied with the closeout requirements. The designer shall forward the GC's final application for payment to the Owner along with respective certificate(s) of compliance required by law.

ARTICLE 33 - PAYMENTS WITHHELD

a. The designer may withhold payment for the following reasons:

1. Faulty work not corrected.

2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer.

3. To provide for sufficient contract balance to cover liquidated damages that will be assessed against the GC.

b. The Owner may authorize the withholding of payment for the following reasons:

1. Claims filed against the GC or evidence that a claim will be filed.

2. Evidence that subcontractors have not been paid.

c. Intentionally left blank for sequential numbering purposes.

d. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the GC without cause will make owner liable for payment of interest to the GC in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

ARTICLE 34 - MINIMUM INSURANCE REQUIREMENTS

GC agrees their insurance policies shall be endorsed evidencing the minimum insurance coverage and limits set forth below prior to the County's signing of this Agreement. The insurance coverage and limits set forth below shall be deemed minimum coverage limits and shall not be construed in any way as a limitation on GC's duty to carry adequate insurance. All policies of insurance shall be on a primary basis, non-contributory with any other insurance coverages and/or self-insurance carried by the County. The minimum insurance coverage which the GC shall procure and maintain at its sole cost and expense during the term of the Agreement is as follows:

Worker's Compensation. Coverage at the statutory limits in compliance with applicable State and Federal laws. GC shall ensure that any subcontractors also have workers compensation coverage at the statutory limits.

Employer's Liability. Coverage with minimum limits of $1,000,000 each employee accident and $1,000,000 each employee disease.

Commercial General Liability. Insurance covering all operations performed by the GC with a minimum limit of $5,000,000 per occurrence with a $10,000,000 aggregate. Coverage shall not contain any endorsement(s) excluding nor limiting Product/Completed Operations or Contractual Liability. Buncombe County shall be named as an additional insured under the policy.

Commercial general liability coverage shall not restrict coverage under such policy with respect to the escape or release of pollutants at or from a site owned or occupied by or rented or loaned to County. This policy shall not limit the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage or damage to the work.

Professional Liability. Insurance covering GC for acts, errors, or omissions in performance of the Agreement with a minimum limit of $1,000,000 per claim with a $2,000,000 aggregate. Policy is to be on a primary basis if other professional liability is carried. This policy shall remain in effect three (3) years after project completion.

Contractor's Pollution Liability. If GC's commercial general liability policy referenced above does not include an endorsement including the Limited Pollution Liability Extension, GC will be required to purchase a Pollution Liability policy with limits of $1,000,000 per loss and $1,000,000 aggregate. GC shall keep this policy in effect 3 years after completion of the project. Buncombe

County shall be named as an additional insured with respect to liability and defense of suits arising out of the activities performed by, or on behalf of GC, including completed operations.

Business Automobile Liability. Insurance covering all owned, non-owned, and hired vehicles used in performance of this Agreement. The minimum combined single limit per occurrence shall be $1,000,000 and shall include uninsured/underinsured motorist coverage per N.C. Gen. Stat. § 20-279.21.

Umbrella/Excess Liability. If the underlying liability policy limits are less than those required, GC may provide an excess or umbrella policy to meet the required limits of insurance. The excess or umbrella policy shall extend coverage over the underlying general liability policy. Any additional insured under any policy of the underlying insurance will automatically be an additional insured under this insurance.

Builder's Risk. GC shall purchase and maintain property insurance (Builder's Risk) in the amount of the initial contract plus values of subsequent modification, change orders, and loss of materials supplied or installed by others comprising the value of the entire project at the site on a replacement cost basis (subject to such deductible amounts as may be required by laws and regulations). Such builder's risk insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed to in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made or until no person or entity other than Buncombe County has insurable interest in the property to be covered, whichever is earlier. This insurance shall include the interests of the Owner, Contractor, Subcontractors, Owner's Representatives and Owner's Representative's Consultants in the Work.

The Builders' Risk Coverage shall be written on a Special Covered Cause of Loss form and shall include theft, vandalism, malicious mischief, collapse, false-work, temporary buildings, transit, debris removal including demolition, increased cost of construction, architect's fees and expenses, soft costs, flood (including water damage), earthquake, and if applicable, all below and above ground structures, piping, foundations including underground water and sewer mains, piling including the ground on which the structure rests and excavation, backfilling, filling, and grading. Insured property shall include portions of the work located away from the site but intended for use at the site, and shall also cover portions of the work in transit. The policy shall cover the cost of removing debris, including demolition as may be made legally necessary by the operation of any law, ordinance or regulation.

Contractors engaged in modifications of existing structures are required to secure a Beneficial Occupancy Endorsement to enable the County to occupy the facility during construction.

Additional Insurance Provisions.
If GC maintains higher limits than the minimums shown above, the County requires and shall be entitled to coverage for the higher limits maintained by GC. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the County.

GC shall provide the County with certificates of insurance listing County as the certificate holder and evidencing the above amounts. Buncombe County shall be named as additional insured under the commercial general liability policy and if applicable, GC's Pollution Liability policy. Before

commencing work and for any subsequent renewals, GC shall furnish the County with certificates of insurance on an approved form.

Each insurance policy required above shall state that coverage shall not be canceled, except with written notice to the County, delivered in accordance with the policy provisions. All insurance shall be procured from reputable insurers authorized and qualified to do business in North Carolina with a rating of A- or better as determined by A. M. Best Company and shall be in a form acceptable to the County.

GC shall require and verify that all subcontractors maintain insurance meeting all the requirements stated herein, and GC shall ensure that Buncombe County is an additional insured on insurance required from subcontractors.

Waiver of Subrogation: GC hereby grants to County a waiver of any right to subrogation which any insurer of said Contractor may acquire against the County by virtue of payment of any loss under such insurance. GC agrees to obtain any endorsement that may be necessary to affect this waiver of subrogation.

Providing and maintaining adequate insurance coverage is a material obligation of GC and is of the essence of this contract. GC may meet its requirements of maintaining specified coverage and limits by demonstrating to the County that there is in force insurance with equivalent coverage and limits that will offer at least the same protection to the County. GC shall at all times comply with the terms of such insurance policies, and all requirements of the insurer under any such insurance policies, except as they may conflict with existing North Carolina laws or this contract. The limits of coverage under each insurance policy maintained by GC shall not be interpreted as limiting the contractor's liability and obligations under the contract.

Nothing in this section is intended to affect or abrogate Buncombe County's governmental immunity.

ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND

a. The GC shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount, for the entire project. Bonds shall be executed in the form bound with the specifications.

b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

ARTICLE 36 - CONTRACTOR'S AFFIDAVIT

The final payment of retained amount due the GC on account of the contract shall not become due until the GC has furnished to the Owner through the designer an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or liens exist against the GC in connection with this contract.

ARTICLE 37 - ASSIGNMENTS

The GC shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the GC under the contract may be assigned.

ARTICLE 38 - USE OF PREMISES

a. The GC shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer and shall not exceed those established limits in his operations.

b. The GC shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.

c. The GC shall enforce the designer's and owner's instructions regarding signs, advertisements, fires and smoking.

d. No firearms, any type of alcoholic beverages or drugs (other than those prescribed by a physician) will be permitted at the job site.

ARTICLE 39 - CUTTING, PATCHING AND DIGGING

a. The GC shall ensure that all cutting, fitting or patching that may be required to make the work come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer may direct.

b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.

c. No subcontractor shall endanger any work of another such contractor by cutting, digging or other means, nor shall he cut or alter the work of any other such contractor without the consent of the designer and the affected contractor(s).

ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS

a. The GC shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer, and other utility services, which may be necessary and required for completion of the project. If the Owner specifies that the GC is to pay all utilities, any permanent meters installed shall be listed in the GC's name until his work is fully accepted by the Owner. The Owner may: (1) pay utilities cost directly, (2) require the GC to pay all utilities cost, (3) or reimburse the GC for the actual cost of utilities. The Owner or GC, as applicable, may recover actual costs of metered utilities from the responsible party should delays occur

in project completion. Coordination of the work of the utility companies during construction is the sole responsibility of the GC.

b. If applicable Meters shall be relisted in the Owner's name on the day following completion and acceptance of the GC's work, and the Owner shall pay for services used after that date.

c. Prior to the operation of permanent systems, the GC will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.

d. The GC shall ensure that the permanent building systems are in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows**,** doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed***;*** and other openings have protection, which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the GC and the designer. Use of the equipment in this manner shall in no way affect the warranty requirements of the GC.

e. The GC shall coordinate the work so that the building's permanent power wiring distribution system shall be in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.

f. The GC shall coordinate the work so that the building's permanent lighting system shall be ready at the time interior painting and finishing begins and shall provide adequate lighting in those areas where interior painting and finishing is being performed.

g. The GC shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:

    1. Prior to acceptance of work by the Designer and Owner, the GC shall coordinate the removal and replacement of any parts of the permanent building systems damaged through use during construction.

    2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the Owner's acceptance of the work.

    3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.

4. It shall be understood that any warranty on equipment presented to the Owner shall extend from the day of final acceptance by the Owner. The cost of warranting the equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.

5. The GC shall ensure that all lamps are in proper working condition at the time of final project acceptance.

h. The GC shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other subcontractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.

i. The GC shall, if required by Owner and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer so direct.

j. On multi-story construction projects, the GC shall either provide or ensure that temporary elevators, lifts, or other necessary special equipment is available for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the GC bid.

k. The GC will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the GC's name, and the name of the designer and consultants. Directional signs may be erected on the Owner's property subject to approval of the Owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the Owner.

ARTICLE 41 - CLEANING UP

a. The GC shall ensure that the building and surrounding area is reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the designer. The GC shall provide an on-site refuse container(s) for the use of all subcontractors. The GC shall ensure that each subcontractor removes their rubbish and debris from the building on a daily basis. The GC shall ensure that the building is broom cleaned as required to minimize dust and dirt accumulation.

b. The GC shall provide and maintain suitable all-weather access to the building.

c. Before final inspection and acceptance of the building, the GC shall ensure that all portions of the work are clean, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the Owner, with no cleaning required by the Owner.

ARTICLE 42 - GUARANTEE

a. The GC shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the Owner.

b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The GC shall replace such defective equipment or materials, without cost to the Owner, within the manufacturer's warranty period.

c. Additionally, the Owner may bring an action for latent defects caused by the negligence of the GC, which is hidden or not readily apparent to the Owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

ARTICLE 43 - CODES AND STANDARDS

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina State Building Codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

ARTICLE 44 - INDEMNIFICATION

To the fullest extent permitted by law, the GC shall indemnify and hold harmless the Owner, the designer and the agents, consultants and employees of the Owner and designer, from and against all claims, damages, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance or failure of performance of the work, provided that any such claim, damage, loss or expense (1) is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the work itself) including the loss of use resulting therefrom, and (2) is caused in whole or in part by any negligent act or omission of the GC, the GC’s subcontractor, or the agents of either the GC or the GC’s subcontractor. Such obligation shall not be construed to negate, abridge or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this article.

ARTICLE 45 - TAXES

a. Federal excise taxes do not apply to materials entering into local government work.

b. Federal transportation taxes do not apply to materials entering into local government work (Internal Revenue Code, Section 3475(b) as amended).

c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into local government work and such costs shall be included in the bid proposal and contract sum.

d. Local option sales and use taxes, as required by law, do apply to materials entering into local government work as applicable and such costs shall be included in the bid proposal and contract sum.

e. Accounting Procedures for Refund of County Sales & Use Tax Amount of county sales and use tax paid per GC's statements:

GC's performing contracts for local government agencies shall ensure that they and all subcontractors will provide information to give the local government agency for whose project the materials, supplies, fixtures and/or equipment was purchased a signed statement containing the information listed in N.C.G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement from the contractors setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax.
Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the GC.

Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials,

supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE

The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to equal employment opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the Secretary of Labor, are incorporated herein.

ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES

The GC agrees not to discriminate against any employee or applicant for employment because of physical or mental handicap in regard to any position for which the employee or applicant is qualified. The GC agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices.

ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)

The State of North Carolina has attempted to address all asbestos-containing materials that are to be disturbed in the project. However, there may be other asbestos-containing materials in the work areas that are not to be disturbed and do not create an exposure hazard. General Contractors are reminded of the requirements of instructions under General Conditions of the Contract, titled Examination of Conditions. Statute 130A, Article 19, amended August 3, 1989, established the Asbestos Hazard Management Program that controls asbestos abatement in North Carolina.

ARTICLE 49 - MINORITY BUSINESS PARTICIPATION

N.C.G.S. 143-128.2 establishes a ten percent (10%) goal for participation by minority businesses in total value of work for each State building project and requires documentation of good faith efforts for meeting that goal. The document, *Guidelines for Recruitment and Selection of Minority Businesses for Participation in State Construction Contracts* including Affidavits and Appendix F are hereby incorporated into and made a part of this contract.

ARTICLE 50 – CONTRACTOR EVALUATION

The GC's overall work performance on the project shall be fairly evaluated in accordance with the State Building Commission policy and procedures, for determining qualifications to compete for future capital improvement projects for institutions and agencies of the State of North Carolina. In addition to final evaluation, interim evaluation may be prepared during the progress of project. The document, General Contractor Evaluation Procedures, is hereby incorporated and made a part of this contract. The Owner may request the GC's comments to evaluate the designer.

ARTICLE 51 – GIFTS

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor (i.e. architect, bidder, contractor, General Contractor, design professional, engineer, subcontractor, supplier,

vendor, etc.), to make gifts or to give favors to any County employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, General Contractor and their employees), employees of the County that may have any involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

ARTICLE 52 – AUDITING-ACCESS TO PERSONS AND RECORDS

In accordance with N.C. General Statute 147-64.7, the State Auditor shall have access to Contractor's officers, employees, agents and/or other persons in control of and/or responsible for the Contractor's records that relate to this Contracts for purposes of conducting audits under the referenced statute. The Owner's internal auditors shall also have the right to access and copy the Contractor's records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or relating to Contractor's requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions, and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

ARTICLE 53 – LEFT BLANK FOR NUMBERING PURPOSES

ARTICLE 54 – TERMINATION FOR CONVENIENCE

a. Owner may at any time and for any reason terminate GC's services and work at Owner's convenience. Upon receipt of such notice, GC shall, unless the notice directs otherwise, immediately discontinue the work and placing of orders for materials, facilities and supplies in connection with the performance of this Agreement.

b. Upon such termination, GC shall be entitled to payment only as follows: (1) the actual cost of the work completed in conformity with this Agreement; plus, (2) such other costs actually incurred by GC as are permitted by the prime contract and approved by Owner; (3) plus ten percent (10%) of the cost of the work referred to in subparagraph (1) above for overhead and profit. There shall be deducted from such sums as provided in this subparagraph the amount of any payments made to GC prior to the date of the termination of this Agreement. GC shall not be entitled to any claim or claim of lien against Owner for any additional compensation or damages in the event of such termination and payment.

SIGNLE PRIME GENERAL CONSTRUCTION CONTRACT
BID FORM PROPOSAL

ASHEVILLE HIGH SCHOOL TRACK REPLACEMENT
Buncombe County
30 Valley Street
Asheville, NC 28801

PREPARED BY:
FitFields
314 Tom Hall St.
Fort Mill, SC 29715

Bid Date: _____

TO: Buncombe County
North Carolina

From: _____
Name of Bidder

The undersigned Bidder hereby declares that his Proposal is made without connection with any other person, company, or parties making a similar bid or proposal, and that it is in all respect fair and in good faith, without collusion or fraud. It is the Bidder's intention & purpose to enter into a Contract with Buncombe County. The Bidder signifies that his bid is all-inclusive to perform the work described in the Contract Documents prepared by FitFields dated January 12, 2023. The Bidder has carefully examined the Contract Documents and Proposal Form and is familiar with the scope, details, intent, and conditions under which the Work, or any part of it, is to be done, and the conditions which must be fulfilled in the furnishing and/or erection or construction of any or all items of the Work. The Bidder hereby proposes to furnish all labor, materials, equipment and services necessary to perform the Work required in the Construction Document and terms of this Proposal for the amounts listed below.

A. Total Base Bid: Dollars $_____

ALTERNATES

Should the Alternate(s) be accepted, the amount written below shall be the amount added and/or deducted to the Total Bid. There will be no change in the number of days for over all construction of the work for these Alternate(s) unless otherwise stated. **If the Alternate(s) is left blank, it will be considered a no cost Alternate and therefore would not change the Total Bid if accepted**. The Bidder agrees to construct the Alternate(s) as described in the Contract Document for the following prices:

Add Alternate 1: Asphalt Entrance Driveway as Shown Per the Drawings

Dollars $_____

Add Alternate 2: State the amount to be added to the Base Bid to provide a Full Pour Polyurethane System in lieu of the Polyurethane Sandwich System.

Dollars $_____

Add Alternate 3:
State the amount to be added to the Base Bid to provide a Mondo Super X 720 K39 product in lieu of the Polyurethane Sandwich System.

Dollars $_____

UNIT PRICES

Unit Price No. 1 - Haul in and place compacted ABC stone.

Dollars per Ton $_____

The Bidder acknowledges that he shall utilize the following subcontractors on this project.

CATEGORY	SUBCONTRACTOR NAME	LICENSE/CERT. #
Track and Field Contractor	_____	_____
ASBA Certified Track Builder	Person Name:_____	_____

OTHER SUBCONTRACTORS

List the names and licenses #s of all subcontractors not shown above which will be performing work for which the bidder is not licensed to perform.

CATEGORY	SUBCONTRACTOR	LICENSE #
Electrical	_____	_____
Mechanical	_____	_____
Plumbing	_____	_____
Site Grading	_____	_____
Site Utilities (Water/Sewer)	_____	_____

Other _____ _____

Other _____ _____

Other _____ _____

It is anticipated that the Notice to Proceed will be issued Tuesday, March 14, 2023. The undersigned agrees to begin the work promptly upon receipt of Notice to Proceed and to pursue the work with an adequate work force to complete the work by Tuesday, August 1, 2023. Two hundred and fifty dollars ($250) per calendar day is hereby agreed upon as the Liquidated Damages.

The Bidder acknowledges receipt of the following addenda:

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

The undersigned has enclosed the following with this Proposal:

_____ Bid Bond or Bid Deposit

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

CONTRACTOR:_____

ADDRESS:_____

_____

_____

BY: _____
(Signature)

TTTLE: _____

Print Name: _____

N.C. General Contractor License Number: _____

FORM OF SINGLE PRIME CONSTRUCTION CONTRACT

THIS AGREEMENT, made the _____ day of _____ in the year of 20_____ by and between _____, hereinafter called the Party of the First Part (the "Contractor"), and Buncombe County, a body politic and corporate organized under the laws of the state of North Carolina, hereinafter called the Party of the Second Part (the "Owner').

W I T N E S S E T H :

That the Party of the First Part and the Party of the Second Part for the consideration herein named agree as follows:

1. Scope of Work: This agreement concerns _____ to be performed by The Party of the First Part. The Party of the First Part shall furnish and deliver all materials, and perform all of the work in the manner and form as provided by the approved design drawings and specifications from the preconstruction phase, and those items not on the approved design to ensure the project is functional and complete. These plans, specifications and documents to be titled "_____," are attached hereto and made a part hereof as if fully contained herein *(such documents may include: advertisements; Instructions to Bidders; General Conditions; Supplementary General Conditions; specifications; accepted proposal; contract; performance bond; payment bond; power of attorney; workmen's compensation; public liability; property damage and builder's risk insurance certificates)*:

    i. **Scope of Work**
    ii. **Buncombe County Construction Contract General Conditions of the Contract**
    iii. **Buncombe County's Invitation for Construction Bids**
    iv. **Responsive Bid Bond**
    v. **RFP Bidder Info Workbook**
    vi. **Certificate of Insurance**
    vii. **Performance and Payment Bonds**

    Project Name: _____

2. That the Party of the First Part shall commence work to be performed under this agreement on a date to be specified in a written order of the Party of the Second Part and shall fully complete all work hereunder within _____ consecutive calendar days from said date. For each day in excess thereof, liquidated damages shall be as stated in General and Supplementary General Conditions. The Party of the First Part, as one of the considerations for the awarding of this contract, shall furnish to the Party of the Second Part a construction schedule setting forth planned progress of the project broken down by the various divisions or part of the work and by calendar days as outlined in Article 14 of the General Conditions of the Contract.

3. The Party of the Second Part hereby agrees to pay to the Party of the First Part for the faithful performance of this agreement, subject to additions and deductions as provided in the specifications or proposal, in lawful money of the United States as follows:

_____ dollars and 00/100 Dollars ($_____)

4. In accordance with Article 31 and Article 32 of the General Conditions of the Contract, the Party of the Second Part shall review, and if approved, process the Party of the First Party's pay request within 30 days upon receipt. The Party of the Second Part, after reviewing and approving said pay request, shall make payments to the Party of the First Part on the basis of a duly certified and approved estimate of work performed during the preceding calendar month by the First Party, less five percent (5%) of the amount of such estimate which is to be retained by the Second Party until all work has been performed strictly in accordance with this agreement and until such work has been accepted by the Second Party. The Second Party may elect to waive retainage requirements after 50 percent of the work has been satisfactorily completed on schedule as referred to in Article 31 of the General Conditions.

5. The Party of the First Part shall perform the work associated with this Agreement in such a manner as not to void any warranties, including those for labor, materials, or parts, that are held by the Owner and/or schools systems, colleges, and/or their respective governing bodies, and/or that are applicable to the property on which any activities under this contract occur, and/or that remain in effect on any of the locations at which the Party of the First Part is performing work associated with this Agreement. The Owner and/or schools systems, colleges, and/or their respective governing bodies upon whose property any activities under this contract occur, may allow for the issuer of any such warranties to inspect the drawings, specifications, and/or the work performed by the Party of the First Part to ensure that any such warranties remain valid for their remaining term. The Owner of the property on which the work is being performed shall be responsible for providing notice to the issuers of any warranties, unless such property is occupied by a schools system, college, and/or its respective governing body, in which case the school system, college, or its respective governing bodies for which the work is being performed shall be responsible for providing such notice.

6. Upon submission by the First Party of evidence satisfactory to the Second Party that all payrolls, material bills and other costs incurred by the First Party in connection with the construction of the work have been paid in full, final payment on account of this agreement shall be made within thirty (30) days after the completion by the First Party of all work covered by this agreement and the acceptance of such work by the Second Party.

7. It is further mutually agreed between the parties hereto that if at any time after the execution of this agreement and the surety bonds hereto attached for its faithful performance, the Second Party shall deem the surety or sureties upon such bonds to be unsatisfactory, or if, for any reason, such bonds cease to be adequate to cover the performance of the work, the First Party shall, at its expense, within five (5) days after the receipt of notice from the Second Party so to do, furnish an additional bond or bonds in such form and amount, and

with such surety or sureties as shall be satisfactory to the Second Party. In such event no further payment to the First Party shall be deemed to be due under this agreement until such new or additional security for the faithful performance of the work shall be furnished in manner and form satisfactory to the Second Party.

8. The Party of the First Part attests that it and all of its subcontractors have fully complied with all requirements of NCGS 64 Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

{Signature Pages Follow}

NOW THEREFORE, the parties hereby make, agree, and execute this Contract by the below signatures of duly authorized officials or agents.

CONTRACTOR

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public of the county and State aforesaid, do hereby certify that _____ personally appeared before me this day and voluntarily acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal this _____ day of _____, 20_____

My commission expires: _____ _____.
Notary Public

BUNCOMBE COUNTY

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

STATE OF _____
COUNTY OF _____

I, _____, a Notary Public of the county and State aforesaid, do hereby certify that _____ personally appeared before me this day and voluntarily acknowledged the due execution of the foregoing instrument.

Witness my hand and notarial seal this _____ day of _____, 20_____

My commission expires: _____ _____
Notary Public

This instrument has been preaudited in the manner required by the Local Government Budget and Fiscal Control Act.

_____

Buncombe County Finance Director

FORM OF PERFORMANCE BOND

Date of Contract: _____

Date of Execution: _____

Name of Principal (Contractor): _____

_____

Name of Surety: _____

Name of Contracting Body: Buncombe County, a body politic and Corporate

Amount of Bond: _____

Project: _____

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety, a surety company authorized to do business in North Carolina, above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the contracting body, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

{Signature Pages Follow}

NOW THEREFORE, the parties hereby make, agree, and execute this Performance Bond by the below signatures of duly authorized officials or agents.

CONTRACTOR

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

WITNESS

_____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

SURETY COMPANY

_____,
A Company Licensed to do Business in N.C.

By: _____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

(Surety Corporate Seal)

WITNESS

_____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

REGISTERED AGENT
(An authorized agent of the Surety Company who is licensed to do business in North Carolina must Countersign)

_____
(Signature)

_____
(Printed Name)

_____
(Title)

_____
(Date)

Sheet for Attaching Insurance Certificates

SPECIAL CONDITIONS

1. The Contractor shall coordinate with the utility owners to be aware of utilities located within the project area prior to construction. The Contractor is responsible for all utility locates and protective measures all utilities on the site.

2. The Contractor shall maintain on file at the job site copies of all permits and approvals for the project.

3. The Contractor shall verify and/or secure all other permits required for construction activities prior to beginning construction. All final permits are the responsibility of the contractor, including but not limited to, encroachment and building permits.

4. Any testing shall be accordance with the procedures defined in the NCDOT Standard Specifications.

5. Existing gravel base to be cement stabilized prior to asphalt installation.

6. Contractor shall develop and submit prior to beginning construction, a schedule of work, which will allow construction of the project while maintaining vehicular access to all adjacent parcels during the construction period.

7. Contractor is responsible for all erosion control and stormwater measures on site.

8. Contractor is responsible for third party material testing of all concrete, subgrades, soils etc.

9. If traffic control is needed, it shall be provided by the contractor at their expense.

10. Contractor to follow all rules, regulations and codes by the City of Asheville and Buncombe County.

11. Contractor will vacate the project site from June 9, 2023 – June 10, 2023 for graduation.

12. The General Contractor and/or their designated Track Builder shall employ a Certified Track Builder (CTB) as certified by the American Sports Builders Association (ASBA) to oversee the day to day construction of track work. The CTB must show extensive experience in track construction. Sub Contractor and teaming arrangements are acceptable.

    At a minimum, the CTB shall attend all weekly meetings during the track construction scope of work and be present on site during critical milestones for track construction which shall include installation of subgrade, asphalt, track drainage, netting, event equipment, conduit, comm boxes, synthetic track surfacing and close out.

    Attendance of CTB shall be documented during the project. After bid award, the General Contractor shall submit a schedule of involvement for the CTB to be reviewed and approved by the owner.

    The bidding general contractor must designate both their selected Track Builder and Certified Track Builder Professional at time of bid. A copy of the CTB certificate shall be included in the bid response.

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS AND REQUIREMENTS

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

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Asheville High School Track Replacement.

B. The Work consists of a Single Prime General Construction Contract:
   1. The work of this contract includes but is not limited to site demo, grading, erosion control, seeding, asphalt and concrete paving, storm drainage systems, fencing, track and field construction, and sports equipment.
   2. Contractor shall furnish all material, labor, tools, supplies, equipment, transportation, temporary construction of every nature, insurance, taxes, contributions and all services and facilities, unless specifically excepted, and install all materials, items and equipment required to complete the construction of the Project, as set forth in the Contract.
   3. Coordination of owner provided and owner installed equipment. General Contractor shall coordinate all trades with owner’s contractor for these items.
   4. The General Contractor shall act as the Project Expediter and be responsible for coordinating the work and schedules of other trades.

1.3 CONTRACT

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

1.4 SPECIFICATION FORMATS AND CONVENTIONS

A. Technical Specifications Format: The Specifications are organized into Divisions and Sections using the 16-division format and Construction Specifications Institute / Construction Specifications Canada (CSI/CSC's) "Master Format" numbering system.
   1. Section Identification: The Technical Specifications use section numbers and titles to help cross-referencing in the Contract Documents. Sections in the Project Manual are in numeric sequence; however, the sequence is incomplete. Consult the table of contents at the beginning of the Project Manual to determine numbers and names of sections in the Contract Documents.

B. Technical Specifications Content: The Technical Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 011000

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Requirements:

1. Section 012500 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
2. Section 014000 "Quality Requirements" for general testing and inspecting requirements.

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. The bidding contractor shall provide unit prices for the following items. Unit prices are subject to owner review and consideration as part of the overall bid. All unit prices shall remain firm through the initial contract period.

B. Price decreases are acceptable at any time, need not be verifiable, and are required should the contractor/producer/processor/manufacturer experience a decrease in costs associated with the execution of the contract.

C. All unit prices are to be fully inclusive of all expenses including travel, materials and all fees and be the final cost to the owner

D. Should the awarded vendor, at any time during the life of the contract, sell materials of similar quality to another customer, or advertise special discounts or sales, at a price below those quoted within the contract, the lowest discounted prices shall be offered to the owner

E. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

F. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

G. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. Unit Price No. 1

1. Description: Provide ABC gravel, haul in, place and compact.
2. Unit of Measurement: Dollars per Ton

END OF SECTION 012200

SECTION 012300 – ALTERNATES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Alternate submission procedures.

B. Documentation of changes to Contract Sum and Contract Time.

1.2 RELATED REQUIREMENTS

A. Instructions to Bidders and General Conditions of the Contract.

B. Bid Forms: List of alternates on the Bid Form.

1.3 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

1.4 SCHEDULE OF ALTERNATES

A. ALTERNATE 1 – Asphalt Entrance Driveway as Shown Per the Drawings

B. ALTERNATE 2 - State the amount to be added to the Base Bid to provide a Full Pour Polyurethane System in lieu of the Polyurethane Sandwich System.

C. ALTERNATE 3 - State the amount to be added to the Base Bid to provide a Mondo Super X 720 K39 product in lieu of the Polyurethane Sandwich System.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 012300

SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

B. This Section includes administrative provisions for coordinating construction operations on the Project including, but not limited to, the following:
   1. General project coordination procedures.
   2. Conservation.
   3. Coordination Drawings.
   4. Administrative and supervisory personnel.
   5. Project meetings.

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

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Technical Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
   1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components.
   2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
   3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, the Consultant shall prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
   1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
   1. Preparation of Contractor's Construction Schedule.
   2. Preparation of the Schedule of Values.
   3. Installation and removal of temporary facilities and controls.
   4. Delivery and processing of submittals.
   5. Progress meetings.
   6. Pre-installation conferences.
   7. Project closeout activities.

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
   1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work.

1.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
   1. Indicate relationship of components shown on separate Shop Drawings.
   2. Indicate required installation sequences.

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

1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
   1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting.
   2. Agenda: The Consultant shall prepare the meeting agenda. Distribute the agenda to all invited attendees.
   3. Minutes:

a. The Consultant will compile minutes of each project meeting, and will distribute copies to the Contractor and required copies to the Owner.
b. Recipients of copies may make and distribute such other copies as they wish.

4. Attendance:
   a. To the maximum extent practical, assign the same person or persons to represent the Contractor at the project meetings throughout progress of the Work.
   b. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.
5. Minimum agenda:
   a. Review, revise as necessary, and approve minutes of previous meetings.
   b. Review progress of the Work since last meeting, including status of submittals for approval.
   c. Identify problems which impede planned progress.
   d. Develop corrective measures and procedures to regain planned schedule.
   e. Complete other current business.

B. Pre-construction Conference: Schedule a pre-construction conference before starting construction, at a time convenient to Owner and Consultant, but no later than 14 days after execution of the Construction Contract. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.
   1. Attendees: Authorized representatives of Owner, Consultant, and their consultants; Contractor and its superintendent; major subcontractors and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
   2. Agenda: Discuss items of significance that could affect progress, including the following:
      a. Tentative construction schedule.
      b. Phasing.
      c. Critical work sequencing.
      d. Designation of responsible personnel.
      e. Procedures for processing field decisions and Change Orders.
      f. Procedures for processing Applications for Payment.
      g. Distribution of the Contract Documents.
      h. Submittal procedures.
      i. Preparation of Record Documents.
      j. Use of the premises.
      k. Responsibility for temporary facilities and controls.
      l. Parking availability.
      m. Office, work, and storage areas.
      n. Equipment deliveries and priorities.
      o. Security.
      p. Working hours.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.
   1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Consultant of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
    a. Contract Documents.
    b. Options.
    c. Related Change Orders.
    d. Purchases.
    e. Deliveries.
    f. Submittals.
    g. Review of mockups.
    h. Possible conflicts.
    i. Time schedules.
    j. Weather limitations.
    k. Manufacturer’s written recommendations.
    l. Temporary facilities and controls.
    m. Space and access limitations.
    n. Regulations of authorities having jurisdiction.
    o. Testing and inspecting requirements.
    p. Required performance results.
    q. Protection of construction and personnel.
    r. Record significant conference discussions, agreements, and disagreements.
    s. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at a minimum of once every two weeks. Coordinate dates of meetings with preparation of payment requests.
    1. Attendees: Representatives at the meeting shall be the Owner, Consultant, Subcontractors, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
    2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
        a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
        b. Review present and future needs of each entity present, including the following:
            1) Interface requirements.
            2) Sequence of operations.
            3) Status of submittals.
            4) Deliveries.
            5) Access.
            6) Work hours.
            7) Hazards and risks.

8) Review of Record Drawings
9) Review of construction defects that has been identified by the Consultant

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.
   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 013100

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

C. Related Sections include the following:
   1. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
   2. Division 1, of the Technical Specifications Section "Cutting and Patching" for repair and restoration of construction disturbed by testing and inspecting activities.
   3. Divisions 2 through 16, of the Technical Specifications Sections for specific test and inspection requirements.

1.3 DEFINITIONS

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

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

C. Mockups: Full-size, physical example assemblies to illustrate finishes and materials. Mockups are used to verify selections made under Sample submittals, to demonstrate

aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Mockups establish the standard by which the Work will be judged.

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

1.4 SUBMITTALS

A. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
   1. Technical Specifications Section number and title.
   2. Description of test and inspection.
   3. Identification of applicable standards.
   4. Identification of test and inspection methods.
   5. Number of tests and inspections required.
   6. Time schedule or time span for tests and inspections.
   7. Entity responsible for performing tests and inspections.
   8. Requirements for obtaining samples.
   9. Unique characteristics of each quality-control service.

1.5 QUALITY ASSURANCE

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

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

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

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

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

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

G. Mockups: Before installing portions of the Work requiring mockups as indicated in of the Technical Specifications Sections 2-16 of the Construction Documents., build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
   1. Build mockups in location and of size indicated or, if not indicated, as directed by Consultant.
   2. Notify Consultant seven (7) days in advance of dates and times when mockups will be constructed.
   3. Demonstrate the proposed range of aesthetic effects and workmanship.
   4. Obtain Consultant's approval of mockups before starting work, fabrication, or construction.
   5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
   6. Demolish and remove mockups when directed, unless otherwise indicated.

1.6 QUALITY CONTROL

A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
   1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.
   2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.
   1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
      a. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.
   2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
   3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
   4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
   5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Special Tests and Inspections: Owner will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner.
   1. Testing agency will notify Consultant and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
   2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to Consultant with copy to Contractor and to authorities having jurisdiction.
   3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.

4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
5. Testing agency will retest and re-inspect corrected work.

D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing.

E. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services as requested by the Consultant at the Contractor's expense, including retesting and re-inspecting, for construction that revised or replaced Work, at the Contractor's expense, that failed to comply with requirements established by the Contract Documents.

F. Testing Agency Responsibilities: Cooperate with Consultant and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. In the event there is a need for the Contractor to have testing performed.
2. Notify Consultant and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
3. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

G. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Consultant, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
   1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
   2. Comply with the Contract Document requirements for Division 1, of the Technical Specifications Section "Cutting and Patching."

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

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

END OF SECTION 014000

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

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

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

C. Temporary utilities include, but are not limited to, the following:
1. Sewers and drainage.
2. Water service and distribution.
3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
4. Heating and cooling facilities.
5. Ventilation.
6. Electric power service.
7. Lighting.
8. Telephone service.

D. Support facilities include, but are not limited to, the following:
1. Temporary roads and paving.
2. Dewatering facilities and drains.
3. Project identification and temporary signs.
4. Waste disposal facilities.
5. Field offices as required.
6. Storage and fabrication sheds.
7. Lifts and hoists.
8. Temporary elevator usage.
9. Temporary stairs.
10. Construction aids and miscellaneous services and facilities.

E. Security and protection facilities include, but are not limited to, the following:
1. Environmental protection.
2. Stormwater control.
3. Tree and plant protection.
4. Pest control.
5. Site enclosure fence.
6. Security enclosure and lockup.
7. Barricades, warning signs, and lights.
8. Temporary enclosures.
9. Temporary partitions.

10. Fire protection.

F. Related Sections include the following:
1. Division 1, of the Technical Specifications Section "Submittal Procedures" for procedures for submitting copies of implementation and termination schedule and utility reports.
2. Division 1, of the Technical Specifications Section "Execution Requirements" for progress cleaning requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Consultant, permanent or temporary roofing is complete, insulated, and weather tight; exterior walls are insulated and weather tight; and all openings are closed with permanent construction or substantial temporary enclosures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Consultant and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
1. Owner's construction forces.
2. Consultant.
3. Testing agencies.
4. Personnel of authorities having jurisdiction.
5. Occupants of Project

B. Sewer Service: Pay sewer service use charges for sewer usage, by all parties engaged in construction, at Project site.

C. Water Service: Pay water service use charges, whether metered or otherwise, for water used by all entities engaged in construction activities at Project site.

D. Electric Power Service: Pay electric power service use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at Project site.

E. Communications: Pay all charge associated with communications.

F. Streets, Sidewalks, and Temporary Easements: Pay all charges associated with the Work where charges will occur.

1.5 SUBMITTALS

A. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor's Construction Schedule, submit a schedule indicating implementation and termination of each temporary utility.

1.6 QUALITY ASSURANCE

A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
   1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
   2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

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

1.7 PROJECT CONDITIONS

A. Temporary Utilities: At earliest feasible time, when acceptable to Owner, change over from use of temporary service to use of permanent service.
   1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
   1. Keep temporary services and facilities clean and neat.
   2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if indicated on the plans and/or specifications. Provide materials suitable for use intended.

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

C. Portable Chain-Link Fencing: Minimum 2-inch 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch- OD line posts and 2-7/8-inch- OD corner and pull posts, with 1-5/8-inch- OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.

D. Water: Potable.

2.2 EQUIPMENT

A. General: Provide equipment suitable for use intended.

B. Field Offices: Prefabricated or Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.

C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
   1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure and the requirements of the local Governing agency.

D. Self-Contained Toilet Units: Single-occupant units of chemical or aerated recirculation or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.

F. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
   2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

G. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

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

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

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
3. If existing easements can not be used, the Contractor shall consult and coordinate with the Consultant and Owner to secure as necessary to obtain the temporary easement. Add provisions for work not in the Contract but served by temporary facilities if required.

B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.
2. Connect temporary sewers to municipal system or private system indicated as directed by sewer department officials.
3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction until permanent water service is in use. Sterilize temporary water piping before use.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Subparagraph below may be excessive for small- and medium-size projects.
3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations as required. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
4. Drinking-Water Facilities: Provide drinking-water.

E. Heating and Cooling: Provide temporary heating and cooling as required by construction activities.

F. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear as required.

G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

H. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities.
   1. At each telephone, post a list of important telephone numbers in Spanish and English.
      a. Police and fire departments.
      b. Ambulance service.
      c. Contractor's home office.
      d. Consultant's office.
      e. Engineers' offices.
      f. Owner Representative's office.
      g. Principal subcontractors' field and home offices.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: If required, Comply with the following:
   1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
   2. Maintain support facilities until approved by the Consultant to be removed.

B. Temporary Roads and Paved Areas: If applicable/as needed, construct and maintain temporary roads and paved areas to avoid damage to the site. Locate temporary roads and paved areas in same location as permanent roads and paved areas. If applicable, extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations.

C. Traffic Controls: Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.

D. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs. The General Contractor shall provide one construction sign. The construction sign shall be installed within the first two weeks of construction and shall be removed when the project is substantially complete. The sign shall be as follows:
   1. Project Name
   2. Project Owner
   3. Name of Contractor
   4. Letter sizes to be as shown on the detail. All lettering shall be Optima Semi-Bold typeface.
   5. Location shall be approved by Consultant.
   6. Sign shall be constructed of marine grade ¾ inch plywood, size per detail, 4x4 post(s). The sign shall be single-sided with the plywood on one side.
   7. The colors:
      a. Top Panel/Border-Pratt & Lambert Yale Blue
      b. Middle Panel- Pratt & Lambert Silver Mink #2291
      c. Bottom Panel- Pratt & Lambert Old Mistic #2286
      d. All other letters- 3M White #7216

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous,

or unsanitary waste materials separately from other waste. Comply with “Construction and Demolition Waste Management Recycling.

F. Common-Use Field Office: If required, provide an insulated, weather tight, air-conditioned and heated field office for use as a common facility by all personnel engaged in construction activities; of sufficient size to accommodate required office personnel and meetings.

G. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

B. Storm water Control: Comply as indicated on the erosion control plan/measures before any earth disturbing activities start.

C. Tree and Plant Protection: Comply with the plans and specifications for protection.

D. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

E. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

F. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

G. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

H. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

B. Temporary Facility Changeover: Except for using permanent fire protection as soon as available. Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

C. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
   1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
   2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1, of the Technical Specifications Section "Closeout Procedures."

END OF SECTION 015000

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. Field engineering and surveying.
   3. Progress cleaning.
   4. Starting and adjusting.
   5. Protection of installed construction.
   6. Correction of the Work.

B. Related Sections include the following:

C. Division 1, of the Technical Specifications Section "Project Management and Coordination" for procedures for coordinating field engineering with other construction activities.

D. Division 1, of the Technical Specifications Section "Submittal Procedures" for submitting surveys.

E. Division 1, of the Technical Specifications Section "Cutting and Patching" for procedural requirements for cutting and patching necessary for the installation or performance of other components of the Work.

F. Division 1, of the Technical Specifications Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.

G. Division 1, of the Technical Specifications Section “Construction Waste Management” method of disposal of construction waste.

1.3 SUBMITTALS

A. Qualification Data: For land surveyor to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Consultants and owners, and other information specified.

B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

C. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

D. Certified Surveys: Submit two copies signed by land surveyor or professional engineer as required.

1.4 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A licensed professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
   1. Before construction, verify the location and points of connection of utility services.

B. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning site work, investigate and verify the existence and location of underground utilities and other construction affecting the Work.
   1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; and underground electrical services.
   2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to local utility, Owner, and Consultant that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Consultant, Owner, adjacent property owners not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Consultant's and Owner's written permission.

C. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

E. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Consultant. Include a detailed description of problem encountered, together with recommendations for modifications of the Contract Documents.

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Consultant promptly.

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Consultant when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
7. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
8. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
9. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Consultant.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Consultant. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Consultant before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and site work.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Dispose of material accordance to Division 1, Section “Construction Waste Management”.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
   1. Thoroughly clean surfaces and similar features before applying paint or other finishing materials.

H. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

I. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration until Substantial Completion.

J. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

K. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: If a factory-authorized service representative is required to inspect field-assembled components and equipment installation, comply with qualification requirements in Division 1 Section "Quality Requirements."

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Division 1 Section "Cutting and Patching."

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.PREPARATION

END OF SECTION 017000

SECTION 017700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
   1. Inspection procedures.
   2. Project As-Builts Documents.
   3. Operation and maintenance manuals.
   4. Warranties.
   5. Instruction of Owner's personnel.
   6. Final cleaning.

B. Related Sections include the following:
   1. Division 1, of the Technical Specifications Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
   2. Division 1, of the Technical Specifications Section "Construction Progress Documentation" for submitting Final Completion construction photographs and negatives.
   3. Division 1, of the Technical Specifications Section “Construction Waste Management” method of disposal of construction waste.
   4. Division 1, of the Technical Specifications Section "Execution Requirements" for progress cleaning of Project site.
   5. Division 1, of the Technical Specifications Section “Project Record Documents”.
   6. Division 1, of the Technical Specifications Section “Operation and Maintenance Data”.
   7. Divisions 2 through 16, of the Technical Specifications Sections for specific closeout and special cleaning requirements for products of those Sections.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: The Contractor shall, before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
   1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
   2. Advise Owner of pending insurance changeover requirements.
   3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, “As-Builts” drawings operation and maintenance manuals, Final Completion construction photographs and photographic negatives if required, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of changeover in heat and other utilities.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Consultant will either proceed with inspection or notify Contractor of unfulfilled requirements. Consultant will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Consultant, that must be completed or corrected before certificate will be issued. The Consultant’s Substantial Completion list is composed by verification of the punch list submitted by the Contractor and any additional defects in the work observed by the Consultant.
   1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. Results of completed inspection will form the basis of requirements for Final Completion.

1.4 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:
   1. Submit a final Application for Payment according to Division 1, of the Technical Specifications Section "Payment Procedures."
   2. Submit certified copy of Consultant's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Consultant. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
   3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
   4. Submit pest-control final inspection report and warranty.
   5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training videotapes if required.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Consultant will either proceed with inspection or notify Contractor of unfulfilled requirements. Consultant will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.
   1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.
   2. The Contactor shall take immediate steps to correct the stated deficiencies, and send a written notice to the Consultant, certifying the Project is complete, at which time the Consultant will re-inspect the Work. This review and additional reviews by the Consultant where the Work is not considered Substantial Completion or Final Completion will be considered an additional service from the Consultant. The Contractor will be charged for these additional services incurred by such failure including travel time, observation time, and administrative time at the Consultant's hourly rate, as well as all expenses associated with the distribution of a written notice stating the reasons for failure to reach final completion.
   3. In the event the Contractor is granted Substantial Completion by the Consultant and the Contractor fails to complete and/or correct all of the items listed in the Substantial Completion within 30 calendar days of the date of Substantial Completion, the liquated damages shall start to accrued until all of the items on the Substantial Completion list are completed and/or corrected and have been approved by the Consultant.
   4. If the Consultant is required to make more than two inspections for the project to achieve Substantial Completion, the Contractor shall pay for the Consultant's time and expensive.

1.5 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
   1. Organize list of spaces in sequential order, use the room number as indicated on the drawings and on the exterior areas include a location diagram indicating the defects.
   2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
   3. Include the following information at the top of each page:
      a. Project name.
      b. Date.
      c. Name of Consultant.
      d. Name of Contractor.
      e. Page number.

1.6 PROJECT RECORD DOCUMENTS

A. The Contractor shall provide Project Record Documents, O&M, "As-Builts" Drawings, and Warrantees as indicated in Division 1, of the Technical Specifications Section Project Record Documents. Use Division 1, of the Technical Specifications Section "Project Record Documents".

1.7 OPERATION AND MAINTENANCE MANUALS

A. See Section “Operation and Maintenance Manuals” for additional Information.

1.8 WARRANTIES

A. Submittal Time: Submit written warranties on request of Consultant for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

D. Provide copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
      a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
      b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
      c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
j. Remove labels that are not permanent.
k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
    1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
l. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
m. Replace parts subject to unusual operating conditions.
n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
q. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 017810 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for Project Record Documents, including the following:
   1. As-Built Drawings.
   2. Record Specifications.
   3. Record Product Data.

B. Related Sections include the following:
   1. Division 1, of the Technical Specifications, Section "Closeout Procedures" for general closeout procedures.
   2. Division 1, of the Technical Specifications, Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
   3. Divisions 2 through 16, of the Technical Specifications, Sections for specific requirements for Project Record Documents of products in those Sections.

1.3 SUBMITTALS

A. As-Built Drawings: Comply with the following:
   1. Number of Copies: Submit AutoCAD As-Built Drawings to the Consultant for the Consultant to prepare the Record Drawings.

B. Record Specifications: Submit two copies of Project's marked up Specifications, including addenda and contract modifications.

C. Record Product Data: Submit two copies of each Product Data submittal.
   1. Where Record Product Data is required as part of operation and maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as Record Product Data.

PART 2 - PRODUCTS

2.1 AS-BUILT DRAWINGS

A. As-Built Drawings: Maintain one set of black-line white prints of the Contract Drawings and Shop Drawings.

1. Preparation: Mark As-Built Drawings to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up As-Built Drawings.
    a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
    b. Accurately record information in an understandable drawing technique.
    c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
    d. Provide all information in auto cad format, .dwg files.
2. Content: Types of items requiring marking include, but are not limited to, the following:
    a. Dimensional changes to Drawings.
    b. Revisions to details shown on Drawings.
    c. Depths of foundations below first floor.
    d. Locations and depths of underground utilities.
    e. Revisions to routing of piping and conduits.
    f. Revisions to electrical circuitry.
    g. Actual equipment locations.
    h. Duct size and routing.
    i. Locations of concealed internal utilities.
    j. Changes made by Change Order or Construction Change Directive.
    k. Changes made following Consultant's written orders.
    l. Details not on the original Contract Drawings.
    m. Field records for variable and concealed conditions.
    n. Record information on the Work that is shown only schematically.
    o. Clarification Drawings.
3. Mark the Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. If Shop Drawings are marked, show cross-reference on the Contract Drawings.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
7. Identify and date each As-Builts Drawing; include the designation "PROJECT AS-BUILTS DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

B. Newly Prepared As-Built Drawings: Prepare new Drawings instead of preparing As-Built Drawings where Consultant determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
    1. New Drawings may be required when a Change Order is issued as a result of accepting a substitution or other modification.
    2. Consult with Consultant for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared As-Built Drawings into Record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
   3. Record the name of the manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
   4. For each principal product, indicate whether Record Product Data has been submitted in operation and maintenance manuals instead of submitted as Record Product Data.
   5. Note related Change Orders, As-Built Drawings, and Product Data where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders, As-Built Drawings, and Product Data where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other of the Technical Specifications Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for Project Record Document purposes. Post changes and modifications to Project Record Documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store Record Documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Consultant's reference during normal working hours.

END OF SECTION 017810

SECTION 018200 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
   1. Demonstration of operation of systems, subsystems, and equipment.
   2. Training in operation and maintenance of systems, subsystems, and equipment.

B. Related Sections include the following:
   1. Division 1, of the Technical Specifications Section "Project Management and Coordination" for requirements for pre-instruction conferences.
   2. Division 1, of the Technical Specifications Section "Photographic Documentation" for preparing and submitting demonstration and training videotapes.

1.3 SUBMITTALS

A. Instruction Program: Submit a outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1.4 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 1 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Consultant.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment.
   1. Emergencies: Include the following, as applicable:
      a. Instructions on meaning of warnings, trouble indications, and error messages.
      b. Instructions on stopping.
      c. Shutdown instructions for each type of emergency.
      d. Operating instructions for conditions outside of normal operating limits.
      e. Sequences for electric or electronic systems.
      f. Special operating instructions and procedures.
   2. Operations: Include the following, as applicable:
      a. Startup procedures.
      b. Equipment or system break-in procedures.
      c. Routine and normal operating instructions.
      d. Regulation and control procedures.
      e. Control sequences.
      f. Safety procedures.
      g. Instructions on stopping.
      h. Normal shutdown instructions.
      i. Operating procedures for emergencies.
      j. Operating procedures for system, subsystem, or equipment failure.
      k. Seasonal and weekend operating instructions.
      l. Required sequences for electric or electronic systems.
      m. Special operating instructions and procedures.
   3. Adjustments: Include the following:
      a. Alignments.
      b. Checking adjustments.
      c. Noise and vibration adjustments.
      d. Economy and efficiency adjustments.
   4. Troubleshooting: Include the following:
      a. Diagnostic instructions.
      b. Test and inspection procedures.
   5. Maintenance: Include the following:
      a. Inspection procedures.
      b. Types of cleaning agents to be used and methods of cleaning.
      c. List of cleaning agents and methods of cleaning detrimental to product.
      d. Procedures for routine cleaning
      e. Procedures for preventive maintenance.
      f. Procedures for routine maintenance.
      g. Instruction on use of special tools.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
   1. Owner will furnish Contractor with names and positions of participants.

B. Scheduling: Provide instruction at mutually agreed on times.
   1. Schedule training with Owner, through Consultant, with at least seven days' advance notice.

C. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

END OF SECTION 018200

SECTION 116833.43 - TRACK & FIELD EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers all labor and materials required to install a first-class track & field equipment.

B. The General Contractor is responsible for the purchase and installation of all track & field equipment. The Synthetic Surfacing Contractor is responsible for installation of synthetic surface in, around and on top of the specified equipment.

1.2 CODES AND STANDARDS

A. Codes and standards follow the current guidelines set forth by World Athletics (formerly IAAF), the National Collegiate Athletic Association and National Federation of State High School Associations. Where discrepancies are noted between these various governing bodies, the rules of the NFHS shall be enforced.

1.3 ABREVIATIONS

A. WA = World Athletics (formerly the IAAF)

B. NCAA = National Collegiate Athletic Association

C. NFHS = National Federation of State High School Associations

D. T&F = Track & Field

E. SS = Synthetic Surface

F. SSC = Synthetic Surfacing Contractor

G. GC = General Contractor

1.4 RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section. The following Sections are specifically related to this Section:
   1. 116833.43 T&F Equipment
   2. 321823.39 T&F Quality Control
   3. 321823.40 T&F Synthetic Surface

4. 321823.41 T&F Line Markings
5. 321823.42 T&F Event Materials

1.5 SUBMITTALS

A. The following information must be submitted by the GC prior to installation.
   1. Standard printed specifications and diagrams or drawings depicting installation directions and dimensions for all in-ground sports equipment. One submittal must contain all items within that technical specification – no partial submittals are allowed.
   2. Installation process and requirements for subbase (stone and asphalt) and any conditions that may limit the installation or affect quality of installation.
   3. Material safety data sheets on all products, as necessary.

1.6 QUALITY ASSURANCE

A. The GC shall only accept bids from those vendors or manufacturers that have been pre-approved or identified as approved equal.

PART 2 - PRODUCTS

2.1 T&F EQUIPMENT

A. The following vendors/manufacturers are approved for bidding:
   1. Gill Athletics, Ryver Morrow cell 706-362-4015.
   2. UCS Spirit, Kyle Wolfe cell 518-573-4007.
   3. SportsField Specialties, Brian Jaeger cell 607-267-3621.

B. Basis of Design: the manufacturer's product number listed in this specification establishes the minimum quality for each product. GC must purchase all equipment from the same vendor and may not substitute products from the other vendors.

C. T&F Inground Equipment
   1. Sportsfield Specialties and their products are the basis of design.
   2. Pole Vault Boxes:
      a. One cast aluminum pole vault box, white. Model # PVBCAW.
      b. One cast aluminum pole vault box cover plug. Model # PVBCPCA.
   3. Long & Triple Jump:
      a. Two weighted single layer mesh sand pit covers for long/triple jump sand pits (11’-9” by 31’-6”) with NO Logo. Model # SPCVRML.
      b. Six Adjustable 8” Take Off-Board Systems for long & triple jump. This product is the 8 inch wide synthetic board, metal tray and blanking lids are required. Model # LJTJOB8BL.
   4. Discus:
      a. One discus cage with 7 poles. Model # DCHS7.

b. One discus metal ring (“L” shape) attached to the top of the flat concrete surface. Model # V370.

5. Shot Put:
   a. One shot put metal ring (“L” shape) attached to the top of the flat concrete surface. Model # V372.
   b. One shot put toe board attached to the top of the flat concrete surface. Model # V364.

D. T&F Barrier Netting / Ball Stopping System: ***NOT INCLUDED IN PROJECT.***

E. T&F Loose Equipment: ***NOT INCLUDED IN PROJECT***.

PART 3 - EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. The installation of the in-ground sports equipment shall follow the directions of the manufacturer and/or vendor. Shop drawings must be submitted and approved prior to ordering and installation of equipment.

END OF SECTION 116833.43

SECTION 311000 - SITE CLEARNING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Protecting existing trees and grass remain.
   2. Removing existing trees and grass as noted
   3. Clearing and grubbing.
   4. Stripping and stockpiling topsoil.
   5. Removing above- and below-grade site improvements.
   6. Disconnecting, capping or sealing, and abandoning site utilities in place removing site utilities.
   7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:
   1. Division 01 Section "Temporary Facilities and Controls" for temporary construction and support facilities, and temporary erosion and sedimentation control procedures.
   2. Division 01 Section "Execution" for verifying utility locations and for recording field measurements.
   3. Division 31 Section "Earth Moving" for soil materials, excavating, backfilling, and site grading.
   4. Division 23 Section "Turf and Grasses" for finish grading including preparing and placing planting soil mixes and testing of topsoil material.

1.3 DEFINITIONS

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

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

1.4 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.5 PROJECT CONDITIONS

A. 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.

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

C. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: Requirements for satisfactory soil materials are specified in Division 31 Section "Earth Moving."
   1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

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

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

C. Protect existing site improvements to remain from damage during construction.
   1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

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

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

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

3.3 TREE PROTECTION

A. Erect and maintain temporary fencing around tree protection zones before starting site clearing. Remove fence when construction is complete.
   1. Do not store construction materials, debris, or excavated material within fenced area.
   2. Do not permit vehicles, equipment, or foot traffic within fenced area.
   3. Maintain fenced area free of weeds and trash.

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

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

3.4 UTILITIES

A. Owner will arrange for disconnecting and sealing indicated utilities that serve existing structures before site clearing, when requested by Contractor.
   1. Verify that utilities have been disconnected and capped before proceeding with site clearing.

B. 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.

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

D. 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.
   5. Chip removed tree branches.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
   1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.6 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.
   1. Remove subsoil and nonsoil materials from topsoil, including trash, debris, weeds, roots, and other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Limit height of topsoil stockpiles to 72 inches.
   2. Do not stockpile topsoil within tree protection zones.
   3. Dispose of excess topsoil as specified for waste material disposal.
   4. Stockpile surplus topsoil to allow for respreading deeper topsoil.

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, and waste materials including trash and debris, and legally dispose of them off Owner's property.
   1. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials and transport them to recycling facilities.

END OF SECTION 311000

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Earth Moving: The extent of earth moving is indicated on the drawings. The work, in general, includes the following:
   1. Preparation of subgrade for buildings, pavements, and other grade-supported construction.
   2. Controlling surface water and groundwater.
   3. Excavation.
   4. Fill and backfill placement and compaction.
   5. Installation of drains.
   6. Rough and finish grading.
   7. Furnishing Unit Prices for additional earthwork.

B. Related Sections include the following:
   1. Division 01 Section Construction Progress Documentation for recording preexcavation and earthwork progress.
   2. Division 01 Section "Temporary Facilities and Controls" for temporary controls, utilities, and support facilities.
   3. Division 31 Section "Site Clearing" for temporary erosion and sedimentation control measures, site stripping, grubbing, stripping and stockpiling topsoil, and removal of above- and below-grade improvements and utilities.
   4. Division 31 Section "Dewatering" for lowering and disposing of groundwater during construction.
   5. Division 32 Section "Turf and Grasses" for finish grading, including preparing and placing topsoil and planting soil.

C. Excavation Definition: “Excavation” consists of removal of all material encountered to required subgrade elevations indicated and subsequent disposal of all materials removed.

1.3 DEFINITIONS

A. Backfill: Soil material or controlled low-strength material used to fill an excavation.

B. Excavation: Removal of all material encountered to required subgrade elevations indicated and subsequent disposal of all materials removed.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions, as directed by Owner. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Owner. Unauthorized excavation, as well as remedial work directed by Engineer, shall be without additional compensation.

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

D. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials. Subgrade shall be free of any loose materials, organics, or other deleterious materials.
1. Stable Subgrade: Subgrade that is firm and unyielding during proof rolling operations.
2. Unstable Subgrade: Subgrade that is rutting or pumping during proof rolling operations or is otherwise determined by the Geotechnical Engineer to be unfit for the placement of new fill or support of grade-supported construction. This also includes excessively wet materials at subgrade elevations.

1.4 SUBMITTALS

A. Product Data: For the following:
1. Washed stone (No. 57)
2. Graded aggregate base
3. Filtration geotextile
4. Type 1 geogrid
5. Type 2 geogrid

B. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
1. Classification according to ASTM D 2487 of each on-site and borrow soil material proposed for fill and backfill.
2. Laboratory compaction curve according to ASTM D 698 for each on-site and borrow soil material proposed for fill and backfill.

1.5 QUALITY ASSURANCE

A. Inspections, Laboratory, and Field Testing Services:
1. Geotechnical Engineer: The owner will engage a Geotechnical Engineer for soil inspections, laboratory testing, and field testing services for quality control testing during earthwork operations and foundation construction.
2. Test classification and compaction of soils. Tests will be performed at the following locations and frequencies:
    a. Expanded Building Limits: Perform one test per compacted lift, per 2,500 square feet but no less than one test per lift.
    b. Pavement Areas: Perform one test per compacted lift, per 5,000 square feet but no less than one test per lift.

c. Utility Trenches: Perform one test per compacted lift, per 200 linear feet but no less than one test per lift.
d. Stormwater Management Facilities: Perform one test per compacted lift, per 5,000 square feet but no less than one test per lift.
e. Perform percent passing sieve No. 200 (ASTM D 1140), Atterberg Limits (ASTM D 4318), and organic content (ASTM D 2974) testing as required to verify the intent of the Subsurface Exploration Report in accordance with the respective ASTM Standards.

3. Allow Geotechnical Engineer to inspect and test subgrade and each fill or backfill layer: Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
4. When subgrades, fills, or backfills are unstable or have not achieved degree of compaction specified, scarify and moisten or aerate, remove and replace, or otherwise stabilize the subgrade using an approved procedure.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Additional testing performed to determine compliance of corrected work with specified requirements shall be at Contractor's expense.

D. Preinstallation Conference:
1. Before commencing earthwork or construction, meet with representatives of governing authorities, Owner, Architect/Engineer, Civil Engineer, Geotechnical Engineer, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

E. Codes and Standards: Perform excavation work in compliance with all applicable requirements of governing authorities having jurisdiction.

F. Depth of Bearing Strata: It is to be understood that site soil conditions are variable across the site. The design of the footings is based on the assumed strata bearing capacity at the elevation shown on the drawings and as indicated in the General Notes. If the indicated depth of footing excavation is reached without developing the required strata bearing capacity, the Geotechnical Engineer will immediately advise the contractor for additional excavation to reach the required bearing elevation for each individual footing. Revisions will be paid for in accordance with the Contract condition relative to changes in the Work.

1.6 PROJECT CONDITIONS

A. Site Information:
1. The Contractor, by careful examination, shall inform himself as to the nature and location of the Work; the conformation of the ground, the nature of subsurface conditions; the locations of the groundwater table; the character, quality, and quantity of the materials to be encountered; the character of the equipment and facilities needed preliminary to and during the execution of the work; and all other matters

which can be in any way affect the Work.

2. The Contractor shall examine the site, available drawings, records of existing utilities and construction, record of test borings, and the subsurface exploration reports and the soil and rock samples to determine conditions under which the Work will be performed.
3. Data on indicated subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. The Owner will not be held responsible for interpretations or conclusions drawn by the Contractor. Additional test borings and other exploratory operations may be made by the Contractor at no cost to the Owner.

B. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth moving operations.

C. Existing Utilities:
1. Locate all existing underground utilizes in areas of work before proceeding. Provide adequate support and protection during earthwork operations of utilizes that are to remain in place. Demolish existing utilities as indicated and completely remove from the project site. Coordinate with utility companies, or governing entity, for proper shut-off of services for active lines.
2. If any active utility not indicated in the drawings is encountered, notify the Engineer and protect from damage until instructions for proper disposition of the utility are given by the Engineer. Perform the requested work in compliance with the rules and regulations of authority having jurisdiction.
3. Repair active utilities schedule to remain that are damaged by earthwork operations to the satisfaction of the utility owner.
4. If any inactive utility not indicated on the drawings is encountered, remove, plug, or cap as directed by the Engineer. Obtain any necessary data relative to proposed abandonment of existing utility service from authority having jurisdiction.
5. Do not interrupt existing utilities serving facilities occupied and used by Owner or others, during occupied hours, except when permitted in writing by the Construction Manager and then only after acceptable temporary utility services have been provided. Provide minimum of 48-hour notice to Construction Manager, and receive written notice to proceed before interrupting any utility.

D. 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. Satisfactory Soils: ASTM D 2487 Soil Classification Groups SM, SC, SW, SP, GM, and GC, or a combination of these group symbols. Open graded materials, such as Gravels (GW and GP), which contain void space in their mass shall not be used in structural fills unless properly encapsulated with filter fabric.
1. Satisfactory materials shall be free of organic matter, debris, waste, frozen materials, vegetation, and other deleterious matter.

2. Satisfactory materials shall be free of rock or gravel larger than 3 inches in the largest dimension.
3. Satisfactory materials shall have a maximum liquid limit (LL) of 40, plasticity index (PI) of 15 and fines content (material passing sieve No. 200) of 35 percent. Soils with high plasticity index and liquid limit values may be blended with lower plasticity materials such that the plasticity index and liquid limit values of the combined material meet the required values.

B. Unsatisfactory Soils: Materials which do not comply with the requirements for satisfactory materials are unsatisfactory.
1. Unsatisfactory materials also include topsoil, organic materials (OH, OL), elastic Silt (MH), fat Clay (CH), man-made fills, trash, refuse, backfills from previous construction, and material classified as satisfactory materials which contains root and other organic matter or frozen material.
2. Unsatisfactory soils also include satisfactory soils not maintained within 3 percent of optimum moisture content at time of compaction.

C. Approved Fill Material: All soil materials used for the project shall be approved by the Geotechnical Engineer prior to hauling and placement. Soil materials used for fill or backfill shall be retested and reapproved each time the source or properties of the material changes.

PART 3 - EXECUTION

3.1 CLEARING AND GRUBBING

A. Remove all existing trash, rubbish, debris, trees, roots, stumps, underbrush, shrubs, plants, and other vegetation from within the mass earthwork limits.

3.2 PREPARATION

A. Survey Work, Grades, and Elevations:
1. Survey Work: Lay out site features after clearing but before excavation. Record actual measurements centerline location, deviation from specified tolerances, and all other pertinent data as required.
2. Grades and Elevations: Finished grades indicated by spot elevations and normal contour line elevations denote finished top surface elevations. Report conflicts, errors and inconsistencies in grades and elevations to the Engineer for resolution. Do not proceed with the work in questionable areas until conflicts are resolved by the Engineer.
3. Maintain all benchmarks and other reference points.
4. Set required lines and levels as required to accurately perform the excavation work.

B. Protection of Work:
1. Protect the subgrade during construction by sealing off with a smooth drum roller prior to prolonged delay such as the end of the work week or before a forecasted storm. Scarify the smooth surface before placing the next lift.
2. Protect any existing structures, utilities, sidewalks, pavements, and other facilities from

damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

3. Protect and maintain erosion and sedimentation controls during earth moving operations.
4. Protect subgrades soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.
5. Do not commence earth moving operations until temporary erosion and sedimentation control measures in place.
6. Do not commence earth moving operations until plant protection measures are in place.
7. The following practices are prohibited within protection zones:
    a. Storage of construction materials, debris, or excavated material.
    b. Parking vehicles or equipment.
    c. Erection of sheds or structures.
    d. Impoundment of water.
    e. Excavation or other digging unless otherwise indicated.
    f. Attachment of signs or wrapping materials around trees or plants unless otherwise indicated.
8. Do not direct vehicle or equipment exhaust towards protection zones.
9. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

3.3 DEWATERING

A. Excavations should be kept dry at all times by means of cofferdams, trenches, sumps, pumps, and whatever equipment or arrangements are required.

B. Prevent surface water and subsurface or groundwater from flowing into excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

C. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation and/or subsurface seepage.

D. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavation as temporary drainage ditches. Do not use excavated trenches as temporary drainage ditches.

3.4 EXCAVATION, GENERAL

A. Materials to be excavated will be classified as earth. All excavation shall extend to the depths of the form and size required for the installation of the work as indicated on the Drawings. When excavations have reached the required depths, the Geotechnical Engineer shall make an inspection of the conditions.

B. Materials that in the opinion of the Geotechnical Engineer are not suitable for fill, any surplus earth, and rock shall be removed from the site and legally disposed of off-site.

C. The bottom of excavations shall be leveled off and graded to receive new compacted fill or other construction materials.

D. Excavations made below the elevations shown or specified, unless authorized, shall be filled and compacted as hereinafter specified, at no additional cost.

3.5 EXCAVATION FOR STRUCTURES, PAVEMENTS AND OTHER GRADE SUPPORTED CONSTRUCTION

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

B. Subgrades shall be approved by the Geotechnical Engineer before proceeding with fill placement or installation of any structures or grade-supported construction materials.

C. The top 12 inches of subgrade resulting from excavation shall be free of unsuitable material (fill, organics, debris, etc.) as judged by the Geotechnical Engineer.

D. Cut areas shall be excavated and graded to subgrade elevation per the Contract Drawings. The subgrade should be proof rolled with approved construction equipment having a minimum axle load of 10 tons. Do not proof roll wet or saturated subgrades. Any soft or wet areas, areas exhibiting rutting, pumping or areas that are otherwise unstable, as deemed by the Geotechnical Engineer, shall be repaired.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Trenches for underground piping, where necessary, shall be excavated to the required depth and bell holes shall be provided where necessary to insure uniform bearing. Trench excavation lines shall provide sufficient clearance for proper execution of underground work.

B. Trenches shall be by open cut from the surface. No tunneling will be allowed. Irregularities at bottom of trench, or where excavation is below required depth, shall be refilled to required grade with compacted soil.

C. Where trenches are in wet or soft ground that in the opinion of the Geotechnical Engineer is unsuitable for supporting the pipe, concrete cradles or approved equivalent, shall be installed as directed by the Engineer.

D. Where necessary and per OSHA standards, the sides of trenches and excavations shall be properly sloped or supported by adequate sheeting and bracing to insure proper construction and safety of the workers. The Contractor will be held responsible for the sufficiency of sheeting and bracing and for all damages to property or injury to persons resulting from improper quality, strength, placing, maintaining and removing of same.

E. Backfill trenches with suitable fill. Scarify sides of excavation to facilitate bonding of soil. Do not backfill trenches until tests and inspections have been made and backfilling is authorized by Geotechnical Engineer or other authorized Owner’s representative. Use care in backfilling

to avoid damage or displacement of pipe system.

F. Immediately after piping has been installed, tested, inspected, and accepted, piping shall be filled around with special care to solidly fill voids without causing injury to piping. Up to 2 feet above, 4-inch layers shall be hand filled. For remainder of trench, 12-inch layers shall be filled in. Each layer shall be tamped before placing next layer. No stones larger than 2 inches in diameter shall be allowed in fill up to 2 feet above pipe and no stones larger than 4 inches in diameter shall be allowed in fill above. Backfill shall be in such a manner so as to prevent future settlement.

G. Existing utility lines to be retained that are shown on the drawings or the locations of which are made known to the Contractor prior to excavation operations, shall be protected from damage during excavation and backfilling, and if damaged, shall be repaired by the Contractor, at own expense.

H. As backfilling proceeds, all sheeting and shoring shall be removed in such a manner as to prevent the sides of the excavation from caving in or cracking. No backfilling of utility lines shall be done until any testing and inspection of the system or portion of the system has been completed and accepted.

I. Unless otherwise shown or specified, make trenches for piping and utilities not less than 16 inches no more than 24 inches wider than the outside width of the piping or utilities. Accurately grade bottoms of trenches with bell holes scooped out to provide uniform bearing and support of pipe and utilities on undisturbed soil throughout its entire length, except where other means of supporting pipe are indicated.

3.7 PLACING AND BACKFILL

A. General: Place fill or backfill on subgrades free of mud, frost, snow, or ice. It is to be understood that some selective reconnaissance and excavation will be required to obtain fill material.

B. Place fill and backfill soil materials in layers not more than 8 inches loose depth for material compacted by heavy self-propelled compaction equipment.

C. Place fill and backfill soil materials in layers not more than 4 inches loose depth for material compacted by portable, hand operated compaction equipment.

D. Ground surface preparation:
   1. Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to fill placement. Plow, strip, or break-up slope surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with existing surface.
   2. Proof roll the exposed subgrades with approved construction equipment having a minimum axle load of 10 tons. Do not proof roll wet or saturated subgrades. Any soft or wet areas, areas exhibiting rutting, pumping or areas that are otherwise unstable, as deemed by the Geotechnical Engineer, shall be repaired.

E. Grading:
   1. General: Uniformly grade areas within limits of grading under this section, including adjacent transition areas. Smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated, or between such points and existing grades.
   2. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within plus or minus 1 inch.
   3. Compaction: After grading, compact subgrade surfaces to the depth and indicated percentage of maximum or relative density for each area classification. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

3.8 COMPACTION

A. General: Control all soil compaction during construction, providing minimum percentage of density specified for each area classification indicated below. Place backfill and fill materials in layers not more than 8.0 inches in loose depth for material compacted by heavy compaction equipment, and not more than 3.0 inches in loose depth for material compacted by hand-operated compaction equipment.

B. Density Requirements: Compact soil materials to not less than 95 percent of the maximum dry unit weight according to ASTM D 698. Within the top 24 inches of finished soil subgrade elevations beneath foundations, slabs-on-grade, and pavements, compact structural fill to at least 98 percent of its maximum dry density.

C. Moisture Control:
   1. Where subgrade or layer of soil material must be moisture conditioned before compaction, apply water as needed.
   2. Remove and replace, or scarify and air dry, soil material that is too wet to compact to specified unit weight.
   3. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by mechanical or chemical methods.

3.9 DRAINS

A. Construct subsurface drainage during grading operations at locations and dimensions shown on the approved drawings.

3.10 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
   1. Provide a smooth transition between adjacent existing grades and new grades.
   2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding.

3.11 FIELD QUALITY CONTROL

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

B. The Geotechnical Engineer shall review all laboratory test results and submit reports specified in this Section. Geotechnical Engineer will also observe, in the field, all earthwork related operations.

C. The Geotechnical Engineer will interpret the tests, state in each report whether or not the test specimens comply with all requirements of the Contract Documents and note any deviations therefrom.

D. The Geotechnical Engineer will identify when and where samples are to be obtained. Contractor shall collect samples and forward them to the Testing Laboratory for testing. As necessary, the Geotechnical Engineer will submit the following laboratory test reports on each type of borrow and fill material:
   1. Percent passing sieve No. 200 – ASTM D 1140.
   2. Atterberg Limits – ASTM D 4318.
   3. Standard Moisture-Density Relationship – ASTM D 698.

E. The Geotechnical Engineer will determine the conformance of material to be used for fills.

F. Field Testing of Fill Areas: Prepared fill lifts will be tested and approved by the Geotechnical Engineer before construction of any further work thereon. Inspection and test of subgrades and fill layers will be taken as follows:
   1. For each compacted fill layer, make a minimum of 2 field density tests for every lift. Perform field density tests in accordance with ASTM D 1556, D 6938 or D 2937. Each lift shall meet the compaction requirement of Part 3.8 of this Section.

G. Footing Subgrades: Geotechnical Engineer shall inspect bearing surfaces and monitor proof rolling operations at foundation subgrade locations.

H. Contractor shall cooperate with Geotechnical Engineer in the performance of the required tests and inspections.

I. When testing agency reports that subgrades, fills, or backfills are unstable or have not achieved degree of compaction specified, scarify and moisten or aerate, remove and replace, or otherwise stabilize the subgrades using an approved procedure. Additional compaction and testing shall be at the expense of the Contractor.

3.12 MAINTENANCE

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

B. Repair and reestablish grades in eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions. Scarify surface, reshape, and compact to required density prior to further construction.

C. Where settling is measurable or observable at excavated areas, add backfill material and compact. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.13 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Contractor. Remove waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 312000

SECTION 312319 - DEWATERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes construction dewatering.

B. Related Sections:
   1. Division 01 Section Construction Progress Documentation for recording preexisting conditions and dewatering system progress.
   2. Division 31 Section "Earth Moving" for excavating, backfilling, site grading, and for site utilities.
   3. Division 33 Section "Subdrainage" for permanent dam embankment drainage.

1.3 PERFORMANCE REQUIREMENTS

A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.
   1. Delegated Design: Design dewatering system, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
   2. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, that excavation does not flood, and that damage to subgrades and permanent structures is prevented.
   3. Prevent surface water from entering excavations by grading, dikes, or other means.
   4. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
   5. Remove dewatering system when no longer required for construction.

1.4 PROJECT CONDITIONS

A. Project-Site Information: A geotechnical report has been prepared for this Project and is available for information only. The opinions expressed in this report are those of geotechnical engineer and represent interpretations of subsoil conditions, tests, and results of analyses

conducted by geotechnical engineer. Owner will not be responsible for interpretations or conclusions drawn from this data.

1. Make additional test borings and conduct other exploratory operations necessary for dewatering.
2. The geotechnical report is included in the bid documents

B. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent structures and site improvements, establishing exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

1. During dewatering, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Engineer if changes in elevations occur or if any damage is evident in adjacent construction.

PART 2 - PRODUCTS (NOT USED)

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 dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site and surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

B. Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

C. Provide temporary grading to facilitate dewatering and control of surface water.

D. Monitor dewatering systems continuously.

E. Promptly repair damages to adjacent facilities caused by dewatering.

F. Protect and maintain temporary erosion and sedimentation controls, which are specified in Division 01 Section "Temporary Facilities and Controls Division 31 Section Site Clearing during dewatering operations.

3.2 INSTALLATION

A. Contractor shall furnish, install, operate, and maintain any pumping equipment, etc. needed for removal of water from various parts of the stormwater facility.

B. Contractor shall coordinate with Geotechnical Engineer as needed.

3.3 FIELD QUALITY CONTROL

A. Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

END OF SECTION 312319

SECTION 312500 - EROSION CONTROL

PART 1 - GENERAL

1.1 INTENT

A. The main concern associated with erosion on a construction site is the movement of soil off the site and its impact on water quality. It is the Owner's intent that the Contractor install and maintain sufficient erosion control practices to retain sediment within the boundaries of the site in addition to complying with regulatory authorities having jurisdiction and local erosion and sedimentation control laws and ordinances. All erosion control methods and devices used shall conform to the latest requirements imposed by federal, state and local authorities. The Contractor shall be responsible for repair of any damage caused and shall be financially responsible for any penalties imposed.

B. If an erosion control drawing has been included in the drawings prepared by the landscape architect/engineer, it shall be the Contractor's responsibility to review the drawing prior to implementation. If an erosion control drawing is not included in the project documents, the Contractor shall submit, for approval, a proposed sequence of operations and a compatible method of preventing erosion.

1.2 SUMMARY

A. Work under this section shall include but not be limited to, installation and maintenance of both temporary and permanent soil erosion control measures, slope protection and stabilization measures, protection of all surface water and property both on and off site. This work shall include all labor, materials, and equipment necessary to meet all applicable requirements and as specified in the contract documents.

1.3 REFERENCE STANDARDS

A. All applicable standards and requirements of all regulatory authorities having jurisdiction, including local soil conservation agencies

1.4 QUALITY ASSURANCE

A. Soil erosion and sediment control measures shall be implemented in accordance with the requirements and procedures outlined in this specification, contract drawings and documents, the state standards or guidelines for soil erosion and sediment control, and all regulatory authorities having jurisdiction. Where conflict between requirements exist, the more restrictive rules shall govern.

B. The Contractor shall provide all temporary control measures shown on the drawings, or as directed by the Owner, Owner's representative, or soil conservation district for the duration of

the contract. Erosion control drawings are intended to be a guide to address the stages of work shown. Additional erosion control measures not specified on the drawings may be necessary and shall be implemented to address intermediary stages of work and any conditions that may develop during construction at no cost to the Owner.

C. Temporary control provisions shall be coordinated with permanent erosion control features to the extent practical to assure economical, effective and continuous erosion control throughout the construction and post-construction period.

D. Soil erosion and sediment control measures shall at all times be satisfactory to the Owner's Representative. Owner's Representative will inform the Contractor of unsatisfactory construction procedures and operations if observed. If the unsatisfactory construction procedures and operations are not responded to and corrected within 48 hours, the Owner's Representative may suspend the performance of any or all other construction until the unsatisfactory condition has been corrected. Such suspension shall not be the basis of any claim by the Contractor for additional compensation nor for an extension of time to complete the work. Any complaints, fines, etc. relating to ineffective erosion control, shall be the sole responsibility of the Contractor.

E. The Contractor shall inspect all soil erosion and sediment control measures at least at the beginning and end of each day to ascertain that all devices are functioning properly during construction. Maintenance of all soil erosion and sediment control measures on the project site shall be the responsibility of the Contractor until the project is 100% complete, and until the permanent soil erosion controls are established and in proper working condition.

F. The Contractor shall protect adjacent properties and watercourses from soil erosion and sediment damage throughout construction.

1.5 SEQUENCE OF CONSTRUCTION

A. The approved construction sequence, as permitted/approved shall be adhered to during the execution of work under this section. All soil erosion and sediment control measures shall be installed in accordance with the phasing sequence shown on the contract documents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Contractor shall provide all materials necessary to perform the work.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. The Contractor shall comply with and implement the Erosion and Sedimentation Control Plans provided in the contract documents.

B. Review the soil erosion and sediment control drawings as they apply to current site conditions. Any deviation from the drawings must be submitted for approval to the owner/landscape architect in writing at least 72 hours prior to commencing that work.

C. All soil sediment and erosion control devices shall be in place prior to any earthwork construction, in their proper sequence, and maintained until permanent protection is established.

D. The limit of the area of any earthwork operations in progress shall be commensurate with the Contractor's capability and progress in keeping the finished grading, mulching, seeding and other such permanent control measures current and in accordance with the accepted schedule for construction phasing. Should seasonal limitations make such coordination unrealistic, as determined by the Owner's Representative, temporary erosion control measures shall be provided immediately by the Contractor at no expense to the Owner.

E. Temporary erosion control measures shall be used to correct conditions which develop during construction that are needed prior to installation of permanent control features, or that are temporarily needed to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

F. The Contractor shall incorporate all permanent erosion control features into the project at the earliest practical time to minimize the need for temporary controls.

G. A temporary construction entrance pad shall be installed and maintained at any point where construction vehicles enter a public right-or-way, street or parking area. The pad shall be used to eliminate mud from the construction area onto public right-of-way. The pad shall be constructed as shown on the drawings. Any mud or debris tracked on streets shall be cleaned up immediately.

H. Any disturbed or stockpiled areas that will be left exposed more than 14 days, and not subject to construction traffic, shall immediately receive a temporary seeding. Mulch/straw shall be used if the season prevents the establishment of a temporary cover. Disturbed areas shall be limed and fertilized prior to temporary seeding.

I. Permanent vegetation shall be established as specified on all exposed areas within 14 days after final grading, unless otherwise directed by the Owner and permitted by appropriate regulations. Mulch as necessary for seed protection and establishment. Lime and fertilize seedbed prior to permanent seeding.

J. Cut slopes shall be permanently seeded and mulched as the excavation proceeds to the extent considered desirable and practical. Slopes that erode easily shall be temporarily seeded and mulched.

K. All storm drainage outlets must be stabilized, as specified, before the discharge points become operational. Equip all inlets with inlet protection immediately upon construction.

L. Discharge from de-watering operations for the excavated areas shall not be directed to surface waters without first properly removing the suspended sediment through filtration and/or settlement. The Contractor shall obtain any required permits associated with dewatering activities.

M. The quantity of silt fence to be installed will be affected by the actual conditions that occur during the construction of the project. Silt fence shall be installed at locations shown on the drawings and any additional locations necessary for proper erosion control. The Contractor shall maintain the silt fence until the project is accepted and shall remove and dispose of the silt fence and silt accumulations.

N. Soil erosion and sediment control shall include but not be limited to the approved measures. The Contractor shall be responsible for providing all additional measures that may be necessary to accomplish the intent of the drawings.

O. Comply with all other requirements of authorities having jurisdiction.

END OF SECTION 312500

SECTION 321216.36 – ATHLETIC TRACK ASPHALT PAVING

PART 1 - GENERAL

1.1 SCOPE

A. If asphalt is needed on the project the track contractor to approve all asphalt specifications and materials prior to construction and to confirm that the asphalt specification and materials meets all manufacture requirements for the synthetic turf surface.

1.2 SUMMARY

A. The extremely strict tolerances for gradients and flatness, which are stipulated by the Sport Federations or Associations for the synthetic surfaces, mean that the construction of adequate asphalt and base is of supreme importance. Tolerances are required to be met not only by the newly completed facility, but also over its life, which might be two or three times the expected life of the synthetic surface.

B. The contractor must review the ASBA guidelines for asphalt track surfacing and confirm that the proposed asphalt surface meets and/or exceed the ASBA guidelines. https://sportsbuilders.org/page/asphalt_guidelines

C. The asphalt and existing base should be designed/and or confirmed to be able meet the following criteria:
   1. It should be capable of supporting and transmitting to the existing ground the loads of all vehicles, machines and materials to be used in the construction, without causing deformation of the site, or exceeding the ground-bearing capacity.
   2. It should be capable of supporting and transmitting the loads on the synthetic surface from athletes and maintenance equipment, without permanent deformation of the asphalt or base.
   3. It should be sufficiently flexible to provide protection to the synthetic surface from the effects of sub-soil movement and frost heave.
   4. No Recycle Asphalt (RAP) in the surface course unless specifically allowed by the Synthetic Track Surfacing Manufacturer.
      a. A signed letter is required from the Synthetic Track Surfacing Manufacturer if RAP is to be allowed. Percent RAP must be identified in the letter.
   5. All asphalt third party testing to be provided by the contractor.

1.3 REFERENCES

A. North Carolina State Department of Transportation Standard Specifications

B. Standard Specifications for Highway Materials and Methods of Sampling and Testing, American Association of State Highway and Transportation Officials (AASHTO)

C. American Society of Testing Materials (ASTM)

D. American Sports Builder Association (ASBA)

1.4 SUBMITTALS

A. Complete asphalt material submittal is required to confirm all asphalt components meets specifications and ASBA Guidelines at a minimum
   1. Material/Pavement Course - **No Recycle Asphalt (RAP) Allowed unless specifically allowed by the Synthetic Track Surfacing Manufacturer – Written letter is required from the manufacturer.**
   2. Binder Course
   3. Course Aggregate
   4. Fine Aggregate
   5. Name and Address of all suppliers
   6. All applicable certificates to be signed by material producer and contractor certifying that each item meets and/or exceeds the specifications and that the proposed asphalt meets ASBA Guidelines.

PART 2 - PRODUCTS AND MATERIALS

2.1 HOT MIX ASPHALT

A. Hot mix asphalt for surface courses shall consist of coarse and fine aggregates and mineral filler plant-mixed with bitumen binder.

B. All hot mix asphalt shall be in accordance with applicable provisions of North Carolina State Department of Transportation “Standard Specifications for Road and Bridge Asphalt Construction,” except herein as modified.

C. The hot mix asphalt shall be plant-mixed and bituminous material for mixture shall be AC-1, 85-100 penetration grade or 60 – 70 penetration grade where required in warm climates. The asphaltic cement (AC-1) content shall be 4.0% - 6.0% (by weight) of the total composite mixture.

D. Course aggregate (material retained on the 4.75mm sieve) shall be sound, angular crushed stone or grave (shale is not recommended).

E. Fine aggregate (material passing the 4,75mm sieve and retained on the #200 (0.075mm) sieve) shall be sand, stone sand and stone screening class B quality or better and gradation FA-3.

F. Mineral filler (Material passing the #200 (0.075mm) sieve) shall be dry limestone or dust.

G. The aggregate shall have the following maximum limits of detrimental substances:

Soft fragments, AASHO Ti 89	2.00%

Coal and lignite, AASHO Ti 13	0.25%
Clay lumps, GHD 1	0.25%
Flat or elongated pieces (greater than five times the average thickness)	10.00%
Sulfur content computed as sulfide sulfur, ASTM E30	0.01%
Other local detrimental Substances	2.00%

H. The gradation of the composite aggregate for the Asphalt Binder Course shall conform to or near the following:

Sieve	Total % Passing
3/4”	100
1/2”	90 – 100
3/8”	80
#4	45 – 70
#8	25 – 55
#30	(19)
#50	5 – 20 (12)
#100	5 – 16 (6.5)
#200	2 – 9 (3)

Note: The aggregate grain should be as close to the figures in brackets for the maximum density to the asphalt mixture.

I. The gradation of the composite aggregate for the Asphalt Top Coat shall conform to or near the following:

Sieve	Total % Passing
1/2”	100
3/8”	90 – 100
#4	60 – 90 (70)
#8	35 – 65 (49)
#30	(22)
#50	6 – 25 (14)
#100	(8)
#200	2 – 10 (3)

Note: The aggregate grain should be as close to the figures in brackets to give maximum density to the asphalt mixture. A majority of the minus 200 material should consist of mineral filler. The increase in the amount of mineral filler has, in many instances, increased the toughness of the asphalt. This can be accomplished by using a resultant mineral aggregate having a minus 200 contents of about 7% - 8%.

J. The asphalt “Binder Course” and “Top Coat” mixtures are the type IV mixes recommended by the Asphalt Institute. Asphaltic concrete mixtures may differ from the above provided

specification, meet or exceed the present specifications. The synthetic surfacing contractor must be informed about proposed changes/deviations to the present specification. Determination of the job mix formula shall be based on attaining a mix having Marshall Stability (ASTM D1559, 75 blows each Side) of 750 lbs. or greater.

K. Samples of the job mix from the asphalt plant shall be laboratory tested for Marshall Stability. A compacted specimen shall be retained for density (ASTM D2726) comparison with core samples from the installed pavement.

L. No Recycle Asphalt Product is allowed in the surface course, unless approved by the track surfacing manufacturer.

2.2 PRIME COATS AND TACK COATS

A. The primer for application on asphalt surfaces (tack coat) shall be RC-1.

PART 3 - EXECUTION

3.1 HOT MIX ASPHALT PAVEMENT

A. Mixing of hot mix asphalt should be undertaken in a mixing plant capable of effectively drying and heating the aggregate to the specified temperature, accurately proportioning and uniformly mixing coarse and fine aggregate, filler and binder to meet the specified requirements at all times. In general, batch-mixing plants are preferable to drum mixing plants, because of their greater capability to fine-tune the aggregate gradation.

For all types of mixing facilities:

1. Cold aggregates must be handled and stored in a manner that avoids contamination and minimizes degradation and segregation.
2. Filler shall be stored and handled in a separate system from that which handles aggregate
3. The bitumen storage and handling shall be arranged so that contamination of the bitumen by flushing liquids or other materials cannot occur.
4. The bitumen storage tanks shall be capable of holding at least sufficient bitumen for one day's production.
5. Heating of bitumen shall be accomplished by steam coils, electricity or other means that will allow no direct flame to come into contact with the heating tank.
6. Discharge from the plant shall be so arranged as to minimize segregation.
7. Asphalt, which has been stored for more than twenty-four hours or produced at temperatures not in accordance with those specified, shall not be used.
8. The mix shall leave the mixing facility at a temperature between 285°F (140°C) and 325°F (163°C).

B. The hot mix asphalt must be kept clean during hauling and covered if necessary, during transit with canvas or other material that will retain the desired pavement temperatures. The mixtures must not be hauled in such a manner that segregation of the ingredients takes place

or that a crust is formed on the surface, or that mixture will crumble or flatten out when dumped. Trucks that transport the mixture must have metal beds, and the beds must be clean, smooth and free of holes. Before loading, the truck bed is coated with a thin film of a release agent (oil or soap solution) that assists in preventing fresh hot mix asphalt from sticking to the surface of the bed. After the bed is coated, any excess release agent must be drained from the bed.

C. The hot mix asphalt shall be spread with a self-propelled machine spreader having a floating screed assembly controlling the elevation of the strike-oft. The use of road graders or towed spreaders will not be allowed. Means shall be provided to heat the screed uniformly over its full width. The screed shall be equipped with automatic screed controls to adjust automatically to place a uniform mat of desired thickness, grade and shape.

D. Typical members of the paving crew should be: paving superintendent, paver operator, dump person, two screed people, and two people to lute and take care of joints and mat repairs. Co-ordination of the entire crew with the paving superintendent and screed people is essential to achieve all the desired goals.

E. Self-propelled rollers are required as compaction equipment. Towed-type rollers should not be used. Hand-held or vibrating plate compactors can be used in small, inaccessible areas. Steel-wheeled non-vibrating rollers shall have a mass of 10 tons (9 metric tons). Steel wheeled vibrating rollers shall have a mass of 5 tons (4.5 metric tons). Pneumatic tired multi-wheeled rollers shall not be used.

F. The hot mix asphalt shall be placed with a minimum delay after delivery. On no account shall hot mix asphalt be reheated.

G. The day's work shall be organized so that each layer spread covers the full width of the pavement.

H. Hot mix asphalt shall be spread to a depth consistent with the specified compacted thickness. Each layer shall be completed to a surface parallel to the finished surface of the pavement and at a depth below it equal to the compacted thickness of the subsequent layer or layers specified.

I. Hot mix asphalt shall not be placed during rain, or when the air temperature in the shade and away from artificial heat is 40°F (5°C) or less, or while the surface is wet or when the pavement temperature does not comply with the table below.

Pavement surface temperature in shade	Minimum Laying Temperatures Binder Course	Minimum Laying Temperatures Top Coat
40°F – 50°F (5°C – 10°C)	302°F (150°C)	293°F (145°C)
50°F – 60°F (10°C – 15°C)	293°F (145°C)	284°F (140°C)
60°F - 77°F (15°C - 25°C)	284°F (140°C)	275°F (135°C)
Over 77°F (Over 25°C)	275°F (135°C)	266°F (130°C)

J. Maximum laying temperature of the mixture shall be 325°F (163°C)

K. The temperature of the mix shall be measured in the truck just prior to discharging into the paver hopper. A suitable stem type thermometer shall be used. The stem shall be inserted into the mix to a depth of approximately 8" (200mm) at a location at least 12" (300mm) from the side of the truck body. An average of at least two readings shall be adopted as the temperature of the mix.

L. There are three acceptable types of sensing devices used with the automatic screed control system:
   1. The Wand Sensor
   2. The Ultra Sonic Sensor
   3. The Laser Sensor

M. The grade reference used with the above listed sensing devices can be either a fixed string-line tied between graded iron pins or on an existing surface, a previously placed surface, a curb line, etc. A string-line can be erected that will include roll down factors for true grade. The roll down is estimated to be about 25% of the un-compacted mat thickness. To calculate the exact position of the string-line, a survey crew is used to determine the existing grade at approximate intervals of 9 meters (30 feet). The existing grade is subtracted from the theoretical grade for calculation of lift thickness. A roll down factor of 25% of this thickness is added for the string-line grade. Once the string-line is erected, intermediate points of support may be placed under the string-line, especially on curves or in sudden changes of grade. Graded iron pins and intermediate supports should be placed so that they will not interfere with the travel of the machine spreader, but close enough to each other and to the path of the machine spreader that they can hold the string in a convenient position to be reached by the electronic sensors and by a short straight edge placed on the newly laid pavement to visual check on its level.

N. The reference system that is best for the job depends on the existing pavement surface on which the mat is to be placed. If the surface on which the mat is to he placed has an appropriate longitudinal grade, so that the finished pavement is expected to have a constant thickness, then the surface on which the mat has to be placed, an adjoining existing surface, a previously placed surface, a curb line, etc. can be used as the reference system, since a constant roll down is expected. If the longitudinal grade is erratic, so that the finished pavement is expected to have a variable thickness, a string-line should be used as the reference system, to take in account the variable roll down.

O. To maintain proper transverse grade, automatic screed controls use:
   1. A dual sensing systems on both sides of the paver, using two grade references, one on each side of the paver or
   2. A single sensing system on a single side of the paver, using a single grade reference on a single side of the paver, in association with an automatic slope control system: in using the transverse slope control, no specific roll down factors can be applied to grade calculations for slope transfer.

      The Control System that is best for the job depends on the existing pavement surface on which the mat is to be placed. Dual Grade Control System is preferable if the surface on which the mat has to be placed has an unsatisfactory transverse grade. Single Grade Control System transfers the roll-down factors of the grade control side to the opposite side as equal factors, which may or may not be equal. Single Grade Control System is

acceptable in situations where the surface on which the mat is to be placed has an appropriate transverse grade.

P. The area to be surfaced with hot mix asphalt shall be cleared of all foreign or loose material with power blowers, power brooms or hand brooms.

Q. Asphalt surfaces shall be primed prior to the installation of the binder course and topcoat. Prime asphalt surfaces at the rate of 0.05 gallons per square yard. Sprayers shall be capable of spraying the tack coat uniformly through jets in a spray bar at the desired rate of application. Each sprayer shall be fitted with a hand lance. Tack Coat shall be applied, not less than thirty (30) minutes nor more than two (2) hours before asphaltic concrete is placed. When spraying the tack coat, shields shall be used and all necessary precautions taken to protect curbs, gutters, channels, adjoining structures, surfaces and grassed areas. Any pools of tack coat, which may form in small depressions or surface irregularities, shall be brushed out over the adjacent area with brooms or rubber squeegees before the emulsion breaks. In dusty conditions, every precaution shall be taken to prevent freshly coated surfaces from being contaminated by dust or other foreign material.

R. Uniformity of operations is essential in hot mix asphalt paving. Uniform, continuous operation of the paver produces the highest quality pavement. Paving too fast can result in the paver stopping frequently to wait for trucks to bring more mix. The smoothness of the pavement will suffer when the paver stops and starts up again. The paver speed should he matched to the quantity of HMA being delivered to the project to provide a uniform paver speed. The paver must be continuously supplied with enough mix, and at the same time, trucks should not have to wait a long time to discharge their loads into the paver hopper.

S. Starting blocks equal to 1.25 times the thickness of the un-compacted mat are required to set the thickness and to null the screed. By using starting blocks the grade can be very close at the beginning of the operation.

T. Blocks equal to 25% of the un-compacted thickness are used to start from a joint. The 25% additional thickness allows for proper roll-down or compaction while maintaining proper grade. Extended screeds will require multiple shims for each extension area.

U. The screed must be initially heated at the start of each new paving operation. If not, the mix will tear and the texture will look open and coarse, as if the mix were too cold.

V. If the mat being placed is uniform and satisfactory in texture, and the thickness is correct, no screed adjustments are required. But when adjustments are required, they should be made in small increments. Time should he allowed between the adjustments to permit the paver screed to complete reaction to the adjustments sequentially.

W. The minimum un-compacted thickness of a hot mix asphalt course is equal to 1.25 times its minimum compacted thickness, which is equal to three times the nominal maximum size aggregate. When the mat falls below this thickness, it pulls, tears, cools rapidly and generally will not be able to achieve the proper density and pavement smoothness.

X. There are places on many projects where spreading with a paver is either impractical or impossible. In these cases, hand spreading may he required. Placing and spreading by hand should be done very carefully and the material distributed uniformly so there will be no segregation of the mix. When the HMA is dumped in piles, it should be placed upon arrival on steel dump sheets outside the area in which it is to be spread and shall then be immediately laid to the required depth. The material should be deposited from the shovels into small piles and spread with lutes. In the spreading process, all material should be thoroughly loosened and evenly distributed. Any part of the mix that has formed into lumps and does not break down easily should be discarded. After the material has been placed and before rolling starts, the surface should be checked with templates or straightedges and all irregularities corrected.

Y. Asphaltic concrete shall be spread in such a manner as to minimize the number of transverse and longitudinal joints in the pavement.

Z. Transverse joints shall be constructed where the spreading operation is stopped for longer than 20 minutes. Transverse joints in adjoining spreader runs shall be offset by not less than 8 feet (2.44m). Transverse joints shall be offset from layer to layer by not less than 8 feet (2.44m). Transverse joints shall be constructed at right angles to the direction of spreading and be cut to a straight vertical face for the full depth of the layer.

AA. When the construction is ready to stop for the end of the day or for a period longer than 20 minutes, the following procedure is used to form a suitable transverse joint:
1. When the paver is placing the last load, it is shifted into low gear as it approaches the location of the proposed joint.
2. As the hopper empties and the amount of material in the screed chamber decreases below normal operating level, the paver is stopped.
3. The screed is raised and the paver moved out of the way.
4. The mix is then removed from the end of the mat to form a clean, vertical edge.
5. Heavy wrapping paper is placed on the existing surface along the edge of the joint.
6. New material is finally placed on top of the paper and used to form a ramp, from the new surface to the existing surface.

BB. When construction is ready to resume, the following procedure is used to form a suitable transverse joint:
1. The ramp of material is removed along with the board or paper.
2. A straightedge is used to check the longitudinal grade of the mat. Because the paver was running out of material as it laid the last few feet of mat, it is possible that those last few feet taper slightly from the specified level of the mat. If this is the case, a new transverse edge must be cut behind the point where the taper begins.
3. The vertical face of the mat is tack-coated.
4. The paver is backed up to the edge of the mat and the screed rested on the mat surface.
5. The screed is heated while it rests on the mat. This provides some heat to the material at the edge of the mat.
6. The heated screed is raised and shims as thick as the difference between the compacted and the un-compacted mat (approximately 25% of the compacted thickness) are positioned under its ends.

7. The truck with the first load of HMA is backed carefully to the hopper. During discharge of the mix from the truck bed to the paver, it is essential that the truck not bump the paver and cause it to move.
8. The paver starts forward in a low gear.
9. Once the paver has moved away, excess asphalt is cleaned off the surface of the mat and the smoothness of the joint is checked with a straightedge.
10. If the joint is satisfactory, a 6" (150mm) width of the fresh mix is rolled transversely and the joint checked for smoothness. If the joint is satisfactory, transverse rolling is continued in 6" to 12" (150 to 300mm.) increments until the entire width of the roller is on the new HMA. If straight edging shows an uneven joint, the surface of the new mat must he scarified while still warm and workable. Scarification is done with the fine side of the lute. Excess material can then be removed or additional material added, and the joint rolled. During rolling, lumber should be placed along the edges of the mat to prevent the roller from driving off and distorting the longitudinal edge.

CC. Longitudinal joints shall be offset from layer to layer by not less than 6" (150mm). Longitudinal joints shall be parallel to the centerline of the pavement. Alignment of the mat is dependent on the accuracy of the guideline provided for the paver operator and his alertness in following it. Attention to this detail is vital to the construction of a satisfactory longitudinal joint, since only a straight edge can be properly matched to make the joint

DD. Hot joints are formed by two payers operating in echelon. The screed of the rear paver is set to match the grade or thickness of the unrolled edge of the first mat placed. The advantages of a hot joint are that the two mats are automatically matched in thickness; the density on both sides of the joint is uniform because both sides are compacted together, and the hot mats form a solid bond. The disadvantage is that traffic cannot move in one of the lanes while the other is being paved. Both lanes are blocked simultaneously.

EE. In building a cold joint, one lane is placed and compacted. At a later time, after the HMA in the first lane has cooled, the companion lane is placed against it and compacted. Special precautions must be followed to ensure a joint of good quality.

FF. The following procedure is used to form a suitable longitudinal joint:
1. The exposed edge of the first lane shall be formed while hot to a straight line with a dense face, which shall lie between vertical and 45° to the vertical for the full depth of the layer.
2. The unsupported longitudinal edges of spread material should be side tamped to raise the level of the asphaltic concrete slightly to secure maximum edge compaction from subsequent rolling.
3. While placing the companion lane, the paver screed should be set to overlap the first mat by 1" to 2" (25 to 50 mm).
4. The elevation of the screed above the surface of the first mat should he equal to the amount of roll-down expected during compaction of the new mat.
5. The coarse aggregate in the material overlapping the cold joint should be carefully removed and wasted. This leaves only the finer portion of the mixture to be pressed into the compacted lane at the time the joint is rolled.

GG. The placing of hot mix asphalt against abutting structures such as curbs, gutter manhole or adjoining pavement shall be carried out in the same manner as for longitudinal and transverse joints. Any spaces left unfilled between the spreader run and abutting edges shall be filled with sufficient material to the proper height prior to compaction.

HH. After the paving mixture has been property spread; it shall be thoroughly and uniformly compressed by rolling with power rollers.

II. Hot mix asphalt shall be compacted uniformly to the standard specified as soon as it will support rollers without undue displacement. All rolling shall be completed while the mix is at a temperature above 185°F (85°C)

JJ. The sub-soil shall be rolled and compacted by a roller to a minimum density at ninety-five percent (95%) as determined by the Modified Proctor Test (AASHO T99).

KK. Testing required to validate or control the mix supplied is the Paving Contractor's responsibility and will be included in the bid cost for providing these HMA items. Daily maximum theoretical specific gravity (Gmm) values must be made available to the Contractor's density technician for verifying in-place density within four hours of start of production. Asphalt content, gradation, and bulk specific gravity (Gmb) testing shall be performed on the first day of installation for each product used, then done a minimum of once every 400 tons of HMA supplied or every third day for low tonnages that when added together successively do not equal 400 tons. Acceptable average measures are made by use of a correlated nuclear density gauge, a correlated Pavement Quality Indicator or Pave Tracker (non-nuclear) or by cutting (4) cores per lift, per day and testing per AASHTO T-166, Method C. Additional testing shall be performed on any given day once 400 tons of asphalt is placed on that day.

The average sub-lot (daily or 400 tons; whichever is less) in-place density measure for surface course mixtures shall be 94.0% of Gmm with no value less than 92.5% of Gmm. Base and leveling installation of asphalt shall meet local DOT specifications for in-place density measures or average of 92.0% of Gmm, whichever is greater. Surface course longitudinal joints shall be measured directly upon the joint, centered upon by core or density gauge, and shall meet the mat density requirements. Base and leveling course longitudinal joint density measures shall achieve between 95% - 102% of maximum achievable individually, with an average of 98% on any given day.

Process Control testing shall be in accordance with state standards for frequency and methods where the work being performed is done with a minimum of testing meeting the above QC requirements. Process Control Voids and minus #200 gradation shall target mix design with no test outside plus / minus 1.0% and VMA shall target the asphalt mix design value or greater, with no test value less than minimum allowed minus 0.3%.

Print outs of ingredients used shall be supplied for each run of asphalt; data logger Or computer screen shot. Print outs shall be supplied daily with the final load of asphalt ticket.

LL. The exact number of passes of a roller that will be required to obtain adequate density will be determined on a test strip using a nuclear density gauge to measure the density of the mat

after each pass, until maximum achievable density is indicated by the test results. The rolling pattern used on the test strip should be the same that will be used on the remainder of the job. The number of rollers and/or the rate of production will be adjusted accordingly. The Contractor is responsible for all third party testing.

MM. The speed of rollers at all times shall be slow enough to avoid displacement of the mix and shall not be greater than 3 mph (5 km/h).

NN. Steel wheel rollers shall be operated with minimum wetting of rollers.

OO. The driving roll shall be nearer the spreader.

PP. Vibratory mechanisms shall be disengaged before stopping or reversing direction.

QQ. Rollers shall not remain stationary on asphaltic concrete while it is still warm. Roller wheels shall be kept free from any buildup.

RR. The roller shall pass over the unprotected end of the freshly laid mixture only when a transverse joint has to be made.

SS. Initial (breakdown) rolling shall be performed with a static steel-wheeled roller. Transverse joints shall be rolled first, then the longitudinal joint and the outside edge. Breakdown rolling shall continue longitudinally, commencing on the lower side and proceeding to the higher side of the spreader run. The roller shall overhang the unsupported edges of the run by about 4-inch (100mm). Each longitudinal pass shall overlap the previous pass by about 4-inch (100mm) and adjacent passes of the roller shall be of different lengths.

TT. Secondary rolling to obtain required density before the mixture cools to 1850F (850C) shall be performed as soon as possible after initial rolling and shall be performed with a static or a vibratory steel wheeled roller. Rolling shall be carried out longitudinally commencing on the lower side and proceeding to the higher side of the spreader run. Each roller pass shall overlap the previous pass and adjacent passes shall be of different lengths.

UU. Final rolling for the improvement of the surface while the mixture is still warm enough to permit removal of any roller marks shall be performed with static steel wheeled roller.

VV. When paving in echelon, the edge of the run common to adjacent spreaders shall be left unrolled for a width of 8 inch (200mm) until the longitudinal joint has been constructed. This strip shall be rolled together with the edge of the adjacent spreader run. Rolling shall commence before the temperature of the material along the edge of the first spreader run has fallen below 95 0C (203 0F).

3.2 ACCEPTANCE OF PAVING WORK – REMEDY WORK

A. Each successive layer shall not be commenced until the underlying layer has been approved following inspection and/or testing.

B. Acceptance of paving work as far as compaction and stability specifications is concerned will be based on tests to be performed on core samples taken from each layer shortly after application. Test results shall be submitted to synthetic surfacing contractor.

C. Should a section of the work be not acceptable on the basis of inadequate compaction and/or the mixture became loose and broken, mixed with dirt or in any way defective, it shall be removed and replaced with fresh mixture which shall be immediately compacted to conform with the surrounding area.

D. Areas of one (1) square inch or more showing excess of bitumen shall be removed and replaced.

E. On completion of placement and compaction, pavement courses shall comply with the tolerances itemized in the following table.

Item	Characteristic	Tolerance
Top Coat	Level	+2mm/-2mm from design levels
	Thickness	+5mm/-0mm from design levels
	Flatness	3mm maximum departure from a 3m straight-edge in all directions
Binder Course	Level	+4mm/-4mm from design levels
	Thickness	+5mm/-0mm from design levels
	Flatness	4mm maximum departure from a 3m straight-edge in all directions

F. Surface shape of each layer of pavement shall be such that water cannot accumulate at any point and the surface shall free drain to drainage channels.

G. The whole surface of each layer of pavement should be checked for levels by a local surveyor, and for flatness with a 10 foot straightedge in all directions; the surface shall also be flooded and inspected for ponding, "bird baths", ridges, etc. After testing, all high and low areas shall be marked on the leveling course surface.

H. Low areas shall be remedied by cutting out the course to full depth (or to a minimum depth of 3/4" – 1” (20 - 25 mm)) and replacing with the correct hot mixture. The repaired area shall be thoroughly compacted to the specified tolerance. First the area must be fully tack coated. No filling by using sand mix shall be allowed. Sand asphalt lacks sufficient internal strength. No tar emulsions such as 'jet shield" or similar products shall be applied to the surface. Nor shall any other type at asphalt or tar leveling or sealing product (hot or cold) be coated on the surface. Under specific conditions and with synthetic surfacing contractor’s prior approval, a polyurethane underlayment material as recommended by the manufacturer can be used for correcting small low areas. Extensive use of Polyurethane underlayment is no substitute for

proper installation and leveling of the asphalt. The depth of the underlayment layer must be limited to 1/4" (6 mm) or less.

I. High areas shall be remedied by cutting out the course to full depth (or to a minimum depth of 3/4” – 1” (20 - 25 mm)) and replacing with the correct hot mixture. The repaired area shall be thoroughly compacted to the specified tolerance. In some cases, it is practical to repair high areas and ridges by heating with a "hot iron" or a butane torch and scraping them off. These areas must be rolled smooth afterwards.

3.3 CURING OF HOT MIX ASPHALT INSTALLATIONS

A. The asphalt-leveling course will have to cure a minimum of twenty-eight (28) days prior to installation of the synthetic surface in order to allow the escape of surface volatiles, oils. Etc.

END OF SECTION 321216.36

SECTION 321218 - STONE BASE COURSE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide crushed stone base (with prime) constructed on the compacted subgrade where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

B. Related work:
   1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
   2. Section 02513 - Asphaltic Concrete Paving.

1.2 QUALITY ASSURANCE

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

1.3 SUBMITTALS

A. Comply with pertinent provisions of Section 01340.

B. Certificates, signed by materials producer, stating that materials meet the specified requirements.

C. Contractor is responsible for all third party testing.

1.4 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01640.

PART 2 - PRODUCTS

2.1 COARSE AGGREGATE

A. Furnish a coarse aggregate (retained on No. 4 sieve) consisting of hard, durable particles of stone, reasonably free from soft, thin, elongated or laminated pieces and deleterious substances.

B. Furnish aggregate with an abrasion loss of less than 65% as measured by the Los Angeles Abrasion Test.

2.2 FINE AGGREGATE

A. Furnish a fine aggregate consisting of material produced by stone crushing operations.

B. Liquid limit shall not exceed 25 and the plasticity index shall not exceed 6 when tested in accordance with AASHTO T-89 and T-90, respectively.

2.3 COMPOSITE MIXTURE

A. Produce in one crushing operation or by blending the fine and coarse aggregate in proper proportions.

B. After the materials have been mixed, laid down, and initial compaction operations begun, the composite mixture shall conform to the following:

Sieve Designation	Percent by Weight Passing
2"	100
1-1/2"	95-100
1"	70-100
1/2"	48-75
No. 4	30-50
No. 30	11-30
No. 200	0-12
Liquid Limit	25 max.
Plasticity Index	6 max.

2.4 PRIME ASPHALT

A. Use prime complying with requirements of North Carolina Department of Transportation Standard Specifications for Highway Construction subsections 305.4.6 Application of Prime Coat and Subsection 401.4.18 Application of Prime or Tack Coat, latest revisions and supplements.

B. Provide prime coat from a supplier listed on the most recent edition of NCDOT Qualified Product List 38.

PART 3 - EXECUTION

3.1 PREPARATION OF SUBGRADE

A. Proofroll all areas to receive crushed stone paving.

1. Make not less than three passes over the full area, using a 35 to 50 ton rubber tired roller.

B. Remove all soft, unstable or unsuitable material that will not compact readily.
   1. Remove to full depth of unsuitable material, or to a depth of 30", whichever is less.
   2. Replace with satisfactory materials.

C. Fill all holes, ruts or depressions which develop in the subgrade with approved on-site material, bringing subgrade to indicated line and grades.

D. Compact subgrade using suitable construction procedures to provide not less than 95% Standard Proctor Maximum Dry Density.

E. Seal roll the subgrade surface with a steel wheel roller, sealing the surface against excessive water infiltration.

3.2 PLACING AND MIXING OF PAVING MATERIAL

A. Place aggregates using spreader boxes or other approved spreaders uniformly on one operation.

B. Take care to avoid segregation of the fine from the coarse aggregate during handling, spreading or shaping operations.

C. Mix, while at proper moisture, with motor grader or other equipment and maintain to required section and grade until thoroughly compacted.

3.3 ROLLING AND COMPACTING

A. Perform using 3-wheel steel wheel roller weighing not less than 10 tons, tandem roller weighing at least 8 tons, or other rollers approved by the Engineer.

B. Start rolling at edges and proceed toward the center, continue rolling until aggregates are firmly keyed or set.

C. When initial compaction is completed, should voids remain, place fine aggregates on the surface in an amount only sufficient to fill the voids.

D. Broom, wet and roll until coarse aggregate is set, bonded and thoroughly compacted for full width and depth.

3.4 ALLOWABLE TOLERANCES

A. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 1/2".

1. Depth measurements will be made by digging through the base at intervals no closer than 250', nor greater than 500' apart.
2. Where thickness is less than depth specified minus 1/2", it shall be corrected as directed by the Engineer.

B. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in 10', parallel to the center line of the roadway nor more than 1/2" from a template conforming to the cross sections shown on the plans.

C. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.

3.5 PLACING PRIME COAT

A. Allow base course to season sufficiently to permit uniform penetration.

B. Do not apply to wet surfaces or when the temperature is below 60ºF in the shade and falling, or below 55ºF in the shade and rising.

C. Clean surfaces of all dust, dirt, clay, etc. using mechanical brooms, etc.

D. Apply prime material, using pneumatic mounted distributors, at a rate of 0.25 to 0.30 gallon per square yard.

E. Permit no traffic on primed surfaces until bituminous material has penetrated and dried sufficiently that it does not pick up under traffic.

3.6 MEASUREMENT AND PAYMENT

A. No separate measurement or direct payment will be made for this work and all costs for same shall be included in the price bid for the work to which it pertains.

END OF SECTION 321218

SECTION 321313 - CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Driveways.
   2. Roadways.
   3. Parking lots.
   4. Curbs and gutters.
   5. Sidewalks

1.2 ACTION SUBMITTALS

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

B. Samples: For each exposed product and for each color and texture specified.

C. Other Action Submittals:
   1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.3 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

B. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

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

B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.

C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.

D. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.

E. Deformed-Steel Wire: ASTM A 496/A 496M.

F. Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars [; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating]. Cut bars true to length with ends square and free of burrs.

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

2.2 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C 150, portland cement
      a. Fly Ash: ASTM C 618
      b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
   2. Blended Hydraulic Cement: ASTM C 595,

B. Normal-Weight Aggregates: ASTM C 33,

C. Water: Potable and complying with ASTM C 94/C 94M.

D. Air-Entraining Admixture: ASTM C 260.

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

F. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable,[free of carbon black,] nonfading, and resistant to lime and other alkalis.

2.3 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, [Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry] [or] [cotton mats].

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

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B,

dissipating.

2.4 RELATED MATERIALS

A. Joint Fillers: [ASTM D 1751, asphalt-saturated cellulosic fiber] [or] [ASTM D 1752, cork or self-expanding cork] in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.5 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), with the following properties:
   1. Compressive Strength (28 Days): 4000 psi
   2. Maximum Water-Cementitious Materials Ratio at Point of Placement: .50
   3. Slump Limit: 4 inches
   4. Air Content: 4-1/2percent plus or minus 1.5 percent.

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

C. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.

D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions.

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M[and ASTM C 1116/C 1116M]. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Proof-roll prepared subbase surface below to identify soft pockets and areas of excess yielding.

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

3.2 EDGE FORMS AND SCREED CONSTRUCTION

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

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

3.3 STEEL REINFORCEMENT

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

3.4 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

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

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

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

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

3.5 CONCRETE PLACEMENT

A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

B. Comply with ACI 301 (ACI 301M) requirements for measuring, mixing, transporting, placing, and consolidating concrete.

C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

D. Screed paving surface with a straightedge and strike off.

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

3.6 FLOAT FINISHING

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

B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
   1. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions.
   1. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
   2. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.

3.7 CONCRETE PROTECTION AND CURING

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

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

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

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

E. Curing Methods: Cure concrete by [moisture curing] [moisture-retaining-cover curing] [curing compound] [or] [a combination of these].

3.8 PAVING TOLERANCES

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

1. Elevation: 3/4 inch (19 mm).
2. Thickness: Plus 3/8 inch (10 mm), minus 1/4 inch (6 mm).
3. Surface: Gap below 10-foot- (3-m-) long, unleveled straightedge not to exceed 1/2 inch (13 mm).
4. Joint Spacing: 3 inches (75 mm).
5. Contraction Joint Depth: Plus 1/4 inch (6 mm), no minus.
6. Joint Width: Plus 1/8 inch (3 mm), no minus.

3.9 REPAIRS AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

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

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

END OF SECTION 321313

SECTION 321373 - PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Expansion and contraction joints within cement concrete pavement.
   2. Joints between cement concrete and asphalt pavement.

1.2 SUBMITTALS

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

B. Samples: For each type and color of joint sealant required.

C. Product certification and test reports.

D. Compatibility and Adhesion Test Reports: From sealant manufacturer.

1.3 QUALITY ASSURANCE

A. Preconstruction Compatibility and Adhesion Testing: Submit samples of materials that will contact or affect joint sealants to joint-sealant manufacturers for testing according to AASHTO M153 for Type I,II, or III; or be a bituminuous type that meets AASHTO M213 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 32 articles.

B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 32 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backing materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer based on testing and field experience.
   1. Primers: Product recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Colors of Exposed Joint Sealants: As indicated by manufacturer's designations and coordination with architect.

2.3 COLD-APPLIED JOINT SEALANTS

A. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, nonsag silicone sealant complying with ASTM D 5893 for Type NS.
   1. Available Products:
      a. Crafco Inc.; RoadSaver Silicone.
      b. Dow Corning Corporation; 888.
      c. NCDOT approved equal

B. Type SL Silicone Sealant for Concrete and Asphalt: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D 5893 for Type SL.
   1. Available Products:
      a. Crafco Inc.; RoadSaver Silicone SL.
      b. Dow Corning Corporation; 890-SL.
      c. NCDOT approved equal.

2.4 HOT-APPLIED JOINT SEALANTS

A. Sealant for Concrete and Asphalt: Single-component formulation complying with ASTM D 6690.
   1. Available Products:
      a. Koch Materials Company; Product No. 9005.
      b. Koch Materials Company; Product No. 9030.
      c. Meadows, W. R., Inc.; Sealtight Hi-Spec.
      d. NCDOT approved equal.

2.5 JOINT SEALANT MATERIALS

A. General: Provide joint-sealant backer materials that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by joint-sealant manufacturer based on field experience and laboratory testing.

B. Type L – A closed-cell expanded polyethylene foam backer rod. Use in roadway and bridge joints with Type NS silicone only.

C. Type M – A closed-cell polyolefin foam backer rod which has closed-cell skin over an open-cell core. Use in roadway and bridge joints with both silicon sealant types

D. Backer Rods for Cold-Applied Sealants: ASTM D 1622, 2lbs/cf minimum; ASTM D 1623 25 psi minimum; ASTM C 509 0.5% by volume maximum.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience.

C. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

D. Install backer materials to support sealants during application and at position required to produce optimum sealant movement capability. Do not leave gaps between ends of backer materials. Do not stretch, twist, puncture, or tear backer materials. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

E. Install sealants at the same time backings are installed to completely fill recesses provided for each joint configuration and to produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

G. Clean off excess sealants or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

END OF SECTION 321373

SECTION 321823.39 – TRACK & FIELD QUALITY CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. General provisions of Contract, including General and Supplementary Conditions and other Division-1 Specifications Sections, apply to this Section.

1.2 SUMMARY

A. This section covers all labor and materials required to provide survey and certification of key construction elements and the final track & field facility. The GC is responsible for completing all survey work.

1.3 CODES AND STANDARDS

A. The survey work must be completed by a licensed surveyor or engineer.

B. Codes and standards follow the current guidelines set forth by World Athletics (formerly IAAF), the National Collegiate Athletic Association (NCAA) and National Federation of State High School Associations (NFHS). Where discrepancies are noted between these various governing bodies, the rules of the NFHS shall be enforced.

1.4 ABREVIATIONS

A. WA = World Athletics

B. IAAF = International Association of Athletics Federations

C. NCAA = National Collegiate Athletic Association

D. NFHS = National Federation of State High School Associations

E. T&F = Track & Field

F. SS = Synthetic Surface

G. SSC = Synthetic Surfacing Contractor

H. SSM = Synthetic Surfacing Manufacturer

I. GC = General Contractor

1.5 RELATED SECTIONS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section. The following Sections are specifically related to this Section:
   1. 116833.43 T&F Equipment
   2. 321823.39 T&F Quality Control
   3. 321823.40 T&F Synthetic Surface
   4. 321823.41 T&F Line Markings
   5. 321823.42 T&F Event Materials

1.6 SUBMITTALS

A. The following information must be submitted by the GC, this is the typical order of construction:
   1. The GC MUST identify (mark on the survey submittal in RED) all areas out of tolerance with the Bid Documents and NFHS rules.
   2. The GC MUST identify the elevations, the slope percentage, (mark on the survey submittal with slope arrows with % of slope value, i.e. 0.8% slope) all slopes (lateral, radial and in the direction of running & throwing), as identified in these Bid Documents.
   3. Athletes run counterclockwise around the oval and all elevations are in relation to this direction.
   4. Turn 1: Immediately after installation of the new precast channel drain at the inside of lane 1:
      a. Survey the new precast channel drain with elevations at:
         1) 1 point at the beginning & end of channel drain plus 3 points equally spaced.
         2) At the right-hand edge of the concrete surrounding the precast channel (in the direction of running).
   5. Turn 2: Immediately after installation of new the precast channel drain at the inside of lane 1 and the at the outside of lane 6:
      a. Survey the new channel drain with elevations at:
         1) 1 point at the beginning & end of channel drain plus 3 points equally spaced around the turn.
         2) Elevations at lane 1 and lane 6 should be perpendicular to each other.
         3) At the right-hand edge of the concrete surrounding the precast channel (in the direction of running) at lane 1 and the left-hand edge of the concrete surrounding the precast channel at lane 6.
      b. At the infield concrete curbs that are parallel to channel drain, survey the right-hand edge of the infield curb, with elevations at:
         1) Perpendicular to the elevation points taken at the precast channel drain, listed above in Submittals, 4., a., 1).
         2) If the concrete curb is notched or held down, then two elevations are required at the bottom & top of the notch.
      c. At the straight portion of the concrete curb in the D-area (area inside the turn of the track oval & looks like the capital letter D), take 3 elevations equally spaced

along the straight concrete curb that align with the elevations at the channel drain on the turn and provide a radial slope arrow with percentage.

d. Provide verification that the 400 meter oval fits between the installed channel drain and outside concrete curb with the specified radius and number of running lanes, prior to installing T&F asphalt subbase.

6. After installation of all field events:
   a. Survey all embedded field events with elevations as follows:
      1) 4 corners of all long/triple jump sand pits (at the nearest edge of sand).
      2) 4 corners of all long/triple jump take-off board trays.
      3) 4 corners of all pole vault boxes (at the top of flange) and the nearest edge of surrounding concrete.
      4) 4 corners of all throw pads that surround the flat circle with the metal ring.
      5) 1 spot elevation at the center of the flat circle.
   b. Survey all field events with dimensions to determine:
      1) The take-off boards are centered on the sand pit.
      2) The take-off boards are parallel to the nearest edge of the sand pit.
      3) The take-off boards (not the tray) are the correct distance from the sand pit.
      4) The long axis of the pole vault boxes is parallel to the runway lines and all vault boxes are aligned with each other or as designed.
   c. Survey Shot Put Landing Area:
      1) Provide spot elevations, along both sides, at the middle and far end of the concrete border.
      2) Provide spot elevation at the middle of the concrete border at the end of the arc landing area.
      3) Provide spot elevations at the top of the rock dust down the center of the landing area, aligned with the spot elevations in item C. 1 & 2 above.
7. After installation of the asphalt:
   a. Survey the oval's asphalt subbase, with elevations at the inside edge of Lane 1, inside edge of Lane 4 and outside edge of lane 6 at:
      1) All spot elevations to align with elevations listed above in item Submittals, 4 & 5.
      2) Spot elevations at the 4 PCs and middle of straights
      3) All sprint chute corners and at the right-hand side of lane 1 & outside edge of lane 6 at the start lines for the 110 meter & 100 meters, provide lateral slope and slope in the direction of running.
   b. Survey the asphalt for all field events with the following elevations to determine the event meets the Bid Documents:
      1) At the D-areas for long/triple jump runways, pole vault runway, high jump area and discus throwing pad. Provide slope arrows with percent of slope.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 321823.39

SECTION 321823.40 - TRACK & FIELD SYNTHETIC SURFACE

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers all labor and materials required to install a first-class track & field surface. The SSC is responsible for installing:
   1. All T&F SS materials and labor
   2. All T&F line markings

B. The GC is responsible for all work.

1.2 CODES AND STANDARDS

A. Codes and standards follow the current guidelines set forth by World Athletics, the National Collegiate Athletic Association and National Federation of State High School Associations. Where discrepancies are noted between these various governing bodies, the rules of the NFHS shall be enforced.

1.3 ABREVIATIONS

A. WA = World Athletics (formerly IAAF)

B. NCAA = National Collegiate Athletic Association

C. NFHS = National Federation of State High School Associations

D. T&F = Track & Field

E. SS = Synthetic Surface

F. SSC = Synthetic Surfacing Contractor

G. SSM = Synthetic Surfacing Manufacturer

H. GC = General Contractor

I. SBR = Styrene Butadiene Rubber

J. EPDM = Ethylene Propylene Diene Monomer

K. UV = Ultra-Violet

L. PU =Polyurethane

M. MDI = Methylene Diphenyl Isocyanate

N. TDI = Toluene Diisocyanate Isocyanate

1.4 RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section. The following Sections are specifically related to this Section:
   1. 116833.43 T&F Equipment
   2. 321823.39 T&F Quality Control
   3. 321823.40 T&F Synthetic Surface
   4. 321823.41 T&F Line Markings
   5. 321823.42 T&F Event Materials

1.5 SUBMITTALS

A. The following information must be submitted by the SSC prior to installation.
   1. The daily on-site Project Manager/Superintendent/Foreman Qualifications:
      a. This person will be on-site during all SS operations.
      b. Once the installation of the SS begins, no substitution of this person is allowed.
      c. This person must have completed a minimum of 5 facilities which are certified to meet NCAA or WA rules & regulations in the past 3 years.
   2. Standard printed specifications of the SS system that is being installed and notify the Design Team of any deviations between this technical specification and the SSM specification.
   3. Installation process and requirements for subbase (stone, asphalt and concrete) and any conditions that may limit the SS installation or affect quality of installation.
   4. Temperature/climatic conditions limiting quality of installation.
   5. Standard specification and application for recommended subbase primers, crack filler, patching and leveling material.
   6. One product sample for the Owner, a minimum of 6" x 6" in size, the same color, same texture, same thickness, etc. of the SS being installed. This must be a representative sample of the product. This sample must be submitted and approved by the Owner, prior to installation. During installation of the SS or at completion of the project this sample may be used as a comparison to judge the quality of the installed product. Separate SS samples are required for each color being installed.
   7. Material safety data sheets on all individual components of the product being installed.
   8. Provide a letter stating the SSC reviewed and accept the concrete and asphalt specification. Prior to installing the SS, the SSC must accept the installation of the concrete and asphalt as acceptable to receive the SS.
   9. Provide a letter from the SSM approving the SSC as a certified/acceptable installer of their SS.
   10. Written notice and acceptance that all inground track equipment is installed as per the Contract Documents and as per the rules of the sport.

B. The following information shall be submitted after completion of the specified work:
   1. SSC's and SSM's standard Warranty, for installation and material respectively, noting any exceptions to the Warranty information included in this Specification Section.
   2. Provide a "Care and Maintenance" manual for the Owner's use in maintaining the SS.

1.6 QUALITY ASSURANCE

A. The GC shall coordinate all necessary information to the other sub-contractors and Owner that are working on the site. For example:
   1. Watering and/or mowing of the adjacent natural grass.
   2. The use of curing agents in concrete.
   3. All areas receiving SS must have a vapor barrier under the concrete subbase.
   4. Subbase and concrete curb tolerances.
   5. No vehicles allowed on the wearing layer of asphalt, etc.

B. GC must ensure all finished products are properly protected throughout the construction of this facility. For example:
   1. The asphalt contractor must take great care NOT to damage the installed concrete curbs when rolling the asphalt or stone aggregate.
   2. The installed junction boxes are NOT damaged by adjacent construction.
   3. The installed precast channel drain is NOT damaged by adjacent construction, etc.

C. Prior to installation, or during installation or at completion of installation of the SS, if the Owner has any question or doubt about the quality or formulation of the material, the SSC shall have the product tested. If the product meets these specifications, then the Owner shall pay for the cost of the testing; if the product does not meet these specifications or the SSM's specifications, then the SSC shall pay for the testing. Any material failing to meet specifications will be replaced with new material at the SSC's expense.

D. Slopes & Tolerances as per the NFHS rule book:

   1. Track Oval:
      a. Maximum lateral inclination of the oval shall not exceed 2:100 or 2% (outside to inside running lane).
      b. Maximum downward inclination in the direction of running shall not exceed 1:1000 or 0.1%.
      c. The inside edge of lane one should be at the same elevation all the way around oval.
      d. When feasible, it is recommended that there be at least a 1 meter obstacle-free zone on the inside and on the outside of the track oval.
   2. Throwing Events (Shot Put, Discus and Javelin):
      a. Hammer is not an official NFHS event.
      b. Javelin is listed as a NFHS event, but most States do not participate in this event.
         (a) Maximum lateral inclination of the Javelin runway is NOT stated, so assume it shall not exceed 2:100 or 2% (similar to the other runways).
      c. Maximum downward inclination from the throwing area to the landing area shall not exceed 1:100 or 1%.

d. Throwing circles shall be level.
e. Throwing sector shall be 34.92 degrees.

3. High Jump:
   a. Maximum downward inclination in the approach shall not exceed 1:100 or 1%.
   b. Hard and unyielding surfaces, such as but not limited to concrete, wood, or asphalt, that extend out from beneath the sides and back of the high jump landing pad shall be padded with a minimum of 2 inch dense foam or other suitable material.
4. Pole Vault:
   a. Maximum lateral inclination of the runway shall not exceed 2:100 or 2%.
   b. Maximum downward inclination in the direction of running & jumping shall not exceed 1:1000 or 0.1%.
   c. Hard and unyielding surfaces, such as but not limited to concrete, wood, or asphalt, around the landing pad, or between the planting box and the landing system, shall be padded or cushioned with a minimum of 2 inch dense foam or other suitable material.
5. Long & Triple Jump:
   a. Maximum lateral inclination of the runway shall not exceed 2:100 or 2%.
   b. Maximum downward inclination in the direction of jumping shall not exceed 1:1000 or 0.1%.
6. Design Notes:
   a. Do NOT design the slopes at their maximum, please use 80% or 90% of their maximum to allow for some margin of error for the contractor during construction.
   b. Install the steeplechase water jump pit level, if required, not a high school event.
   c. The asphalt subbase and synthetic surface shall allow for an 1/8” deviation in a 10’ radius.

1.7 SPECIAL PROJECT CONDITIONS

A. The SSC will provide a project manager/superintendent/foreman on-site daily through the completion of the SSC’s portion of the contract.

B. This on-site person shall remain on-site through the completion of the project. Substitution of this person is not permitted.

C. Prior to installing any concrete, the GC must verify if any curing compounds or agents are allowed or acceptable.

1.8 SPECIFIC SCOPE OF WORK

A. The SSC shall verify the entire T&F subbase and all events to determine that:
   1. The T&F SS for the 400 meter track oval will accurately fit onto the Asphalt Paving base.
   2. The slopes, tolerances and elevations meet the required tolerances of these specifications and the rules of the NFHS.
   3. No bird baths or areas exceed the allowable limits as specified.

B. The SSC shall provide all labor, materials and equipment to perform the following work as designated in these specifications:
   1. The installation of all T&F SS materials and line markings.
   2. Provide technical assistance and approve the Asphalt Paving base work as required in the specifications.
   3. Review and approve installation of all T&F event inground equipment before any T&F SS is installed as specified and shown on the project drawings.
   4. Brush, blow, clean, wash down, etc. all areas to receive SS, as often as necessary during the installation of the T&F SS.
   5. Install removable SS (full pour polyurethane) plugs (with Mondo if applicable) in all pole vault boxes and long/triple jump take-off boards (1" x 1" corner notches on one short side (12" side) of the plug) apply SS to the communication box covers.
   6. SSC must prevent PU from entering the channel drain's slot opening. The drainage slot opening shall be neatly trimmed out (vertical 90 degree cuts only), after the synthetic surfacing installation. No excess polyurethane is allowed on the inside of the drainage slot opening.
   7. Repair all damaged areas, clean-up all glue, and remove excess PU, primers and similar products. All trim cuts shall be neat and clean; on all curves & straights the trim-out shall follow the adjoining object for accuracy and neatness, i.e. concrete curb or painted line, etc.

1.9 WARRANTY/GUARANTEE

A. Warranty period to be seven years on the BASE BID and ten years on ALTERNATE #1 & ALTERNATE #2 for T&F SS.

B. Warranty shall cover all labor and materials to remove existing material and replace with new material during the warranty period.

C. Warranties / Guarantees specified in this section shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and are in addition to and run concurrent with other warranties/guarantees made by the GC under requirements of the Contract Documents.

D. The following are inclusive of the term "Track & Field Synthetic Surface" for provisions of the guarantee:
   1. All slopes & tolerances as required in this specification.
   2. T&F SS product as specified and represented by the SSC and SSM.
   3. All materials and products specified.
   4. All line markings installed in accordance with the Contract Documents.

E. GC Guarantee: Provide in writing a "Full System Guarantee" agreement. The President/Principal(s) of both the SSC and the SSM (if different) shall sign this document and it shall include the following:
   1. All work executed under this section will be free from defects of material and workmanship for the specified period from date of Substantial Completion/Acceptance of the Owner.

2. Any defects will be remedied on written notice at no additional cost to the Owner.
3. The warranty shall not be prorated.
4. All material shall be guaranteed to the extent that the surfacing:
   a. Has been manufactured, applied and will perform in accordance with these specifications, the SSC and SSM specifications and industry standards.
   b. Will hold fast and/or adhere to the primer, asphalt, concrete, edging, filler, patches or overlay materials.
   c. Is Ultra-Violet resistant, will not bubble, blister, fade, crack, or wear excessively during the warranty period.
5. One replacement of high stress areas during the warranty period at no cost to the Owner; High stress areas are estimated at 300 square yards. If possible, all replacements must be cut out to the nearest painted line and all painted lines repainted.
6. One restriping of the T&F Line Markings during the warranty period at no cost to the Owner.

F. The SSC shall, in the presence of the Owner, inspect the T&F SS each year until the end of the warranty period, or at any time requested by the Owner. Any defects in workmanship or materials (at no fault of the Owner) shall be repaired at the expense of the SSC to the satisfaction of the Owner.

G. The Warranty does not cover any defect, failure, damage caused by or connected with abuse, neglect, deliberate acts, acts of God, casualty or loads exceeding the SSC's "Care and Maintenance" manual.

PART 2 - PRODUCTS

2.1 TRACK & FIELD SYNTHETIC SURFACE

A. The SS shall be as per the SSC's specifications, plus the following requirements and where discrepancies exist, they shall be brought to the attention of the Owner or Owner's representative prior to Bidding and Installation.

B. BASE BID: The following SSC and their T&F SS products are approved.
1. Beynon Sports Surfaces, Mike Smoak cell 443-465-8040.
   a. Base Bid Product: BSS 300 (Sandwich System).
2. GeoSurfaces Southeast, Danny Williamson cell 828-399-1519.
   a. Base Bid Product: Stobitan SW (Sandwich System).
3. Rekortan, Doug Stone cell 518-960-8399.
   a. Base Bid Product: Rekortan M or Spurtan BV (Sandwich System).

C. ALTERNATE #1: The following SSC and their T&F SS products are approved.
1. Beynon Sports Surfaces, Mike Smoak cell 443-465-8040.
   a. Product is BSS 1000 (Full Pour Polyurethane, not the BSS 1000ML, System.
2. Rekortan, Doug Stone cell 518-960-8399.
   a. Product is Rekortan M99 (Full Pour Polyurethane System).

D. ALTERNATE #2: The following SSC and their T&F SS product is approved.

1. GeoSurfaces Southeast, Danny Williamson cell 828-399-1519.
    a. Product is Mondo Super X 720 K39.

E. Thickness
1. SSC shall install the T&F SS at the current WA certified thickness.

F. Colors
1. SSC to provide their standard colors (no custom colors), TBD with shop drawings during the submittal phase.
2. The standard colors for T&F SS is a brick red with an accent color of medium gray for the 4 x 100m relay exchange zone.

G. Materials: BASE BID FOR SANDWICH SYSTEM
1. All materials must be approved by the SSM & SSC and must be compatible with each other. All materials must meet the SSM's standard specifications, brochures and website information plus these specifications.
2. Primer:
    a. SSC approved primer for asphalt, concrete and T&F SS.
3. SBR Rubber:
    a. The rubber granules are recycled SBR rubber, cleaned, processed and chopped. Granules containing any trace of fiber or steel are unacceptable.
    b. They must not exceed 4.0mm in size and contain nominal dust.
4. Polyurethane Binder:
    a. Single component, 100% polyurethane, moisture curing binding agent.
    b. Binder shall contain no solvents and no extenders.
5. Polyurethane Seal Coating:
    a. Two-component thixotropic pigmented polyurethane containing no solvents, TDI or mercury.
6. EPDM Granules:
    a. The synthetic rubber granules must be EPDM granules containing a minimum of 20% pure EPDM, shore A hardness of 60, tensile strength of >6MPa, elongation to break >700%, have long-term color fastness and resistance to UV radiation.
    b. The preferred granule size is 1.0mm to 3.5mm in size, but no greater than 4mm in size is allowed and have a low dust content.
    c. The EPDM granules must match the color of the PU.
7. Polyurethane Coating:
    a. The two-component, pigmented polyurethane is compounded from the SSM's proprietary polyol and isocyanate components, 100% MDI (no TDI allowed).
    b. The PU contains no heavy metals (mercury, lead, etc.) as defined by the EPA.
    c. It must be UV stable.
    d. The PU must have no solvents or fillers added.
8. All layers of PU and EPDM granules must match in color.
9. The same components and materials utilized in the SSM's WA approved sandwich system must be used in this system.

H. Materials: ALTERNATE #1 FOR FULL POUR POLYURETHANE SYSTEM
1. All materials must be approved by the SSM & SSC and must be compatible with each other. All materials must meet the SSM's standard specifications, brochures and website

information plus these specifications.

2. Primer:
    a. SSC approved primer for asphalt, concrete and T&F SS.
3. SBR Rubber:
    a. The rubber granules are recycled SBR rubber, cleaned, processed and chopped. Granules containing any trace of fiber or steel are unacceptable.
    b. They must not exceed 4.0mm in size and contain nominal dust.
4. EPDM Granules:
    a. The synthetic rubber granules must be EPDM granules containing a minimum of 20% pure EPDM, shore A hardness of 60, tensile strength of >6MPa, elongation to break >700%, have long-term color fastness and resistance to UV radiation.
    b. The preferred granule size is 1.0mm to 3.5mm in size, but no greater than 4mm in size is allowed and have a low dust content.
    c. The EPDM granules must match the color of the PU.
5. Polyurethane Coating:
    a. The two-component, pigmented polyurethane is compounded from the SSM's proprietary polyol and isocyanate components, 100% MDI (no TDI allowed).
    b. The PU contains no heavy metals (mercury, lead, etc.) as defined by the EPA.
    c. It must be UV stable.
    d. The PU must have no solvents or fillers added.
6. All layers of PU and EPDM granules must match in color.
7. The same components and materials utilized in the SSM's WA approved sandwich system must be used in this system

I. Materials: ALTERNATE #2: MONDO SUPER X 720 K39

1. Prefabricated rubber product with a honeycomb (elongated hexagon-shaped) design and engineered shock absorption layer and an embossed texture wearing layer. An impermeable product.
2. Rubber: A closed cell structure, based on special isoprenic rubbers, mineral fillers, stabilizing agents and pigmentation.
3. Layers: The two layer system has differential elasticity between the top and bottom layers. The two layers are calendered & vulcanized together.
4. Rolls of Rubber:
    a. The width shall be between 3' to 6'.
    b. The length shall be between 19'-8" to 52'-5".
5. Adhesive:
    a. Only use approved and manufactured products by Mondo.
    b. Two-part PU.
    c. PU 100 used for installation on asphalt.
    d. PU 105 used for installation on concrete.
6. Bricks: Only use gray concrete utility bricks (2"x4"x8") on all seams.
7. All installed materials must be the standard materials as identified in the SSC's specifications and brochures

PART 3 - EXECUTION

3.1 INSPECTION AND ACCEPTANCE

A. Examine all surfaces and contiguous elements to receive work of this section and correct, as part of the Work of this Contract, any defects affecting installation.

B. Commencement of work will be construed as complete acceptability of surfaces and contiguous elements.

3.2 INSTALLATION REQUIREMENTS

A. The following installation requirements must be met by the GC:
   1. Installation by SSC approved project manager/superintendent, applicators and technicians. Local laborers may be hired for non-technical work, only.
   2. Upon SSC arrival, the GC shall have the subbase clean and free of dirt, oil, grease or any other residue. Once the SSC begins installation, it is the SSC's responsibility to clean the areas to receive the SS.
   3. Apply SS in dry weather when pavement and atmospheric temperatures are 50 degrees or above and are anticipated to remain above 50 degrees for 24 hours after SS installation.

3.3 PRODUCT INSTALLATION

A. As per the SSC's standard installation literature & brochure and must follow all industry standards.

B. Installed Thickness
   1. SSC must bid and install their product at the current WA certified thickness.

C. Installation: BASE BID FOR SANDWICH SYSTEM
   1. The SSC shall only install the PU system after the subbase has been checked for moisture content, excess moisture can affect the quality of installation and longevity. No PU shall be installed if rain or inclement weather is imminent.
   2. Primer:
      a. Install PU primer to ensure the PU adheres to the subbase and each layer adheres to the previously installed layer.
      b. This primer may be spray applied or rolled applied.
      c. All products must be installed on the primer within 24 hours.
   3. Base Mat:
      a. Thickness as per the SSM specifications.
      b. The SBR granules must be dry prior to installation, granules & binder mixed in a mechanical mixer and paved in-place using a heated mechanical screed paver, specifically designed for this type of work.
   4. Base Mat Seal Coating:
      a. The PU is applied by squeegee or notched trowel to the Base Mat and is self-leveling.
   5. Wearing Layer:
      a. Thickness as per the SSM specifications, minimum 4mm.

b. The PU is applied by squeegee or notched trowel, is self-leveling and the EPDM granules are broadcasted into the curing PU.
c. The EPDM granules must be integrated into the full depth PU wearing layer. The textured finish must be a dense matrix of embedded EPDM granules with no bald spots. All loose or excess EPDM granules must be completely removed prior to installing line markings.

6. All installation methods & practices must meet industry standards and meet the standard installation methods as identified in the SSC's specifications, brochures and website.

D. Installation: ALTERNATE #1 FOR FULL POUR POLYURETHANE SYSTEM
1. The SSC shall only install the PU system after the subbase has been checked for moisture content, excess moisture can affect the quality of installation and longevity. No PU shall be installed if rain or inclement weather is imminent.
2. Primer:
a. Install PU primer to ensure the PU adheres to the subbase and each layer adheres to the previously installed layer.
b. This primer may be spray applied or rolled applied.
c. All products must be installed on the primer within 24 hours.
3. Base Layer(s) and/or Force Reduction Layer(s):
a. Thickness as per the SSM specifications.
b. Apply shelf leveling two-component PU to seal the asphalt base.
c. The flow applied base layers shall be a mixture of pigmented SBR rubber granules and pigmented PU and applied by notched trowel to the proper depth.
d. PU to match wearing layer colors.
4. Wearing Layer:
a. Thickness as per the SSM specifications, minimum 4mm.
b. The flow applied PU is applied by notched trowel, is self-leveling and the EPDM granules are broadcasted into the curing PU.
c. The EPDM granules must be integrated into the full depth PU wearing layer. The textured finish must be a dense matrix of embedded EPDM granules with no bald spots. All loose or excess EPDM granules must be completely removed prior to installing line markings.
d. All head seams shall be flush to the adjacent PU.
5. All installation methods & practices must meet industry standards and meet the standard installation methods as identified in the SSC's specifications, brochures and website.

E. Installation: ALTERNATE #2 FOR MONDO SUPER X 720 K39
1. Allow all material to acclimate to site temperature prior to installation.
2. Unroll material and allow rubber to relax overnight or minimum of 12 hours; colder temperatures may require additional time.
3. Dry lay and cut to fit all material prior to adhesion.
4. All head (short) seams shall be staggered.
5. All side (long) seams to fall under painted lines for running lanes and runways.
6. One edge of the head (short) seam and side (long) seam to have 3/16 inch overlap to provide a tight compression seam when glued.

7. Apply adhesive with proper sized trowel; a V shaped trowel with 1/8” (height, width & spacing) notch; adjust size of trowel to insure a minimum of 90% adhesive transfer.
8. Immediately remove any adhesive from areas where it is not intended to be while it is still fresh, dried adhesive is difficult to remove.
9. Prior to applying weights to the seams, manually work the seams to ensure all seams are perfectly flat and tight with NO peaking; Use a lightweight (100lb) roller to eliminate entrapped air and roll in multiple directions.
10. Weights must be applied over all seams and completely cover the seam; Only use gray concrete utility bricks (2”x4”x8”); weights to remain in place a minimum of 12 to 24 hours depending on site temperature and adhesive curing.
11. All head and side seams shall be flush to adjacent material.

1.2 TIMING, LIMITATIONS, AND CONDITIONS AFFECTING INSTALLATION

A. Weather and Climate: If in the opinion of the SSC or the Owner, weather and climatic conditions are having or will have an adverse effect on installation; work shall be delayed until the adverse condition has passed.

B. Adjacent and Concurrent Construction: Installation shall not take place until the completion of the adjacent or concurrent construction operations which generate dust, airborne abrasives, or any other by-product that, in the opinion of the Owner or SSC, would be harmful to the SS material. Under specific direction of the Owner, the SSC may be allowed to cover the track material with an approved covering if such harmful construction operations must occur after the SS material has been installed.

END OF SECTION 321823.40

SECTION 32 18 23.41 - TRACK & FIELD LINE MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers all labor and materials required to install the T&F line markings. The SSC is responsible for the layout and installation of all painted line markings.

1.2 CODES AND STANDARDS

A. Codes and standards follow the current guidelines set forth by World Athletics, the National Collegiate Athletic Association and National Federation of State High School Associations. Where discrepancies are noted between these various governing bodies, the rules of the NFHS shall be enforced.

1.3 ABREVIATIONS

A. WA = World Athletics (formerly IAAF)

B. NCAA = National Collegiate Athletic Association

C. NFHS = National Federation of State High School Associations

D. T&F = Track & Field

E. SS = Synthetic Surface

F. SSC = Synthetic Surfacing Contractor

G. SSM = Synthetic Surfacing Manufacturer

H. GC = General Contractor

I. UV = Ultra-Violet

1.4 RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section. The following Sections are specifically related to this Section:
   1. 116833.43 T&F Equipment
   2. 321823.39 T&F Quality Control
   3. 321823.40 T&F Synthetic Surface

4. 321823.41 T&F Line Markings
5. 321823.42 T&F Event Materials

1.5 SUBMITTALS

A. The following information must be submitted by the SSC for approved.
   1. A drawing depicting the colors of all line markings and labels of the events. Also, all symbols and markings clearly identified, illustrated, and their colors stated. The recommended NCAA colors shall be used.
   2. ******Review & modify this written specification as needed and submit this specification on your letterhead as a submittal.***
   3. Installation process and requirements for line markings and any conditions that may limit the installation or affect quality of installation.
   4. Material safety data sheets on all products, as necessary.

B. The following information shall be submitted at the completion of the specified work.
   1. Upon completion of all line markings, the SSC shall submit to the Owner five diagram/drawing depicting and identifying all line markings: 1) a key to the color codes, 2) a chart for all symbols, and 3) labels for all events.
   2. A letter from a registered surveyor stating the line marking calculations, actual painted lines and slopes are legal and in compliance with these Bid Documents.

PART 2 - PRODUCTS

2.1 PAINT

A. The paint must be approved by the SSC & SSM.

B. Temporary reference markings must be removed at the completion of the project or within the following 14 days; i.e. chalk.

C. Paint shall be UV stable and completely cover the T&F SS.

PART 3 - EXECUTION

3.1 SUMMARY

A. General line markings of the 400 meter T&F events shall be spray applied, using only paint, primers and finishes supplied and guaranteed by the SSC & SSM.

B. No line markings shall be installed if the weather conditions are not proper, i.e. too windy, cold or wet.

C. All line markings must be reviewed and verified with the Owner's representative prior to installation.

D. The line striper must NOT make any changes to the approved line marking submittal without the written approval from the Owner's representative (Architect, Engineer or T&F Consultant).

3.2 LINE MARKINGS

A. Paint – all markings to receive sufficient paint to fully cover the SS, no SS shall be visible under the installed paint. All paint shall be crisp with clean edges, no excessive overspray from working too fast or in excessive wind.

B. Track Oval:
1. The measure line is not painted.
2. Oval distance is between 400.000 & 400.040 meters.
3. Track oval will NOT utilize a portable curb, 20 cm rule.
4. Radius to the oval's measure line is 104.432 feet and to be verified by GC & SSC.
5. Lane lines are 42 inches wide, measured from right hand side to right hand side.

C. Painted Line Precedence:
1. Waterfall starting lines take precedence over straight starting lines.
2. Straight starting lines to taper at waterfall starting lines and maintain a 1/2" unpainted gap.
3. Lane lines to take precedence over other markings.
4. Numbers and letters to be broken at all lane lines.

D. Straightaway Chute Extensions:
1. Lines to be solid, not dashed.
2. Break chute extension lies 2" either side of track oval lane lines.

E. Assembly Lines – not to be painted.

F. 55 Meters and 55 Meter Hurdles:
1. One direction on the home straight.
2. Event label:
   a. 55
   b. Approximately 3" high.
   c. The color is white.
   d. Located in the outside lane and is above/past the starting line.
3. Color of the starting line is white.
4. Hurdle tic marks:
   a. Boys are Green.
   b. Girls are Orange.
   c. Hurdle tic marks are small triangles and pointing in the direction of running.
   d. Two tic marks per lane with each tic mark adjacent to the lane line.

G. 100 Meters:

1. One direction on home/main straight.
2. Event label:
    a. 100
    b. Approximately 3” high.
    c. The color is white.
    d. Located in the outside lane and is above/past the starting line.
3. Color of starting line is white.

H. 100 Meter Hurdles:
1. One direction on home/main straight.
2. Event label:
    a. 100
    b. Approximately 3” high.
    c. The color is white.
    d. Located in the outside lane and is above/past the starting line.
3. Color of the starting line is white.
4. The hurdle tic marks are yellow:
    a. Hurdle tic marks are small triangles and pointing in the direction of running.
    b. Two tic marks per lane with each tic mark adjacent to, but not touching the lane line.

I. 110 Meter Hurdles:
1. One direction on home/main straight.
2. Event label:
    a. 110
    b. Approximately 3” high.
    c. The color is white.
    d. Located in the outside lane and is above/past the starting line.
3. Color of the starting line is white.
4. The hurdle tic marks are blue; if SS is blue, then use contrasting (light or dark) blue paint:
    a. Hurdle tic marks are small triangles and pointing in the direction of running.
    b. Two tic marks per lane with each tic mark adjacent to, but not touching the lane line.

J. 200 Meters:
1. All in lanes.
2. Both turns (normal & reverse).
3. Event label:
    a. 200
    b. Approximately 3” high.
    c. The color of the label to be white.
    d. Located in lane 2 and is above/past the starting line.
4. Color of the main starting line is white and the reverse starting line is black.

K. 300 Meter Hurdles:
1. All in lanes.
2. Event Label:

a. 300
b. Approximately 3” high.
c. The color is white.
d. Located in lane 2 and is above/past the starting line.

3. Color of the starting line is white.
4. The hurdle tic marks are red; if the SS is red, then the tic marks are black:
   a. Hurdle tic marks are small triangles and pointing in the direction of running
   b. Two tic marks per lane with each tic mark adjacent to the lane line

L. 400 Meters:
1. All in lanes.
2. Event label:
   a. 400
   b. Approximately 3” high.
   c. The color is white.
   d. Located in lane 2 and is above/past the starting line.
3. Color of the starting line is white.

M. 800 Meters:
1. Waterfall start and 1 turn stagger in lanes.
2. Event label:
   a. 800
   b. Approximately 3” high.
   c. The color is white.
   d. The 1 turn stagger start line label is in lane 2, the waterfall start line label is in the outside lane, and the labels are above/past the start line.
3. Color of the 1 turn stagger start line is white with a green insert, 2” by approx. 16” green insert centered.
4. The color of the waterfall start line is white.

N. 1500 Meters:
1. Waterfall start.
2. Event label:
   a. 1500
   b. Approximately 3” high.
   c. The color is white.
   d. Located in the outside lane and is above/past the start line.
3. The start line is white in color and painted in lane 1 out to the outer or furthest lane, into the chute, if possible.

O. 1600 Meters:
1. Waterfall start.
2. Event label:
   a. 1600
   b. Approximately 3” high.
   c. The color is white.
   d. Located in the outside lane and is above/past the start line.
3. Color of the start line is white.

P. Mile Run:
   1. Waterfall start.
   2. Event label:
      a. Mile
      b. Approximately 3” high.
      c. The color is white.
      d. Located in the outside lane and is above/past the start line.
   3. Paint 3 x 1” wide by 3” long tic mark on the infield side of lane 1:
      a. Tic marks are painted white and are for ¼ mile, ½ mile and ¾ mile splits, no labels.
   4. Color of the start line is white.

Q. 3200 Meters:
   1. Waterfall start.
   2. Event label:
      a. 3200
      b. Approximately 3” high.
   3. The color is white.
   4. Located in the outside lane and is above/past the start line.
   5. Color of the start line is white.

R. 5000 Meters:
   1. Waterfall start.
   2. Event label:
      a. 5000
      b. Approximately 3” high.
      c. The color is white.
      d. Located in the outside lane and is above/past the start line.
   3. Color of the start line is white.

S. 10000 Meters:
   1. Waterfall start.
   2. Event label:
      a. 10000
      b. Approximately 3” high.
      c. The color is white.
      d. Located in the outside lane and is above/past the start line.
   3. Color of the start line is white.

T. 4 x 100m Relay:
   1. All in lanes.
   2. Event label:
      a. 400
      b. Approximately 3” high.
      c. The color is white.
      d. Located in lane 2 and is above/past the start line.
   3. Color of the start line is white, same starting line as the two turn staggered starting line for the 400 meters.
   4. The relay exchange zone markers are yellow:

a. Exchange zone markings are approximately 36” wide by 36” tall triangles, triangles point into the 30 meter long exchange zone and the zone markings are included in the 30 meter long exchange zone.

5. 10m before the end of the exchange zone mark is a 2” by 16” white line, centered in the lane, for the third exchanges (first exchange use the 300 meter hurdle start lines and the second exchange uses the 200 meter start lines).

U. 4 x 200m Relay:
1. All in lanes.
2. Event label:
   a. 4 x 200
   b. Approximately 3” high
   c. The color is white
   d. Located in lane 2 and is above/past the start line
3. Color of the start line is white with a red insert, 2” by 16” insert is centered (if the exchange zone markers change to black, then the insert must change to black).
4. The relay exchange zone markers are red; if the SS is red, then the exchange zone markers are black:
   a. Exchange zone markers are approximately 36” wide by 36” tall triangles, triangles point into the 30 meter long exchange zone and the zone markings are included in the 30 meter long exchange zone.
   b. First exchange zone in lane 1 is red (or black) & yellow.

V. 4 x 400m Relay:
1. 3 turn stagger.
2. Event label:
   a. 4 x 400
   b. Approximately 3” high.
   c. The color is white.
   d. Located in lane 2 and is above/past the start line.
3. Color of the start line is white with a blue insert, 2” by 16” insert is centered.
4. The relay exchange zone markers and acceleration zone markers are blue:
   a. Exchange zone markings are approximately 36” wide by 36” tall triangles, triangles point into the 20 meter long exchange zone and the zone markings are included in the 20 meter long exchange zone
   b. The first exchange of the baton shall use the staggered triangles
   c. The second and third exchange of the baton shall use triangles in a straight line, 10 meters before the finish line; and the end of this exchange zone shall use the painted triangle in lane one (same as used in the first exchange) and triangles in lanes two thru five are in a straight line 10 meters past the finish line and parallel to the finish line.

W. 4 x 800m Relay:
1. Waterfall start.

X. Break Lines:
1. One turn break line on the back straight is a solid line, curved and the color is green; painted from the outside lane to the inside of lane two.

2. One turn break line on the home straight is a 2” by 2” green mark on lane five’s inside lane line (a single cone will be placed on this mark during competition).
3. Provide 2” by 2” green tic marks, approx. every 13 feet (not to exceed every 4 meters), on lane five’s inside lane line from the box alley start to the break line (both turns); these tic marks will indicate the location of the 15cm tall cones.

Y. Finish Lines:
1. Locations:
   a. Common finish line is 10m prior to the point of curvature (PC) on home/main straight.
   b. Reverse 200 meter finish line located at the PC, at the end of the back straight.
2. 2" wide and white in color.
3. The intersection of all finish lines with the oval’s lane lines shall be alternating as per the example in the current NCAA Rule Book.
4. No lean lines are to be provided.

Z. Staggered Alleys:
1. Provide three 1 turn staggered alley start lines, two in turn 1 and 1 in turn 2, and the color is white for all staggered start lines:
   a. Normal 1 turn stagger in turn 1, label painted as – 1 Turn
   b. Normal 1 turn stagger in turn 1, label painted as – Mile 1 Turn
   c. Normal 1 turn stagger in turn 2, label painted as – 1 Turn
2. Staggered alley start lines painted in lanes 5 thru outside lane.

AA. Long/Triple Jump:
1. Runway lines:
   a. 2" wide lines.
   b. White in color.
   c. 48" wide runways (inside edge to inside edge of line).
2. Painted takeoff lines:
   a. 8” by 48”.
   b. Painted white lines at 4’, 20’ and 36’ from the sand pit.
   c. Label all painted lines and takeoff boards, adjacent to each line or board with the distance it is from the sand pit. This distance label shall be approximately 3” high and white on the right-hand side of the runway.

BB. Pole Vault:
1. Runway lines:
   a. 2" wide lines.
   b. White in color.
   c. 48" wide runways (inside edge to inside edge of line).
   d. Terminate runway lines at zero line.
2. Zero line:
   a. ¾” wide line and 24' long centered on back edge of box (not flange); should extend a minimum of 1 foot past the standards.
   b. White in color.
3. NCAA Marks:

a. Provide seven runway markings in the center of the runway as per the dimensions and pattern in the current NCAA Rule Book.

CC. Shot Put:
1. Dividing lines:
   a. 2" wide lines.
   b. White in color.
   c. Extend 2.46' (75cm) from outer edge of throw circle .
   d. The 2” line is painted toward the top half of the circle, in the direction of throwing.
2. Sector lines (34.92 degrees):
   a. 2" wide white lines.
   b. White in color.
   c. Outside the throwing circle and from outer edge of throw circle to the end of concrete pad or beginning of the landing area.
   d. Install 2" wide sector tic marks at the end of the landing area on the face of the concrete or timber curb.

DD. Discus:
1. Dividing lines:
   a. 2" wide lines.
   b. White in color.
   c. Extend 2.46' (75cm) from outer edge of throw circle.
   d. The 2” line is painted toward the top half of the circle, in the direction of throwing.
2. Sector lines (34.92 degrees):
   a. 2" wide white lines.
   b. White in color.
   c. Outside the throwing circle and from outer edge of throw circle to the beginning of the synthetic turf infield.

EE. Lane Numbers:
1. The numbers are a block style, approximately 24” high and the numbers will NOT have a color shadow.
2. The color of the numbers will be white.
3. Paint the following numbers:
   a. There is 1 set of numbers 1 foot before the common finish line, facing to the outside of the track oval.
   b. There is 1 set of numbers staggered in the first turn, 1 foot above/past the 400M staggers.
   c. There is 1 set of numbers staggered at the beginning of the back-straight, 1 foot above/past the 300 meter hurdle staggered start lines.
   d. There is 1 set of numbers staggered in the second turn, 1 foot above/past the 200M staggers.
   e. Paint a set of numbers at the very end of each chute (1 foot from the end/edge of SS), in the chute & not in the oval lanes.

FF. Letters & Logos:

1. The stencils for custom fonts for the letters and the logo are to be provided by the SSC.
2. Logo size is 10’ by 10’ is included in the project:
    a. The colors shall be the school colors (black or gray), TBD by Owner.
    b. The painted athletic department logo is a “Cougar Paw”, the Paw will be in the center of the high jump area & field verified.

GG. Interval Marks:
1. Provide a 1” wide by 3” long white line, on the T&F SS, on the infield side of lane one:
    a. These lines are to be at 50 meter intervals starting at the common finish line and running the entire length of the track oval.
2. Provide a 1” wide by 3” long white line, on the T&F SS, outside of the outer oval lane, only along home straight, not on the turns:
    a. These lines are to be at 10 meter intervals starting at the 110m start line in the chutes.

END OF SECTION 321823.41

SECTION 32 18 23.42 - TRACK & FIELD EVENT MATERIALS

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers all labor and materials required to install high quality track & field event special materials. The GC is responsible for installing:
   1. Sand for the long and triple jump sand pits.
   2. Decomposed granite rock dust in the shot put landing area.

1.2 CODES AND STANDARDS

A. Codes and standards follow the current guidelines set forth by World Athletics (formerly IAAF), the National Collegiate Athletic Association and National Federation of State High School Associations. Where discrepancies are noted between these various governing bodies, the rules of the NFHS shall be enforced.

1.3 ABREVIATIONS

A. WA = World Athletics

B. IAAF = International Association of Athletics Federations

C. NCAA = National Collegiate Athletic Association

D. NFHS = National Federation of State High School Associations

E. T&F = Track & Field

F. SS = Synthetic Surface

G. SSC = Synthetic Surfacing Contractor

H. GC = General Contractor

1.4 RELATED WORK

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section. The following Sections are specifically related to this Section:
   1. 116833.43 T&F Equipment
   2. 321823.39 T&F Quality Control
   3. 321823.40 T&F Synthetic Surface

4. 321823.41 T&F Line Markings
5. 321823.42 T&F Event Materials

1.5 SUBMITTALS

A. The following information must be submitted by the GC prior to installation.
   1. Installation process and requirements for the special materials and any conditions that may limit the installation or affect quality of installation.
   2. Material safety data sheets on all products, as necessary.
   3. GC to supply Design Team with a one-half gallon sample of product for visual inspection and testing.

1.6 QUALITY ASSURANCE

A. The physical make-up of these products varies across the country; therefore, the GC shall use his best efforts to supply the Design Team with a product that best meets the specifications listed below.

PART 2 - PRODUCTS

2.1 SAND FOR LONG & TRIPLE JUMP SAND PITS

A. All sand for the long/triple jumps sand pits shall follow the specifications outlined by the United States Golf Association (USGA) guidelines for Bunker Sand.

B. GC may wish to contact the local golf course or country club and the green superintendent should be able to tell you where to find this high-quality sand.

C. The GC can remove, save and reuse all suitable sand from the existing sand pits. All new sand should be of similar color, characteristics and properties of the existing sand, if not then GC shall provide all new sand.

D. The sand shall be washed and sized to meet the USGA Bunker Sand and as follows:
   1. Screen Number 10 – 99% Passing
   2. Screen Number 18 – 92% Passing
   3. Screen Number 35 – 19% Passing
   4. Screen Number 60 – 2% Passing
   5. Screen Number 100 – 1% Passing

E. Sand shall be white in color (as white as possible for that region of the country), free of trash, organic matter, clay, silt, rocks, etc.

F. Sand shall have the following technical data:
   1. Water permeability or filtration rate with a minimum of 20 inches/hour
   2. Bulk density of 1.55 grams per cubic centimeter

3. Penetrometer Reading of 1.8 to 2.2 kg/cm2
4. Sand shape of high sphericity and rounded

2.2 ROCK DUST

A. The shot-put landing area shall consist of a Decomposed Granite (DG) or similar hard & durable material.

B. The DG material must be firmly compacted, yet porous to allow vertical drainage.

C. The material shall be compacted to at least ninety (90%) percent of Standard AASHTO Density with discing, sprinkling, and rolling as necessary.

D. All material aggregate larger than one-quarter inch in diameter that comes to the surface during discing shall be removed prior to compacting operations.

E. The color should be gray or similar.

F. The material shall be sized as follows:
1. Screen Number 3/8 – 100% Passing
2. Screen Number 4 – 100% Passing
3. Screen Number 8 – 86% Passing
4. Screen Number 16 – 65% Passing
5. Screen Number 30 – 45% Passing
6. Screen Number 50 – 35% Passing
7. Screen Number 100 – 25% Passing
8. Screen Number 200 – 15% Passing

PART 3 - EXECUTION

3.1 INSPECTION AND ACCEPTANCE

A. Examine all surfaces and contiguous elements to receive work of this section and correct, as part of the Work of this Contract, any defects affecting installation.

B. Commencement of work will be construed as complete acceptability of surfaces and contiguous elements.

3.2 INSTALLATION REQUIREMENTS

A. The following installation requirements must be met by the GC:
1. These materials should be one of the last items installed on the facility to maintain the physical properties. Keep newly installed materials clean and free from debris.
2. Do not install these materials until drainpipes are installed and connected to system.

3. Upon completion of installation, test materials to demonstrate satisfactory operation acceptable to Owner. The GC shall clean or replace unsuitable or contaminated materials.

END OF SECTION 321823.42

SECTION 323113 - CHAIN LINK FENCING AND GATES (BLACK AND GALVANIZED)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Vinyl Chain-link fences and gates

B. Related Sections:
   1. Concrete Paving

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Chain-link fence shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to ASCE/SEI 7:
   1. Minimum Post Size: Determine according to ASTM F 1043 for framework up to 6 feet high, and post spacing not to exceed 10 feet.
   2. Minimum Post Size and Maximum Spacing: Determine according to CLFMI WLG 2445, based on mesh size and pattern specified and on the following:
      a. Wind Loads: 105 mph.
      b. Exposure Category: B.
      c. Fence Height: Varies
      d. Material Group: IA, ASTM F 1043, Schedule 40 steel pipe or stronger if warranted to meet wind load requirements. Contractor to verify prior pipe material prior to bid and installation.

B. Fence posts, footers and fabric not structurally designed for wind/privacy screen applications. Any wind/privacy screens installed after construction will be at the owner's discretion and risk.

C. Fence system shall meet all applicable ASTM standards. Including but not limited to
   1. F 668 - Specification for Poly (Vinyl Chloride)/(PVC) - Coated Steel Chain Link Fabric
   2. F 567 - Practice for Installation of Chain Link Fence
   3. F 669 - Specification for Strength Requirements of Metal Posts and Rails for Industrial Chain Link Fence
   4. F 900 - Specification for Industrial and Commercial Swing Gates
   5. F 934 - Standard Colors for Polymer-Coated Chain Link Fence Materials

6. F 1083 - Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
7. F 1234 - Specification for Protective Coatings in Steel Framework for Fences

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components, and finishes for chain-link fences and gates.
   1. Fence, rails, and fittings.
   2. Chain-link fabric, reinforcements, and attachments.

B. Samples for Initial Selection: For components with factory-applied color finishes.

C. Product Certificates: For each type of chain-link fence from manufacturer.

D. Product Test Reports: For framing strength, according to ASTM F 1043.

E. Field quality-control reports.

F. Operation and Maintenance Data: For the following to include in emergency, operation, and maintenance manuals:
   1. Polymer finishes.

G. Warranty: Sample of special warranty.

H. Other Informational Submittals:
   1. Record drawings.

1.5 QUALITY ASSURANCE

A. In general, conform to standards of the CHAIN LINK FENCE MANUFACTURERS INSTITUTE (CLFMI). Manufacturer:

B. Company specializing in commercial quality chain link fencing with five years' experience.

C. Installer: Company specializing in commercial quality chain link fence installation with three years' experience and approved by manufacturer.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

1.7 WARRANTY

A. All material and workmanship shall be warrantied for a period of one (1) year after final acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements.

B. The types of fencing required for the project are as indicated below, subject to detailed material requirements which follow.
   1. All fencing materials shall be black in color.
   2. All material shall be new, and products of recognized reputable manufacturers. Used, re- rolled or re-galvanized materials are not acceptable.
   3. Like items of materials provided hereinafter shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.
   4. Fencing Fabric Wire shall conform to the following:
      a. Fabric shall be premium grade helically wound and woven steel core wire in accordance with ASTM F668 for Class 2B poly vinyl chloride (PVC) fabric. Color to be black.
      b. Material specifics shall be as follows:

	Core (inches)	Wire (uncoated) (gauge)	Wire Breakload (lbf)	Mesh Size
Fence Fabric	0.148	9	1290	2”

      c. All fencing is to be knuckle – knuckle (no barbs top or bottom)
   5. Powder coated framework shall be steel pipe high strength – Type II: Cold formed and welded steel pipe complying with ASTM F1043, Group IC, with minimum yield strength of 50,000 psi (344 MPa), sizes as indicated. Protective coating per ASTM F 1043, external coating Type B, zinc with organic overcoat, 0.9 oz/S.F. (275 g/m2) minimum zinc coating with chromate conversion coating and verifiable polymer film. Internal coating Type B, minimum 0.9 oz/S.F. (275 g/m2) zinc or Type D, zinc pigmented, 81% nominal coating, minimum 3 mils (0.08 mm) thick. Color to be black.
   6. Schedule of pipes sizes shall be as follows:

Application	Height (feet)	Outside Dimensions (inches)	Wall Thickness (inches)	Weight (lbs/foot)
Terminal/Corner Posts	ALL	4.00	0.160	6.56
Line Posts	Less than 6’	1.900	0.120	2.28

	6’-8’	2.875	0.160	4.64
Rails and Braces	(all heights)	1.660	0.111	1.84

7. Post tops shall be provided with secured post caps that fit tightly and cannot be removed by hand.
8. Top rails shall have lengths no less than eighteen feet (18’-0”) and shall be fitted with minimum six inches (6”) long outside sleeved or internally swaged couplings for connecting the lengths into a continuous run.
9. Provide top rail with pass-through fittings at line posts and rail end cups and brace bancs at terminal or gate posts.
10. Middle and Bottom Rails shall be properly secured to line posts with steel boulevard clamps and to terminal, corner, gate or pull posts with rail end cups and brace bands.
    a. Where the chain link fence is in line with the Protective Ball netting, special boulevard clips shall be used to allow for the field side of the ball net post and the chain link fence post to be flush with each other. This means the posts will not be lined up center to center, but rather will be offset from each other to have a flush fabric condition on the field side.
11. Brace Rails shall be provided for each terminal post with fabric height of six feet or more. Extend brace to each adjacent post at approximate mid-height of fabric and secure with rail end cups and brace bands.
12. Fence fittings and accessories shall be fabricated of steel or cast iron and shall conform to minimum requirements of ASTM F-626, and as below. Following fabrication and galvanizing, all fence fittings shall receive a 10 to 14 mil thick fusion bonded vinyl coating to match fabric color. With the exception of field painting for nuts and bolts, no painted fittings will be accepted.
    a. Where the chain link fence is in line with the Athletic Ball Netting, special boulevard clips shall be used to allow for the field side of the ball net post and the chain link fence post to be flush with each other. This means the posts will not be lined up center to center, but rather will be offset from each other (see Project Drawings and Details).
    b. Stretcher Bars shall not be less than three sixteenth’s (3/16”) of an inch by three quarter’s of an inch (¾”) and not less than 2 inches shorter than the nominal height of the fabric with which they are to be used. One stretcher bar shall be provided for each end and gate post, and two for each corner and pull post.
    c. Fabric connectors shall be provided in sufficient number for attaching the fabric to all line posts at intervals not exceeding twelve inches (12”); and not exceeding twelve inches (12”) when attaching fabric to top or bottom rail. Connectors shall be galvanized with a min. 0.8 oz/S.F. coating of zinc.
    d. Unless designated otherwise on the details, tie wires shall be fabricated from rolled 9-gauge wire stock which has been cut to required lengths for hand-twisted connections at the site. Color to be black.
    e. Tension Bands shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding twelve inches (12”). Tension bands shall have a minimum thickness after galvanizing of 0.078 inch; and minimum width of three quarters of an inch (3/4”) for posts four inches (4”) O.D. or less; and 0.108 inch thickness by seven eighths of an inch (7/8”) for posts larger

than four inches (4") O.D. Brace bands shall be formed from flat or beveled steel and shall have a minimum thickness of 0.108 inch after galvanizing; and a minimum width of three quarters of an inch (3/4"). Attachment bolts shall be five sixteenths of an inch (5/16") by one and one quarter of an inch (1 ¼") galvanized carriage bolts with nuts, ASTM A-307, Grade A.

f. Other hardware required shall be fabricated from steel, and galvanized in accordance with ASTM A123 and/or ASTM A153.

g. All threaded bolts are to be turned away from secured areas, especially field of play

C. Chain Link Swing Gates:

1. All gates to be heavy duty commercial grade.
2. Fabricate chain link swing gates in accordance with ASTM F 900 using galvanizing two inch (2") steel tubular members weighing 2.60 lb/ft. Fusion or stainless steel welded connections forming rigid one-piece unit. Frames shall be thermally fused after fabrication with minimum 10 mils per ASTM 1043. Coating before fabrication will not be allowed.
3. Chain link fabric for gates shall match fabric for fencing.
4. Gate posts shall be steel pipe – type II finished to match fence posts:

Double Leaf Gates	Post Size (inches)	Weight (lb/ft.)
8'-12' wide	4.00	5.79

Gate fabric height up to and including 6ft.

Gate Leaf Width	Outside Diameter
Up to 10 ft.	2.875 in.

Gate Leaf Width	Outside Diameter
Up to 6 ft.	2.875 in.
Over 6 ft. to 12 ft.	4.000 in.

5. Gate hinges shall be heavy-duty offset type. Install gate with 90 degree malleable heavy duty hinges. Hinges shall have large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by the person.
6. All gates should open outward away from the field of play.
7. All gates shall be equipped with a positive closure latch and padlock fitting.
8. Drop Rods are not allowed. All Post openings must be securely capped with rounded galvanized post caps. Galvanized chains shall be welded to the larger drive gate closure points in lieu of drop rods and latches.
9. Lockable latches are required on all walk and double gates.
10. All threaded bolts are to be turned away from secured areas, especially field of play.

2.2 CAST-IN-PLACE CONCRETE

A. Materials: Portland cement complying with ASTM C 150, Type I aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94/C 94M. Measure, batch, and mix Project-site-mixed concrete according to ASTM C 94/C 94M.
   1. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 3-inch slump, and 1-inch maximum size aggregate.

B. Materials: Dry-packaged concrete mix complying with ASTM C 387 for normal-weight concrete mixed with potable water according to manufacturer's written instructions.

2.3 SHOP DRAWINGS

A. Contractor to provide full shop drawings and specifications for approval of all fencing, gates and components.

PART 3 - EXECUTION

3.1 EXAMINATION

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 otherwise permitted by owner’s representative.

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

3.2 PREPARATION

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

3.3 INSTALLATION, GENERAL

A. Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated.
   1. Install fencing on established project boundary lines inside property line as shown on Drawings.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed soil.

B. 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 in position during setting with concrete or mechanical devices.
   2. Where the chain link fence is inline with the Athletic Ball Netting, special boulevard clips shall be used to allow for the field side of the ballnet post and the chain link fence post to be flush with each other. This means the posts will not be lined up center to center, but rather will be offset from each other. (see Project Drawings and Details).
   3. Concrete Fill: Place concrete around posts to dimensions indicated and vibrate or tamp for consolidation. Protect aboveground portion of posts from concrete splatter.
      a. Exposed Concrete: Extend 2 inches above grade; shape and smooth to shed water.
      b. Concealed Concrete: Top 2 inches below grade to allow covering with surface material.
      c. Posts Set into Concrete in Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
      d. Posts Set into Voids in Concrete: Form or core drill holes not less than 5 inches deep and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with non-shrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, and finished sloped to drain water away from post.
   4. Mechanically Driven Posts: Drive into soil to depth of 30 inches. Protect post top to prevent distortion.

C. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 30 degrees or more.

D. Line Posts: Space line posts uniformly on center per detail.

E. Post Bracing and Intermediate Rails: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Diagonally brace terminal posts to adjacent line posts with truss rods and turnbuckles. Install braces at end and gate posts and at both sides of corner and pull posts.

F. Locate horizontal braces at mid-height of fabric on fences with top rail and at two-third

G. fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

H. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended in writing by fencing manufacturer.

I. Intermediate and Bottom Rails: Install and secure to posts with fittings.

J. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches between finish grade or surface and bottom selvage unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

K. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.

L. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

M. Maximum Spacing: Tie fabric to line posts at 12 inches o.c. and to braces 24 inches o.c.

N. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

3.5 GATE INSTALLATION

A. Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing per manufacturer requirements. Attach hardware using tamper- resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

A. Gates: Adjust gates to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding. Lubricate hardware and other moving parts.

END OF SECTION 323113

SECTION 330500 - COMMON WORK RESULTS FOR UTILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:
   1. Piping joining materials.
   2. Transition fittings.
   3. Grout.
   4. Flowable fill.
   5. Piping system common requirements.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

B. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

1.4 COORDINATION

A. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.

B. Coordinate installation of identifying devices after completing covering and painting if devices are applied to surfaces.

C. Coordinate size and location of concrete bases. Formwork, reinforcement, and concrete requirements are specified in Division 03.

PART 2 - PRODUCTS

2.1 PIPING JOINING MATERIALS

A. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

B. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

2.2 TRANSITION FITTINGS

A. Transition Fittings, General: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2.3 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
   1. Characteristics: Post hardening, volume adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
   2. Design Mix: 5000-psi, 28-day compressive strength.
   3. Packaging: Premixed and factory packaged.

2.4 FLOWABLE FILL

A. Description: Low-strength-concrete, flowable-slurry mix.
   1. Cement: ASTM C 150, Type I, portland.
   2. Density: 115- to 145-lb/cu. ft..
   3. Aggregates: ASTM C 33, natural sand, fine and crushed gravel or stone, coarse.
   4. Aggregates: ASTM C 33, natural sand, fine.
   5. Admixture: ASTM C 618, fly-ash mineral.
   6. Water: Comply with ASTM C 94/C 94M.
   7. Strength: 100 to 200 psig at 28 days.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Install piping according to the following requirements and Division 33 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved by the Engineer.

C. Install piping at indicated slopes.

D. Install piping free of sags and bends.

E. Install fittings for changes in direction and branch connections.

3.2 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 33 Sections specifying piping systems.

B. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

C. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
   1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
   2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

D. Grooved Joints: Assemble joints with grooved-end pipe coupling with coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

E. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.

3.3 GROUTING

A. Mix and install grout for equipment base bearing surfaces, pump and other equipment base plates, and anchors.

B. Clean surfaces that will come into contact with grout.

C. Provide forms as required for placement of grout.

D. Avoid air entrapment during placement of grout.

E. Cure placed grout.

END OF SECTION 330500

GEOTECHNICAL ENGINEERING REPORT

Asheville High School Track Upgrades

Asheville, Buncombe County, North Carolina

PREPARED FOR:

Buncombe County Schools
40 McCormick Place
Asheville, North Carolina 28801

NOVA Project Number: 10705-2021067

September 7, 2022

NOVA
PROFESSIONAL | PRACTICAL | PROVEN

NOVA

September 7, 2022

Buncome County Schools
40 McCormick Place
Asheville, North Carolina 28801

Attention: Mr. Ronnie Lunsford, PEM
Facilities/Project Manager

Subject: Geotechnical Engineering Report
ASHEVILLE HIGH SCHOOL TRACK UPGRADES
Asheville, Buncombe County, North Carolina
NOVA Project Number 10705-2021067

Dear Mr. Lunsford:

NOVA Engineering and Environmental, Inc. (NOVA) has completed the authorized Geotechnical Engineering Report for the proposed Asheville High School Track upgrades in Asheville, Buncombe County, North Carolina. The work was performed in general accordance with NOVA Proposal Number 005-20216880 Revision 1, dated March 2, 2022. This geotechnical report briefly discusses our understanding of the project at the time of the recent subsurface exploration, describes the geotechnical consulting services provided by NOVA, and presents our findings, conclusions, and recommendations.

We appreciate your selection of NOVA and the opportunity to be of service on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,
NOVA Engineering and Environmental, Inc.

Steven E. Marshall, E.I.
Project Manager

NORTH CAROLINA PROFESSIONAL SEAL 10204 9-7-2022 ENGINEER JAMES W. NIEHOFF

James W. Niehoff, P.E.
Senior Geotechnical Engineer
NC PE License 010204

Copies Submitted: Addressee (electronic)

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PROJECT INFORMATION

Our understanding of the requirements of the project are based on the provided documents and notes (as listed below), a review of available information from Buncombe County Geographic Information System (GIS) Mapping Tool, information from our site reconnaissance, and our experience with similar projects and knowledge of the local geology.

1.1.1 Site Plans and Documents

- Request for Qualifications titled "Geotechnical Services for Replacement/Repair of the Athletic Track at Asheville High School"
- Document titled "211212-AHS-Notes from Site Visit by Paige"
- Document titled "Asheville HS Boring Locations-220103 comments by Paige"
- Document titled "211212-AHS-Survey Requirements by Paige"
- AutoCAD file titled "211212 AHS-Survey Info-2013 Format.dwg"
- Document titled "Asheville HS Survey Limits"

1.1.2 Proposed Development

NOVA understands that the existing track and field facility has deteriorated over time. The proposed development will include reconstruction of the track and field facilities at the current location. The proposed reconstruction will also include the relocation of several existing utilities, and minor changes in site grades.

1.1.3 Final Elevations / Site Grading

Site grading plans were not provided to NOVA at the time of this report. We anticipate proposed site grades will generally follow existing topography; therefore, cuts and fills on the order of 3 feet or less are anticipated. Deeper cuts will be required for utility installations.

1.2 SCOPE OF WORK

Buncombe County engaged NOVA to provide geotechnical engineering consulting services for the proposed Asheville High School Track upgrades. This report briefly discusses our understanding of the project, describes our exploratory procedures, and presents our findings, conclusions, and recommendations.

The primary objective of this study was to perform a geotechnical exploration within the areas of the proposed construction and to assess these findings as they relate to geotechnical aspects

of the planned upgrades. The authorized geotechnical engineering services included a site reconnaissance, a soil test boring and sampling program, laboratory testing, engineering evaluation of the field and laboratory data, and the preparation of this report.

The services were performed substantially as outlined in our proposal number 005-20216880 Revision 1, dated March 2, 2022, and in general accordance with industry standards.

2.0 SITE DESCRIPTION

2.1 LOCATION AND LEGAL DESCRIPTION

The Subject Property is located within the existing Asheville High School campus at 419 McDowell Street in Asheville, Buncombe County, North Carolina. The proposed area of improvement is located within the southwest portion of the Subject Property. A legal description of the Subject Property was not provided to NOVA.

A Site Location Map and a Boring Location Plan depicting the location of the site and the approximate locations of the performed borings are included in Appendix A (Figures 1 and 2). The approximate latitude and longitude coordinates of the site are 35.5717° North and 82.5531° West, respectively.

2.2 SUBJECT PROPERTY AND VICINITY CHARACTERISTICS

Existing site grades around the athletic facilities to be improved are located at approximately 2062 feet above Mean Sea Level (ft-MSL). Minimal variance in elevation is observed over the proposed area of improvements, as shown in the provided topographic survey. Slight relief is observed to the southeast of the existing track and field facilities, with site grades increasing to the west, north and south of the existing facilities.

Existing Facilities in the general vicinity of the proposed improvements include an athletic track and field in a standard competition layout, home and away bleacher seating, stadium lighting, and associated existing walking paths.

3.0 FIELD AND LABORATORY PROCEDURES

3.1 FIELD EXPLORATION

Our field exploration included:

- A site reconnaissance
- The drilling of eight (8) soil test borings (B-1 through B-8) drilled to a depth 8 feet below existing ground surface.

Soil Test Borings: Exploratory boring locations were established in the field by NOVA personnel using a hand-held GPS device. Soil test borings were performed to assess existing subsurface conditions across the site. The approximate locations of these borings are shown on Figure 2 in Appendix A.

The soil test borings were performed using the guidelines of ASTM Designation D-1586, "Penetration Test and Split-Barrel Sampling of Soils". A hollow-stem auger drilling process was used to advance the borings. At regular intervals, soil samples were obtained with a standard 1.4-inch I.D., 2.0-inch O.D., split-tube sampler. The sampler was first seated six inches and then driven an additional foot with blows of a 140-pound hammer falling 30 inches. The number of hammer blows required to drive sampler the final foot is designated the "Penetration Resistance". The penetration resistance, when properly interpreted is an index to the soil strength and density. Representative portions of the soil samples, obtained from the sampler, were placed in sample containers and transported to our laboratory for further evaluation and laboratory testing.

Test Boring Records in Appendix B show the standard penetration test (SPT) resistances, or "N-values", and present the soil conditions encountered in the borings. These records represent our interpretation of the subsurface conditions based on the field exploration data, visual examination of the split-barrel samples, laboratory test data, and generally accepted geotechnical engineering practices. The stratification lines and depth designations represent approximate boundaries between various subsurface strata. Actual transitions between materials may be gradual.

The groundwater levels reported on the Test Boring Records represent measurements made at the completion of the soil test borings and 24 hours thereafter, where noted. The soil test borings were subsequently backfilled with the soil cuttings.

3.2 LABORATORY TESTING

A laboratory testing program was conducted to characterize materials penetrated by the borings using split-spoon samples recovered from the site. The laboratory test data are presented in Appendix C. Selected test data are presented on the Test Boring Records attached in Appendix B. A summary of laboratory test data is presented in Table 1 below. The specific tests are briefly described below.

It should be noted that all soil samples will be properly disposed of 30 days following the submittal of this NOVA subsurface exploration report unless you request otherwise.

3.2.1 Soil Classification

Soil classification provides a general guide to the engineering properties of various soil types. Samples obtained during drilling operations were observed in our laboratory and visually classified by an engineer. The soils are classified according to consistency (based on number of blows from standard penetration tests), color and texture. These classification descriptions are included on our "Test Boring Records". The classification system discussed above is primarily qualitative; laboratory testing is generally performed for detailed soil classification. Using the test results, the soils were classified using the Unified Soil Classification Systems (USCS). This classification system and the in-place physical soil properties provide an index for estimating the soil's behavior. The soil classification and physical properties obtained are presented in this report.

3.2.2 Moisture Content

The moisture content is the ratio expressed as a percentage of the weight of water in a given mass of soil to the weight of the solid particles. This test was conducted in general accordance with ASTM D 2216. A total of two (2) moisture content tests were performed in this study.

3.2.3 Atterberg Limits

The Atterberg Limits are moisture contents of fine-grained soils as they transition between a solid to a liquid-state. For classification purposes, the two primary Atterberg Limits used are the plastic limit (PL) and the liquid limit (LL). The plastic index (PI) is also calculated for soil classification.

The plastic limit (PL) is the moisture content at which a soil transitions from a semisolid state to a plastic state. The liquid limit (LL) is defined as the moisture content at which a soil transitions from a plastic state to a liquid state. Two (2) tests were performed for this study in accordance with ASTM D4318 - Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

3.2.4 Sieve Analysis

The sieve analysis consists of passing a soil sample through a series of standard sieve openings. The percentage of soil, by weight, passing the individual sieves is then recorded and generally presented in a graphical format. The percentage of fines passing through the No. 200 sieve is generally considered to represent the amount of silt and clay

of the tested soil sample. The sieve analysis test was conducted in general accordance with ASTM Designation D 1140. A total of two (2) sieve analysis tests were performed for this study.

3.2.5 California Bearing Ratio (CBR) Testing

One (1) California Bearing Ratio (CBR) test was performed in accordance with (ASTM D 1883 – Standard Test Method for CBR (California Bearing Ratio) to determine strength and deflection characteristics of soil correlated with pavement performance to establish design curves for pavement thickness. The sample utilized for testing was obtained from the soil cuttings at each boring location.

The laboratory test results are summarized in the table below.

Table 1: Summary of Laboratory Test Results

Boring	Depth (ft.)	Atterberg Limits			%Fines	Maximum Dry Density (lb/ft³)	Optimum Moisture (%)	CBR (%)	Natural Moisture (%)	USCS
		LL	PL	PI						
B-4	3' – 5'	34	22	12	48.6	NT	NT	NT	23	SC
B-7	6½' – 8'	NP	NP	NP	50.2	NT	NT	NT	40	ML
Bulk	0' – 5'	NP	NP	NP	47.7	115.1	13.8	7.8	20.6	SM

4.0 SUBSURFACE CONDITIONS

4.1 GEOLOGY

The site of the proposed improvements is located within the Blue Ridge Physiographic Province of North Carolina. The Blue Ridge is a deeply dissected mountainous area of numerous steep mountain ridges, intermontane basins and trench valleys that intersect and give the area its rugged mountain character. The Blue Ridge contains the highest elevations and the most rugged topography in the Appalachian Mountain system of eastern North America. The North Carolina portion of the Blue Ridge is about 200 hundred miles long and ranges from 15 to 55 miles wide. It contains an area of about 6,000 square miles, or about 10 percent of the area of the state.

According to the "Geologic Map of North Carolina: Department of Natural Resources and Community Development, Division of Land Resources, and the NC Geological Survey" by Rhodes and Conrad, 1985, the site is generally underlain by locally sulfidic interlayered and gradational muscovite-biotite gneiss including mica schist, minor amphibolite, and hornblende gneiss.

Residual soils in the region are primarily the product of in-situ chemical decomposition of the parent rock. The extent of the weathering is influenced by the mineral composition of the rock and defects such as fissures, faults and fractures. The residual profile can generally be divided into three zones:

- An upper zone near the ground surface consisting of red clays and clayey silts which have undergone the most advanced weathering,
- An intermediate zone of less weathered micaceous sandy silts and silty sands, frequently described as “saprolite”, whose mineralogy, texture and banded appearance reflects the structure of the original rock, and
- A transitional zone between soil and rock termed partially weathered rock (PWR). PWR is defined locally as materials which can be penetrated by soil augers and which exhibits standard penetration resistances exceeding 100 blows per foot.

The boundaries between zones of soil, partially weathered rock, and bedrock are erratic and poorly defined. Weathering is often more advanced next to fractures and joints that transmit water, and in mineral bands that are more susceptible to decomposition. Boulders and rock lenses are sometimes encountered within the overlying PWR or soil matrix. Consequently, significant variations in depths to materials requiring difficult excavation techniques may be present over short horizontal distances.

4.2 SOIL AND ROCK CONDITIONS

The following paragraphs provide generalized descriptions of the subsurface profiles and soil conditions encountered by the borings conducted during this study.

The Test Boring Records in Appendix B should be reviewed to provide more detailed descriptions of the subsurface conditions encountered at each boring location. These records represent our interpretation of the subsurface conditions based on the field logs and visual observations of samples by NOVA personnel. The lines designating the interface between various strata on the Test Boring Records represent the approximate interface locations and elevation. The actual transition between strata may be gradual. Groundwater levels shown on the Test Boring Records represent the conditions at the time of drilling and 24 hours thereafter (where noted). It should be understood that soil conditions may vary between boring locations.

4.2.1 Surface Materials

Pavement: At all performed soil test boring locations, 2 inches of asphalt underlain by approximately 6 to 8 inches of stone base materials was encountered. These surficial materials are consistent with the existing track facilities.

4.2.2 Existing Fill

Existing fill, or potential fill was encountered in Borings B-1, B-2, B-3, B-4, B-5, B-6, and B-8. Fills were found to extend from directly below topsoil to depths ranging from approximately 3-1/2 to 7 feet beneath existing grades. Fill consisted of sandy silts (ML), silty sands (SM) and clayey sands (SC).

The following table depicts locations, and thickness of the fill in the boring locations.

BORING	APPROXIMATE THICKNESS OF FILL (feet)
B-1	6
B-2	3-1/2
B-3	6
B-4	7
B-5	3-1/2
B-6	3-1/2
B-8	3-1/2

4.2.3 Residual Soils

Residual soils were encountered in all borings beneath surficial or fill materials (where noted). The sampled residuum typically consisted of sandy silts (ML) and silty sands (SM). Standard penetration resistance values recorded in the residuum ranged from 2 to 16 bpf, but more commonly ranged between 3 and 10 bpf.

4.3 GROUNDWATER CONDITIONS

4.3.1 General

Groundwater in the Blue Ridge typically occurs as an unconfined or semi-confined aquifer condition. Recharge is provided by the infiltration of rainfall and surface water through the soil overburden. More permeable zones in the soil matrix, as well as fractures, joints and discontinuities in the underlying bedrock can affect groundwater conditions. The groundwater table is expected to be a subdued replica of the original surface topography.

Groundwater levels vary with changes in season and rainfall, construction activity, surface water runoff, and other site-specific factors. Groundwater levels in the Blue Ridge area are typically lowest in the late summer-early fall and highest in the late winter-early spring, with annual groundwater fluctuations of 4 to 8 feet; consequently, the water table may be different that that observed during this study at other times.

4.3.2 Soil Test Boring Groundwater Conditions

Groundwater was observed in boring B-1 at a depth of 5-1/2 feet below the existing ground surface (approximate elevation at 2057 feet-MSL). Caving was noted in some of the other borings following retrieval of the augers. Caved depths are sometimes indicative of groundwater elevations and have been included in the Test Boring Records in Appendix B.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are based on our understanding of the proposed construction, site observations, our evaluation and interpretation of the field and laboratory data obtained during this exploration, our experience with similar subsurface conditions, and generally accepted geotechnical engineering principles and practices.

Subsurface conditions may vary from those encountered at specific boring locations. If such variations are noted during construction, or if project development plans are changed, we request the opportunity to review the changes and amend our recommendations, if necessary.

Further discussion of these issues along with detailed recommendations for site excavation, foundation design, as well as other construction considerations are presented in the following sections of this report.

In general, the subsurface conditions encountered by our exploratory study are considered favorable for the proposed improvements from a geotechnical standpoint.

Recommendations for site preparation, and pavement reconstruction are presented in the following sections of this report.

5.1 SITE PREPARATION, EXCAVATION AND FILL PLACEMENT

5.1.1 Site Preparation

Prior to proceeding with construction, any vegetation, root systems, topsoil, and other deleterious non-soil materials should be stripped from proposed construction areas. Debris-laden materials, if encountered, should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

After clearing and stripping, areas which are at grade or will receive fill should be carefully evaluated by a NOVA geotechnical engineer. This evaluation should include the observation of proofrolling of the exposed subgrade with multiple passes of a 20 to 30 ton loaded truck, a 10 to 12-ton vibratory roller, or other vehicle of similar size and weight. Vibratory compaction should be turned off and static rolling should be performed if yielding conditions occur.

The purpose of the proofrolling is to locate soft, weak, or excessively wet soils present at the time of construction. Unstable materials observed during the evaluation and proof-rolling operations should be undercut and replaced with structural fill or stabilized in-place by scarifying and re-densifying. Actual remedial recommendations can best be determined by the geotechnical engineer in the field at the time of construction.

5.1.2 Excavation

We anticipate that the proposed development will require typical cuts and fills of less than 3 feet. Greater cut and fill depths may be required locally. It is expected that the materials within the depth of excavation will consist primarily of fill and residual soils. These materials can generally be excavated with conventional earth moving equipment.

Excavations in residual soils may employ temporary slopes as steep as 1.5:1 (H:V). Protection from erosion will need to be implemented at the face of such slopes. Surcharge loads such as those resulting from construction materials will need to be restricted from an area extending at least 10 feet from the crest of cut slopes.

5.1.3 Existing Fills

Fill materials were observed in a majority of the performed borings. Based on our experience, we anticipate that some fill materials may exist at other locations as well. Old fills may be erratic in composition and consistency. In the event that low consistency and/or debris-laden fill materials are encountered during construction, they should be undercut and backfilled with compacted structural fill.

5.1.4 Moisture Sensitive Soils

Moisture sensitive soils have the potential to lose some of their strength when exposed to a combination of wet weather and construction traffic. The severity of these potential problems depends to a great extent on the weather conditions during construction. A concerted effort should be made to control construction traffic and surface water while subgrade soils are exposed. In the performed borings, moisture sensitive soils were not encountered. These soils may exist intermittent of boring locations.

High plasticity soils are often expansive and have the potential to swell or shrink upon increasing or decreasing moisture content, respectively, leading to potential damage to hardscape. Where these soils are encountered, evaluation by NOVA personnel should be performed to determine their suitability for structural support. Remediation for unsuitable soils of this type includes removal and replacement to allow for a minimum separation of 3 feet between the plastic clays and the proposed track.

5.1.5 New Fill

Materials proposed to be used as fill during site redevelopment should be low plasticity soil (Plasticity Index Less than 30), free of non-soil materials and rock fragments larger than 3-inches in any one dimension. Based on visual examination, the existing residual soils which do not contain appreciable amounts of debris, rock organics or other deleterious materials encountered during this exploration generally appear suitable for

re-use as structural fill. Prior to construction, bulk samples of the proposed fill materials should be laboratory-tested to confirm their suitability.

Organic and/or debris laden material are not suitable for re-use as structural fill. Topsoil, mulch and similar organic materials can be wasted in architectural areas. Debris-laden materials should be excavated, transported, and disposed of off-site in accordance with appropriate solid waste rules and regulations.

Structural fill should be placed in thin, horizontal loose lifts (maximum 8-inch) and compacted to at least 95 percent of the standard Proctor maximum dry density (ASTM D 698). The upper 12 inches of soil beneath pavements and slab-on-grade should be compacted to at least 98 percent. In confined areas, such as utility trenches or behind retaining walls, portable compaction equipment and thinner fill lifts (3 to 4 inches) may be necessary. Fill materials used in structural areas should have a target maximum dry density of at least 95 pounds per cubic foot (pcf). If lighter weight fill materials are used, the NOVA geotechnical engineer should be consulted to assess the impact on design recommendations.

Soil moisture content should be maintained within 3 percent of the optimum moisture content. We recommend that the grading contractor have equipment on site during earthwork for both drying and wetting fill soils. Moisture control may be difficult during rainy weather.

Filling operations should be observed by a NOVA soils technician, who can confirm suitability of material used and uniformity and appropriateness of compaction efforts. The technician can also document compliance with the specifications by performing field density tests using thin-walled tube, nuclear, or sand cone testing methods (ASTM D 2937, D 6938, or D 1556, respectively). One test per 400 cubic yards and every 1 foot of placed fill is recommended, with test locations well distributed throughout the fill mass. When filling in small areas, at least one test per day per area should be performed.

5.2 GROUNDWATER

During the current study, groundwater was observed at boring locations B-1 at a depth of 5-1/2 feet below the existing ground surface (approximate elevation of 2057 feet-MSL). As such, groundwater will not likely be encountered during site development.

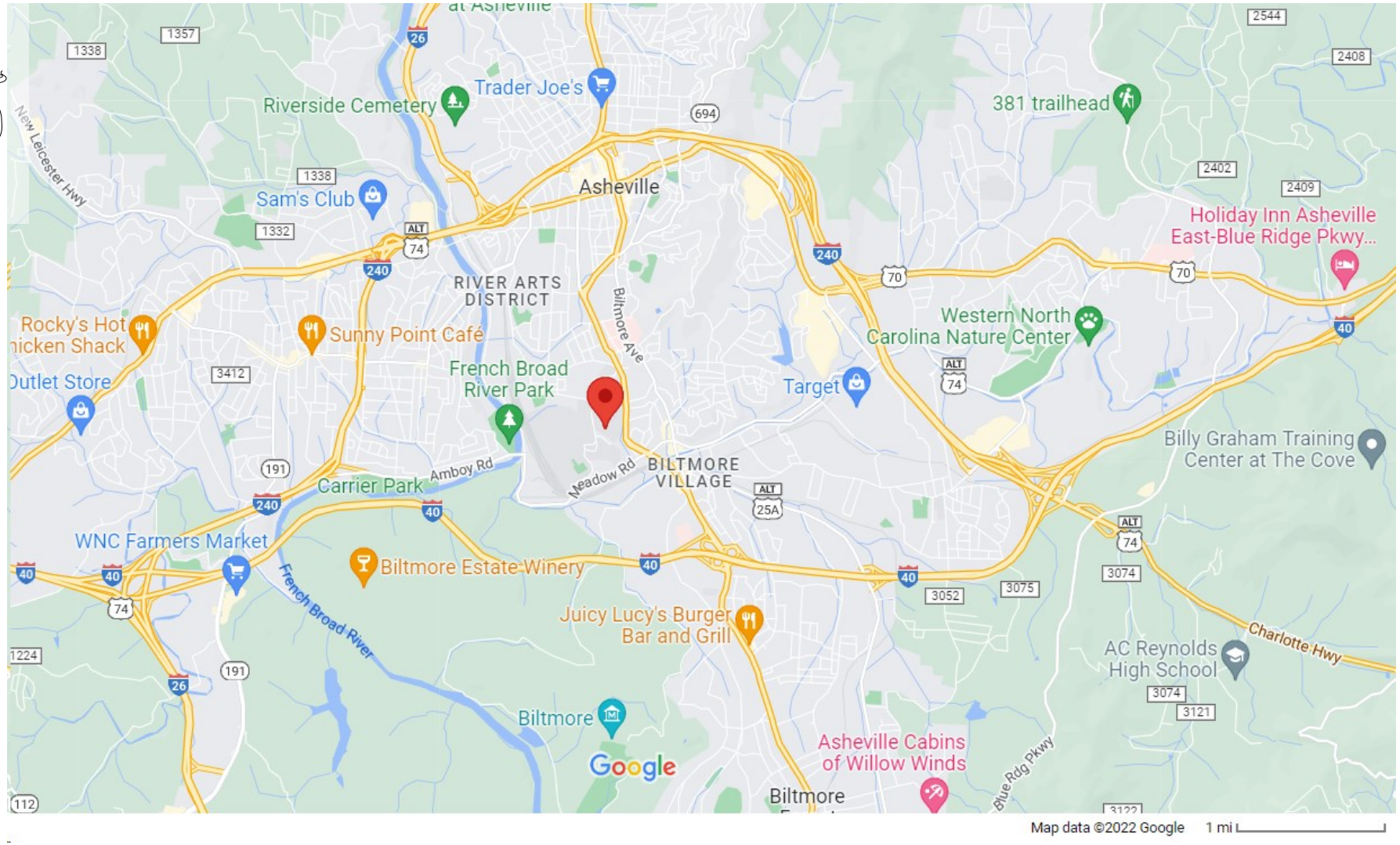
However, as previously noted, groundwater levels are subject to seasonal, climatic and other variations and may be different at other times and locations. The extent and nature of any dewatering required during construction will be dependent on the actual groundwater conditions prevalent at the time of construction and the effectiveness of construction drainage to prevent run-off into open excavations.

5.3 RECONSTRUCTION

Provided the recommended site and subgrade preparation and fill placement procedures are followed, we recommend that the proposed new track bear on the surface of recompacted or newly compacted fill. This recommendation is based on the assumption that the soils encountered during site construction activities are consistent with those encountered in the borings.

The new track will primarily be used by runners during sporting events, but also will likely need to support some vehicle traffic. The design of the new track surface was beyond the scope of this exploration. However, for the purposes of design a CBR of 7 may be assumed for fill soils compacted as recommended herein.

APPENDIX A
Figures and Maps



SOURCE: Google Maps

SCALE: Graphic

NOVA

Figure 1: Site Location Plan

Asheville High School Track
Asheville, North Carolina
NOVA Project Number: 10705-2021067

SOURCE: Google Earth

Boring locations were approximated in the field using Handheld GPS

SCALE: NTS

NOVA

Figure 2: Boring Location Plan

Asheville High School Track
Asheville, North Carolina
NOVA Project Number: 10705-2021067

APPENDIX B
Subsurface Data

KEY TO SYMBOLS AND CLASSIFICATIONS

DRILLING SYMBOLS

	Split Spoon Sample
	Undisturbed Sample (UD)
	Standard Penetration Resistance (ASTM D1586)
	Water Table at least 24 Hours after Drilling
	Water Table 1 Hour or less after Drilling
100/2”	Number of Blows (100) to Drive the Spoon a Number of Inches (2)
NX, NQ	Core Barrel Sizes: 2⅛- and 2-Inch Diameter Rock Core, Respectively
REC	Percentage of Rock Core Recovered
RQD	Rock Quality Designation – Percentage of Recovered Core Segments 4 or more Inches Long
	Loss of Drilling Water
MC	Moisture Content Test Performed

CORRELATION OF PENETRATION RESISTANCE WITH RELATIVE DENSITY AND CONSISTENCY

	Number of Blows, “N”	Approximate Relative Density
	0 – 4	Very Loose
	5 – 10	Loose
SANDS	11 – 30	Medium Dense
	31 – 50	Dense
	Over 50	Very Dense

	Number of Blows, “N”	Approximate Consistency
	0 – 2	Very Soft
	3 – 4	Soft
SILTS	5 – 8	Firm
and	9 – 15	Stiff
CLAYS	16 – 30	Very Stiff
	31 – 50	Hard
	Over 50	Very Hard

DRILLING PROCEDURES

Soil sampling and standard penetration testing performed in accordance with ASTM D1586. The standard penetration resistance is the number of blows of a 140 pound hammer falling 30 inches to drive a 2-inch O.D., 1⅜-inch I.D. split spoon sampler one foot. Core drilling performed in accordance with ASTM D2113. The undisturbed sampling procedure is described by ASTM D1587. Soil and rock samples will be discarded 30 days after the date of the final report unless otherwise directed.

NOVA

SOIL CLASSIFICATION CHART

COARSE GRAINED SOILS	**GRAVELS**	Clean Gravel less than 5% fines	GW	Well graded gravel
			GP	Poorly graded gravel
		Gravels with Fines more than 12% fines	GM	Silty gravel
			GC	Clayey gravel
	SANDS	Clean Sand less than 5% fines	SW	Well graded sand
			SP	Poorly graded sand
		Sands with Fines more than 12% fines	SM	Silty sand
			SC	Clayey sand
FINE GRAINED SOILS	**SILTS AND CLAYS** Liquid Limit less than 50	Inorganic	CL	Lean clay
			ML	Silt
		Organic	OL	Organic clay and silt
	SILTS AND CLAYS Liquid Limit 50 or more	Inorganic	CH	Fat clay
			MH	Elastic silt
		Organic	OH	Organic clay and silt
HIGHLY ORGANIC SOILS		Organic matter, dark color, organic odor	PT	Peat

PARTICLE SIZE IDENTIFICATION

GRAVELS	Coarse	¾ inch to 3 inches
	Fine	No. 4 to ¾ inch
SANDS	Coarse	No. 10 to No. 4
	Medium	No. 40 to No. 10
	Fine	No. 200 to No. 40
SILTS AND CLAYS		Passing No. 200

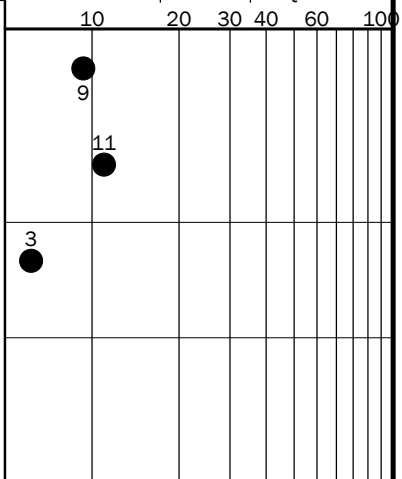
NOVA

TEST BORING RECORD B-1

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: ▽ 5.5 | AFTER 24 HOURS: ▽ N/R | CAVING> C 5.6

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0		Asphalt (2")				
		Gravel (7")				
	2060	FILL: Moist, stiff, brown, micaceous sandy SILT (ML)				4-5-4
5		FILL: Moist, stiff, brown to gray, slightly micaceous clayey SAND (SC) with some gravel		▽		2-3-8
	2055	RESIDUUM: Moist, soft, brown to light brown, highly micaceous sandy SILT (ML)				1-1-2
10		Boring Terminated at 8.0 ft.				
	2050					
15						
	2045					
20						
	2040					
25						
	2035					
30						
	2030					
35						

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

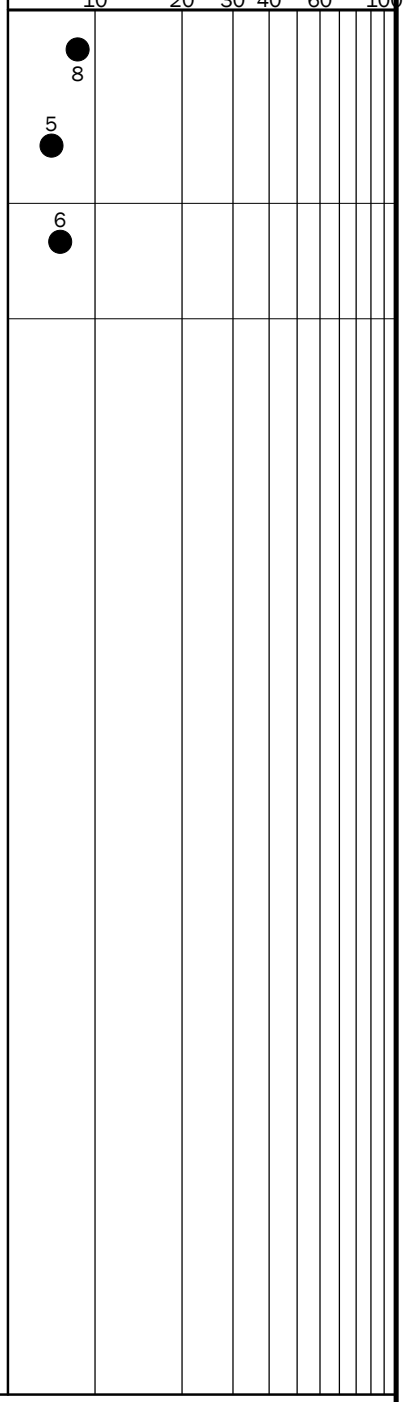
TEST BORING RECORD B-2

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 3.8

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0		Asphalt (2")				
		Gravel (6")				
	2060	FILL: Moist, firm, brown, highly micaceous sandy SILT (ML)				3-3-5
5		RESIDUUM: Moist, loose, brown, micaceous silty SAND (SM)		C		2-2-3
	2055	Moist, firm, brown, micaceous sandy SILT (ML)				0-2-4
10		Boring Terminated at 8.0 ft.				
	2050					
15						
	2045					
20						
	2040					
25						
	2035					
30						
	2030					
35						

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT



This information pertains only to this boring and should not be interpreted as being indicative of the site.

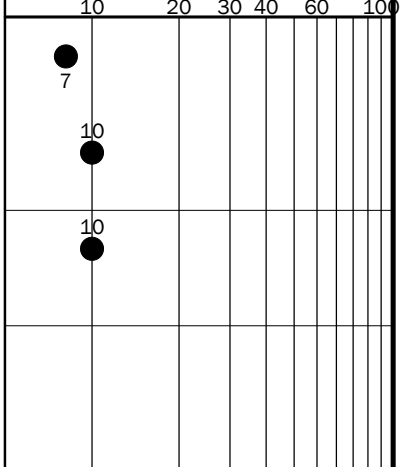
NOVA

TEST BORING RECORD B-3

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2061 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 6.1

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
	2060	Asphalt (2")				
		Gravel (6")				
		FILL: Moist, firm, red to brown, micaceous sandy SILT (ML)				3-3-4
5		FILL: Moist, loose, brown, micaceous silty SAND (SM)				5-5-5
	2055	RESIDUUM: Moist, stiff, brown to black, micaceous sandy SILT (ML) with trace organics		C		4-3-7
		Boring Terminated at 8.0 ft.				
10	2050					
15	2045					
20	2040					
25	2035					
30	2030					
35						

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

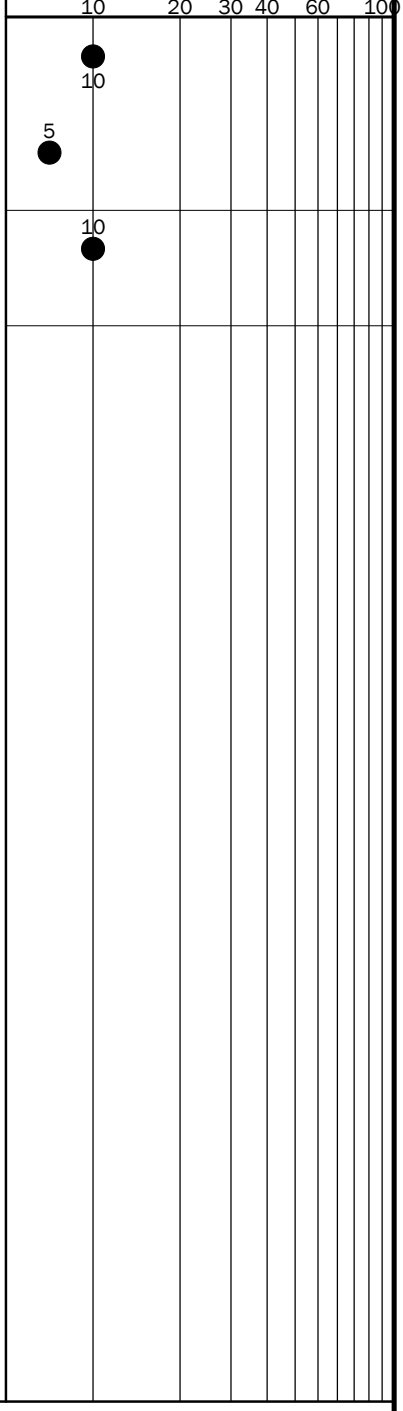
NOVA

TEST BORING RECORD B-4

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 6.1

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Asphalt (2")				
		Gravel (4")				
	2060	FILL: Moist, loose to firm, grey to brown, clayey SAND (SC) with some gravel				4-5-5
5				C		1-1-4
	2055	RESIDUUM: Moist, loose, brown, micaceous silty SAND (SM)				8-6-4
		Boring Terminated at 8.0 ft.				
10	2050					
15	2045					
20	2040					
25	2035					
30	2030					
35						

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

TEST BORING RECORD B-5

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> 5.9

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0						
		Asphalt (2")				
		Gravel (6")				
	2060	FILL: Moist, stiff, brown, micaceous sandy SILT (ML) with trace gravel				3-3-7
		RESIDUUM: Moist, loose, brown, micaceous silty SAND (SM) with trace gravel				3-3-4
5	2055			C		2-2-3
		Boring Terminated at 8.0 ft.				
10	2050					
15	2045					
20	2040					
25	2035					
30	2030					
35						

Graphic Depiction

BLOW COUNT
NATURAL MOISTURE
PLASTIC LIMIT — LIQUID LIMIT

10 20 30 40 60 100

10
7
5

This information pertains only to this boring and should not be interpreted as being indicative of the site.

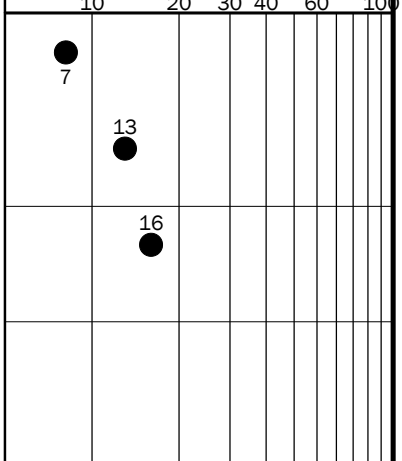
NOVA

TEST BORING RECORD B-6

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 6.1

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0	2060	Asphalt (2")				
		Gravel (6")				
		FILL: No Recovery				3-3-4
5	2055	RESIDUUM: Moist, stiff to very stiff, brown to black, micaceous sandy SILT (ML) with trace gravel		C		3-6-7
						6-7-9
10	2050	Boring Terminated at 8.0 ft.				
15	2045					
20	2040					
25	2035					
30	2030					
35						

Graphic Depiction



This information pertains only to this boring and should not be interpreted as being indicative of the site.

NOVA

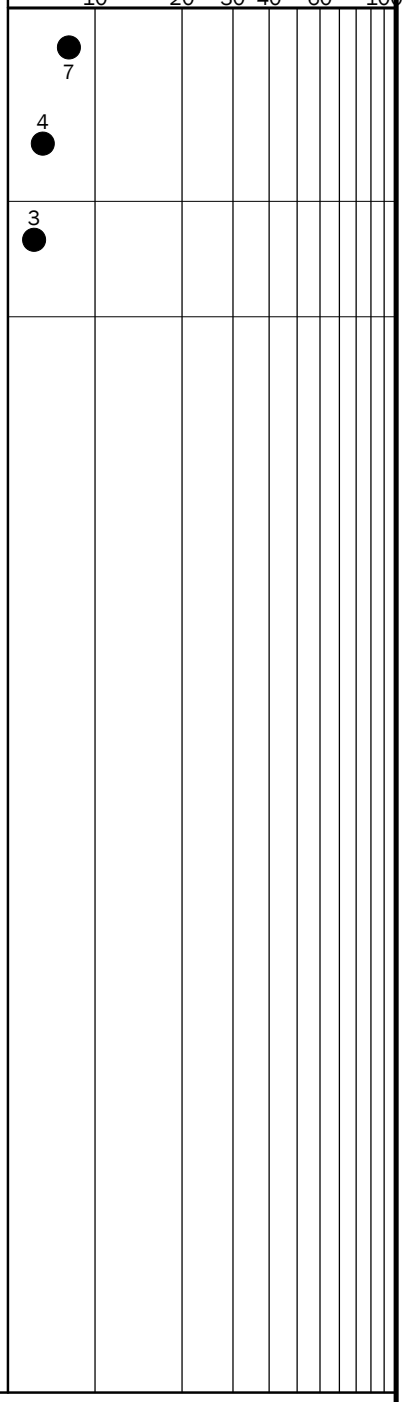
TEST BORING RECORD B-7

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 5.1

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0		Asphalt (2")				
		Gravel (6")				
	2060	RESIDUUM: Moist, loose to very loose, red to brown, micaceous silty SAND (SM)				4-4-3
5				C		2-2-2
	2055	Moist, soft, black to gray, micaceous sandy SILT (ML) with trace clay and organics				0-0-3
10		Boring Terminated at 8.0 ft.				
	2050					
15						
	2045					
20						
	2040					
25						
	2035					
30						
	2030					
35						

Graphic Depiction

● BLOW COUNT
▲ NATURAL MOISTURE
PLASTIC LIMIT ⊢——⊣ LIQUID LIMIT
10 20 30 40 60 100



This information pertains only to this boring and should not be interpreted as being indicative of the site.

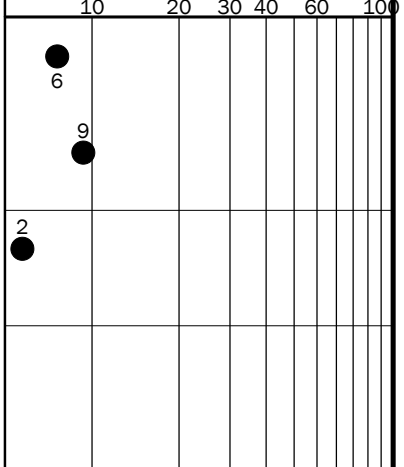
NOVA

TEST BORING RECORD B-8

PROJECT: Asheville High School Track | PROJECT NO.: 10705-2021067
CLIENT: Buncombe County Schools
PROJECT LOCATION: Asheville, North Carolina
LOCATION: Existing Athletic Track | ELEVATION: 2062 ft-MSL
DRILLER: Capstone Civil Engineering | LOGGED BY: SEM
DRILLING METHOD: SPT via HSA | DATE: 06-17-2022
DEPTH TO - WATER> INITIAL: N/E | AFTER 24 HOURS: N/R | CAVING> C 5.8

Depth (feet)	Elevation (ft-MSL)	Description	Graphic	Groundwater	Sample Type	N-Value
0		Asphalt (2")				
		Gravel (8")				
	2060	FILL: Moist, loose, light brown silty SAND (SM)				4-3-3
5		RESIDUUM: Moist, stiff, red to brown, micaceous sandy SILT (ML) with trace gravel		C		4-4-5
	2055	Moist, very soft, red to gray micaceous sandy SILT (ML)				0-0-2
10		Boring Terminated at 8.0 ft.				
	2050					
15						
	2045					
20						
	2040					
25						
	2035					
30						
	2030					
35						

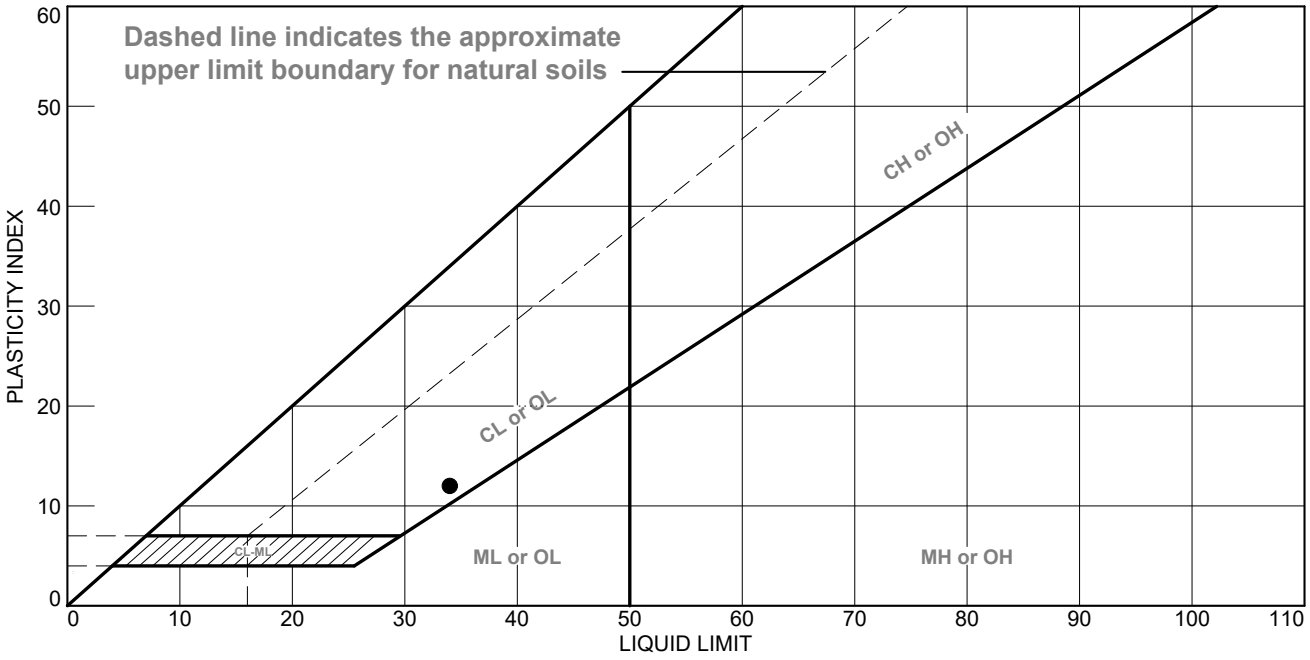
Graphic Depiction

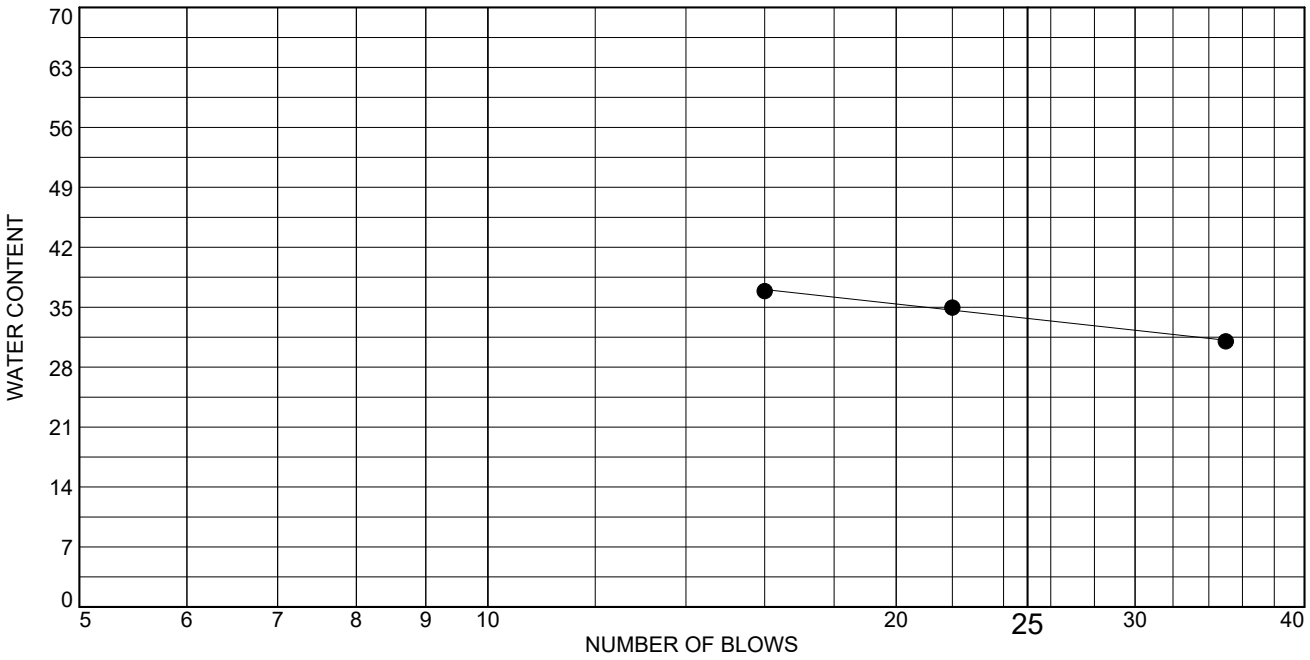


This information pertains only to this boring and should not be interpreted as being indicative of the site.

APPENDIX C
Laboratory Data

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Reddish-Tan and Gray Clayey SAND	34	22	12		48.6	SC

Project No. 10705- **Client:** Buncombe County Schools

Project: Asheville High School Track

Location: B-4
Sample Number: 137418-1 **Depth:** 3.0' - 5.0'

Nova Engineering & Environmental

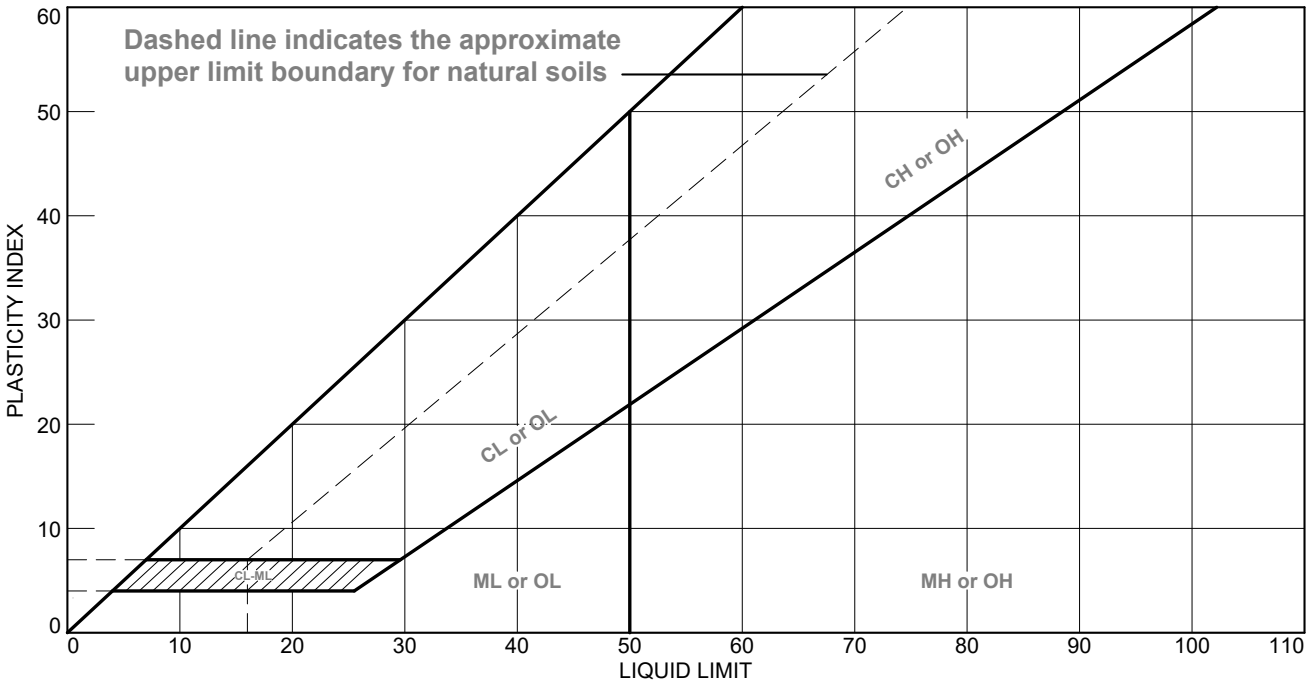
Charlotte, NC

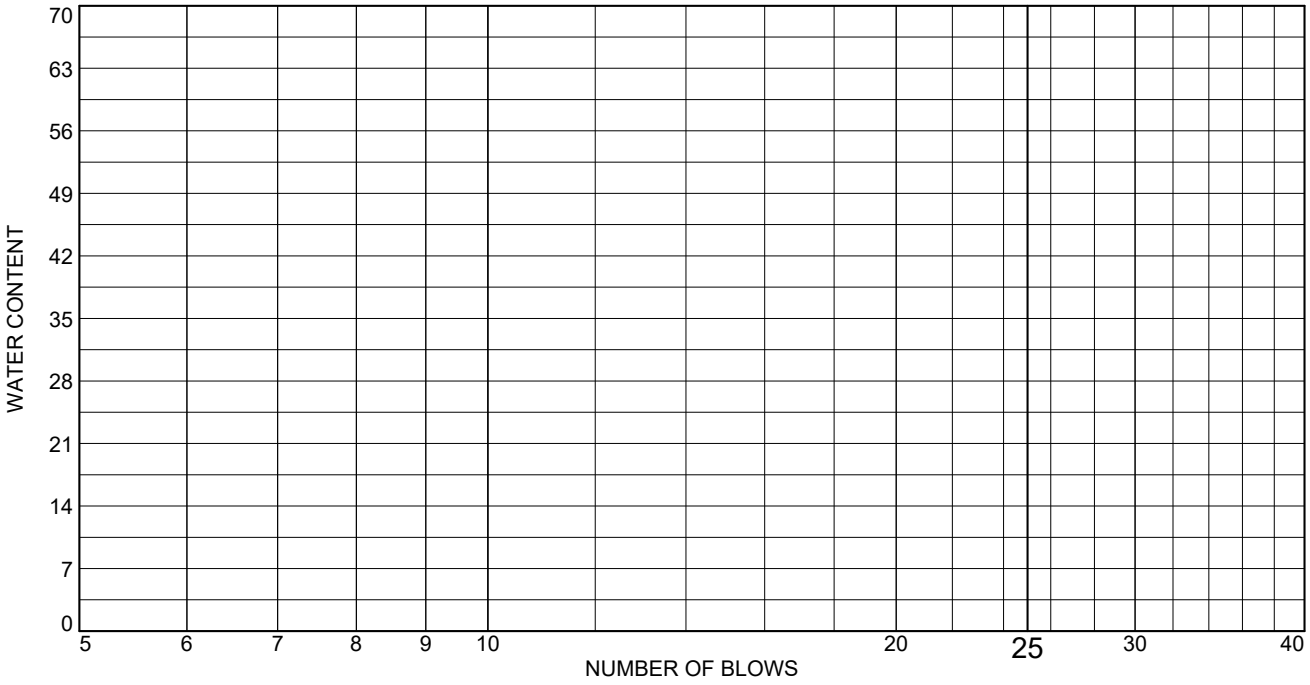
Remarks:
● Natural Moisture = 23.0%

Figure

Tested By: J. Jones

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Moist, soft, black to grey, micaceous sandy SILT with trace clay and organics	NV	NP	NP		50.2	ML

Project No. 10705- **Client:** Buncombe County Schools

Project: Asheville High School Track

Location: B-7
Sample Number: 137418-2 **Depth:** 6.5' - 8.0'

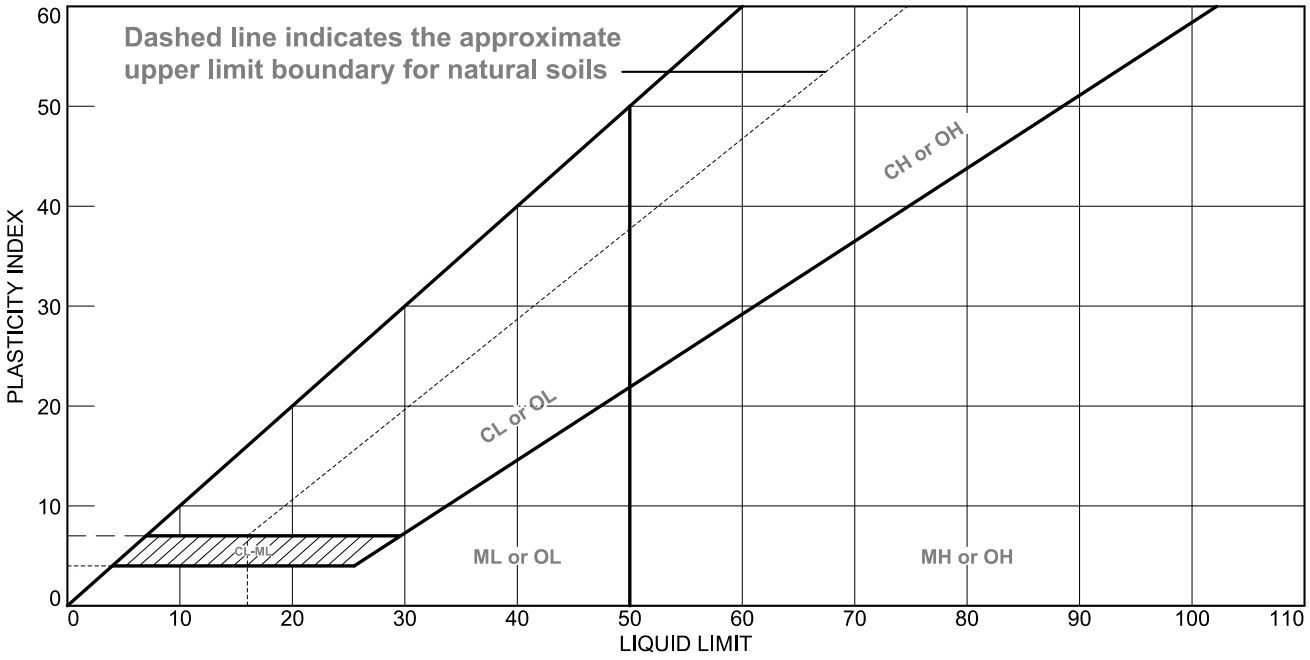
Nova Engineering & Environmental

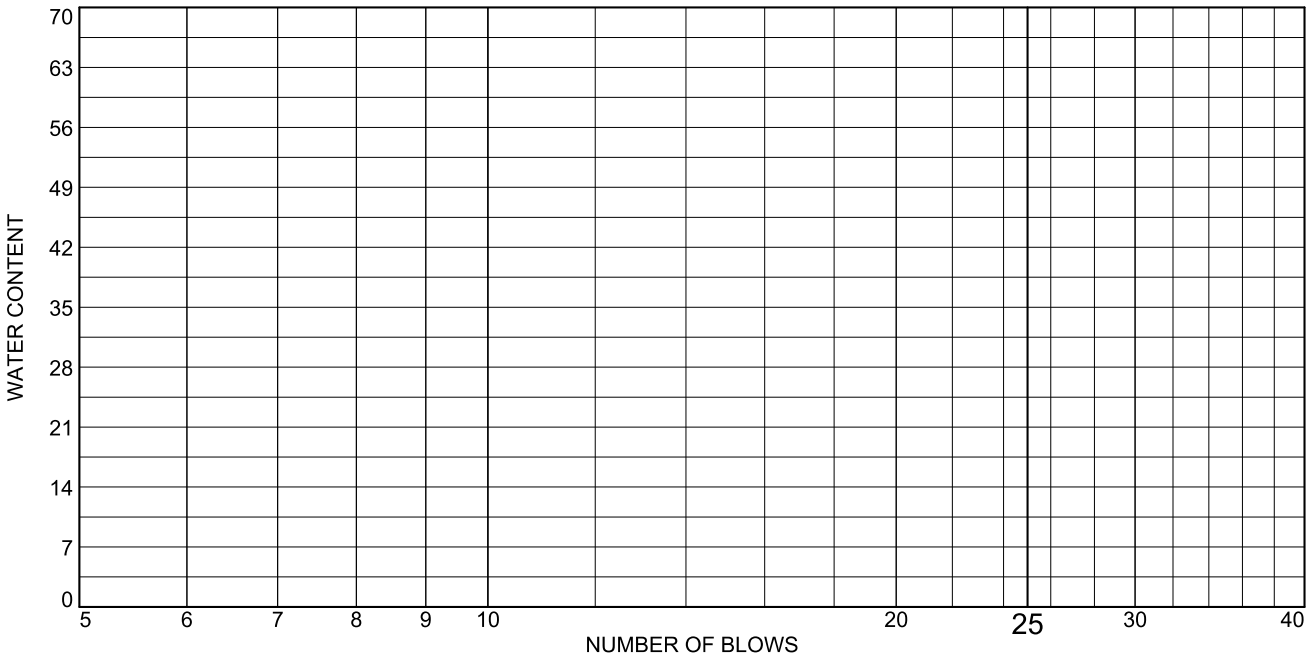
Charlotte, NC

Remarks:
● Natural Moisture = 40.0%

Figure

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Dark brown to gray silty SAND with trace to little gravel	NV	NP	NP		47.7	SM

Project No. 2021067 **Client:** Buncombe County Schools

Project: Asheville High School Track Replacement

Location: Bulk Combined
Sample Number: 137418-3 **Depth:** 0.0' - 5.0'

Nova Engineering & Environmental

Charlotte, NC

Remarks:
● Natural Moisture = 20.6%

Figure

Tested By: A. West

COMPACTION TEST REPORT

Curve No.: 137481-3

Project No.: 2021067 **Date:** 07-13-2022

Project: Asheville High School Track Replacement

Client: Buncombe County Schools

Location: Bulk Combined

Sample Number: 137418-3 **Depth:** 0.0' - 5.0'

Remarks: Manual Rammer

MATERIAL DESCRIPTION

Description: Dark brown to gray silty SAND with trace to little gravel

Classifications - **USCS:** SM **AASHTO:**

Nat. Moist. = 20.6 %

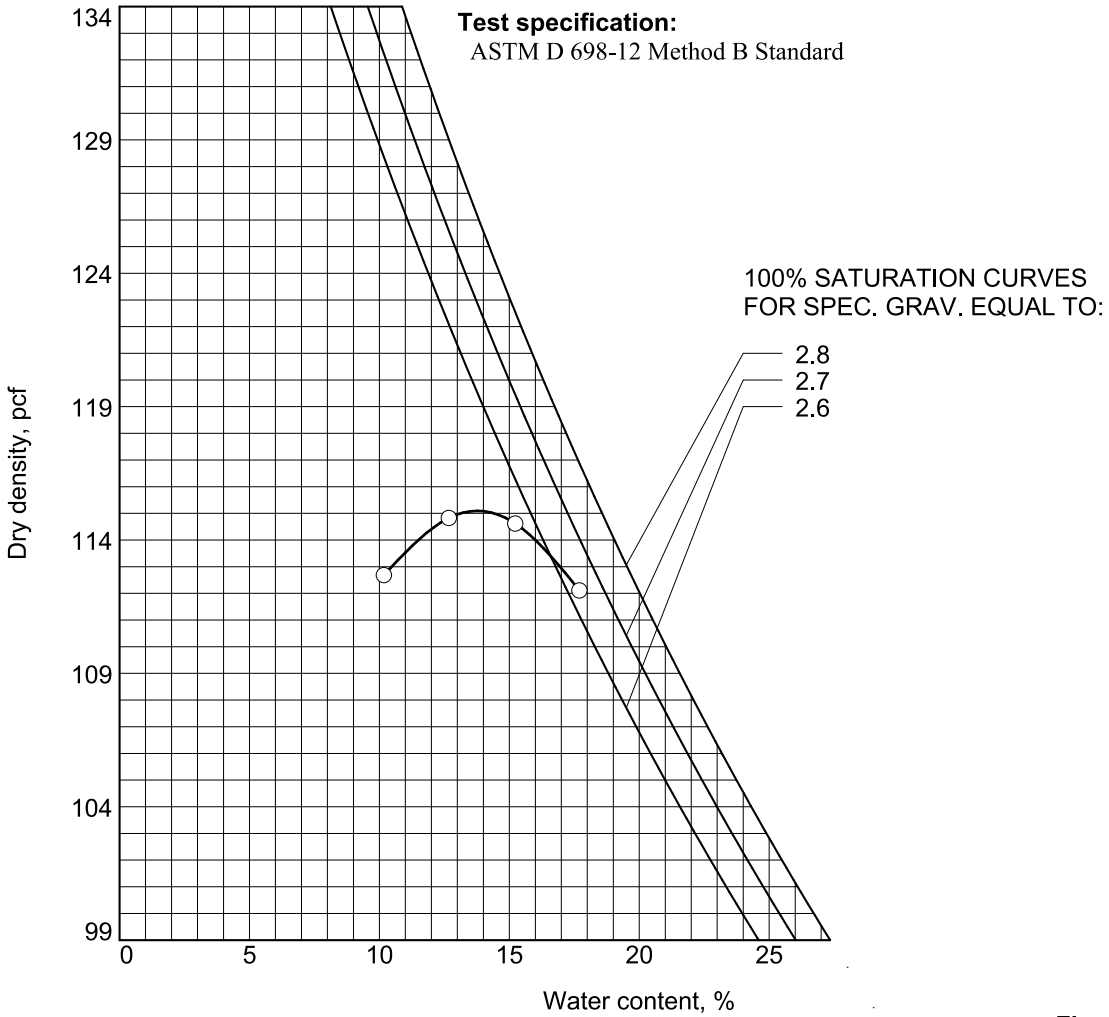
Liquid Limit = NV

Sp.G. =

Plasticity Index = NP

% < No.200 = 47.7 %

TEST RESULTS
Maximum dry density = 115.1 pcf
Optimum moisture = 13.8 %



Figure

Nova Engineering & Environmental

Tested By: J. Jones

BEARING RATIO TESTING RESULTS
(ASTM D1883-16)

Date:	07-14-2022		
Project No.:	2021067		
Project:	Asheville High School Track Replacement		
Location:	Bulk Combined		
Depth:	0.0' - 5.0'	**Sample Number:**	137418-3
Material Description:	Dark brown to gray silty SAND with trace to little gravel		
USCS Classification:	SM		
Liquid Limit:	NV	**Plasticity Index:**	NP

Test Description:

Maximum Dry Density, pcf :	115.1	**Optimum Moisture Content, %:**	13.8

Testing Remarks:

Sample 1 (47 Blows; Surcharge: 10 lbs.)

Water Content

Wt. Wet Soil+Tare, gms. 422.66	Wt. Soil+Tare, gms. 368.0	Wt. Tare, gms. 8.48	Moisture, % 15.2

Unit Weight

Wt. Mold+Soil, lbs. 25.814	Wt. Mold, lbs. 16.010	Ht. Soil, in. 4.595	Density, pcf 113.2

Swell Data

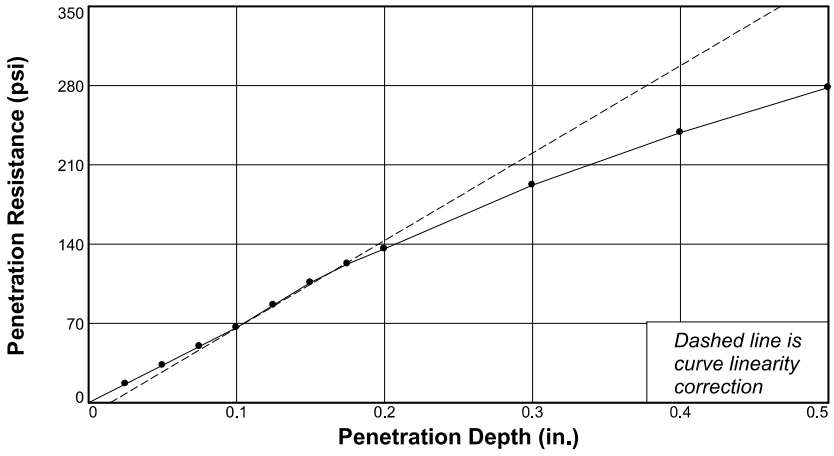
Elapsed Time, hrs.	Dial Reading in. x 1,000	Swell %
0	341	0.0
.5	357	0.3
1.5	366	0.5
24	398	1.2
48	409	1.5
72	411	1.5
96	412	1.5

Final Water Content

	Wt. Wet Soil+Tare, gms.	Dry Soil+Tare	Tare	Moisture, %
1)	475.21	369.88	8.13	29.1

Penetration Test Data

Pen. in.	Dial Reading	Stress psi	CBR %
0.0	0	0.0	
0.025	5	16.6	
0.05	10	33.1	
0.075	15	49.7	
0.1	20	66.3	7.8
0.125	26	86.1	
0.15	32	106.0	
0.175	37	122.6	
0.2	41	135.8	9.6
0.3	58	192.2	
0.4	72	238.6	
0.5	84	278.3	



APPENDIX D
Qualifications of Recommendations

QUALIFICATIONS OF RECOMMENDATIONS

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for NOVA to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by the geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, NOVA should be retained by the owner to observe all earthwork and foundation construction to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations. NOVA is not responsible or liable for the conclusions and recommendations presented in this report if NOVA does not perform these observation and testing services.

This report is intended for the sole use of **Buncombe County Schools** only. The scope of work performed during this study was developed for purposes specifically intended by **Buncombe County Schools** and may not satisfy other users' requirements. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. NOVA is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

Our professional services have been performed, our findings obtained, our conclusions derived and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the State of North Carolina. This warranty is in lieu of all other statements or warranties, either expressed or implied.

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org