DH&W
ARCHITECTURE INTERIORS PLANNING

PROJECT MANUAL

HCDE Bid Number 24-59

Signal Mountain Middle High School Tennis Courts Addition

2654 Sam Powell Trail
Signal Mountain, TN 37377

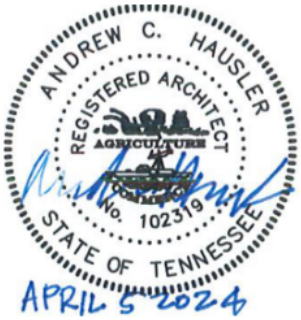
Bid Set

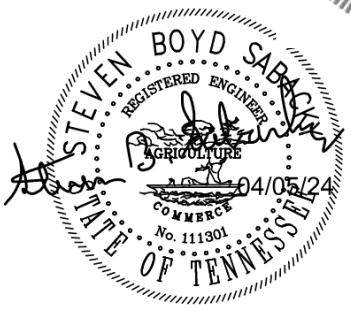
April 5, 2024

Hamilton County Department of Education
DH&W Project No. 2325

SECTION 00 01 10

TABLE OF CONTENTS
HCDE-SMMHS Tennis Courts





END OF SPECIFICATIONS INDEX

SECTION 00 01 15
LIST OF DRAWING SHEETS

G001	**COVER SHEET AND DRAWINGS INDEX**
A100	**ARCHITECTURAL SITE PLAN**
A101	**PLAN DETAIL**
C001	**SURVEY**
C100	**SITE PLAN**
C200	**EXISTING AND DEMOLITION PLAN**
C302	**SITE DRAINAGE**
C301	**SITE GRADING**
C400	**SITE UTILITIES**
C500	**SEDIMENT AND EROSION CONTROL NOTES**
C501	**SEDIMENT AND EROSION CONTROL**
C502	**SEDIMENT AND EROSION CONTROL - PHASE II**
C600	**GENERAL NOTES**
C700	**SITE DETAILS**
C800	**SITE DETAILS**
ES101	**ELECTRICAL SITE PLAN**
ES102	**ELECTRICAL PHOTOMETRICS PLAN**
ES103	**ELECTRICAL SITE DETAILS**

END OF SECTION

SECTION 00 50 00
CONTRACTING FORMS AND SUPPLEMENTS

PART 1 GENERAL

1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.

1.02 AGREEMENT AND CONDITIONS OF THE CONTRACT

A. See Section 00 52 00 - Agreement Form for the Agreement and General Conditions.

B. The Agreement is based on AIA A101.

C. The General Conditions are based on AIA A201.

1.03 FORMS

A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in Contract Documents.

B. Bond Forms:
   1. Bid Bond Form: AIA A310.

C. Post-Award Certificates and Other Forms:
   1. Submittal Transmittal Letter Form: AIA G810.
   2. Schedule of Values Form: AIA G703.
   3. Application for Payment Forms: AIA G702 with AIA G703 (for Contractors).

D. Clarification and Modification Forms:
   1. Architect's Supplemental Instructions Form: AIA G710.
   2. Construction Change Directive Form: AIA G714.
   3. Change Order Form: AIA G701.

E. Closeout Forms:
   1. Certificate of Substantial Completion Form: AIA G704.
   2. Contractor’s Affidavit of Release of Liens Form: AIA G706A
   3. Consent of Surety to Final Payment Form: AIA G707.

1.04 REFERENCE STANDARDS

A. AIA A101 - Standard Form of Agreement Between Owner and Contractor where the basis of Payment is a Stipulated Sum.

B. AIA A201 - General Conditions of the Contract for Construction.

C. AIA A310 - Bid Bond.

D. AIA G701 - Change Order.

E. AIA G702 - Application and Certificate for Payment.

F. AIA G703 - Continuation Sheet.

G. AIA G704 - Certificate of Substantial Completion.

H. AIA G706A - Contractor’s Affidavit of Release of Liens.

I. AIA G707 - Consent of Surety to Final Payment.

J. AIA G710 - Architect's Supplemental Instructions.

K. AIA G714 - Construction Change Directive.

L. AIA G810 - Transmittal Letter.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

ADVERTISEMENT DATE: **May 8, 2024**

HAMILTON COUNTY DEPARTMENT OF EDUCATION
3074 Hickory Valley Road
Chattanooga, Tennessee 37421
(423) 498-7030
INVITATION TO BID (ITB)

BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts

Sealed envelopes containing bids must be sent to the Purchasing Department and addressed to the Hamilton County Department of Education, 3074 Hickory Valley Road, Chattanooga, Tennessee 37421. Proposers must submit and mark an "original" bid, one "copy", and one "USB Flash Drive" in one (1) sealed envelope. Bid documents may be secured from the Procurement Department at the above address and on our website at www.hcde.org via vendor registry. Bids received shall be opened by the Purchasing Department at the time and place designated in the Solicitation and/or associated addenda. The opening for the ITB shall be open to the public.

Bids must be received in the Purchasing Department prior to the designated time for opening. Bids received after the designated time of opening will be considered late and shall be considered Non-Responsive.

SOLICITATION NUMBER & TITLE	BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts
OPENING/DUE DATE & TIME	June 13, 2024, **DUE 1:30 PM**
LOCATION	3074 Hickory Valley Road, Chattanooga, Tennessee 37421
PROCUREMENT CONTACT	Steven Hodgen
PHONE	423-498-7030
EMAIL	DOE_Purchasing@HCDE.Org
PRE-SOLICITATION MEETING	Yes
TYPE	MANDATORY
DATE & TIME	May 30, 2024 2:00 PM
LOCATION	**Project Site** 2654 Sam Powell Trail, Signal Mountain, TN 37377

BIDDER NAME _____

HAMILTON COUNTY DEPARTMENT OF EDUCATION
3074 Hickory Valley Road
Chattanooga, Tennessee 37421
(423) 498-7030

INVITATION TO BID (ITB)

BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts

Sealed bids will be received addressed to the **Attention of Purchasing Department, Hamilton County Department of Education**, 3074 Hickory Valley Road, Chattanooga, Tennessee 37421, **until 1:30 PM** on **June 13, 2024.** Any bid received after the scheduled closing time for receipt of such bid will be considered late and shall be considered Non-Responsive.

TERMS AND CONDITIONS

These terms and conditions shall be part of the Contract. HCS reserves the right to negotiate other terms and conditions it deems appropriate and necessary under the circumstances to protect the public's trust.

Note: Throughout this document the terms Proposer, Contractor, Company, Vendor, Firm or Bidder are used interchangeably and refer to any organization submitting a response to any solicitation. Additionally, the words terms, quote, bid, proposal are used interchangeably and refer to the submission in response to any solicitation. Hamilton County Schools, will be referenced as "HCS".

1. **Quality and Guarantee** - All material on which bids are submitted shall be of the quality and grade specified. Each bid must be accompanied with complete descriptions, catalog cuts, or other illustrations of each item upon which a bid is made. The names of manufacturers and stock numbers shall be clearly indicated. Approximate delivery dates are to be given for each item. Any item bid which does not completely meet stated specifications must be listed as an alternate.

2. **Requirements for Submitting Bids** – Bids made on forms other than the Bid Form will not be considered. No modifications or alterations to the bid documents may be made either by interlineation, supplements or deletions. Documents submitted with modifications of any kind will be ruled non-responsive and the vendor possibly removed or suspended from the bid vendor listing for a period of up to two (2) years. The signature of the person submitting the bid shall be in longhand without erasure.

3. **Bid amendment:** If it becomes evident that an invitation must be amended, a formal written amendment will be issued to all known Bidders. If necessary, a new due date will be established.

4. **Bid delivery:** HCS requires that all bids be submitted and time/date-stamped by the date and before the time specified in the bid documents to be considered, regardless of method of delivery. The time clock in the Procurement Department shall be the official record of the time. HCS is not responsible for any technical difficulties of any vendor in the delivery of its bid. No late bids will be accepted, opened or returned.

5. **Bid forms:** Vendors must complete bid forms contained in the bid package. Failure to fully complete the bid forms may result in rejection of the bid.

    a. All information shall be entered in ink or typed/computer generated. Mistakes may be crossed out and corrections inserted before submission of your bid. Corrections shall be

initialed in ink by the person signing the bid. Corrections and/or modifications received after the closing time specified will not be accepted.

6. **Bid preparation:** Prospective bidders are solely responsible for their own expenses in Bid preparation and subsequent negotiations with HCS, if any.

7. **Bid pricing:** Any bid, and its associated pricing, shall remain valid for at least ninety (90) days after the bid due date, unless otherwise indicated in the bid specifications. Unit price must be shown for all products or services. In case of error in extension, unit price will govern.

8. **Bid submission and transmission:** Bid must be submitted in a sealed envelope with the Bid Number/Name, the closing date and time, as well as your company name provided on the envelope. If your response envelope is enclosed in another envelope/package for delivery, the latter should also be clearly labeled with the same identifying information.

    a. All bids are to be F.O.B. Hamilton County, TN. All responses to this invitation become the property of HCS. Bids/Bids submitted via e-mail or facsimile machine are unacceptable.

9. **Cooperation with Other Service Providers:** If HCS undertakes or awards other contracts for additional related work, the Service Provider shall fully cooperate with such other Service Providers and HCS employees, and carefully fit its own work to such additional work as may be directed by HCS. The Service Provider shall not commit or permit any act which will interfere with the performance of work by any other Service Provider or County employees.

10. **Withdrawal** - Withdrawal of an inadvertent or erroneous bid or proposal by the vendor (before or after opening) may be permitted, when the Purchasing Department determines it to be appropriate. For an unopened manually submitted bid or proposal in exclusive possession of HCS to be withdrawn, a written request for withdrawal must be submitted to the office of the HCS Purchasing Department by a duly authorized representative of the vendor. To take effect, such requests must be received prior to the time set for the opening. A successfully withdrawn submission may be replaced with another sealed bid / proposal if it is received prior to the time set for the opening. In all cases, determination of bid / proposal receipt will be solely governed by the clock-in time as determined by a clock or timepiece designated by the Purchasing Department. No other clock or timepiece will have any bearing on determining whether or not the bid / proposal has been received prior to the time set for the opening. Electronic bids / proposals are available to be withdrawn by the vendor until the specified opening. An apparent successful bidder alleging a material mistake may be allowed to withdraw their Bid at the option of HCS.

11. **Rights of Owner** - The Hamilton County Board of Education reserves the right to reject any or all bids or any part thereof, to waive technicalities and informalities, and to award a contract to other than the low bidder. The right is reserved to reduce or increase the quantity of any item; and to award contract by item number, or group of items. Price, quality, and suitability will be considered in awarding bids. Samples to be submitted by the bidder upon request.

12. **Negotiation** – Hamilton County Department of Education may select a successful Proposer on the basis of initial offers received without discussions. Therefore, each Bid shall contain the Proposer's best terms from a cost or price, experience and technical and service standpoint. Hamilton County Department of Education reserves the right to enter into negotiations with Proposers. If Hamilton County Department of Education and the selected Proposer cannot negotiate a successful agreement, Hamilton County Department of Education may terminate said negotiations and begin negotiations with the other Proposers. Hamilton County Department of Education retains the right to negotiate with multiple Proposers simultaneously. This process will continue until a Contract has been executed or all Proposers have been rejected. No Proposer shall have any rights against Hamilton County Department of Education arising from such negotiations.

13. **Clarification of Bid Document** - Should a bidder find discrepancies in or omissions from the bid document or should he be in doubt as to its meaning, he shall at once request clarification of the Owner.

14. **Awarding of Contracts** - Award will be made to the most responsive, responsible bidder(s) meeting specifications, who presents the product of service that is in the best interest of HCS. HCS reserves the right: (1) to award bids received on the basis of individual items, or groups of items, or on the entire list of items; (2) to reject any or all bids, or any part thereof; (3) to waive any informality in the bids; and (4) to accept the bid that is considered lowest and best.

15. **Tax Exemption** - Hamilton County Board of Education is a tax exempt entity/organization and will only pay those taxes for which it is obligated. Hamilton County Board of Education can provide a Government Certificate of Exemption for purchases where the entity's tax exemption may apply. All bidders should include in their bids, all sales and use tax which they are obligated to pay when making purchases for material or sub-contractor services. Sales and Use Tax shall be omitted when requesting pricing related to only equipment, supplies, product or equivalent purchases where the Certificate of Exemption for would exempt Hamilton County Board of Education from paying such taxes.

16. **Meeting Specifications** - By my written signature on this bid, I (we) agree and certify that all items included in the bid meet or exceed any and all specifications covering such items. I (we) further agree, if awarded a contract, to deliver merchandise which meets or exceeds the specifications. Failure to comply with this section will result in removal of your firm from our list of bidders for at least six (6) months. This penalty does not preclude action to enforce specific performance.

17. **Declaration/Statement by Bidder** - The respondent hereby states that he, his company, or any of its employees, agents, officers or proposed sub-contractors have not violated or participated in a violation of, been convicted, or pled "nolo contendre" to any act involving an unlawful restraint of trade such as, but not limited to violations of the Sherman Act (15 U.S.C. § 1-2), the Racketeer Influenced and Corrupt Organizations Act (18 U.S.C. 1961-1968), the Hobbs Act (18 U.S.C. §1961), the mail or wire fraud statutes (18 U.S.C. §1341,1343), the false statements statute (18 U.S.C. §1001), the Tennessee Anti-Trust Act (T.C.A. § 47-25-101) or similar state or federal law. Respondent further states that he, his company or any of its officers, agents, or employees have not been debarred by any governmental agency (Federal, state, or local).

    a. In submitting this bid, you are certifying that you are aware of the requirements imposed by T.C.A. §49-5-413(d) to conduct criminal background checks through the Tennessee Bureau of Investigation and the Federal Bureau of Investigation on yourself and any of your employees who may come in direct contact with students or who may come on or about school property anytime students are present. You are further certifying that at no time will you ever permit any individual who has committed a sexual offense or who is a registered sex offender to come in direct contact with children or to come on or about school property while students are present.

18. **Drug-Free Workplace Program**- Note: Required for construction services, encouraged for others. Law prohibits state or local governments from contracting for construction services with any private entity having five or more employees who has not furnished a written affidavit by its principal officer at the time of the bid or contract stating that the contractor is in compliance with the provisions of this act. Other organizations are encouraged to ensure that their workplace is Drug-Free

19. **Title VI of the Civil Rights Act of 1964** - No person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

20. **Title IX of the Education Amendments of 1972** - Prohibits discrimination based on gender in all programs or activities that receive Federal financial assistance. Title IX also includes same gender harassment as well as student-to-student harassment.

21. **Bid Acceptance**- Bidders shall hold their price and/or discount firm and subject to acceptance by HCS for a period of ninety (90) days from the date of the bid opening, unless otherwise indicated in their bid.

22. **Qualifications of Bidders**- A bidder may be required, before the award, to show to the complete satisfaction of HCS that it has the necessary facilities, ability, insurance, and financial resources to provide the service or goods specified.

23. **Restrictive or Ambiguous Specifications-** It is the responsibility of the prospective bidder to review the entire invitation to bid (ITB) or Invitation to Bid (Bid) packet and to notify the Procurement Department if the specifications are formulated in a manner that would unnecessarily restrict competition. Any such protest or question regarding the specifications of bidding procedures must be received in the Procurement Department *not less than seventy-two hours* prior to the time set for bid opening. These requirements also apply to specifications that are perceived to be ambiguous.

24. **Samples:** Samples of articles, when required, shall be furnished free of cost of any sort to HCS and may be retained for future comparison. Samples which are not destroyed by testing or which are not retained for future comparison will be returned upon request *at bidder expense*.

25. **TN Department Of Revenue Requirements:** Any awarded Vendor must be registered with the Department of Revenue for the collection of Tennessee sales and use tax.

26. **No Contact Policy-** After the date and time established for receipt of bids by the HCS Procurement Department, any contact initiated by any bidder with any HCS representative, other than the Procurement Division representative listed herein, concerning this solicitation is prohibited. Any such unauthorized contact may cause the disqualification of the bidder from this procurement transaction.

27. **Pricing:** Vendors are to quote a firm fixed price or discount for the term of the contract; inclusive of any renewals. Upon notice of request for renewal, or in the event of significant industry wide market changes, the Vendor may request a price increase. Proof of price increase must be supplied to the HCS Procurement Department. HCS reserves the right to accept or reject the requested price increase. If the price increase is rejected, the vendor may:

    - Continue with existing prices;
    - Submit a revised request for price increase;

      Or
    - not accept the renewal offer.

    a. If a price increase is approved by HCS, the approval notification will be done in writing and the vendor will be notified of the new price schedule. This documentation will become part of the bid file. No approvals will be authorized verbally.
    b. All orders are to be quoted F.O.B. destination.

28. **Quantities-** HCS does not guarantee any quantities of items to be purchased. We will buy these items on an as-needed basis.

29. **TN Cooperative Purchasing**: also known as piggybacking, HCDE reserves the right to extend the terms, conditions and prices of this contract to other institutions (such as State, Local and/or Public Agencies) who express an interest in participating in any contract that results from bids and/or bids. Each of the piggyback institutions will issue their own purchasing documents for purchasing of the goods. Bidder agrees that HCDE shall bear no responsibility or liability for any agreements between Bidder and the other Institution(s) who desire to exercise this option

30. **Acceptance:** all terms and conditions in this contract are deemed to be accepted by the vendor and incorporated in the bid, except the provision(s) which are expressly excluded by the specifications.

31. **Additional Information:** vendors are cautioned that any statement made by any individual or employee of HCS that materially changes any portion of the bid document, either before or after the issuance of the bid documents, shall not be relied upon unless subsequently ratified by a formal written amendment to the bid document.

32. **Alteration or amendments:** no alterations, amendment, changes, modifications or additions to any contract resulting from this bid shall be binding on HCS without the prior written approval of HCS.

33. **Assignment:** contractors shall not assign or sub-contract this agreement, its obligations or rights hereunder to any party, company, partnership, incorporation or person without the prior written consent of HCS.

34. **Brand names:** brand names and numbers, when used, are for reference to indicate the character or quality desired. Equal items will be considered, provided they are clearly identified by manufacturer, part number, diagrams, brochures and other related material, *unless stated otherwise in the bid specifications*. When brand, number, or level of quality is not stated by the bidder, it is understood the offer is exactly as specified.

35. **Code Of Ethics:** all suppliers are expected to adhere to business ethics and professional behaviors as outlined in these documents.

36. **Compliance With All Laws:** companies submitting bids must agree to observe and comply with all federal, state, and local laws, statutes, ordinances, and regulations, including but not limited to title vi of the federal civil rights act of 1964, the equal employment opportunity act and the regulations issued there under by the federal government, the Americans with disabilities act of 1990 and the regulations issued there under by the federal government, in any manner affecting the provision of goods and/or services, and all instructions, prohibitive orders issued, and shall obtain all necessary permits.

37. **Declarative Statement:** any statement or word (e.g., must, shall, will) are declarative statements and the vendor must comply with the conditions. Failure to comply with any such statement may result in their bid being deemed non-responsive and disqualified.

38. **Default:** in case of default by the vendor, HCS may procure the articles or services from other sources and may deduct from any monies due, or that may thereafter become due to the vendor, the difference between the price named in the contract or purchase order and actual cost thereof to HCS. Prices paid by HCS shall be considered the prevailing market price at the time such purchase is made. Periods of performance may be extended if the facts as to the cause of delay justify such extension in the opinion of the procurement director.

39. **Deliveries:** must be accompanied by delivery tickets or packing slips. These shall contain the following information for each item delivered: purchase order number; item number; name of article; quantity; and supplier.

40. **Delivery Of Goods And Services** - it is understood and agreed that this bid shall constitute an offer which, when accepted in writing by Hamilton County Schools, will constitute a valid and binding contract between the undersigned and the Hamilton County Department of Education. Failure to supply needed material and/or services will result in removal of your firm from our list of bidders for at least six (6) months.

41. **Delivery Requirements:** time of delivery shall be stated as the number of calendar days following receipt of the order by the vendor to receipt of the goods or services by HCS. *Note: time of delivery may be a consideration in the award.*

42. **Drug-Free Workplace Program for Construction Services:** law prohibits state or local governments from contracting for construction services with any private entity having five or more employees who has

not furnished a written affidavit by its principal officer at the time of the bid or contract stating that the contractor is in compliance with the provisions of this act. Companies, other than construction services, are also encouraged to have and maintain drug-free workplace policies.

43. **Grant Funded Purchases:** for purchases that are grant funded, the grant agreement may contain/require special terms and conditions. If there is a conflict between the terms and conditions of the grant agreement and the general terms and conditions of the bid or bid, the grant agreement terms and conditions shall prevail.

44. **Indemnifications/Hold Harmless:** contractor shall indemnify, defend, save and hold harmless HCDE, the school board, administration, and their agents and employees from any and all suits, claims, actions or damages of any nature brought because of, arising out of, or related to the contractor's performance under the terms of this contract, including the work of any sub-contractor, and without regard to any allegations of fault.

45. **Insurance Requirements**: The Vendor shall maintain the following minimum insurance requirements throughout the duration of the Agreement. HCS reserves the right to request additional documentation or additional policies be provided at its sole discretion and where deemed in its best interest. HCS in no way represents that the insurance required is sufficient or adequate to protect the Vendor's interest or liabilities.

    Vendor shall provide Worker's Compensation Insurance as required by applicable laws of the State of Tennessee and shall provide liability insurances as required. All insurance must be occurrence based. Vendor shall add Hamilton County Department of Education as additional named insured by policy endorsement and provide a certificate of insurance evidencing such coverage and endorsement number (#) for each additional named insured. Complete copies of insurance policies must be provided, if requested. A failure to provide said documentation will be considered a contract breach and grounds for termination of contract or pending award recommendation.

Insurance Required	
Coverage	**Amount**
Workers Compensation	Statutory Limits of Tennessee
Employers Liability	$1,000,000 per occurrence
Commercial General Liability	$1,000,000 each occurrence; $2,000,000 aggregate
Auto (Truck) Liability	$1,000,000 each occurrence

46. **Invoices**: will be returned for correction unless they contain the following information: purchase order number; item numbers; description of item; quantity; unit price; extensions; and total.

47. **New equipment:** the vendor shall guarantee that the units submitted for this bid shall be new, and the latest and most improved model of current production, and shall be first quality as to workmanship and materials used in said units. All modifications shall be made at the factory. Demonstrators shall not be acceptable. *Note: when the bid is for services, this item does not apply.*

48. **Non-Collusion:** vendors, by submitting a signed bid, certify that the accompanying bid is not the result of, or affected by, any unlawful act of collusion with any other person or company engaged in the same line of business or commerce, or any other fraudulent act punishable under Tennessee or federal law.

49. **Non-Conflict Statement:** vendors, by submitting a signed bid, agree that it has no public or private interest and shall not acquire directly or indirectly any interest that would conflict in any manner with the provision of its goods or performance of its services. Supplier warrants that no part of the total contract amount provided herein shall be paid directly or indirectly to any officer or employee of HCS as wages,

compensation, or gifts in exchange for acting as officer, agent, employee, subcontractor or consultant to the contractor in connections with any goods provided or work contemplated or performed relative to the agreement.

50. **Non-Discrimination Statement:** supplier must agree that no person on the grounds of age, color, disability, gender, genetic information, national origin, political affiliation, race, religion, sexual orientation, or veteran's status shall be excluded from participation in, or be denied benefits of, or be otherwise subjected to discrimination in the performance of this agreement, or in the employment practices of vendor. Supplier shall upon request show proof of such non-discrimination, and shall post in conspicuous places available to all employees and applicants notices of non-discrimination. Suppliers covenants that it complies with the fair wage and hour laws, the national labor relations act, and other federal and statement employment laws as applicable. Supplier covenants that it does not engage in any illegal employment practices.

51. **Payment Method-** HCS utilizes two (2) methods of placing orders for products. The first is the use of Purchase Orders. These Purchase Orders will be issued from HCS Procurement Division via the method selected by the vendor during registration. The Purchase Order will detail the quantity, specific items(s) and the contracted price for each item.

    a. The second method is the use of the HCS Credit Card (MASTERCARD). Orders placed with the credit card will list the same information as the Purchase Order. Vendors will be given the card information and approval to process the transactions by the requesting department. Vendors must indicate in their bid response if the vendor will accept the HCS Credit Card (MASTERCARD) as a form of payment. Bidders are prohibited to charge HCS any type of merchant fee from their financial institution to accept this type of payment.

52. **Payment Terms:** HCS payment terms are Net 30 after receipt/inspection of merchandise and receipt of invoice unless otherwise stated in the contract documents.

53. **Public Access to Procurement Information:** Subject to the requirements of the TN Open Records Act, information relating to the award of a particular contract shall be open to the public only after evaluation of that bid or bid has been completed. All public records pertaining to procurement shall be open for inspection during normal business hours as scheduled in advance with the Procurement Department.

54. **Protest of Award:** Any vendor who has submitted a timely bid or bid in response to a solicitation may protest the recommendation of award for a contract by submitting such protest to HCS's Director of Procurement. Any protest must be submitted in writing and be in the possession of the Procurement Department before noon (ET) of the 2nd working day following the public recommendation of contract award.

    FAILURE OF A VENDOR TO FOLLOW THE PROTEST REQUIREMENTS WITHIN THE TIME FRAMES PRESCRIBED IN THIS SECTION CONSTITUTES A WAIVER OF THE PROTEST AND ANY RESULTING CLAIMS.

55. **Right to Audit:** During all phases of the work and services to be provided hereunder the Provider agrees to permit duly authorized agents and employees of HCS to enter the Provider's offices for the purpose of inspections, reviews and audits during normal working hours. Reviews may also be accomplished at meetings that are arranged at mutually agreeable times and places. The Provider will maintain all books, documents, papers, accounting records, and other evidence pertaining to the fee paid/charged under this Contract and make such materials available at their offices at all reasonable times during the period of this Contract and for seven (7) years from the date of payment under this Contract for inspection by HCS or by any other governmental entity or agency participating in the funding of this Contract, or any authorized agents thereof; copies of said records to be furnished if requested.

56. **Safety Data Sheets:** After award, the successful bidder(s) will be required to provide HCS with a master set of Safety Data Sheets for any applicable products.

57. **Severability:** If any provisions of these Rules or any application thereof to any person or under any circumstance is held to be invalid, such invalidity shall not affect the provisions or applications of these rules which can be given effect without the invalid provision or application, and to this end the provisions of these Rules are declared to be severable.

58. **Termination for Cause:** In the event of any breach of contract by the successful service provider(s), HCS may serve written notice to the service provider of its default, setting forth with specificity the nature of the default. If the defaulting party fails to cure its default within thirty (30) days after receipt of the notice of default, then HCS shall have the right to terminate the contract upon thirty (30) days written notice and pursue all other remedies available to HCS, either at law or in equity.

59. **Termination for Convenience:** Contract may be terminated for convenience by either party by giving written notice to the other, at least sixty (60) days before the effective date of termination unless otherwise specified in the solicitation and/or contract documents. Said termination shall not be deemed a Breach of Contract.

60. **Termination Due To Non-Appropriation:** HCS shall not be obligated for the Contractor's performance hereunder or by any provision of this Contract during any of HCS's future fiscal years unless and until HCS appropriates funds for this Contract in HCS's Budget for each such future fiscal year.

61. **Terms and Conditions:** In the event of a conflict between the specifications and these terms and conditions, the specifications will govern.

62. **Warranties:** Vendor warrants to HCS that all items delivered and all services rendered shall conform to the specifications, drawings, bid and/or other descriptions furnished and/or incorporated by reference, and will be fit for the particular purpose purchased, of merchantable quality, good workmanship, and free from defects. Vendor extends to HCS all warranties allowed under the U.C.C. Vendor shall provide copies of warranties to the HCS. Return of merchandise not meeting warranties shall be at Vendors expense.

63. **Waiving of Informalities:** HCS reserves the right to waive minor informalities or technicalities when it is in the best interest of HCS.

64. **Governing Law/Jurisdiction: The Agreement shall be governed by the laws of the State of Tennessee. Any action brought in law or in equity to enforce any provision of the entire Agreement shall be filed in the appropriate state court in Hamilton County, Tennessee. In any action to enforce this Agreement, the prevailing party shall be entitled to recover its costs and expenses, including reasonable attorney's fees. By submission of a proposal and acceptance of a Purchase Order or Contract, Vendor hereby agrees to adhere to Governing Law/Jurisdiction requirements as described herein.**

HCS DOES NOT DISCRIMINATE ON THE BASIS OF AGE, COLOR, DISABILITY, GENDER, GENETIC INFORMATION, NATIONAL ORIGIN, POLITICAL AFFILIATION, RACE, RELIGION, SEXUAL ORIENTATION, OR VETERAN'S STATUS IN THE EVALUATION AND AWARD OF BIDS.

SPECIAL CONDITIONS

1.0 CONTRACT PERIOD

1.1 CONSTRUCTION TERM: From the Notice to Proceed or the Purchase Order date, whichever applies: 120 calendar days to substantial completion, 14 calendar days from substantial completion to final completion (total contract days 134).

2.0 FUNDING NOTICE NOTICE:

2.1 As a notice to all Vendors, this solicitation and its associated Agreement is funded in whole or in part with Federal funds in addition to general funds of the agency. Where federal funding is utilized the federal provisions as provided within the Federal Notice & Provisions of this Agreement shall apply. Notice of application of federal funding may be given by HCS authorized Project Manager/Ordering Contact and may be notated on applicable Purchase Order where known in advance. When funding is not clear it shall be the responsibility of the Vendor to clarify with the HCS authorized Project Manager.

3.0 BOND

3.1 Each bid must be accompanied by a Bid Bond in the amount of 5% of the proposed dollar amount (excluding Alternates) must be submitted with the bid. Failure to provide a valid Bid Bond at the time of bid submission shall deem Contractor Non-Responsive and therefore ineligible for evaluation and award.

3.2 For any construction Project Total that is equal to or exceeds $100,000.00, Vendor shall provide a Performance & Payment Bond meeting the HCS requirements for 100% of the Project Total from a surety company authorized to do business in the state of Tennessee or other form satisfactory to HCS. Fees/costs associated with procuring any bonding shall be at the sole expense of the Vendor and such shall be covered by the Project Total provided by Vendor for the associated Project.

SCOPE OF SERVICES

BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts

1.0 SUMMARY OF SCOPE

1.1 Hamilton County Schools (HCS) seeks to contract with a qualified, experienced, and professional Vendor to construct Tennis Court Assemblies as detailed by and within the Contract Documents prepared by DH&W Architects.

2.0 DETAILED SCOPE OF SERVICES

2.1 The services and products provided by the Vendor shall include, but not be limited to the following provisions:

2.1.1 Contractor shall be responsible for Payment Invoicing, maintaining a Project Schedule, coordinating the Work, maintaining the temporary Stormwater components such as silt fencing, temporary seeding, waddles, etc.

2.2 The detailed scope of work and Contractor responsibilities are further defined within the Project Manual/Specifications and project plans provided as part of the solicitation. It is the responsibility of the Vendor to review and fully understand all associated project documents.

HAMILTON COUNTY DEPARTMENT OF EDUCATION
Chattanooga, Tennessee 37421

SOLICITATION RESPONSE & BID/PROPOSAL FORM

BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts

1. Vendor Name _____
2. Vendor Address _____
3. City _____ State _____ Zip _____
4. Telephone Number _____ Fax Number _____
5. Contact Person _____
6. Contact Person's email address _____
7. By submission of this bid/proposal, each Vendor and each person signing on behalf of any Vendor certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each Vendor is not on the list created pursuant to Tennessee Code Annotated § 12-12-106.
8. Authorizing Signature _____
   (Sign)
9. Authorizing Print Name & Title: _____
10. Vendor's Hamilton County Business License Number _____
    (If Applicable) *Attach A Copy Of The License.*
11. I Acknowledge the Receipt Of: (Please Write "Yes" If You Received One)
    Addendum 1 _____ Addendum 2 _____ Addendum 3 _____ Addendum 4 _____
12. Do you accept the Terms and Conditions of the solicitation/contract? Yes _____ No _____
13. May other Government Agencies in Tennessee purchase these products/services at the same prices as this bid/proposal? Yes _____ No _____
14. Will you accept E-commerce payments? Yes _____ No _____
15. Pricing: Complete following page Bid/Proposal Form

REMINDER:

All questions pertaining to this solicitation must be submitted electronically to doe_purchasing@hcde.org no later than 8 calendar days prior to the Opening/Due date designated herein. Failure to submit a question in the timeframe indicated above may result in the question going unanswered at the discretion of HCS.

An extension to the opening date does not guarantee an extension to the question deadline period. Such will be communicated in associated addendum posting.

It is the sole responsibility of the Vendor to ensure they receive/obtain all solicitation related documentation.

Form 1 (Page 2 of 2)

HAMILTON COUNTY SCHOOLS

BID/PROPOSAL FORM

COMPANY NAME: _____

SOLICITATION: **BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts**

Having carefully examined the Solicitation/Contract Documents, Contractor/Vendor proposes to furnish the Scope of Services as described herein and within all applicable proposal submission documents for the fee(s) as presented below.

Pricing shall be inclusive of all labor, equipment, supplies, overhead, profit, material, and any other incidental costs required to perform and complete all work as specified in the Solicitation/Contract Documents. All Unit Prices shall be bid at the nearest whole penny.

In the event there is a discrepancy between a subtotal or total amount and the unit prices and extended amounts, the unit prices shall prevail and the corrected extension(s) and total(s) will be considered the price.

HCS requests bids/proposals be submitted on bid/proposal forms provided by the HCS for this solicitation. Fee(s) submitted on other forms, other than those provided by the HCS, may be deemed Non-Responsive upon review by and at the sole discretion of the HCS Purchasing Office.

SMMHS Tennis Courts

PROJECT

Item	Description	Unit of Measure	Quantity	Unit Price
1	Base Bid: Project & Unit Prices (Include Unit Price Quantities Items a.- e.)	Lump Sum	1	$
2	Base Bid: Owner's General Purpose Allowance	Lump Sum	1	$50,000.00

BID SUMMARY

BASE BID PROJECT TOTAL **(Base Project + Unit Prices Subtotal + General Purpose Allowance)**	**$**

ALTERNATES

3	Alternate 1 (Additive)	Lump Sum	1	$
4	Alternate 2 (Additive)	Lump Sum	1	$

NOTE: UNIT PRICES/QUANTITIES LISTED BELOW SHALL BE INCLUDED IN BASE BID @ ITEM 1

Item	Description	Unit of Measure	Quantity	Unit Price	Extended Amount
a	Undercutting of unsuitable material paved areas beneath sub-grade and re-spreading unsuitable material on-site at location approved by owner occurred.	CY (Loose)	1,600	$	$
b	Excavation and placement of approved onsite backfill material(including transportation) under proposed pavement or parking areas where undercutting of unsuitable material.	CY (Compacted In Place)	600	$	$
c	Offsite approved soil backfill material (including transportation) under proposed paved or parking areas where undercutting of unsuitable material occurred.	CY (Compacted In Place)	600	$	$
d	Stone backfill (including transportation) to replace undercut areas, where recommended by onsite testing	CY (Compacted In Place)	400	$	$
e	Trench Rock Excavation to sub-grade (including transportation onsite) for all utility Lines or curbs onsite "Trench Rock Excavation" shall be such material which cannot be removed by means other than by blasting or with air hammer. Materials, which can be removed by ripping, shall not be considered "Trench Rock Excavation" (see specifications).	CY (Computed Cut Measurements)	450	$	$

***Quantities are not guaranteed. Final payment of Unit Prices will be based on actual quantities.*

Form 2

CERTIFICATE OF COMPLIANCE

By indication of the authorized signature below, the Proposer/Bidder does hereby make certification and assurance, under penalty of perjury, of the Proposer's/Bidder's compliance with all provisions of this bid/bid and the following items:

1. the laws of the State of Tennessee and Hamilton County;
2. Title VI of the Civil Rights Act of 1964;
3. Title IX of the Education Amendments of 1972
4. the condition that no amount shall be paid directly or indirectly to an employee or official of Hamilton County Department of Education as wages, compensation, or gifts in exchange for acting as an officer, agent, employee, subcontractor, or consultant to the Proposer/Bidder in connection with the procurement under this Bid/RFP.

Signed _____ Dated _____

Print Name _____ Email _____

Company _____ Telephone No. _____

Address _____ Fax No. _____

City _____ State _____ Zip _____

Form 3

AUTHORIZATION TO BIND

By signing this proposal, I certify and acknowledge that the information contained in this document is true and correct, containing **NO** misrepresentations. The information is **NOT** tainted by any collusion. I certify and acknowledge that I have reviewed and approved the release of this proposal/bid for HCS's consideration. Further, I am authorized to bind my company to the responses and pricing in these proposal/bid documents, and any subsequent negotiations, as well as execute the actual Contract documents, if selected.

_____
Authorized Signature (Officer of the Company)

_____
Name of Authorized Signer (Printed or Typed)

_____
Title of Authorized Signer

_____
Firm Name

_____
Taxpayer Identification Number

_____
Firm Address, City and Zip Code

_____
Telephone Number

_____
Fax Number

_____
Email Address

_____
Date

Form 4

Drug-Free Workplace Requirements & Affidavit
TENNESSEE CODE ANNOTATED, § 50-9-113

(1) Each Contractor or Subcontractor with no less than five (5) employees receiving pay shall submit an affidavit stating that such employer has a drug-free workplace program in effect at the time of submission of bids. Said program shall comply with Title 50, Chapter 9, TCA.

(2) If it is determined that an employer subject to the provisions of this section has entered into a contract for this Project and does not have a drug-free workplace pursuant to the referenced requirements, such employer shall be prohibited from entering into another contract with any local government or state agency until such employer can prove compliance.

(3) The written affidavit shall be submitted with the Construction Contractor's Bid Form, and the Bid shall not be considered complete if said affidavit is not included, and the Bid shall be rejected as Non-Responsive. For all other product or service contracts submission of the affidavit is encouraged only.

(4) For purposes of compliance with this section, any private employer shall obtain a certificate of compliance with the applicable portions of the Drug-Free Workplace Act from the Department of Labor and Workforce Development.

(To be submitted with bid by construction contractor with 5 or more employees and encouraged for all others)

AFFIDAVIT

I _____, president or other principal

Officer of _____, swear or affirm that the
(Name of Company)

Company has a drug-free workplace program that complies with Title 50, Chapter 9, Tennessee Code Annotated, in effect at the time of this bid submission at least to the extent required of governmental entities. I further swear or affirm that the company is in compliance with the Tennessee Code Annotated, § 50-9-113.

_____
President of Principal Officer

For: _____

STATE OF TENNESSEE}
COUNTY OF _____}

Subscribed and sworn before me by _____, President

or principal officer of _____,

On this _____ day of _____, 20_____.

_____ NOTARY PUBLIC

My Commission Expires: _____

Instructions for Non-Collusion Affidavit

(1) This non-collusion affidavit is material to any contract awarded pursuant to this bid.

(2) This non-collusion affidavit must be executed by the member, officer, or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

(3) Bid rigging and other efforts to restrain competition, and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that such statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval or submission of the bid.

(4) In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an affidavit must be submitted separately on behalf of each party.

(5) The term "complementary bid" as used in the Affidavit has the meaning commonly associated with that term in the bidding process, and includes the knowing submission of bids higher than the bid of another firm, and intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

Non-Collusion Affidavit
(Attachment A)

State of_____

County of _____

I state that I am_____of _____
(Title) (Name of Firm)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any other contractor, bidder, or potential bidder.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____, its affiliates, subsidiaries, officers, directors and
(Name of my Firm)
employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that_____understands and acknowledges that the
(Name of my Firm)
above representation are material and important and will be relied on by Hamilton County Department of Education in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Hamilton County Department of Education of the true facts relating to submission of bids for this contract.

_____
(Signature and Company Position)

SWORN TO AND SUBSCRIBED
BEFORE ME THIS_____DAY OF

_____, 20 _____

NOTARY PUBLIC:

My Commission Expires: _____

Form 6

CERTIFICATION OF COMPLIANCE WITH THE IRAN DIVESTMENT ACT

Effective July 1, 2016, this form must be submitted for any contract that is subject to the Iran Divestment Act, Tenn. Code Ann. § 12-12-101, et seq., ("Act"). This form must be submitted with any bid or bid regardless of where the principal place of business is located.

Pursuant to the Act, this certification must be completed by any corporation, general partnership, limited partnership, limited liability partnership, joint venture, nonprofit organization, or other business organization that is contracting with a political subdivision of the State of Tennessee.

Certification Requirements.

No state agency or local government shall enter into any contract subject to the Act, or amend or renew any such contract with any bidder/contractor who is found ineligible under the Act.

Complete all sections of this certification and sign and date it, under oath, in the presence of a Notary Public or a person authorized to take an oath in another state.

CERTIFICATION:

I, the undersigned, certify that by submission of this bid, each bidder and each person signing on behalf of any Respondent certifies, and in the case of a joint bid or contract each party thereto certifies, as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not on the list created pursuant to Tenn. Code Ann. § 12-12-106.

Respondent represents it has the full power, knowledge, and authority to make this Certification and that the signatory signing this Certification on behalf of bidder/contractor has been duly authorized to do so on behalf of the bidder/contractor.

Sworn as true to the best of my knowledge and belief, subject to the penalties of false statement.

_____
Company Name

_____
Signature of Authorized Official

State of _____

County of _____

The foregoing instrument was signed and acknowledged before me, by means of ☐ physical presence or ☐ personally known, this _____day of _____, 20___, by

_____ who has produced _____ as identification.
(Print or Type Name) (Type of Identification and Number)

_____
Notary Public Signature

_____
Printed Name of Notary Public

_____
Notary Commission Number/Expiration

The signee of these Affidavit guarantees, as evidenced by the sworn affidavit required herein, the truth and accuracy of this affidavit to interrogatories hereinafter made.

Form 7

Hamilton County Board of Education
Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion

The prospective participant / vendor certifies, by submission of this bid, that neither it nor its Principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal Department or agency.

Where the prospective participant / vendor is unable to certify to any of the statements in this Certification, such prospective participant / vendor shall attach an explanation to this bid.

_____

Organization Name

_____

Name(s) and Title(s) of Authorized Representative(s)

_____ _____

Signature

Form 8

Certification of Compliance with Tennessee Public Chapter # 587

The General Assembly of the State of Tennessee requires any person, corporation or other entity who enters into or renews a contract with a local board of education comply with Tennessee Public Chapter #587 (TPC587).

TPC587 requires persons, employees of the person or corporation that have direct contact with school children or access to school grounds when children are present to have supplied to the corporation a fingerprint sample and have conducted a criminal history records check by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation prior to permitting the person to have contact with such children or enter school grounds. (The Public Chapter 1080, (D) was amended to: "A person whose contract is for the performance of a service at a school-sponsored activity, assembly or even at which school officials or employees are present when the service is performed and where the activity, assembly, or event is *conducted under the supervision of school officials or employees."*

TPC587 provides guidance for employees who have been convicted of an offense that is classified as a sexual offense or a violent sexual offense.

I have read the attached TENNESSEE PUBLIC CHAPTER # 587 and certify compliance with the regulations.

_____

Name/Address of Organization

_____

Name/Title of Submitting Official

_____ _____

Signature Date

Form 9

BID BOND

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

_____

as Principal, and _____

as Surety, are hereby held and firmly bound unto Hamilton County Department of Education, Tennessee

as Owner in the penal sum of _____ for the payment of which, well and truly to be

made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed, this _____day of _____, 20___.

The condition of the above obligated is such that whereas the Principal has submitted to Hamilton County Department of Education, Tennessee, a certain Bid, attached hereto and hereby made a part hereof to enter into a contract in writing for the Project known as: BID 24-59, Signal Mountain Middle/High School (SMMHS) Tennis Courts.

NOW, THEREFORE,

(a) If said Bid shall be rejected, or in the alternate.

(b) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection herewith, and shall in all other respects perform the agreement created by the acceptance of said Bid, then this obligation shall be void, otherwise shall remain in force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

_____ _____ (L.S.)
Surety Principal

By:_____ _____
Title

_____
Title

SEAL

Note: Bond may be declared invalid if not accompanied by Power of Attorney.

Form 10

HAMILTON COUNTY SCHOOLS

FUNDING NOTICE & PROVISIONS

NOTICE: the services being requested and the associated Agreement are funded in whole or in part with Federal funds in addition to general funds of the agency. As such, the applicable federal provisions of Appendix II, supported and enforced by the 2 CFR Part 200.327, and provided within this Funding Notice & Provisions section shall apply to the Agreement and where/as applicable to the Work performed.

Consultant/Contractor/Vendor agrees, through signature and certification provided below, to abide by and comply with all Federal terms, conditions, provisions, certifications, affidavits, or otherwise as applicable and stated herein and further agrees to incorporate all such clauses, provisions, and regulations into any sub-contracted agreements or equivalent business relationships the Consultant/Contractor/Vendor creates to support the Consultant/Contractor/Vendor's servicing to HCS.

When the funding source or the applicability of any provision provided herein is not clear, it shall be the sole responsibility of the Consultant/Contractor/Vendor to clarify any such items with the HCS authorized Project Manager or Sponsoring Department prior to omitting or not performing any action or requirement.

_____

Name & Address of Consultant/Contractor/Vendor

_____

Name & Title of Submitting Authorized Official

_____

Signature of Authorized Official Date

Form 11

CERTIFICATION REGARDING LOBBYING

Applicable to Grants, Subgrants, Cooperative Agreements, and Contracts Exceeding $100,000 in Federal Funds.
Submission of this certification is a prerequisite for making or entering into this transaction and is imposed by section 1352, title 31, U.S. Code. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of a Federal contract, the making of a Federal grant, the making of a Federal loan, the entering into of a cooperative agreement, and the extension, continuation, renewal, amendment, or modification of a Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal grant or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying", in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all covered sub awards and that all sub recipients shall certify and disclose accordingly to undersigned.

_____
Name & Address of Consultant/Contractor/Vendor

_____
Name & Title of Submitting Authorized Official

_____
Signature of Authorized Official Date

Complete as applicable only.

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C.1352

Approved by OMB
4040-0013

1. * Type of Federal Action:	2. * Status of Federal Action:	3. * Report Type:
☐ a. contract ☒ b. grant ☐ c. cooperative agreement ☐ d. loan ☐ e. loan guarantee ☐ f. loan insurance	☐ a. bid/offer/application ☒ b. initial award ☐ c. post-award	☒ a. initial filing ☐ b. material change

4. Name and Address of Reporting Entity:

☒ Prime ☐ SubAwardee

* Name

* Street 1 | Street 2

* City | State | Zip

Congressional District, if known:

5. If Reporting Entity in No.4 is Subawardee, Enter Name and Address of Prime:

6. * Federal Department/Agency:

7. * Federal Program Name/Description:

CFDA Number, if applicable:

8. Federal Action Number, *if known:*

9. Award Amount, *if known:*

$

10. a. Name and Address of Lobbying Registrant:

Prefix | * First Name | Middle Name

* Last Name | Suffix

* Street 1 | Street 2

* City | State | Zip

b. Individual Performing Services (including address if different from No. 10a)

Prefix | * First Name | Middle Name

* Last Name | Suffix

* Street 1 | Street 2

* City | State | Zip

11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when the transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be reported to the Congress semi-annually and will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

* Signature:

*Name: Prefix | * First Name | Middle Name

* Last Name | Suffix

Title: | Telephone No.: | Date:

Federal Use Only:

Authorized for Local Reproduction
Standard Form - LLL (Rev. 7-97)

Form 12

Attachment: Immigration Law Affidavit Certification

This Affidavit is required and should be signed by an authorized principal of the Consultant/Contractor/Vendor and submitted with HCS Procurements where applicable. Further, Consultant/Contractor/Vendor are required to enroll in the E-Verify program, and provide acceptable evidence of their enrollment, upon request by HCS personnel. Acceptable evidence consists of a copy of the properly completed E-Verify Company Profile page or a copy of the fully executed E-Verify Memorandum of Understanding for the company.

HCS will not intentionally award HCS contracts to any vendor who knowingly employs unauthorized alien workers, constituting a violation of the employment provision contained in 8 U.S.C. Section 1324 a(e) Section 274A(e) of the Immigration and Nationality Act ("INA").

HCS may consider the employment by any vendor of unauthorized aliens a violation of Section 274A (e) of the INA. Such Violation by the recipient of the Employment Provisions contained in Section 274A (e) of the INA shall be grounds for unilateral termination of the contract by HCS.

Vendor attests that they are fully compliant with all applicable immigration laws (specifically to the 1986 Immigration Act and subsequent Amendment(s)) and agrees to comply with the provisions of the Memorandum of Understanding with E-Verify and to provide proof of enrollment in The Employment Eligibility Verification System (E-Verify), operated by the Department of Homeland Security in partnership with the Social Security Administration at any time upon request by HCS.

_____

Name & Address of Consultant/Contractor/Vendor

_____

Name & Title of Submitting Authorized Official

_____

Signature of Authorized Official Date

FUNDING PROVISIONS

1. EQUAL EMPLOYMENT OPPORTUNITY:

1.1. During the performance of this contract, the contractor agrees as follows:

A. The Consultant/Contractor/Vendor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The Consultant/Contractor/Vendor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer, recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Consultant/Contractor/Vendor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the contracting officer setting forth the provisions of this nondiscrimination clause.

B. The Consultant/Contractor/Vendor will, in all solicitations or advertisements for employees placed by or on behalf of the Consultant/Contractor/Vendor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.

C. The Consultant/Contractor/Vendor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the Consultant/Contractor/Vendor's legal duty to furnish information.

D. The Consultant/Contractor/Vendor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or workers' representative of the Consultant/Contractor/Vendor's commitments under section 202 of Executive Order 11246 of September 24, 1965, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

E. The Consultant/Contractor/Vendor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.

F. The Consultant/Contractor/Vendor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by the rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

G. In the event of the Consultant/Contractor/Vendor's non-compliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the Consultant/Contractor/Vendor may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

H. The Consultant/Contractor/Vendor will include the provisions of paragraphs (a) through (h) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each sub-Consultant/Contractor/Vendor. The Consultant/Contractor/Vendor will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions including sanctions for noncompliance: Provided, however, that in the event the Consultant/Contractor/Vendor becomes involved in, or is threatened with, litigation with a sub-Consultant/Contractor/Vendor as a result of such direction, the Consultant/Contractor/Vendor may request the United States to enter into such litigation to protect the interests of the United States.

2. MAINTENANCE OF RECORDS:

2.1. The Consultant/Contractor/Vendor will keep and maintain adequate records and supporting documentation applicable to all of the services, work, information, expense, costs, invoices and materials provided and performed pursuant to the requirements of this agreement. Said records and documentation will be retained by the Consultant/Contractor/Vendor for a minimum of seven (7) years from the date of termination of this agreement, or for such period is required by law.

2.2. Consultant/Contractor/Vendor shall provide, when requested, access by HCS, Federal granting agency, the Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the Consultant/Contractor/Vendor which are directly pertinent to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

2.3. Consultant/Contractor/Vendor agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

2.4. Consultant/Contractor/Vendor agrees to provide the Grant Agency Administrator or his authorized representatives' access to construction or other work sites pertaining to the work being completed under the contract.

2.5. Consultant/Contractor/Vendor shall retain all records associated with this Agreement for a period of no less than five (5) years after final payments and all other pending matters are closed.

2.6. HCS and its authorized agents shall, with reasonable prior notice, have the right to audit, inspect and copy all such records and documentation as often as HCS deems necessary during the period of this agreement, and during the period as set forth in the paragraphs above; provided, however, such activities shall be conducted only during normal business hours of the Consultant/Contractor/Vendor and at the expense of HCS.

3. DHS SEAL, LOGO, AND FLAGS

3.1. The Consultant/Contractor/Vendor shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific Grant Agency pre-approval.

4. LOCAL VENDOR PREFERENCE EXCLUSION

4.1. Local Vendor Preference is not applicable to this Agreement and subsequent contract and/or purchase order(s).

5. COMPLIANCE WITH FEDERAL LAW, REGULATIONS, and EXECUTIVE ORDERS

5.1. This is an acknowledgment that Grant Agency financial assistance will be used only to fund the services requested. The Consultant/Contractor/Vendor will comply with all applicable federal law, regulations, executive orders, Grant Agency policies, procedures, and directives.

6. NO OBLIGATION BY THE FEDERAL GOVERNMENT

6.1. The Federal Government is not a party to this Agreement and is not subject to any obligations or liabilities to the non-Federal entity, Consultant/Contractor/Vendor, or any other party pertaining to any matter resulting from the Agreement.

7. FRAUD and FALSE OR FRAUDULENT OR RELATED ACTS

7.1. The Consultant/Contractor/Vendor acknowledges that 31 U.S.C. Chapter 38 (Administrative Remedies for False Claims and Statements) applies to the Consultant/Contractor/Vendors actions pertaining to this Agreement.

8. SUBCONTRACTS

8.1. The selected firm must require compliance with all federal requirements of all sub-Consultant/Contractor/Vendors performing work for Prime Consultant/Contractor/Vendor under this Agreement, by including these federal requirements in all contracts with sub-Consultant/Contractor/Vendors.

9. CONFLICT OF INTEREST:

9.1. No employee, officer, or agent may participate in the selection, award, or administration of a contract supported by a Federal award if he or she has a real or apparent conflict of interest. Such a conflict of interest would arise when the employee, officers, or agent, any member of his or her immediate family, his or her partner, or an organization which employs or is about to employ any of the parties indicated herein, has a financial or other interest in or a tangible personal benefit from a firm considered for a contract. The officers, employees, and agents of the non-Federal entity must neither solicit nor accept gratuities, favors, or anything of monetary value from Consultant/Contractor/Vendors or parties to subcontracts.

10. EMPLOYMENT ELIGIBILITY VERIFICATION SYSTEM (E-VERIFY):

10.1. Statutes and Executive Orders require employers to abide by the Immigration laws of the United States and to employ only individuals who are eligible to work in the United States. The Employment Eligibility Verification System (E-

Verify) operated by the U.S. Department of Homeland Security (DHS) in partnership with the Social Security Administration (SSA) to provides an internet-based means of verifying employment eligibility of workers in the united States; it is not a substitute for any other employment eligibility verification requirements.

10.2. Sub-Consultant/Contractor/Vendor requirement: Vendors shall require all subcontracted vendors to flow down the requirement to use E-Verify to sub-Consultant/Contractor/Vendors.

10.3. It shall be the vendor's responsibility to familiarize themselves with all rules and regulations governing this program.

10.4. For additional information regarding the Employment Eligibility Verification System (E-Verify) program visit the following website: http://www.dhs.gov/E-Verify.

11. ENERGY POLICY AND CONSERVATION ACT

11.1. Consultant/Contractor/Vendor must follow any mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (42 U.S.C. 6201).

12. SMALL AND MINORITY BUSINESS, WOMEN'S BUSINESS ENTERPRISES, AND LABOR SURPLUS AREA FIRMS:

12.1. Place qualified small and minority businesses and women's business enterprises on solicitation lists.

12.2. Assuring that small and minority businesses, and women's business enterprises are solicited whenever they are potential sources.

12.3. Using the services and assistance, as appropriate, of such organizations as the Small Business Administration and the Minority Business Development Agency of the Department of Commerce.

12.4. Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses, and women's business enterprises.

12.5. Establishing delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises.

12.6. Requiring the prime Consultant/Contractor/Vendor, if subcontracts are to be let, to take the five previous affirmative steps.

13. DOMESTIC PREFERENCES FOR PROCUREMENT (2 C.F.R. § 200.322)

13.1. As appropriate and to the greatest extent consistent with law, state and non-state entities should, to the greatest extent practicable under its Grant Agency award, provide a preference for the purchase of goods, products or materials produced in the United States (including but not limited to iron, aluminum, steel, cement and other manufactured products). The requirements of this section must be included in all subawards including all contracts and purchase orders for work or products under this award. 2 C.F.R. § 200.322 also provides specific definitions for "Produced in the United States" and "manufactured products" that Consultant/Contractor/Vendor should review.

13.2. For purposes of this section: (1) "Produced in the United States" means, for iron and steel products, that all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the United States. (2) "Manufactured products" means items and construction materials composed in whole or in part of nonferrous metals such as aluminum; plastics and polymer-based products such as polyvinyl chloride pipe; aggregates such as concrete; glass, including optical fiber; and lumber.

14. PROHIBITION ON CONTRACTING FOR COVERED TELECOMMUNICATIONS OR SERVICES (2 C.F.R. § 200.216)

14.1. 2 C.F.R. § 200.216 prohibits state and non-state entities from obligating or expending loan or grant funds to procure or obtain, extend or renew a contract to procure or obtain, or enter into a contract (or extend or renew a contract) to procure or obtain, equipment, services, or systems that uses covered telecommunications equipment or services as a substantial or essential component of any system, or as a critical technology as part of any system as identified in Section 889 of the John S. McCain National Defense Authorization Act for Fiscal Year 2019 (FY 2019 NDAA), Pub. L. No. 115-232 (2018) and 2 C.F.R. §§ 200.216, 200.327, 200.471, and Appendix II to 2 C.F.R. Part 200. See Prohibitions on Expending Grant Agency Award Funds for Covered Telecommunications Equipment or Services- Interim Policy for additional information.

15. TERMINATION FOR CAUSE AND/OR CONVENIENCE:

15.1. HCS, by written notice to the Consultant/Contractor/Vendor, may terminate this Agreement with or without cause (for convenience), in whole or in part, when HCS determines in its sole discretion that it is in HCS's best interest to do so. In the event of termination the Consultant/Contractor/Vendor will not incur any new obligations for the terminated portion of the Agreement after the Consultant/Contractor/Vendor has received notification of termination.

15.2. If the Agreement is terminated before performance is completed, the Consultant/Contractor/Vendor shall be paid only for that work satisfactorily performed for which costs can be substantiated. Such payment, however, may not exceed an amount that is the same percentage of the Agreement price as the amount of work satisfactorily completed is a percentage of the total work called for by this Agreement. All work in progress shall become the property of HCS and shall be turned over promptly by the Consultant/Contractor/Vendor.

16. SUSPENSION AND DEBARMENT

16.1. This contract is a covered transaction for purposes of 2 C.F.R. pt. 180 and 2 C.F.R. pt. 3000. As such the Consultant/Contractor/Vendor is required to verify that none of the Consultant/Contractor/Vendor, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R. § 180.940) or disqualified (defined at 2 C.F.R. §180.935).

16.2. The Consultant/Contractor/Vendor must comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.

16.3. This certification is a material representation of fact relied upon by the awarded Consultant/Contractor/Vendor. If it is later determined that the Consultant/Contractor/Vendor did not comply with 2 C.F.R. pt.180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to HCS, the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

16.4. The Consultant/Contractor/Vendor agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

17. RECOVERED MATERIALS

17.1. In the performance of this contract, the Consultant/Contractor/Vendor shall make maximum use of products containing recovered material that are EPA-designated items unless the product cannot be acquired:

- Competitively within a timeframe providing for compliance with the contract performance schedule;
- Meeting contract performance requirements; or
- At a reasonable price.

17.2. Information about this requirement is available EPA'S Comprehensive Procurement Guidelines web site, http://www.epa.gov/cpg/ The list of EPA- designate items is available at http://www.epa.gov/cpg/products/htm

18. REMEDIES

18.1. In the event the Consultant/Contractor/Vendor fails to satisfactorily perform or has failed to adhere to the terms and conditions under this Agreement, HCS may, upon fifteen (15) calendar days written notice to the Consultant/Contractor/Vendor and upon the Consultant/Contractor/Vendor's failure to cure within those fifteen (15) calendar days, exercise any one or more of the following remedies, either concurrently or consecutively:

18.1.1. Withhold or suspend payment of all or any part of a request for payment.

18.1.2. Require that the Consultant/Contractor/Vendor refund to HCS any monies used for ineligible purposes under the laws, rules and regulations governing the use of these funds.

18.1.3. Exercise any corrective or remedial actions, to include but not be limited to:

18.1.4. Requesting additional information from the Consultant/Contractor/Vendor to determine the reasons for or the extent of non-compliance or lack of performance;

18.1.5. Issuing a written warning to advise that more serious measures may be taken if the situation is not corrected;

18.1.6. Advising the Consultant/Contractor/Vendor to suspend, discontinue or refrain from incurring costs for any activities in question; or

18.1.7. Requiring the Consultant/Contractor/Vendor to reimburse HCS for the amount of costs incurred for any items determined to be ineligible.

19. OTHER REMEDIES AND RIGHTS:

19.1. Pursuing any of the above remedies will not keep HCS from pursuing any other rights or remedies, which may be otherwise available under law or in equity. If HCS waives any right or remedy in this Agreement or fails to insist on strict performance by the Consultant/Contractor/Vendor, it will not affect, extend or waive any other right or remedy of HCS, or affect the later exercise of the same right or remedy by HCS for any other default by the Consultant/Contractor/Vendor.

19.2. Unless otherwise provided by the Contract, all claims, counter-claims, disputes and other matters in question between HCS and the Consultant/Contractor/Vendor arising out of or relating to the Agreement between the parties, or the breach of it, that cannot be resolved by and between the parties after conferring in good faith, will be decided by a court of competent jurisdiction pursuant to Tennessee law. If such dispute is in state court, venue shall be in the courts of Hamilton County.

20. CONTRACT WORK HOURS & SAFETY STANDARDS: For Agreements exceeding $100,000 with use of mechanics or laborers.

20.1. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

20.2. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

20.3. Withholding for unpaid wages and liquidated damages. The State of Tennessee Division of Emergency Management or equivalent office shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

20.4. Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

21. CLEAN AIR ACT: For Agreements exceeding $150,000.

21.1. The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

21.2. The contractor agrees to report each violation to the Grant Agency and the Regional Office of the Environmental Protection Agency and understands and agrees that the Grant Agency and the Regional Office of the Environmental Protection Agency will, in turn, report each violation as required to assure notification to HCS, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

21.3. The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by Grant Agency.

22. FEDERAL WATER POLLUTION CONTROL ACT

22.1. The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

22.2. The contractor agrees to report each violation to the Grant Agency and the Regional Office of the Environmental Protection Agency and understands and agrees that the Grant Agency and the Regional Office of the Environmental Protection Agency will, in turn, report each violation as required to assure notification to HCS, Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

22.3. The contractor agrees to include these requirements in each subcontract exceeding $150,000 financed in whole or in part with Federal assistance provided by Grant Agency.

23. BYRD ANTI-LOBBYING AMENDMENT:

23.1. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with nonfederal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient. Consultant/Contractor/Vendors who apply or bid for an award of $100,000 or more shall file the required certification.

24. CONTRACT CHANGES OR MODIFICATIONS

24.1. No alterations, amendment, changes, modifications or additions to any contract resulting from this bid shall be binding on HCS without the prior written approval of HCS.

25. RIGHTS TO INVENTIONS MADE UNDER AN AGREEMENT

25.1. If the Federal award meets the definition of "funding agreement" under 37 CFR §401.2 (a) and HCS enters into a contract with a small business firm or nonprofit organization regarding the substitution of parties, assignment or performance of experimental, developmental, or research work under that "funding agreement," the Agreement must comply with the requirements of 37 CFR Part 401, "Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements," and any implementing regulations.

26. CIVIL RIGHTS ASSURANCE STATEMENT

26.1. The vendor hereby agrees that it will comply with:

1. Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.);
2. Title IX of the Education Amendments of 1972 (20 U.S.C. 1681 et seq.);
3. Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794);
4. Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.);
5. Title II and Title III of the Americans with Disabilities Act (ADA) of 1990 as amended by the ADA Amendment Act of 2008 (42 U.S.C. 12131-12189);
6. Executive Order 13166, "Improving Access to Services for Persons with Limited English Proficiency." (August 11, 2000);
7. Where USDA applies: All provisions required by the implementing regulations of the Department of Agriculture (USDA) (7 CFR Part 15 et seq.);
8. Department of Justice Enforcement Guidelines (28 CFR Parts 35, 42 and 50.3);
9. Where USDA applies: Food and Nutrition Service (FNS) directives and guidelines to the effect that, no person shall, on the grounds of race, color, national origin, sex, age, or disability, be excluded from participation in, be denied the benefits of, or otherwise be subject to discrimination under any program or activity for which the Program applicant receives Federal financial assistance from USDA; and hereby gives assurance that it will immediately take measures necessary to effectuate this Agreement.
10. Where USDA applies: The USDA non-discrimination statement that in accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs).

27. Where USDA applies:

(1) This assurance is given in consideration of and for the purpose of obtaining any and all Federal financial assistance, grants, and loans of Federal funds, reimbursable expenditures, grant, or donation of Federal property and interest in property, the detail of Federal personnel, the sale and lease of, and the permission to use Federal property or interest in such property or the furnishing of services without consideration or at a nominal consideration, or at a consideration that is reduced for the purpose of assisting the recipient, or in recognition of the public interest to be served by such sale, lease, or furnishing of services to the recipient, or any improvements made with Federal financial assistance extended to the Program applicant by USDA. This includes any Federal agreement, arrangement, or other contract that has as one of its purposes the provision of cash assistance for the purchase of food, and cash assistance for purchase or rental of food service equipment or any other financial assistance extended in reliance on the representations and agreements made in this assurance.

(2) Food service staff will be funded by School Nutrition funds, a non-federal entity subject to the provisions in 2 CFR 200. Therefore, the fees for food service positions cannot be quoted using cost plus a percentage of cost, per 2 CFR 200.324(d). The proposer must provide pricing for food service staff using a cost plus fixed-fee method. Other position types may be quoted using either pricing method.

Sealed Label - **Affix this page to your sealed solicitation envelope to identify it as a "Sealed Submission/Proposal".**

BID/PROPOSAL DOCUMENTS • DO NOT OPEN

SOLICITATION NO.: 24-59

SOLICITATION TITLE: Signal Mountain Middle/High School (SMMHS) Tennis Courts

OPENING/DUE DATE: June 13, 2024

TIME DUE: Prior to: 1:30 PM

SUBMITTED BY: _____

(Name of Company)

e-mail address Telephone

DELIVER TO: Hamilton County Board of Education
Attn: Purchasing Department
3074 Hickory Valley Road
Chattanooga, TN 37421

CONTRACTOR LICENSING DETAILS

Per TCA 62-6-119, it is necessary for Bidder to be properly licensed at the time of the bid and provide evidence of compliance with the applicable provisions of TCA 62-6-119 before such bid may be considered. As such the following licensure table shall be completed and affixed to the exterior of the Bidder's submission.

Provide TN state contractor license number, expiration date, and classification for Bidder and listed subcontractors as applicable. Provide name as listed on license.

Prime Contractor

	Name	License Number	Expires	Classification	Address
Prime Contractor					

Subcontractor(s)

- If any trade work meets the monetary value listed below, list subcontractor(s) that will perform that work. If Prime Bidder will perform work in that category with Prime Bidder's own forces, fill in Prime Bidder's name as subcontractor.
- If no work is required in a subcontractor category, write "None Required".
- If the monetary amount of a subcontractor's work is such that no license is require, write "N/A" in the license number column, but still write name.
- Failure to provide licensure information may deem bid submission Void and ineligible for receipt and up to award.

	Name	License Number	Expires	Classification	License Required If Greater Than
Electrical					≥ $25,000
~~Geothermal~~					~~≥ $25,000~~
~~HVAC~~					~~≥ $25,000~~
~~Masonry~~					~~≥ $100,000~~
Plumbing					≥ $25,000
~~Roofing~~					~~≥ $25,000~~

***Notices:**

- **The Date Due/Submission Deadline Date/Opening Date as stated on this label and other forms contained herein may have been updated via issuance of Addenda against this project. It is the sole responsibility of the Contractor/Vendor to monitor the HCS solicitation for any updates to the Date Due/Submission Deadline Date/Opening Date via Addenda. This label or other original forms may not be updated. Contractor/Vendor may strike through and update Date Due/Submission Deadline Date/Opening Date at their discretion to match any updates to this date that have been published via Addenda.**
- **Submissions received after the time and date of the Date Due/Submission Deadline Date/Opening Date will not be accepted at the sole discretion of HCS.**
- **Some submissions may require the Vendor to provide the company name, Tennessee Contractor's license number, expiration date, license classification and company address on the outside of the sealed bid envelope in accordance with TCA 62-6-119. Where this is requested within the project documents the Vendor is solely responsible for compliance with this request.**
- **Please print clearly.**

Draft

AIA® Document A101® – 2017

Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum

AGREEMENT made as of the day of in the year
(In words, indicate day, month and year.)

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

Hamilton County Department of Education
3074 Hickory Valley Road
Chattanooga, Tennessee 37421
and the Contractor:
(Name, legal status, address and other information)

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

Signal Mountain Middle/High School Tennis Courts
2650 Sam Powell Trail
Signal Mountain, Tennessee 37377

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

Derthick, Henley & Wilkerson Architects, PLLC (DH&W)
1001 Carter Street
Chattanooga, Tennessee 37402

The Owner and Contractor agree as follows.

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

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

The parties should complete A101®–2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201®–2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

TABLE OF ARTICLES

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:
(Check one of the following boxes.)

[ ] The date of this Agreement.

[ ] A date set forth in a notice to proceed issued by the Owner.

[ ] Established as follows:
(Insert a date or a means to determine the date of commencement of the Work.)

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:
(Check one of the following boxes and complete the necessary information.)

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

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be ($), subject to additions and deductions as provided in the Contract Documents.

§ 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
Alternate 1 -Add Courts 7-8	
Alternate 2- Add Lighting to courts 1-6	

§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement.
(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)

Item	Price	Conditions for Acceptance

§ 4.3 Allowances, if any, included in the Contract Sum:
(Identify each allowance.)

Item	Price
Owners General Purpose Allowance	Fifty Thousand dollars ($50,000.00)

§ 4.4 Unit prices, if any:
(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)

Item		Units and Limitations	Price per Unit ($0.00)
1.	Undercutting and removal on site of unsuitable soils	1,600 CY	
2.	Excavation and placement of Approved on-site backfill (including transportation) under proposed pavement or parking areas where undercutting of unsuitable soils occurred.	600 CY	
3.	Offsite Approved backfill material (including transportation) to replace undercut are, where recommended by onsite testing	600 CY	
4.	Stone Backfill (including transportation) where recommended	400 CY	

by onsite testing

5. Trench Rock Excavation to sub-grade (including transportation onsite) for all utility lines or curbs onsite "Trench Rock Excation" shall be such material which cannot otherwise be removed by means such as blasting or with air hammer. Materials that can be removed by ripping. 450 CY

§ 4.5 Liquidated damages, if any:
(Insert terms and conditions for liquidated damages, if any.)

§ 4.6 Other:
(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)

ARTICLE 5 PAYMENTS

§ 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the 28th day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the 28th day of the following month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than thirty (30) days after the Architect receives the Application for Payment.
(Federal, state or local laws may require payment within a certain period of time.)

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™–2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

.1 That portion of the Contract Sum properly allocable to completed Work;

.2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and

.3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

.1 The aggregate of any amounts previously paid by the Owner;

.2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201–2017;

.3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;

.4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201–2017; and

.5 Retainage withheld pursuant to Section 5.1.7.

§ 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)

§ 5.1.7.1.1 The following items are not subject to retainage:

(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:

(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:

(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201–2017.

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

§ 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

.1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201–2017, and to satisfy other requirements, if any, which extend beyond final payment; and

.2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

§ 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.
(Insert rate of interest agreed upon, if any.)

Prime plus 2% %

ARTICLE 6 DISPUTE RESOLUTION

§ 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201–2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

§ 6.2 Binding Dispute Resolution

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:
(Check the appropriate box.)

[ ] Arbitration pursuant to Section 15.4 of AIA Document A201–2017

[X] Litigation in a court of competent jurisdiction

[ ] Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

ARTICLE 7 TERMINATION OR SUSPENSION

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner's convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:
(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner's convenience.)

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

ARTICLE 8 MISCELLANEOUS PROVISIONS

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner's representative:
(Name, address, email address, and other information)

§ 8.3 The Contractor's representative:
(Name, address, email address, and other information)

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™–2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201–2017, may be given in accordance with AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:
(If other than in accordance with AIA Document E203–2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

.1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor
.2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds
.3 AIA Document A201™–2017, General Conditions of the Contract for Construction
.4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013 incorporated into this Agreement.)

.5 Drawings

Number	Title	Date

.6 Specifications

Section	Title	Date	Pages

.7 Addenda, if any:

Number	Date	Pages

Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:
(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017 incorporated into this Agreement.)

[ ] The Sustainability Plan:

Title	Date	Pages

[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages

.9 Other documents, if any, listed below:
(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™–2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)

This Agreement entered into as of the day and year first written above.

OWNER *(Signature)*

CONTRACTOR *(Signature)*

(Printed name and title)

(Printed name and title)

AIA® Document A201® – 2017

General Conditions of the Contract for Construction

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

Signal Mountain Middle/High School Tennis Courts
2650 Sam Powell TrailSignal Mountain, Tennessee 37377

THE OWNER:
(Name, legal status and address)

Hamilton County Department of Education
3074 Hickory Valley RoadChattanooga, Tennessee 37421

THE ARCHITECT:
(Name, legal status and address)
Derthick, Henley & Wilkerson Architects 1001 Carter StreetChattanooga, Tennessee 37402

TABLE OF ARTICLES

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

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.
/

INDEX

(Topics and numbers in bold are Section headings.)

ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

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

§ 1.1.2 The Contract

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

§ 1.1.3 The Work

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

§ 1.1.4 The Project

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

§ 1.1.5 The Drawings

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

§ 1.1.6 The Specifications

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

§ 1.1.7 Instruments of Service

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

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

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

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

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

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

§ 1.3 Capitalization

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

§ 1.4 Interpretation

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

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

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

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

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

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

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

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

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

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

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

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

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

§ 2.4 Owner's Right to Stop the Work

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

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

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

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

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

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

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

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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

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

§ 3.4 Labor and Materials

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

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

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

§ 3.5 Warranty

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

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

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

§ 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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

§ 3.8 Allowances

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

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

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

§ 3.9 Superintendent

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

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

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

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

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

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

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

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

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

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

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

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

§ 3.14 Cutting and Patching

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

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

§ 3.15 Cleaning Up

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

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

§ 3.16 Access to Work

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

§ 3.17 Royalties, Patents and Copyrights

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

§ 3.18 Indemnification

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

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

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

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

§ 4.2 Administration of the Contract

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

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

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

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

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

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

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

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

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

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

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

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

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

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

§ 5.3 Subcontractual Relations

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

§ 5.4 Contingent Assignment of Subcontracts

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

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

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

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

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

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

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

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

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

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

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

§ 6.2 Mutual Responsibility

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

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

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

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

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

§ 6.3 Owner's Right to Clean Up

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

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

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

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

§ 7.2 Change Orders

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

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

§ 7.3 Construction Change Directives

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

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

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

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
.2 Unit prices stated in the Contract Documents or subsequently agreed upon;
.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
.4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

.1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
.2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
.4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
.5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

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

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

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

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

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

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

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

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

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

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

§ 8.2 Progress and Completion

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

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

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

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

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

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

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

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

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

§ 9.3 Applications for Payment

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

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

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

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

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

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

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

§ 9.5 Decisions to Withhold Certification

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

.1 defective Work not remedied;

.2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;

.3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a Separate Contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

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

§ 9.6 Progress Payments

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

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

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

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

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

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

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

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

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

§ 9.8 Substantial Completion

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

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

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

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

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

§ 9.9 Partial Occupancy or Use

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

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

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

§ 9.10 Final Completion and Final Payment

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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

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

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

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

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

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

§ 10.2 Safety of Persons and Property

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

.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

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

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

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

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

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

§ 10.2.8 Injury or Damage to Person or Property

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

§ 10.3 Hazardous Materials and Substances

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

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

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

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

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

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

§ 10.4 Emergencies

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

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

§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance. Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 Failure to Purchase Required Property Insurance. If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance. Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

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

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

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

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

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

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

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

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

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

§ 12.3 Acceptance of Nonconforming Work

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

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

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

§ 13.3 Rights and Remedies

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

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

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

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

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

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

§ 13.5 Interest

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

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

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

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

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

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

.4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

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

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

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

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

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

§ 14.3 Suspension by the Owner for Convenience

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

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

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

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

§ 14.4 Termination by the Owner for Convenience

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

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

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

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

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

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

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

§ 15.1.7 Waiver of Claims for Consequential Damages

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

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

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

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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

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

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

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

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

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

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

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

(Paragraphs deleted)

§ 15.4 Arbitration

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

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

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

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

§ 15.4.4 Consolidation or Joinder

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

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

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

SECTION 00 73 00
SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 72 00 - General Conditions and other provisions of Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 REFERENCE STANDARDS

A. AIA A503-2007 - Guide for Supplementary Conditions.

1.03 MODIFICATIONS TO GENERAL CONDITIONS

A. ARTICLE 3 -Warranty-Add Subparagragh 3.5.1 as follows: A. 3.5.1 General Contractor shall guarantee all work for a period of one (1) year from the date of Completion. The completion date is determined when all items noted on the Punch List as deficient have been completed and are accepted as completed by the Architect, his consultants and the Owner and all closeout documents including Consent of Surety Form (AIA G707) have been recieved by the Owner.

B. ARTICLE 3- Permit Fees and Notices-Add Paragraph 3.7.1.1 as follows: All permit and plans review fees costs shall be the obligation of the Contractor.

C. ARTICLE 11 Insurance -Add paragraph 11.1.3.1 as follows: Contractor shall purchase Builder's Risk insurance for this project equal to the amount of the Contract for Construction. This policy shall also name the Owner as co-insured._____

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 20 00
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

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

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 50 00 - Contracting Forms and Supplements: Forms to be used.

B. Section 00 52 00 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.

C. Section 00 72 00 - General Conditions: Additional requirements for progress payments, final payment, changes in the Work.

D. Section 01 22 00 - Unit Prices: Monetary values of unit prices; Payment and modification procedures relating to unit prices.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

C. Forms filled out by hand will not be accepted.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.

C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

D. Forms filled out by hand will not be accepted.

E. For each item, provide a column for listing each of the following:
   1. Item Number.
   2. Description of work.
   3. Scheduled Values.
   4. Previous Applications.
   5. Work in Place and Stored Materials under this Application.
   6. Authorized Change Orders.
   7. Total Completed and Stored to Date of Application.
   8. Balance to Finish.
   9. Retainage.

F. Execute certification by signature of authorized officer.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

H. Submit one electronic and three hard-copies of each Application for Payment.

I. Include the following with the application:
   1. Transmittal letter as specified for submittals in Section 01 30 00.
   2. Construction progress schedule, revised and current as specified in Section 01 30 00.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.

E. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.

F. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 22 00
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected work.

1.02 RELATED REQUIREMENTS

A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.

1.03 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by Owner.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

D. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

1.06 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.07 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not complying with specified requirements.

1.08 SCHEDULE OF UNIT PRICES

A. See Bid Form for Unit Prices/Allowances

B. Allowances stipulated must be included in Base Bid- Example Undercutting of unsuitable material beneath sub grade and redistribuition of material on site is part of the Base Bid in quatities stipulated. Should the quantity required removed and redistributed differ from the quatity stipulated, the price for that work is adjusted based on the unit price and either results in a Credit to the Owner of a Change in Contract Price to the Contractor.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 23 00
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of Alternates.

1.02 RELATED REQUIREMENTS

A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 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.

1.04 SCHEDULE OF ALTERNATES

A. Alternate No. 1 - Courts 7 and 8 : Install Tennis Court Assemblies 7 and 8 including light pole bases, conduit, junction boxes, pull strings for future conductors and storm drainage assemblies specific to courts 7 and 8.

B. Alternate No. 2 - Tennis court Light fixtures for Courts 1-6: Provide fully functional lighting system for Courts 1-6 including conductors, fixtures, switches and timers for fully operational lighting for these courts.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 25 00
SUBSTITUTION PROCEDURES

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

2.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.

B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.

C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.

D. Limit each request to a single proposed substitution item.

2.02 RESOLUTION

2.03 ACCEPTANCE

END OF SECTION

SECTION 01 30 00
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Preconstruction meeting.

C. Progress meetings.

D. Construction progress schedule.

E. Progress photographs.

F. Submittals for review, information, and project closeout.

G. Requests for Interpretation (RFI) procedures.

H. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 00 72 00 - General Conditions: Dates for applications for payment.

B. Section 01 60 00 - Product Requirements: General product requirements.

C. Section 01 70 00 - Execution and Closeout Requirements: Additional coordination requirements.

D. Section 01 78 00 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 REFERENCE STANDARDS

A. AIA G716 - Request for Information.

B. AIA G810 - Transmittal Letter.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 70 00 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

B. Make the following types of submittals to Architect:
   1. Requests for Interpretation (RFI).
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.
   4. Civil Engineer.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract, Owner and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.02 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Contractor's superintendent.
   5. Major subcontractors.
   6. Civil Engineer.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with copies to Architect, Owner, participants, and those affected by decisions made.

3.03 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.04 PROGRESS PHOTOGRAPHS

A. Photography Type: Digital; electronic files.

B. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Completion of site clearing.

2. Excavations in progress.

C. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.05 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare in a format and with content acceptable to Owner.
      a. Use AIA G716 - Request for Information .

C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.

D. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

E. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.

F. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 78 00 - Closeout Submittals.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.

5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 78 00 - Closeout Submittals:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.09 SUBMITTAL PROCEDURES

A. General Requirements:

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule.

B. Submit updated schedule with each Application for Payment.

C. Submit in PDF format.

1.03 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Sheet Size: Multiples of 8-1/2 x 11 inches (216 x 280 mm).

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

D. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

3.05 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 40 00
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. References and standards.

C. Testing and inspection agencies and services.

D. Control of installation.

E. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 31 00 - Available Project Information: Soil investigation data.

B. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.

1.03 REFERENCE STANDARDS

A. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation.

B. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

C. IAS AC89 - Accreditation Criteria for Testing Laboratories.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Test Reports: After each test/inspection, promptly submit _____ copies of report to Architect and to Contractor.

1. Include:
    a. Date issued.
    b. Project title and number.
    c. Name of inspector.
    d. Date and time of sampling or inspection.
    e. Identification of product and specifications section.
    f. Location in the Project.
    g. Type of test/inspection.
    h. Date of test/inspection.
    i. Results of test/inspection.
    j. Compliance with Contract Documents.
    k. When requested by Architect, provide interpretation of results.

1.05 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.06 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Owner will employ and pay for services of an independent testing agency to perform specified testing.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.

c. To facilitate tests/inspections.
d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.03 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY OF REFERENCE STANDARDS

A. Regulatory requirements applicable to this project are the following:

B. 29 CFR 1910 - Occupational Safety and Health Standards.

C. ICC (IBC) - International Building Code.

D. ICC (IPC) - International Plumbing Code.

E. NFPA 70 - National Electrical Code.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 55 00
VEHICULAR ACCESS AND PARKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Parking.

B. Existing pavements and parking areas.

C. Maintenance.

D. Removal, repair.

E. Mud from site vehicles.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: For access to site, work sequence, and occupancy.

B. Section 01 58 13 - Temporary Project Signage: Post Mounted and Wall Mounted Traffic Control and Informational Signs.

C. Section 31 22 00 - Grading: Specifications for earthwork and paving bases.

PART 2 PRODUCTS

PART 3 EXECUTION

3.01 PREPARATION

A. Clear areas, provide surface and storm drainage of road, parking, area premises, and adjacent areas.

3.02 PARKING

A. Use parking created from site for conctruction parking immediately upon completion of clearing and grading activities. Existing parking area for soccer fields may be used intially, however, these areas must be kept clean of litter and mud.

3.03 MAINTENANCE

A. Maintain traffic and parking areas in a sound condition.

B. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

3.04 MUD FROM SITE VEHICLES

A. Provide means of removing mud from vehicle wheels before entering streets.

END OF SECTION

SECTION 01 70 00
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Cutting and patching.

C. Surveying for laying out the work.

D. Cleaning and protection.

E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 57 13 - Temporary Erosion and Sediment Control: Additional erosion and sedimentation control requirements.

B. Section 01 78 00 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.

1.03 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.04 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

1.05 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   2. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

C. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.06 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent

responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 60 00 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and _____.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and _____.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

D. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

F. Restore work with new products in accordance with requirements of Contract Documents.

G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

H. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.06 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.07 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.08 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.09 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

C. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

D. Clean debris from overflow drains, area drains, drainage systems, and parking areas.

E. Clean site; sweep paved areas, rake clean landscaped surfaces.

F. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.10 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

C. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

D. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

E. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

F. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

G. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 DEFINITIONS

Whenever occurring in this Division the following words shall have the meanings given below:

A. "Provide" shall mean to furnish, install and connect complete.

B. "Wiring" shall mean wire or cable, installed in conduit, cable tray, or wireways with all required boxes, fittings, connectors, and accessories completely installed.

C. "Work" shall be understood to mean the materials completely installed including the labor involved.

D. "Plans and Specifications/Contract Documents" shall be understood to mean the complete documents, including all trades, divisions, sections, addenda, etc.

E. "Review of Shop Drawings" - see Division 1.

F. "Conduit" shall mean either rigid steel conduit, intermediate metal conduit (IMC), electrical metallic tubing (EMT), or plastic conduit (PVC).

1.02 The Contractor AGREES that upon the submittal of a bid, he will have read and studied ALL of the Contract Documents, and that all of the requirements and coordination resulting from these documents are included in his bid. The intent is to obtain a complete installation of electrical work to which end the Contractor shall provide ALL labor, equipment, material, freight, rigging, etc., specified, shown or scheduled on plans. He also agrees that any other accessory items which may not be specified, shown, or scheduled on the plans, but which normally are furnished or can be reasonably implied from the specifications and/or plans to be required shall be provided.

1.03 No exclusion from, or limitations in the drawings, specifications, or other contract documents for the electrical work shall be reason for the omitting of the appurtenances or accessories necessary to complete any required system or item of equipment in this project.

1.04 Should the Contractor find any discrepancies and/or omissions in the contract documents or be in doubt as to the intent of said documents, he shall obtain clarification or correction from the Architect and the Engineer BEFORE submitting a bid for work under this division. The Contractor will not be granted monetary allowances for discrepancies between his bid and the intent or the work after the contract is let, due to failure to follow this instruction.

1.05 The contractor shall not use any material or equipment that contains asbestos, PCB's, or any other substance which is known to endanger the public health.

1.06 SCOPE OF WORK

A. The Contractor shall refer to Architectural, Mechanical, and Structural drawings the Mechanical Divisions of these specifications for related work.

B. The work of this division shall include the furnishing of all labor, supplies, materials, sales tax, permits, inspection fees, costs of testing, shop drawings, as built drawings, operation and maintenance manuals, and the performing of all operations including installation, cutting and chasing, trenching and backfilling, compaction, coordination with other trades on the job, etc., to the end of obtaining a complete installation of electrical work as shown on the drawings and called for in the written specifications.

C. The work to be performed under the electrical contract shall include, but not be limited to:
   1. Service entrance conduit and wire.
   2. Service entrance equipment including disconnects, switchboards, panelboards, etc.
   3. Feeder conduit and wire.
   4. Distribution, lighting, and miscellaneous panelboards.
   5. Branch circuit conduit and wire.

6. Lighting Fixtures.
7. Wiring devices including receptacles, light switches, etc.
8. Telephone service entrance conduit, and interior conduit and outlets.
9. Fire Alarm System complete, if called for on the drawings
10. Disconnects
11. Control system conduit for mechanical contract.
12. Provision of temporary power at 120/240, single phase for construction.

D. Work not included under the electrical contract:
1. Unless provided in motor control center, all motor starters and their associated control devices, heaters, etc. will be furnished with the motors under Division15 of these specifications.
2. Control and interlock wiring for mechanical contract supplied systems.
3. Telephone instruments and wiring
4. Cable television equipment and wiring

E. The owner will not make any consideration to the contractor for any alleged misunderstanding of the amount of work to be performed. Submittal of a bid for work shall convey full agreement by the Contractor to all items and conditions specified, indicated on the drawings, and/or required by the nature of the job site.

F. The Contractor shall be responsible for insuring that all equipment and materials are installed in a neat and workmanlike manner and are aligned, leveled and adjusted for satisfactory operation. He shall install all equipment so that all parts are easily accessible for inspection, operation, maintenance and repair. He shall insure that all equipment is solidly supported from building structures.

1.08 CODES, LAWS AND ORDINANCES

A. Comply with all laws, codes, ordinances, and etc., having jurisdiction over the work to be performed under the contract for this project, EXCEPT where the requirements of the drawings and/or specifications are in excess of those called for in said laws, codes, ordinances, etc.

B. Perform work in accordance with the locally adopted editions of the standards listed below; EXCEPT where federal, state and/or local codes are more stringent, in which case, follow them instead:

1.	National Fire Protection Association	NFPA
2.	Underwriters Laboratories	UL
3.	American Society of Testing Materials	ASTM
4.	National Electrical Code	NEC
5.	National Electrical Manufacturing Association	NEMA
6.	Occupational Safety & Health Act	OSHA

C. The Contractor shall be responsible for installation of the work called for in the contract documents in accordance with all codes, laws, and ordinances which govern such work. Should he encounter anything contained within the contract documents during preparation for bid which would prohibit the successful compliance of his responsibility under this item, he shall notify the Architect prior to execution of the contract for work so that adjustments can be made to the contract.

D. The Contractor shall be responsible for obtaining all permits, inspection certificates, etc., required by local, state and/or federal authorities for this project, at his expense. Any and all additional work, expense, etc., incurred as the result of failure to request timely inspections, and or permits, shall be charged against the Contractor.

E. Approval of the Architect, Engineer, and the appropriate inspection authorities must be secured for the complete electrical installation prior to contract closeout. Upon completion of the electrical work, the Contractor will furnish the Architect with two (2) copies of all certificates of inspection, permits, etc. Final payment to the Contractor will not be made until the requirements of this paragraph have been met.

1.09 LOCAL CONDITIONS

A. Existing site utilities, underground services, structures, etc., are shown on the drawings accurately in scope only. No expressed or implied guarantee is given as to exact location of the above items. The Contractor is required to verify exact locations and subsequent effects of such on the job.

B. The Contractor shall contact the local utility companies (power, telephone, etc.) to confirm the scheme of service called for on the drawings. Should the Contractor discover the need for any change to these service schemes per the utility involved, he shall notify the Architect prior to execution of the contract so that a solution can be provided.

C. Contractor shall verify with the Local Power Company the value of fault current in amperes which will be available at the secondary terminals of the Power Company transformer. If this value is in excess of the AIC ratings of the various panels, circuit breakers, etc., as shown on the drawings, the Contractor shall supply such equipment with AIC ratings which will accommodate the available fault current. Any increase in cost due to this item shall be included in the bid.

D. Contractors desiring to bid on work under this division are required to visit the job site before bid submittal. During said visit the Contractor shall become familiar with all site conditions which will affect his work and the cost of the work. He shall also verify exact location of the equipment of the various utility companies from whom services will be required. The Contractor shall submit a letter with his bid stating that he has complied with this requirement.

1.10 PLANS AND SPECIFICATIONS

A. While drawings are to scale, they are diagrammatic. DO NOT SCALE DRAWINGS HAVING 1/4" OR SMALLER SCALE. Equipment, conduit, outlets, etc., are not exactly positioned; therefore, the Contractor shall refer to architectural drawings for actual building dimensions, ceiling layouts, light fixture locations, work by other trades, etc.

B. Should any conflict exist between the drawings and the written specifications, the specifications shall generally govern. Contact Engineer for clarifications.

C. The drawings and written specifications for all divisions are part of the contract. Any work and material shown in the one and omitted in the other, or which may be reasonably implied by both or either, shall be fully furnished and performed by the Contractor, as required for a complete electrical system installation.

D. No deviation from the drawings and specifications shall be made without the full knowledge and consent of the Architect. Should the Contractor find, at any time during the progress of the work, that, in his judgment, existing conditions make desirable a modification in requirements covering any particular item or items, he shall report such item promptly to the Architect for his decision and instructions.

E. The right is reserved by the Architect to move any equipment, outlet, conduit, etc.; as much as ten (10) feet at no increase in cost, provided the Contractor is notified of the change before work on the detail in question is started.

F. It shall be the responsibility of the Contractor to insure that the equipment he provides will fit into the available space, leaving reasonable space for maintenance and servicing of the equipment. If, after the installation of any equipment, it is determined that the space requirements have not been met, the Contractor shall rearrange the work at no additional cost.

1.11 COORDINATION OF WORK

A. It is the responsibility of the Contractor to plan all work so that it proceeds with a minimum of interference with all other trades. He is to inform all parties concerned of openings in the building construction for equipment or conduit required for the electrical work. He is to coordinate the electrical work with the mechanical and plumbing installation.

B. The contractor shall review and coordinate the locations of all electrical equipment (meters,

instrument transformer cabinets, panels, disconnect switches, lighting contactors, etc.) mounted on the outside walls of buildings with the drawings for the mechanical, plumbing, and architectural disciplines to avoid any conflicts in locations with sprinkler risers, plumbing risers, rain downspouts, doors, etc. Generally, meter center risers are shown on the drawings for the purposes of information only; they are not dimensioned. In addition, the locations of the meter centers on the site plans are diagrammatic only. They are not dimensioned. The contractor must coordinate these installations. If there are any questions as to locations of equipment, notify the engineer for clarification prior to installation of equipment.

C. The Contractor shall provide all required frames, sleeves, inserts, supports, anchor bolts, etc., as required for completion of the work.

D. The Contractor shall lay out and coordinate all work well enough in advance so as to avoid conflicts or interference with other work in progress. If there is any interference, the electrical layout may be altered to suit the conditions, prior to the installation of any work and at no additional cost to the Owner. Consult the Architect for instructions.

E. The contractor shall verify the location of all disconnect switches required by the project, prior to their installation. The installed location of any disconnect shall not impede the access to, or working space around, any piece of equipment. Neither shall the location cause any loss of equipment performance due to impeded air flow, etc. This requirement applies regardless of the location shown for the disconnects on the plans. If there is any question as to disconnect location, the contractor shall ask the engineer for clarification prior to installation. If any disconnect is found to be installed in such a way that it causes any problems as mentioned above, it shall be relocated at the expense of the contractor.

F. Work lines and established heights shall be in strict accordance with architectural drawings and specifications, insofar as these drawings and specifications extend. It is the Contractor's responsibility to verify all elevations and detailed dimensions not indicated.

G. The Contractor shall coordinate all outlets, fixtures, equipment, etc., with floor, wall and ceiling patterns. Any lines which must pitch shall have right-of-way over lines whose elevations can be changed.

1.12 EQUIPMENT DATA

A. Deliver all printed tags, instructions, certified drawings, parts lists, certificates, etc., supplied with equipment items, to the Architect at completion of the project.

B. Assemble all such printed materials into a stiff-back binder identified on its face. Provide quadruple copies.

1.13 SHOP DRAWINGS

A. Shop drawings for switchboards, panelboards, transformers, generators, bus duct, cable tray, fire alarm systems, security systems, lighting fixtures, and other items as might be requested, shall be submitted to the Architect's Engineer for his approval, by the Contractor promptly upon receipt of the contract for work.

B. The engineer will review the shop drawings for errors in the contractor’s interpretation of the contract documents only, and to assist the contractor in compliance with the documents. Corrections of comments made on shop drawings during the review do not relieve the contractor from compliance with requirements of the contract documents, plans, and specifications. Review of the shop drawings shall not relieve the contractor from responsibility for confirming and correlating all quantities and dimensions, coordination of his work with the other trades, and performance of his work in a safe and satisfactory manner. Review of shop drawings shall not permit any deviations from plans and specifications by the contractor, nor shall it permit changes to the plans and specifications by the engineer. Changes to, or deviations from, the contract documents may only be made by a Change Order issued by the architect and executed properly.

C. Equipment subject to shop drawing approval shall not be ordered until approved by the

Engineer. Material ordered or installed without such approval, if rejected by the Engineer, shall be removed and replaced with approved items at the Contractor's expense.

D. In order to procure approval for such equipment, the Contractor shall submit a minimum of six (6) sets of shop drawings and/or brochures describing each piece of equipment. Description shall include rated capacities, dimensions, manufacturer's catalog number, performance data with operating characteristics, optional features, modifications, etc.

E. ALL BROCHURES AND DRAWINGS SHALL BE SUBMITTED AT THE SAME TIME. Items not approved shall be resubmitted with the necessary corrections made until final approval is obtained.

F. See individual specification sections for additional shop drawing requirements.

F. If equipment is substituted and approved in the shop drawing process; its use may affect electrical, mechanical, structural, and other systems which were designed based on the original equipment specifications. Any changes, and their cost, in any of the divisions of work affected by the substitution of equipment, shall be the sole responsibility of the contractor making the substitution.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. All materials and equipment shall be new and the best grade. They shall conform to all standards and requirements governing the work. Any and all equipment and materials damaged during installation shall be immediately replaced at NO cost to the Owner.

B. Reference shall be made to drawing schedules and details and/or specifications for manufacturer, model, catalog number, size, capacity, performance, installation, etc., of equipment and material. Such information is used to denote design, workmanship, and quality desired.

C. The Contractor shall offer his bid for work based on the electrical equipment (including light fixtures) which is described in these specifications and described in the respective schedules on the drawings. Pre-bid approvals for substitute equipment will not be given.

PART 3 - EXECUTION

3.01 All materials required for the project shall be ordered by the Contractor in a timely manner which allows the material to be received at the job site for installation in agreement with the job schedule, so that work of the other divisions is not held up in any way.

3.02 All materials and equipment received at the job site by the Contractor shall be stored and protected from damage while they wait to be installed.

3.03 All work shall be carried out in a neat and orderly manner by experienced electricians, under the constant supervision of a competent electrician, trained and licensed in this field, who shall represent the Contractor at all times in connection with the work.

3.04 Materials or work installed, rejected by the Architect's Engineer upon inspection shall be completely removed by the Contractor, and the work redone in a manner acceptable to the Engineer by the Contractor at no charge.

3.05 When rejected work is removed, should other material, equipment, etc., be damaged in the process, the Contractor shall make all necessary repairs, so that the damaged equipment is equal in quality, strength and appearance to its original state.

3.06 SPACE REQUIREMENTS

A. The Contractor is fully responsible for determining in advance of purchase that all equipment and materials proposed for installation will fit into the space indicated while allowing sufficient clearance about the equipment and materials to allow proper maintenance and servicing of all components requiring such, including equipment and materials of other divisions located in the

vicinity.

B. Clearances in front of panelboards, switchboards, motor starters, busway taps, and other electrical equipment requiring servicing while energized, shall be provided in accordance with the NEC, table 110-16a, as required by the code text.

C. The contractor shall prepare, and submit for review and approval prior to ordering equipment, dimensioned rough-in drawings at ½" = 1'-0" scale for each equipment room and meter equipment layout. These drawings shall show all equipment to scale based on the actual equipment ordered and shall be fully dimensioned.

3.07 FIRESTOPPING

A. Firestop all penetrations of building fire rated surfaces made by this division.

B. Each penetration shall be protected by a firestop system with a rating equal to or greater than the original assembly in which the penetration occurs.

C. All firestop material shall be installed in accordance with manufacturer's standard details and the UL Building Materials Directory for each type of fire rated assembly penetrated.

D. Telephone sleeves shall be firestopped with materials that will permit re-entry and use of the sleeves.

3.08 WIRING ELECTRICALLY OPERATED EQUIPMENT

A. The Contractor shall provide all conduit, conductors, wiring, etc., required to connect power to all electrically operated equipment installed on the project, whether provided by this division or other divisions, or by the owner.

B. The Contractor shall install, support, and electrically connect motor starters, disconnects, etc., and shall complete all power wiring circuits so that each is left in satisfactory condition.

C. All control equipment associated with any equipment furnished under any other division, or by the owner, shall be furnished by that provider.

D. This division shall provide all conduit required for control wiring as needed for Division 230000. Refer to that division and its associated drawings for specifics.

E. This division is responsible for the provision of, and fire alarm system wiring of, duct smoke detectors for all HVAC equipment requiring them. If there is a fire alarm system provided for the project, the detectors shall be tied to that system. If there is no fire alarm system, the Contractor shall provide remote visual and audible alarm indicators per the requirements of NFPA 90A, latest edition.

3.09 RECORD AND AS-BUILT DOCUMENTS

A. The Contractor shall maintain at the job site a complete set of Contract Documents. These documents shall be kept current with all changes, substitutions, etc., to the original documents as reflected by the actual work being installed.

B. At closeout, the Contractor shall provide the Owner with one complete set of as-built reproducible drawings, and one set of complete specifications. These documents shall show installed locations, sizes, etc., of all work and material as required by the contract documents and actually installed on the project.

C. For each piece of equipment installed or provided, the Contractor shall provide three (1) sets of:
   1. Manufacturer's printed catalog pages
   2. Manufacturer's operating and maintenance instructions
   3. Manufacturer's wiring and connection diagrams, etc.,
   4. Motor interlock and control diagrams, showing operating instructions for, and normal positions of, each motor and controller

   All of this information shall be provided in bound 8-1/2" by 11" hardback booklets.

3.10 CLEANING

A. The Contractor shall insure that all interior and exterior surfaces of panelboards, transformers, switchboards, motor starters, cabinets, etc., are cleaned so as to be free of dust, dirt, grease, plaster, debris, etc. Lighting fixtures shall be cleaned according to manufacturer's recommendations.

B. Any electrical equipment having sustained damage to any factory painted surfaces shall have that damage repaired and restored to original factory condition.

C. Any and all ferrous metal surfaces exposed on the electrical system shall be painted.

3.11 TEMPORARY LIGHTING AND POWER

A. As soon as is possible, the Contractor shall install temporary electrical wiring and lighting for the project in accordance with NEC Article 305.

B. Wiring shall consist of non-metallic sheathed cable with ground wire.

3.12 EXCAVATION, SHORING, AND BACKFILL

A. The Contractor shall perform all necessary excavation required for installation of his work. Each utility shall be installed in a separate trench.

B. Excavation shall be below that required for general construction and final grade. It is expected that the Contractor shall process normally difficulties encountered in excavation related to rocks, debris, etc. However, should the Contractor encounter "solid" rock impediments to his excavation, he shall contact the Architect for directions.

C. Any and all trenching shall be performed strictly in accordance with OSHA, and other authorities having jurisdiction, rules and regulations regarding "cave in" safety shoring. All shoring material used shall be completely removed prior to backfilling the trench.

D. The Contractor shall not backfill trenches until the conduit banks have been inspected by the proper authorities.

E. Backfill shall be done simultaneously on both sides of the equipment, raceways, etc.

Backfill shall be clean soil, free of rocks, cinders, wood, debris, etc.

F. Backfill shall be installed in 12-inch layers. It shall be compacted to 85% per ASTM D-1557 in areas under sidewalks and grass; and to 95% under any paved areas.

G. Should concrete encasement of raceways be required, the sides and floor of the trench shall be used as formwork for the concrete. This shall not apply unless the excavation is clean, free of debris, and of the proper size.

3.13 CUTTING AND PATCHING

A. The Contractor shall be responsible for the location and size of all openings required for his work.

B. The Contractor shall not cut into structural members or architectural finish surfaces without expressed written approval of the Architect.

C. Any patching of surfaces required by the Contractor's work shall be made so that they are equal in quality and appearance to the original surface.

3.14 FLASHING

A. Raceways which pass through walls or roof surfaces to the outside shall be flashed in accordance with architectural standards and with the requirements of the roofing manufacturer.

B. Any raceways penetrating the roof shall maintain a clearance of 18 inches minimum from all parapets.

C. Whenever raceways pass through floor structures which contain a waterproofing membrane,

the Contractor shall provide a watertight floor sleeve for each raceway. The lowest floor shall be exempt.

3.15 MOISTURE - DAMP PROTECTION

A. Whenever any electrical component such as panels, raceways, etc., will be in contact with surfaces which may become damp or wet, that component shall be mounted on standoff devices so that it is a minimum of ¼" away from the surface.

3.16 GUARANTEE AND WARRANTY

A. The Contractor and the General Contractor shall, and hereby does, guarantee that all work executed, and all electrical equipment installed, under this division will be free of all defects in materials, manufacture, and workmanship for a period of one (1) year from the date of final acceptance of the building. The above parties agree that they will, at their expense, repair and/or replace all such defective work and equipment, and any and all other work damaged thereby which becomes defective during the term of this guarantee.

END OF SECTION

SECTION 26 05 02
TESTING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. The entire electrical system shall be tested to insure proper operation and safety for building occupants and operating personnel.

B. Testing shall insure conformity to code requirements and conformity to contract documents.

1.02 REGULATORY REQUIREMENTS

A. Testing shall be in conformance with local codes, utility company requirements, and standard industry practices.

B. Testing shall accomplish the requirements of the NEC, Article 110.

PART 2 - PRODUCTS

2.01 Testing shall be performed with instruments and materials required and approved for the purpose.

PART 3 - EXECUTION

3.01 Perform appropriate tests on the entire electrical system before it is energized. Testing shall be performed to insure that it is free of unintended grounds, short circuits, and open circuits.

3.02 Provide safeguards to protect all personnel involved in the testing as well as for protection of equipment being tested.

3.03 Testing shall be performed in a timely manner. Reports of results shall be filed with the Architect in written form.

3.04 Testing shall include the following:

A. Prior to connections to equipment, all service entrance conductors and feeder conductors shall be tested for unintended grounds and for insulation integrity with a megohm meter. Any conductor found to be defective in the testing shall be replaced.

B. Ground fault protection systems on service entrance equipment shall be tested according to the NEC, Article 230-95.

C. The grounding system network shall be tested to insure a resistance value of not more than ten (10) ohms to ground. Should the system test results be higher than 10 ohms, additional ground rods shall be driven, or alterations made to the system, to produce the 10-ohm or less value required.

D. Full load currents of each feeder shall be measured to test for phase load balance. If the phases are not load balanced, circuit rearrangement shall be made to achieve balanced load conditions.

E. The proper operation of all alarm and control systems installed under this division shall be verified by system operational testing.

F. All circuits having parallel conductors shall be tested for proper phasing using hot phasing or other compatible techniques.

3.05 The Contractor shall provide additional testing as deemed necessary by the Architect to insure that all equipment functions properly and meets the requirements of the specifications and drawings.

END OF SECTION

SECTION 26 05 19
LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes building wires and cables, metal clad cable, connectors, and terminations for systems rated below 600 volts.

1.02 RELATED DOCUMENTS

A. All drawings and Division 01 of the specifications and the general conditions of the Contract apply to this section.

B. Section 260553 – Identification for Electrical Systems

1.03 REGULATORY REQUIRMENTS

A. All products required and furnished under this section shall be listed and labeled per the NEC by UL or other testing agency acceptable to the authority having jurisdiction and marked for intended use.

B. All products furnished under this section, as installed, shall meet all requirements of the NEC.

1.04 WIRE AND CABLE

A. All wire and cable routing shown on the drawings is approximate. Field verify dimensions and routing lengths of all conductors and cables required prior to installation.

B. All wire and cable furnished on this project shall be copper and drawings reflect conductor sizes, conduit sizes, etc. based on copper conductors.

1.05 SUBMITTAL FOR INFORMATION:

A. Provide written data for aluminum conductor substitution to the engineer indicating the voltage drop and ampacity calculations for the aluminum conductor substitute to match the copper conductor involved.

PART 2 - PRODUCTS

2.01 CONDUCTORS

A. Specified gauge sizes refer to American Wire Gauge, copper conductors.

B. All wire and cable shall be of soft drawn, annealed, copper having a conductivity of not less than 98% of that of pure copper; each wire continuous without weld, splice, or joint throughout its length; uniform in cross section and free from flaws, scales and other imperfections.

C. Sizes specified are AWG through No. 4/0 and circular mils above No. 4/0. Conductor No. 10 and smaller shall be solid; No. 8 and larger stranded.

D. Conductors No. 4 and smaller shall be Type "THHN/THWN"; larger conductors shall be type "THW".

E. All conductors shall be of the same name brand and shall be in the original wrapping.

F. All conductors shall be Anaconda, Diamond, General Electric, General Cable, Paranite, Phelps-Dodge, Simplex, Triangle, or Southwire.

2.02 BRANCH CIRCUIT CONDUCTORS

A. Minimum wire size for lighting and power circuits shall be #12. #10 shall be used where the run to the first outlet exceeds 75' for 120V circuit and 150' for 277V circuit.

B. Branch circuit wiring, which supplies more than one fluorescent fixture through the wire-way of other fixtures, shall be rated for use at 150 degrees C.

C. All installations to be based on wire in conduit except for cases where the use of MC cable is allowed on the drawings in certain applications or instances.

2.03 METAL CLAD CABLE

A. Provide a factory assembly of one or more 90 degrees C insulation rated conductors enclosed in an armor of interlocking metal tape or a smooth or corrugated metallic sheath.

B. Approved manufacturers shall be Alflex Corp., Armorlite, and American Flexible Conduit Co., or equal.

C. Provide connectors rated specifically for use on MC cable. Connectors shall have an insulating sleeve or bushing provided between the armor and the conductors. Provide connectors that attach to cabinetry with locknuts. Other types are prohibited.

2.04 SPLICES AND TERMINATIONS

A. Splices for #10 AWG and smaller wire used on Branch circuits and fixtures shall be of the "Live Spring" pressure type, Ideal Co. wing nut and/or wire nut type connectors or approved equal. Splices shall be rated 600 volts or 1000 volts when enclosed in a fixture or sign.

B. Solderless, mechanical type lugs shall be used for terminal connections for copper conductors of #8 AWG or larger.

PART 3 - EXECUTION

3.01 WIRE AND CABLE

A. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with "Live Spring" pressure type connectors. Where connection is made to any material, copper terminal lugs shall be bolted or compression fitted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.

B. Wire shall not be drawn into a conduit until all work on the conduit system, which might cause damage to the wiring, is complete.

C. Where two or more circuits run to a single outlet box, tag each circuit with linen tags as a guide to the fixture hanger in making fixture connections.

D. All stranded conductors shall be furnished with copper connecting lugs drilled or reamed the full diameter of the bare conductors.

E. Mains and feeders shall be run their entire length in continuous pieces without joints or splices. If the runs are too long for a single conductor piece, then joint and/or splices installed per these specifications shall be used.

F. All splices, taps, terminations, etc. in the conductors shall be kept where they are fully accessible for inspection and maintenance.

G. All wiring in cabinets, boxes, gutters, etc., shall be neatly tied and held in place by nylon cable ties and mounting brackets.

H. At each fixture outlet a loop or end or wire not less than 8" long shall be left for connection to fixtures.

I. The number of crosses hatches, where indicated, designates the number of conductors to be installed when the number exceeds minimum of two (2). Where crosshatches are not indicated, the number of conductors shall be as determined by switching, homeruns, etc. This does not apply to conduit provided for telephone or other special systems.

J. Branch circuits shall contain the necessary number of conductors to afford the switch control indicated.

K. Splices, etc. in signal and/or communication conductors shall be made with crimp-on or

soldered connections, which are properly insulated.

L. The Contractor shall not permit conductor bends to a radius less than 10 diameters or thickness on circuits of 600 volts or less.

M. Conductors, when installed, shall not have dents, cuts, and scars, pressure indentation, abraded areas, etc. The Contractor will be responsible for replacement of conductors so damaged, at his expense.

N. Lubricants used to ease conductor-pulling operations shall be specifically manufactured for that purpose. TALC only shall be used on isolated branch circuit wiring.

O. An UL approved non-oxidation compound or grease is to be applied at all terminations of panel feeders, secondary service conductors, and primary (high voltage) service conductors prior to connection.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes the electrical grounding of all electrical systems and equipment provided on this project.

1.02 RELATED DOCUMENTS

A. All drawings and Division 01 of the specifications and the general conditions of the Contract apply to this section.

B. Specification section 260519 – Low Voltage Electric Power Conductors and Cables

1.03 REGULATORY REQUIREMENTS

A. All components, equipment, fittings, accessories, etc. required and furnished under this section shall be listed and labeled per the NEC by UL or other testing agency acceptable to the authority having jurisdiction and marked for intended use.

B. All components, equipment, fittings, accessories, etc. required and furnished under this section shall comply with the NEC, particularly Article 250.

1.04 GROUNDING SYSTEM

A. Components of the grounding system shall include (but not limited to):
   1. Building water supply pipe
   2. Building structural steel
   3. Driven ground rod(s)

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. All grounding equipment shall be manufactured by ERICO International Corporation, Burdy, Thomas Betts, or equal.

B. Grounding conductor manufacturers shall be per Section 260519 of these specifications.

2.02 CONDUCTORS

A. All grounding conductors shall be copper. Conductors smaller than No. 8 AWG shall be solid; all other conductors shall be stranded. Ground conductors shall be bare or have type THHN insulation, green in color.

B. Aluminum grounding conductors shall not be used.

2.03 GROUND RODS

A. Ground rods shall be copper clad, sectional, solid steel, 10-ft. long, ¾ in. diameter.

B. Rods shall be threaded on both ends.

C. All couplings shall be bronze and made by the rod manufacturer.

2.04 CONNECTIONS

A. Grounding connections made to ground rods, building re-steel, counterpoise systems, etc. shall be made via exothermic welding means.

B. Grounding connections to pipes shall be made with bolted pressure type or compression type clamps manufactured for grounding purposes.

C. Grounding connections to boxes, fixtures, etc. shall be made at the factory provided grounding terminal.

PART 3 - EXECUTION

3.01 SERVICE GROUND

A. Provide driven ground rods in 3 separate locations arranged in a triangle, separated from each other by a minimum of 10 ft. Set rods so that top of final rod driven is 2 inches below grade at each of the 3 locations.

B. Connect ground rods together with grounding conductor via exothermic welding process. Provide connection to main service entrance disconnect ground bus connection point and to system neutral at this location with grounding conductor.

C. Provide grounding conductor from main service entrance disconnect ground bus to main building water service piping. Provide grounding conductor shuts around all valves and water meter in water service piping. Shunts shall be braided type.

3.02 BUILDING CONNECTIONS

A. Provide grounding conductors from main service entrance disconnect ground bus connection point to building foundation reinforcement steel and to building frame steel.

B. Provide bonding connections to all above ground sections of gas piping upstream from the equipment shutoff valve that the pipe feeds.

3.03 COMMUNICATIONS SYSTEMS

A. Provide a #4 AWG grounding conductor from the grounding electrode system to the communications system (fire alarm, security, telephone, data, cable television, etc.) utility service cabinet.

B. Provide connection to service and/or central equipment locations on a ¼" by 2" by 12" grounding bus.

3.04 EQUIPMENT CONNECTIONS

A. Provide grounds to all equipment requiring them, including, but not limited to:
1. Electric service
2. Secondary of transformers (except the isolating type).
3. Conduit and enclosures.
4. All neutral conductors.
5. Panelboards, switchboards, etc.
6. Ground terminals on receptacles, appliances, equipment, etc.

B. Make all connections with galvanically compatible materials. Clean all connections points so that new bare metal surfaces are involved in connections.

C. Tighten all bolts, screws, etc. on grounding connections to torque ratings of manufacturer, or per UL 486A if there are no manufacturer's instructions on torque settings.

D. Seal all grounding connections of dissimilar metals with inert product intended for this purpose to exclude moisture infiltration into connection joints.

E. Provide grounding connection for all step-down transformer neutrals to nearest building steel member.

3.05 Route all grounding conductors via shortest physical path possible without obstructing access to other systems or placing the conductors in locations where they will be subjected to any type of damage.

3.06 All bonding conductors (straps, jumpers, etc.) shall be installed so that their connections are isolated from equipment vibrations, etc.

3.07 In all raceway systems provide an equipment grounding conductor in addition to the circuit neutral inside the raceway with the phase conductors. Equipment grounding conductor shall be "Green" in color.

END OF SECTION

SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General and Supplementary Conditions, and General Requirements Divisions apply to the work specified in this Section.

1.02 LOCATION OF OUTLETS

A. Unless specifically indicated, all outlets are located diagrammatically on the drawings. Reference shall be made to the architectural and mechanical plans for the exact location of all outlets.

B. Outlets shall be located so that they will be symmetrical with architectural details and power outlets shall be so located as to properly serve the equipment.

1.03 JUNCTION BOXES AND PULL BOXES

A. Furnish and install junction and pull boxes as required to facilitate installation of the various conduit systems and as required by the NEC.

PART 2 - PRODUCTS

2.01 SECONDARY SERVICE CONDUIT

A. Secondary service duct shall be galvanized rigid steel conduit, IMC or schedule 40 PVC.

2.02 TELEPHONE SERVICE ENTRANCE DUCT

A. Telephone service duct shall be schedule 40 PVC conduit. Where penetrations through slabs occur, use long sweep rigid steel conduit elbows.

2.03 FEEDERS & BRANCH CIRCUITS

A. Rigid conduit or IMC shall be used for all feeders and sub-feeders and branch circuits, where exposed to possible physical damage. EMT shall be permitted in protected areas.

2.04 RIGID CONDUIT

A. All rigid conduit shall be of the best quality steel of standard dimensions, hot dip galvanized, threads included, clean and smooth inside. Conduit shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp on each length of conduit.

B. Fittings for all rigid conduits shall be steel or malleable iron as manufactured by Thomas and Betts or equal. DIE CAST FITTINGS OF ANY MATERIAL SHALL NOT BE USED.

2.05 ELECTRIC METALLIC TUBING (EMT)

A. EMT conduit shall be of the best quality steel of standard dimensions, hot dip galvanized, clean and smooth inside. Conduit shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp on each length of conduit.

B. Fittings for all EMT conduit shall be compression type, made of steel, with case hardened locknuts, and nylon insulated throats; or steel setscrew fillings with case hardened locknuts, and nylon insulated throats. DIE CAST FITTINGS OF ANY MATERIAL SHALL NOT BE USED.

2.06 RIGID NONMETALLIC CONDUIT (PVC)

A. All PVC conduit shall be produced by the same manufacturer, be schedule 40, and manufactured as Electrical Conduit with the manufacturer's trade mark or stamp on each length of conduit.

B. All PVC conduit fittings and cement shall be secured from the conduit manufacturer.

C. All PVC conduit shall meet the following standards:
   1. Rated for 90 degrees centigrade.
   2. Shall have a tensile strength of 7,000 psi @ 73 degrees F.
   3. Shall have a flexural strength of 11,000 psi.
   4. Shall have a compressive strength of 8,600 psi.

D. PVC not allowed above grade.

2.07 FLEXIBLE CONDUIT

A. Flexible Steel Conduit (No Cover) shall be constructed of reduced wall galvanized steel and shall be manufactured as Electrical Conduit with the manufacturer's trademark or stamp.

B. PVC Extruded Cover Flexible Conduit shall be used in all outdoor applications. It shall be UL listed for outdoor use.

C. Connectors and fittings for flexible conduit shall be steel type with nylon insulated throats. Connectors shall "bite" into the conduit under pressure of the connector bolt.

2.08 BELOW GRADE CONDUIT AND CABLE SEAL

A. Seals for either conduit or cable below grade shall form a reliable lasting seal between building and the outside and shall be able to withstand pressures to a minimum head of 50 feet of water.

2.09 THREADED JOINT COMPOUND

A. Threaded joint compound shall be a corrosive inhibiting compound that is electrically conductive under pipe joint pressure.

2.10 CONDUIT IDENTIFICATION TAPE

A. Conduit identification tape for use in marking underground conduit runs shall be inert polyethylene, resistant to acids, alkalis, etc., which might be in the soil. The tape shall be a minimum of 4 mils thick, 6 inches wide, and yellow in color. It shall have the words "CAUTION – ELECTRIC LINE BURIED BELOW" imprinted along its entire length with a contrasting color permanent ink.

2.11 PULL BOXES

A. All pull boxes shall be constructed of code gauge galvanized steel of the dimensions required by Article 370 of the NEC, according to the number, size, and position of conduits entering the box.

B. Pull boxes installed in vertical runs of conductors shall be provided with cable supports as required by Table 300-19 of the NEC.

C. Pull boxes for horizontal runs of feeder conductors which contain more than one feeder shall be provided with reinforced flange and removable 12 gauge 1-1/2" by 1-1/2" galvanized channel for support of conductors. Wood supports shall not be used.

D. Pull boxes installed in finished spaces shall be flush mounted and shall be provided with trim, hinged door, and flush latch with lock to match trims for flush mounted panelboards.

2.12 OUTLET BOXES

A. All outlet boxes shall be constructed of code gauge galvanized steel.

B. Outlet boxes specified herein are minimum size boxes. Larger boxes of the same type shall be provided if required by the NEC in consideration of the number and size of conductors installed.

C. Outlet boxes for surface mounted and pendant mounted lighting fixtures shall be four-inch octagon boxes, 1-1/2 inches deep. Fixtures studs shall be provided for support of fixtures if required.

D. Outlet boxes for flush mounted lighting fixtures shall be four inch square boxes, 1-1/2 inches deep with blank cover.

E. Outlet boxes for switches, receptacles, and wall mounted junction boxes shall be four-inch square boxes, 1-1/2 inches deep. Where only one conduit enters box, 3-1/2 inch deep single gang switch boxes may be used. Outlet boxes for GFCI receptacles shall be 2-3/4 inches deep.

F. Outlet boxes recessed in concrete lock walls and partitions shall be designed especially for installation in concrete block and tile walls and partitions. Single gang or multi-gang square cornered masonry boxes shall be used for one or more devices at the termination of a conduit run. Conventional four inch octagonal or 4-11/16 inch square boxes fitted with square tile covers of proper depth for concrete block shall be used where two or more conduits enter a box.

G. Where specialty equipment such as fire alarm components, security components, etc., are installed, provide outlet boxes suitable in size for these devices.

H. Outlet boxes to be used in exposed conduit run shall be cast ferrous alloy type. Outlet boxes for vapor-tight lighting fixtures shall be cast corrosion resistant type.

2.13 FLOOR BOXES

A. Floor outlet boxes shall be adjustable, sheet steel, designed for use in concrete slabs, and watertight if noted on drawings.

B. Boxes for use in a floor to be carpeted shall be supplied with an adjustable brass

carpet flange.

C. Unless otherwise noted on the drawings boxes installed in slabs less than four inches thick shall be:
1. Hubbell # B-2529
2. Walker # 801
3. Thomas & Betts # 1752

D. Boxes installed in slabs more than four inches thick shall be:
1. Hubbell # B-2557
2. Walker # 800
3. Thomas & Betts # 1754

E. Watertight boxes shall be cast metal and adjustable. Provide rubber gasket and bronze disk. Boxes shall be:
1. Hubbell # B-2536
2. Walker # 800-C1
3. Thomas & Betts # 1810

F. Covers for all floor boxes shall be supplied in accordance with the use of the box.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Unless otherwise specifically noted on the drawings, ALL CONDUCTORS installed on this project shall be installed in conduit as specified herein.

B. Any conduit installed on this project shall be no smaller than ¾", except as otherwise noted on the drawings. Where desirable for ease of installation, larger sizes than those called out on the drawings may be used. The contractor is responsible for resolution of any conflicts arising from the use of larger sizes.

C. Conduit shall be continuous from outlet to outlet, from outlet to panelboard cabinet, junction box, and/or pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each raceway system will be electrically continuous from the service entrance to all

outlets. All conduit from panelboard cabinets and junction boxes shall terminate in approved outlet boxes or conduit fittings. Conduit connection to any box, which has no threaded hub for its reception, shall be installed with two locknuts.

D. In general, the conduit installation shall follow the layout shown. However, this layout is diagrammatic only; and where changes are necessary due to structural conditions, other apparatus, or other causes, such changes shall be made without any additional cost to the Owner. Offsets in conduit are not indicated and must be provided as required.

E. Junction boxes and pull boxes shall be provided and installed as required to facilitate the systems shown on the drawings. “AX” expansion fittings shall be installed in all conduit runs wherever they cross building expansion joints.

F. At couplings, conduit ends shall be threaded so they meet in the coupling. Right and left couplings shall not be used; conduit couplings of the Erickson type or approved equal shall be used at locations requiring such joints.

G. Connections in conduit installed in outdoor or indoor locations where exposed to continuous or intermittent moisture, shall provide a liquid-tight seal. The sealing hub fittings shall be of steel or malleable iron, with recessed sealing "0" ring and a nylon insulated throat, Thomas and Betts Series 370. All conduit and cable, telephone or otherwise, which extend from the interior to the exterior below grade shall be sealed with a fitting designed for that particular use so as to be watertight.

H. No bends will be permitted with a radius less than size (6) times the diameter of the conduit nor more than 90 degrees.

I. All conduits shall be concealed in the wall, in or below floors or above ceilings unless otherwise directed or indicated. Concealed conduit shall be supported from the building construction at intervals not exceeding 8'-0". Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of the lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures.

J. Where conduit is expressly shown to be run exposed, the conduit shall be supported at intervals not exceeding 8'-0" with straps and wood screws for wood construction, machine screws for metal construction, and expansion bolts for masonry construction. Exposed conduit in finished spaces that pass through walls or ceilings shall be provided with chrome plated escutcheons. Run exposed conduit, where permitted by this specification, parallel or at right angles to the building with approved galvanized iron clamps or hangers. Devices attached to masonry or slabs shall be secured with inserts and bolts or lead expansion sleeves. Provided a support at each outlet box, at each conduit elbow, and at each junction box. Wooden plugs inserted in drilled holes are not acceptable as support bases.

K. Where two (2) or more conduits are run parallel and adjacent, they shall be installed on gang hangers.

L. Where connections are made to motors more than 2'-0" away from walls or columns, a vertical conduit, minimum size 3/4", securely attached to floor and ceiling shall be installed and the wiring carried into and out of this conduit by means of condulets and flexible conduit.

M. Conduit embedded in concrete, which is in contact with the earth, and conduit installed outside the building below grade shall be rigid steel conduit, IMC or PVC.

N. Conduit shall be located 6" minimum from surfaces with temperature ranges above 140 degrees F.

O. Conduit shall not be installed in any manner, which will result in the accumulation of condensation in the pipe.

P. In masonry construction, wooden plugs inserted in drilled holes are NOT acceptable as bases for supports for conduit. The Contractor shall use approved types of galvanized wall brackets, beam clamps, strap hangers, or pipe straps secured by means of toggle bolts in hollow

masonry units, expansion bolts in concrete or brick, machine screws or bolts and nuts in metal surfaces, and wood screws in wood surfaces.

Q. Conduit runs left for future use shall be checked for unblocked passage by the use of a ball mandrel. Contractor shall leave a non-mildewing polyolefin pull line in each such conduit. The line shall have an average tensile strength of 200 lbs. for 1" or smaller conduit and 500-lbs. for conduit larger than 1".

R. Electrical contractor to furnish and install all conduit for controls systems, see mechanical plans.

3.02 CONDUIT PROTECTION

A. Conduit shall not be installed in any manner that will result in the accumulation of water inside the pipe.

B. Conduit shall be located a minimum of 6 inches away from any surfaces which will reach surface temperatures of 140°F. or above.

C. All conduit installed in the ground outside of the building shall be buried a minimum of 36 inches below finished grade, but in no case shall it be buried more than 48 inches deep without the written consent of the Engineer.

D. Conduit run inside the building below floor slabs shall be included within the concrete pour of the slab, located between the reinforcing steel vertically.

E. For all conduit installed in the ground outside of the building, provide identifying marker tape over the entire length of the conduit run. Place tape below finished grade between 12 inches and 18 inches absolute.

F. All conduit shall be secured in place and protected to prevent damage to work during construction. The ends of all conduit and conduit fittings shall be plugged to avoid filling with dirt, plaster, gypsum, etc.

G. All conduit shall be blown out and swabbed clear of water and trash prior to the installation of any conductors in the conduit.

3.03 GROUNDING AND TERMINATIONS

A. Connections to all panelboards, cabinets, pull boxes, etc., shall be installed with a grounding wedge lug between the bushings and the box; or with locknuts designed to “bite” into the metal of the box.

B. To insure continuity of electrical ground and to improve conductivity, use compound, series on all rigid conduit threaded joints.

C. In ALL conduit runs, rigid or otherwise provide a green colored insulated grounding conductor inside the conduit with the phase conductors.

3.04 PENETRATIONS

A. Where any electrical item such as conduit, cable, telephone cable, busway, etc., penetrates a wall, floor, or ceiling, the original integrity for the respective wall, floor, or ceiling shall be restored. The opening around the item making the penetration shall be sealed airtight. If the surface penetrated is fire rated, the sealant shall have a fire rating equal to the original surface. In no case shall the penetration result in a lessening of the fire rating of the surface penetrated.

B. Any openings in surfaces left for future routing of electrical work shall be left sealed as noted in Item A above.

C. Provide sleeves for conduit, cables, busway, etc., accurately before concrete floors are poured; or set boxes in the forms so as to leave openings in the floors so the required sleeves can be subsequently located.

D. Sleeves shall be rigid conduit with bushings installed on each end. Sleeves shall extend 6

inches beyond the surface they penetrate.

3.05 FLEXIBLE CONDUIT

A. Non-covered flexible steel conduit shall be used in making short connections from outlet boxes to recessed lighting fixtures. Such conduit runs shall be no longer than 72-inches.

B. Flexible conduit runs to other equipment shall be kept as short as possible but shall have a minimum length of 12 inches.

C. Flexible conduit connections to dry type transformers, rotating or vibrating machinery, kitchen equipment, or any other equipment, which may result in the conduit being exposed to moisture, shall be PVC covered.

3.06 PVC CONDUIT

A. PVC conduit shall not be used above grade under any circumstances.

B. All PVC conduit joints of any type shall be solvent welded in accordance with the manufacturer's recommendations.

3.07 PULL BOXES

A. Pull boxes shall be provided where indicated on the drawings and/or where required to facilitate the installation of all required conductors or as required by NEC.

B. Pull boxes shall be installed exposed only in unfinished spaces. They shall be accessible.

C. Feeders within pull boxes shall be individually laced with nylon tie straps of the type with enlarged tab to permit identification of each feeder.

D. Conductors shall not be spliced inside pull boxes except with the approval in writing of the Architect. Where splices are permitted they shall be made with splicing sleeves attached to the conductors with hydraulic crimping tools. Split bolt connectors shall not be permitted.

3.08 OUTLET LOCATIONS

A. Furnish and install outlet, junction, and pull boxes as required to facilitate the installation of the electrical systems as required.

B. All outlet, junction, and pull boxes shall be accessible with covers designed for quick removal. Where boxes are located above non-accessible ceilings, in walls, etc., in finished areas, the removable cover shall be flush with the finished surface. Cover finish and the exact location of the boxes shall be approved by the Architect.

C. The drawings are intended to show the locations of outlets, devices, fixtures and arrangement and control of circuits only. Exact locations shall be determined by actual measurement at the building and/or reference to the architectural drawings.

D. The location of any outlet may be moved ten feet with the prior approval of the Architect and before it is installed without any additional expense to the Owner.

E. Contractor shall check the location of all wall outlets including light fixtures, receptacles and switches, to verify that the outlets will clear any wall fixture, shelving, worktables, sinks or similar equipment that will be installed.

F. Outlets occurring in architectural features shall be accurately centered in same. Install wall switch outlets on the STRIKE SIDE of doors with cover plate clearing door trim.

G. Outlet boxes in non fire rated partitions shall NOT be set back-to-back. Boxes set side by side facing separate rooms or spaces, shall be connected together by offset nipple; after conductors are pulled, the nipples shall be tightly packed with mineral wool to prevent sound transmission.

H. Outlet boxes in fire-rated partitions shown to be mounted on the opposite side of the partition

at the same height, shall be separated horizontally by a minimum of 24 inches.

I. The mounting height of all wall outlets is indicated on the architectural or electrical drawings. The height is from the finished floor to the center line of the device or outlet. The Contractor may, with the Architect's approval, vary the mounting heights to correspond to masonry joints.

J. Were outlets are shown as being adjacent and different mounting heights are indicated for each, they shall be mounted one directly over the other at the heights specified.

3.09 OUTLET BOXES

A. All outlet boxes shall be flush mounted within the wall regardless of wall construction, unless they are specifically shown as being used with exposed conduit. Cuts for outlet boxes in masonry walls shall be made so that the cover plate will completely cover the cut. The edge of all boxes shall be flush with the surface in which they are installed.

B. The devices that are to be installed in the boxes shall be screwed tight before cover plates are installed. Plates shall not be used as a means for tightening the devices or holding them in place.

C. Provide extension rings for all boxes when required by wall finish.

D. Junction boxes shall be provided with blank covers. Covers on ceiling outlets shall be round and shall be painted to match ceilings. Covers on wall junction boxes shall be of size and finish as used on switch and receptacle outlets.

E. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted ONE DIRECTLY over the other, on the center line of the group or on the center line of the room or wall.

F. The mount height of all wall outlets is indicated on the architectural or electrical plans. The mounting height is from finished floor to the centerline of the device or outlet. The Contractor may, with the Architect's approval on the job, slightly vary the mounting height of wall outlet so that the outlet box, top or bottom, will occur at a masonry joint.

G. Outlet boxes shall be provided with 3/8" fixture stud to support light fixture. Outlet boxes shall be firmly anchored to structural member of the building, using wood screws for wood construction, bolts for steel construction, and expansion bolts secured in place with cement mortar for masonry construction. Ceiling outlet flush in furred acoustical tile ceiling construction for surface or pendant mounted lighting fixtures shall be in 4" square or octagonal pressed steel boxes supported from stud and rod, bars or hangers supported from the building structure independent of the ceiling construction.

H. Where drawings indicate ganged installation of switches controlling 277 Volt lighting circuits of opposite phase, switches shall be separated by one full gang width, or separated with a permanently installed barrier between phase and/or different voltages.

I. Outlet boxes shall not be used as support for fluorescent lighting fixtures.

J. Contractor to hand mark circuit numbers contained on all J box covers. Mark on the exterior if not painted over, interior otherwise.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section includes equipment marking, wire and cable marking, and conduit marking.

1.02 RELATED SECTIONS

A. All conditions and requirements of Division 01 shall apply to the work specified in this section.

B. Section 099100 - Painting

1.03 REGULATORY REQUIREMENTS

A. Furnish products that are manufactured and rated for labeling and marking electrical equipment.

PART 2 - PRODUCTS

2.01 EQUIPMENT NAMEPLATES

A. Nameplates shall be engraved three-layer laminated plastic. In all cases, inner layer shall be white in color.

B. Nameplates shall be provided on all electrical enclosures and/or cabinets.

C. Engraved letters shall be 3/8 inches high.

D. Nameplate outer layer color shall be:
   1. 480/277 Volt equipment – Red
   2. 208/120 Volt equipment – Black
   3. 240/120 Volt equipment – Blue

2.02 WIRE AND CABLE MARKERS

A. Markers shall be colored plastic tape for service entrance and feeder conductors and PVC sleeve type markers for branch circuit conductors.

B. PVC sleeve type markers shall be white with black writing.

C. Service entrance and feeder conductor marking shall consist of phase identification follows:

208Y/120 Volt System	480Y/277 Volt System
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Purple
Phase C - Blue	Phase C - Yellow
Neutral - White	Neutral - White with Black Stripe
Ground - Green	Ground - Green

D. Branch circuit conductor marking shall consist of the source panel name and the branch circuit number as listed in the panel schedules on the drawings.

2.03 CONDUIT MARKERS

A. Conduit and raceway labeling shall be stenciled painted letters of height of 2 conduit diameters, or 2 inches, whichever is smaller. Voltage and function shall be stated in label.

B. Label paint shall be enamel meeting requirements of Section 099100 – Painting. Color per voltage system:
   1. 480/277 Volt raceway – Red
   2. 208/120 Volt raceway – Black
   3. 240/120 Volt raceway – Blue

2.04 UNDERGROUND RACEWAY MARKERS

A. Raceway route markers shall be 4” by 4” by 18” long concrete stakes.

B. Raceway route warning tape shall be inert polyethylene, resistant to acids, alkalis, etc., which might be in the soil. The tape shall be a minimum of 4 mils thick, 6 inches wide, and yellow in color. It shall have the words “CAUTION – ELECTRIC LINE BURIED BELOW” imprinted along its entire length with a contrasting color permanent ink. The tape shall be “Terra Tape” as manufactured by Reef Industries, Inc., Houston, Texas; or equal.

2.05 PANELBOARD CIRCUIT DIRECTORIES

A. Circuit directory cards shall be white heavy cardboard manufactured for the purpose, with machine written black ink circuit number legends.

B. Circuit identification shall be in agreement with the actual connections as guided by the panel schedules on the drawings.

2.06 SWITCHBOARD AND DOORLESS PANELBOARD CIRCUIT BREAKER MARKERS

A. Circuit breakers markers shall be as per paragraph 2.01 above.

B. Circuit identification shall be in agreement with the actual connections as guided by the panel schedules on the drawings.

PART 3 - EXECUTION

3.01 Clean and remove grease, etc. from all equipment surfaces that will receive nameplates.

3.02 Provide labels for all electrical panels, switchboards, disconnects, cabinets, feeder and service raceways, motors, and major pieces of electrical equipment installed under this division

3.03 Provide panelboards that have doors with a directory card of all circuits in the panel.

3.04 Provide circuit breakers in switchboards and in panelboards that do not have doors with labels stating the circuit number and what the breaker is supplying.

3.05 Label all feeder conduits and all single equipment branch circuit conduits in excess of 6 ft. in length with painted labels located at 20 ft. on center along the entire length of the conduit run.

3.06 Mark all underground conduit runs installed outside the building with stakes set with tops flush in the ground directly over the source, end, and bends locations in the conduit run.

3.07 Provide marker tape over the entire length of all underground conduit runs installed outside the building. Tape shall be installed at a depth between 12 and 18 inches below the surface of the ground directly over the conduit.

3.08 Mark all service entrance phase conductors and the neutrals with colored plastic tape to identify phase assignments on each end of the conductor and in all pull and/or junction boxes.

3.09 Branch circuit conductors shall be color-coded via insulation color as follows:

208Y/120 Volt System	480Y/277 Volt System
Phase A - Black	Phase A - Brown
Phase B - Red	Phase B - Purple
Phase C - Blue	Phase C - Yellow
Neutral - White	Neutral - White with Black Stripe
Ground - Green	Ground - Green

END OF SECTION

SECTION 26 24 16
PANELBOARDS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Lighting and appliance panelboards

1.02 RELATED SECTIONS

A. Overcurrent Protective Devices

1.03 REFERENCES

The panelboards and protection devices in this specification are designed and manufactured according to latest revision of the following standards (unless otherwise noted).

A. ANSI 61

B. ANSI/NEMA KS 1, Enclosed and Miscellaneous Distribution Equipment Switches (600 Volts)

C. ANSI/NEMA PB 1, Panelboards

D. ANSI/NFPA 70, National Electrical Code

E. ASTM - American Society of Testing Materials

F. CSA C22.2 No. 29, Panelboards and Enclosed Panelboards

G. CSA C22.2 No. 5.1, Molded Case Circuit Breakers

H. Federal Specification W-C-375, Rev. B, Amend. 1, Circuit Breakers, Molded Case; Branch Circuit and Service

I. Federal Specification W-P 115, Rev. C, Panel, Power Distribution

J. NEMA AB 1, Molded Case Circuit Breakers and Molded Case Switches

K. NEMA PB 1.1, General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less

L. UL 489, Molded-Case Circuit Breakers and Circuit-Breaker Enclosures

M. UL 50, Enclosures for Electrical Equipment

N. UL 67, Panelboards

O. UL 943, Ground-Fault Circuit-Interrupters

1.04 DEFINITIONS

A. Overcurrent Protective Device -- a circuit breaker pole or single fuse. Example: a 2-pole device is considered 2 protective devices.

1.05 SYSTEM DESCRIPTION

A. Short circuit rating of panelboards shall be the interrupting rating of lowest rated device in the panel or applicable UL series rating for proper main and branch device combinations.

B. Panelboards shall have a maximum of 42 protective devices per panel, including sub-feeders and excluding main overcurrent protective devices. For more than 42 devices, 2 or more panelboards are required.

C. With 2 or more panelboards, sub-feed lug or thru-feed lugs shall be used in all but 1 section of each panelboard. Lugs shall have same capacity as incoming mains. Cable inter-connections shall be field installed.

D. Protective devices shall be molded case circuit breakers.

1.06 SUBMITTALS

A. Manufacturer shall provide copies of following documents to owner for review and evaluation in accordance with general requirements of other divisions:
   1. Product Data on specified product.
   2. Shop Drawings on specified product.
   3. Certified trip curves for each specified product.

1.07 PROJECT RECORD DOCUMENTS

A. Maintain an up-to-date set of Contract documents. Note any and all revisions and deviations that are made during the course of the project.

1.08 OPERATION AND MAINTENANCE DATA

A. Manufacturer shall provide copies of installation, operation and maintenance procedures to owner in accordance with general requirements of other divisions.

B. Submit operation and maintenance data based on factory and field testing, operation and maintenance of specified product.

1.09 QUALIFICATIONS

A. Manufacturer shall have specialized in the manufacture and assembly of lighting and appliance panelboards for 25 years.

B. Lighting and appliance panelboards shall be listed and/or classified by Underwriters Laboratories in accordance with standards listed in Article 1.03 of this specification.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products in accordance with recommended practices in manufacturer's Installation and Maintenance Manuals.

B. Deliver each lighting panelboard in individual shipping cases for ease of handling. Each panelboard shall be wrapped for protection.

C. Inspect and report concealed damage to carrier within specified time.

D. Store in a clean, dry space. Maintain factory protection or cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic. (Heat enclosures to prevent condensation.)

E. Handle in accordance with NEMA and manufacturer's written instructions to avoid damaging equipment, installed devices, and finish.

1.11 PROJECT CONDITIONS (SITE ENVIRONMENTAL CONDITIONS)

A. Follow (standards) service conditions before, during and after panelboard installation.

B. Lighting and appliance panelboards shall be located in well-ventilated areas, free from excess humidity, dust and dirt and away from hazardous materials. Ambient temperature of area will be between minus [30] and plus [40] degrees C. Indoor locations shall be protected to prevent moisture from entering enclosure.

1.12 SEQUENCING AND SCHEDULING

1.13 WARRANTY

A. Manufacturer warrants equipment to be free from defects in materials and workmanship for 1 year from date of installation or 18 months from date of purchase, whichever occurs first.

1.14 MAINTENANCE SERVICE

A. Furnish complete service and maintenance of lighting and appliance panelboards for 1 year from date of substantial completion.

B. Include parts and labor.

1.15 EXTRA MATERIALS

A. Provide spares as indicated in drawings.

1.16 FIELD MEASUREMENTS

A. Make all necessary field measurements to verify that equipment shall fit in allocated space in full compliance with minimum required clearances specified in National Electrical Code.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. General Electric Company products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Engineer's discretion, if they comply with all requirements specified or indicated in these Contract documents. Siemens, Eaton and Square D are specifically allowed.

2.02 EQUIPMENT

A. Furnish Lighting Panelboards, as indicated in drawings.

2.03 COMPONENTS

Refer to Drawings for: actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; and other required details.

A. RATINGS
   1. Lighting and appliance panelboards shall be rated as indicated in drawings.
   2. Maximum current ratings for mains, sub-feeds and branches, respectively, shall be specified in drawings.

B. ENCLOSURE
   1. Boxes shall be a nominal 20 inches wide and 5.75 inches deep with wire bending space per National Electric Code. Electrical Contractor to Coordinate with Architect to insure that any walls which have recessed panels are located and a minimum of 6” deep prior to work.
   2. Fronts shall be reinforced steel with concealed hinges and concealed trim adjusting screws. Trim clamps are unacceptable.
   3. All door locks shall be metallic corbin latch bolt type or equivalent. All door locks shall be keyed for a single key.
   4. Clear Lexan (or equal) directory card holders shall be permanently mounted on front door.
   5. All panelboard series ratings shall be prominently displayed on dead front shield.
   6. Interiors shall permit top or bottom incoming cables.

C. BUS BARS
   1. Bus bars shall be phase sequenced, fully insulated and supported by high impact interior base assemblies.
   2. Bus bars shall be mechanically supported by zinc finished galvanneal steel frames to prevent vibration and damage from short circuits.
   3. Terminations shall be UL tested and listed and suitable for UL copper wire.
   4. Provide [1] continuous bus bar per phase. Each bus bar shall have sequentially phased branch circuit connectors bolt-on branch circuit breakers. Bus bars shall be rated as indicated in drawings.
   5. Split solid neutral bus shall be plated and located in main compartment for all incoming neutral cables to be same length.
   6. Lugs shall be rated for 75 degree C terminations.
   7. Main lugs for copper conductors shall be bolted lugs. Lugs for aluminum conductors

shall be compression lugs.

8. Lug bodies shall bolt in place.

D. CIRCUIT BREAKERS

1. Molded case circuit breakers shall be bolt-on devices for 120/240V panels and shall be bolt-on for 277/480V panels.
2. All circuit breakers shall have thermal and magnetic trip elements in each pole.
3. Multi-pole breakers shall have internal common trip crossbars for simultaneous tripping of each pole.
4. Circuit breakers shall not be restricted to any mounting location due to physical size.
5. All branch breakers 15 to 100 amperes shall be able to be mounted in any panel position for twin or double mounting without space penalty. Sum of ratings for 2 such twin mounted devices shall not exceed 180 amperes.
6. Main and sub-feed circuit breakers may be vertically or horizontally mounted.
7. Branch breaker panelboard connections shall be copper to copper.
8. All panelboard terminations shall be rated as indicated in drawings.
9. All breakers shall have an over center mechanism and be quick make and quick break.
10. All breakers shall have handle trip indication and a trip indicator in window of circuit breaker housing.
11. Breaker handle and faceplate shall indicate rated ampacity.
12. Circuit breaker escutcheon shall have standard ON/OFF markings.
13. Main breakers shall be UL listed for use with: Shunt, Under Voltage, and Ground Fault Shunt Trips; Auxiliary and Alarm Switches; and Mechanical Lug Kits.
14. Branch breakers shall be UL listed for use with: Shunt Trips, Auxiliary and Alarm Switches.

E. Contactors shall be electronically held.

2.04 ACCESSORIES

A. Contactor control relays

B. Furnish nameplates for each device as indicated in drawings. Color schemes shall be as indicated on drawings.

C. Provide Transient Voltage Surge Suppression system as specified in the TVSS section and on prints.

2.06 FINISH

A. Boxes shall be corrosion resistant, zinc finish galvanneal.

B. Fronts shall be powder finish painted ANSI 61 gray.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that A-Series® panelboards are ready to install.

B. Verify field measurements are as shown on Drawings.

C. Verify that required utilities are available, in proper location and ready for use.

D. Beginning of installation means installer accepts conditions.

3.02 LOCATION

3.03 INSTALLATION

Additional provisions and editing may be required for this part.

A. Install per manufacturer's instructions.

B. Install required safety labels.

3.04 FIELD QUALITY CONTROL

A. Inspect installed panelboards for anchoring, alignment, grounding and physical damage.

B. Check tightness of all accessible mechanical and electrical connections with calibrated torque wrench>. Minimum acceptable values are specified in manufacturer's instructions.

C. Test each key interlock system for proper functioning.

3.05 ADJUSTING

A. Adjust all circuit breakers, access doors, operating handles for free operation as described in manufacturer's instructions.

3.06 CLEANING

A. Clean interiors of panels to remove construction debris, dirt, shipping materials.

B. Repaint scratched or marred exterior surfaces to match original finish.

END OF SECTION

SECTION 26 43 13
TRANSIENT VOLTAGE SUPPRESSION FOR LOW VOLTAGE ELECTRICAL POWER SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. This section describes the materials and installation requirements for transient voltage surge suppressors (TVSS), including integrated TVSS in switchboards, distribution and branch panelboards and motor control centers for the protection of all AC electrical circuits.

1.02 STANDARDS

Most Recent Editions of:

A. ANSI/IEEE C62.41, C62.45 & C62.48

B. National Electric Code

C. Underwriters Laboratories: UL1449 & UL1283

PART 2 - PRODUCT

2.01 TRANSIENT VOLTAGE SURGE SUPPRESSORS

A. Surge Suppressor

1. TVSS shall be Listed in accordance with UL 1283 and 1449 Second Edition.
2. TVSS shall be marked with a short circuit current rating and shall not be installed at a point on the system where the available fault current is in excess of that rating. (This is Article 285.6 of the 2002 NEC and is the Engineer's requirement, regardless of whether or not the Authority Having Jurisdiction adopts the 2002 Code.)
3. Integral TVSS shall be installed by, UL Listed by and shipped from the electrical distribution equipment manufacturer's factory. Field or aftermarket conversions are disallowed.
4. TVSS shall provide surge current diversion paths for all modes of protection; L-N, L-G, N-G in WYE systems, and L-L, L-G in DELTA systems.
5. TVSS shall be modular in design. Each module shall be fused with a surge rated fuse and incorporate a thermal cutout device. (Note: thermal cutouts protect against sustained overvoltages.)
6. At Service Entrance, a UL approved disconnect switch shall be provided as a means of disconnect if a 60A breaker is not available.
7. TVSS shall meet or exceed the following criteria:
   a. Maximum surge current capability (single pulse rated) per phase or per mode as indicated on the drawings.
   b. UL 1449 Listed and Recognized Component Suppression Voltage Ratings shall not exceed the following:

VOLTAGE	L-N	L-G	N-G
208Y/120	400V	400V	400V

8. TVSS shall have a minimum EMI/RFI filtering of -50dB at 100kHz.
9. TVSS shall be provided with 1 set of NO/NC dry contacts.
10. Service entrance TVSS shall be provided with a surge counter.
11. TVSS shall have a five-year warranty. Warranty shall be the responsibility of the electrical distribution equipment manufacturer and shall be supported by their respective field service division.

2.02 MANUFACTURERS

A. Approved Vendors: General Electric, Square D, Siemens, Eaton and APT.

END OF SECTION

SECTION 26 56 00
EXTERIOR LIGHTING

PART 1 - GENERAL

1.01 SCOPE

A. The General Conditions and Supplementary Conditions and General Requirements (Division 1), apply to the work specified in this Section.

B. All lighting fixtures together with required mounting hardware, lamps, and fixture supports shall be provided under this Section.

1.02 WORK INCLUDED

A. Provide and install fixtures as shown on the drawings and in the schedules complete with all associated hardware, completely wired, controlled, and securely attached to building structure.

B. Coordinate installation and connection of all lighting fixtures with the installation of the ceiling and with the work of all other trades. Provide a total system that is complete and finished in appearance.

C. If any fixture type is shown on the plans but is not described in the Lighting Fixture Schedule, request a clarification from the Architect prior to bid. Provide a suitable fixture as directed. The absence of the description of a fixture, which is shown on the plans, does not relieve the contractor from the responsibility of supplying a fixture.

D. Verify fixture numbers before placing an order. Furnish all fixtures with proper frames, fittings, and devices as required for installation in the ceiling systems being installed.

E. All fixtures of the same type are to be supplied from the same manufacturer, identical in finish and appearance.

1.03 QUALITY ASSURANCE

A. All fixtures supplied for this project shall be new, of good quality, and be approved by, and bear the label of, the applicable regulatory agency. All fixtures shall bear the UL label.

B. All blemished, damaged, or unsatisfactory fixtures shall be replaced in a satisfactory manner as directed by the Architect.

C. All fixtures shall meet all applicable local codes and regulations.

D. The lighting designated for this project is based on design using the fixtures scheduled by manufacturer and catalog number. Where equals are recognized to exist, suitable alternate manufacturers are shown. If substitution of fixtures, other than those scheduled, is desired, this contractor shall provide fixture lighting performance data for the substitute. He shall also provide operating physical samples of the scheduled fixture and its proposed substitute for evaluation by the Engineer. These data shall be supplied to the Engineer 5 days prior to bid. Equality shall be the sole determination of the Engineer.

F. Equality determination for substitute fixtures shall be based on the following:
   1. Performance:
      a. Light Distribution
      b. Utilization
      c. Average brightness/maximum brightness
      d. Visual comfort probability
   2. Construction:
      a. Engineering
      b. Workmanship
      c. Rigidity
      d. Permanence of materials and finishes

3. Installation Ease:
    a. Captive parts and hardware
    b. Provisions for leveling
    c. Through-wire ease
4. Maintenance:
    a. Relamping ease
    b. Replacement of ballast, lamp sockets, etc.
5. Appearance:
    a. Light tightness
    b. Trim styling and neatness

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver lighting fixtures individually wrapped in factory-fabricated containers, unless noted otherwise.

B. Any fixtures damaged are not to be installed. Return damaged fixtures to manufacturer and replace them for installation.

C. Fixtures shall be stored in clean, dry spaces, in their original shipping containers until ready for installation. They are to be protected while stored to prevent damage from all causes.

1.05 SUBMITTALS

A. Refer to the appropriate sections in Division 1 for submittal format, and provide additionally as follows:
    1. Submit standard drawings or cut sheets for each fixture type noted in the Lighting Fixture Schedule. Alternate equals are allowed.
    2. Drawings shall indicate name of project, fixture type, complete details of fixture, including manufacturer's name and complete catalog number including all aspects of fixture intended to be provided.

PART 2 - PRODUCTS

2.01 GENERAL LIGHTING FIXTURES

A. Lampholders with screw shell bases, which accept lamps of 300 watts or less, shall be sized to accept medium base lamps. Those for lamps in excess of 300 watts shall be sized for mogul base lamps.

B. Fixtures shall be supplied complete with lamps of proper wattage as rated for fixture.

C. All parts of the fixtures, including lens, accessories, shields, etc., shall be in perfect condition, cleaned and in proper operating order with lamps on and burning at the time of final acceptance of the project.

D. Fixtures shall be expressly approved by manufacturer, and so stated by label, for use in the intended environment; note NEC 410-4.

E. Fixtures which mount on the surface of low-density cellulose type ceilings shall be UL approved for that service.

F. Fixtures shall have a continuous light-seal gasket seated in such a manner so as to prevent any light leakage through or around frame.

G. Rustproof frames, especially made for the purpose, shall be provided for all units recessed in plaster walls or on ceilings.

H. All pendant type fixtures shall have one-piece continuous stems; NO couplings will be permitted.

2.02 FLOURESCENT FIXTURES

A. Fixtures equipped with diffusers or lens shall be supplied with 100% acrylic lens or diffusers

of a thickness not less than 0.125 inches.

B. Ballasts for fluorescent fixtures shall be UL approved as super premium energy saver type, Class P, sound rated "A"; or shall be high power factor electronic units; per fixture schedule. Ballast shall match fixture and lamps specified in lighting fixture schedule. Ballasts shall have a power factor in excess of 90% and be inaudible in a room ambient noise level of 35 DB.

C. All ballast shall be by the same manufacturer: Magnetek, Advance, or Motorola.

D. Ballasts for fluorescent fixtures installed outdoors or in areas subject to low ambient temperatures, shall be the type specifically designed for low temperatures, suitable for proper operation of the lamps in temperatures to minus 20 degrees F.

E. Fixtures shall be so designed that the ballast case temperature does not exceed 90 degrees C.

F. Ballast for compact fluorescent lamps shall be high power factor, UL listed.

2.03 HID FIXTURES

A. Outdoor fixtures shall be weatherproof and specifically suited for such service, as specified on the drawings.

B. HID ballast shall be high power factor type, UL listed, and complete with factory installed line fuse.

C. Fixtures, which use metal halide type lamps of wattages less than 200 watts, shall be equipped with clear safety glass closures from the factory.

2.04 LAMPS

A. All lamps are to be new, by the same manufacturer, and as scheduled on the drawings.

B. Lamps shall be as manufactured by Phillips Lighting, Sylvania, or General Electric.

C. Metal Halide lamps shall be coated, unless otherwise noted in schedule.

D. Fluorescent fixtures shall be equipped with lamps of the same color temperature from the factory. Fixtures with mixed lamps shall be relamped at no cost.

PART 3 - EXECUTION

3.01 Provide all required mounting hardware and accessories for the ceiling construction encountered. Fixture catalog numbers shown in the fixture schedule do not necessarily denote specific mounting accessories.

3.02 Fixtures located on the building or in/on the canopies are to be supported by building structure.

3.03 Immediately prior to final inspection, the Contractor shall clean all fixtures, replace any and all broken or damaged parts, insure proper fit to adjacent surfaces, install lamps, and test fixtures for proper electrical and mechanical operation.

3.04 Provide labor and materials required for final aiming and adjustment of fixtures requiring such, at the Architect’s instruction.

3.05 All fixture locations unless specifically dimensioned are diagrammatic. Locations are to be verified with the Architectural reflected ceiling plans.

3.06 Notify Architect of any condition in the field, which will prevent specified fixture from being installed as shown, prior to installation.

END OF SECTION

SECTION 31 10 00
SITE CLEARING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Protecting existing trees to remain.
   2. Removing existing trees, shrubs, groundcovers, plants, and grass.
   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 or removing site utilities.
   7. Temporary erosion and sedimentation control measures.

B. Related Sections include the following:
   1. Division 31 Section "Earthwork" for soil materials, excavating, backfilling, and site grading.

1.03 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 (50 mm) in diameter; and free of weeds, roots, and other deleterious 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.

1.04 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.05 SUBMITTALS

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

B. Record drawings according to Division 1 Section "Contract Closeout."
   1. Identify and accurately locate capped utilities and other subsurface structural, electrical, and mechanical conditions.

1.06 QUALITY ASSURANCE

A. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."

1.07 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
   1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
   2. Provide alternate routes around closed or obstructed traffic ways if required by

authorities having jurisdiction.

B. Protection of Existing Improvements: Provide protection necessary to prevent damage to existing improvements indicated to remain in place.
   1. Protect improvements on adjoining properties and on Owner’s property.
   2. Restore damaged improvements to their original condition, as acceptable to property owners.

C. Improvements on Adjoining Property: Authority for performing indicated removal and alteration work on property adjoining Owner's property will be obtained by Owner before award of Contract.

D. Salvable Improvements: Carefully remove items indicated to be salvaged and store on Owner's premises where indicated.

E. Notify utility locator service for area where Project is located before site clearing.

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

1.08 EXISTING SERVICES

A. General: Indicated locations are approximate; determine exact locations before commencing Work.

B. Arrange and pay for disconnecting, removing capping and plugging utility services. Notify affected utility companies in advance, minimum forty-eight hours, and obtain written approval before starting work.

C. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

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

PART 3 - EXECUTION

3.01 PREPARATION

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

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

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

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

3.02 TEMPORARY SEDIMENT AND EROSION CONTROL

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

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.

3.03 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.
   1. Do not store construction materials, debris, or excavated material within drip line of remaining trees.
   2. Do not permit vehicles, equipment, or foot traffic within drip line of remaining trees.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, 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 wet burlap to prevent roots from drying out.
   2. Temporary support and protect roots from damage until they are permanently relocated and covered with soil
   3. Coat cut faces of roots more than 1-1/2 inches in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
   4. Backfill with soil as soon as possible.

D. Maintain fenced area free of weeds and trash.

E. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.
   1. Employ a qualified 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 the qualified arborist.

3.04 UTILITIES

A. Contractor shall arrange for disconnecting and sealing utilities that serve existing structures before site clearing and demolishing begins.
   1. Coordinate schedule with Owner.
   2. 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 to shut off indicated utilities with utility companies. Pay any required fees.

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

D. Excavate for and remove underground utilities indicated to be removed.

3.05 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.
   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. Completely remove stumps, roots, obstructions, and debris extending to a depth of 18 inches (450 mm) below exposed subgrade.

4. Use only hand methods for grubbing within drip line of remaining trees.
5. Chip removed tree branches and dispose of off-site.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.06 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. Strip surface soil of unsuitable 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 (1800 mm).
2. Do not stockpile topsoil within drip line of remaining trees.
3. Dispose of excess topsoil as specified for waste material disposal.
4. Stockpile surplus topsoil and allow for respreading deeper topsoil.

3.07 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.

3.08 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.

B. Burning on Owner’s Property: Burning may be permitted only at designated areas and times as directed by the Owner and by local and state issuing authorities. A burn permit as well as any other associated permit(s) must be obtained by the contractor by the local issuing authority. The contractor shall comply with all local codes. Provide full time monitoring personal for burning materials until fires are extinguished.

END OF SECTION

SECTION 31 20 00
EARTHWORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Preparing subgrades for slabs-on-grade, walks, pavements, lawns, and plantings.
   2. Excavating and backfilling for buildings and structures.
   3. Drainage course for slabs-on-grade.
   4. Subbase course for concrete walks and pavements.
   5. Base course for asphalt paving.
   6. Subsurface drainage backfill for walls and trenches.
   7. Excavating and backfilling trenches within building lines.
   8. Excavating and backfilling trenches for buried mechanical and electrical utilities and pits for buried utility structures.

B. Related Sections include the following:
   1. Division 3 Section "Cast-in-Place Concrete" for granular course over vapor retarder.

1.03 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.
   1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
   2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Layer placed between the subbase course and asphalt paving.

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

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

E. Drainage Course: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations.
   1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
   2. Bulk Excavation: Excavations more than 10 feet in width and pits more than 30 feet in either length or width.
   3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

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

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

I. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

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

K. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as

underground services within buildings.

L. Rock Excavation
   1. Sound, solid rock in its original position in ledges, bedded deposits, or masses of such hardness and texture that, in the opinion of the Engineer, cannot be loosened or broken down and removed by use of heavy construction equipment such as power shovels, bulldozers, heavy-duty rooters, etc., without drilling and blasting, or with an air-hammer shall be classified as rock excavation.
   2. Boulders, stones, or pieces of masonry that are one-half cubic yard or larger in volume shall be considered rock excavation.
   3. Hard pan, small boulders less than one-half cubic yard in volume, chert, clay, soft shale, soft and disintegrated rock, and similar material shall not be considered as rock even though the Contractor elects to excavate same by drilling and blasting, or with an air hammer.

1.04 SUBMITTALS

A. Product Data: For the following:
   1. Each type of plastic warning tape.
   2. Separation fabric.

B. Photographs of existing adjacent structures and site improvements

C. 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 or borrow soil material proposed for fill and backfill.
   2. Laboratory compaction curve according to ASTM D 698 for each on-site or borrow soil material proposed for fill and backfill.

1.05 QUALITY ASSURANCE

A. Codes and Standards: Perform earthwork complying with requirements of authorities having jurisdiction.

B. Geotechnical Testing Agency Qualifications: The Geotechnical testing agency will be hired by the Owner. The Contractor shall coordinate testing requirements with the testing agency and provide access to the site.

1.06 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Architect and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Owner not less than two days in advance of proposed utility interruptions.
   2. Contact utility-locator service for area where Project is located before excavating.

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

C. The contractor shall coordinate with Geotechnical Testing Agency for requirements regarding undercutting and importation of approved fill. The contractor shall include undercutting, offsite waste, importation and compaction of approved fill in the base bid as outlined in the geotechnical report.

D. Contractor shall comply with the Architect's Specifications and Drawings, but they shall notify the Architect prior to performing any Work in question if they perceive conflicts between the Architect's Specifications and the recommendations of the Geotechnical Testing Agency. The Architect will resolve the questions.

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

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

B. Satisfactory Soils: Imported fill soils should consist of low to moderately plastic clay or silt with a plastic index of less than thirty (PI<30) and a standard Proctor maximum dry density greater than 90 pounds per cubic feet. The imported fill should contain no rock fragments larger than 4 inches in any dimension, and should be free from organic matter and other deleterious matter. The on-site soils may be used as engineered fill as approved acceptable by the Owner's Geotechnical testing agency. Existing fill soils will require evaluation by the Owner's Geotechnical testing agency to determine if they can be used as structural fill.

C. Unsatisfactory Soils: The Geotechnical testing agency observation will determine unsatisfactory soils.

D. Backfill and Fill: Satisfactory soil materials.

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

F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

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

H. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

I. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and 0 to 5 percent passing a No. 8 sieve.

J. Filter Material: Narrowly graded mixture of natural or crushed gravel, or crushed stone and natural sand; ASTM D 448; coarse-aggregate grading Size 67; with 100 percent passing a 1-inch sieve and 0 to 5 percent passing a No. 4 sieve.

K. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.

2.02 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant polyethylene film warning tape manufactured for marking and identifying underground utilities, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored as follows:
   1. Red: Electric.
   2. Yellow: Gas, oil, steam, and dangerous materials.
   3. Orange: Communicaiton, Alarm or Singal Lines, Cables or Conduit.
   4. Blue: Potable Water systems.
   5. Green: Sewer and Drain systems.
   6. Purple: Reclaimed Water, Irrigation and Slurry Lines, Fire Protection or other Non-potable Water lines.

PART 3 - EXECUTION

3.01 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

B. Protect subgrades and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary.

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

D. Strip all topsoil, vegetation, and any debris from the construction area and either waste it from the site or use as topsoil or fill in areas to be landscaped. The stripped area should extend at least 10 feet beyond exterior foundation excavations and at least 5 feet beyond the outside edge of paved areas.

3.02 DEWATERING

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

B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
   1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.
   2. Install a dewatering system to keep subgrades dry and convey ground water away from excavations. Maintain until dewatering is no longer required.

3.03 EXPLOSIVES

A. Explosives: Do not use explosives.

3.04 STABILITY OF EXCAVATIONS

A. Comply with all Federal, State and local codes, ordinances and requirements of authorities having jurisdiction to maintain stable excavations.

3.05 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavation to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
   1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
   2. Any reference to rock on the plans or specifications is not to be construed as classification of excavation.

B. Excavation shall be where indicated on the drawings and to the grades indicated.

3.06 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. Extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
   1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
   2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended for bearing

surface.

B. Rock encountered in the process of excavation for structures shall be uncovered and stripped of all loose materials over the entire limits of excavation. Rock encountered for removal in a trench section shall be uncovered for a distance of not less than fifty feet (50'). In both cases, the Engineer shall be notified immediately so that the surface can be examined and the necessary measurements and elevations taken.

C. Rock under structures shall be excavated to lines and grades shown on the Drawings. Except as hereinafter provided otherwise where rock excavation has been carried below grade, the Contractor shall backfill to grade with Class B concrete at his/her own expense.

Where rock foundation is obtained at grade for over 50 percent of the area of any one structure, the portion of the foundation that is not rock shall be excavated below grade to reach a satisfactory foundation of rock .The portion below grade shall be backfilled with Class B concrete.

Where rock foundation is obtained at grade for less than 50 percent of any one structure and satisfactory rock cannot be found over the remaining area by reasonable additional excavation, the rock shall be removed for a depth of 12 inches below grade, and the space below grade shall be backfilled with crushed stone as specified above for pipe lines.

D. Rock excavation for all structures and adjacent trenches under this Contract and any other rock excavation directed by the Engineer shall be completed before construction of any structure is started in the vicinity.

3.07 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.08 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.
1. Beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.

B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit, unless otherwise indicated.
1. Clearance: 12 inches on each side of pipe or conduit.

C. Trench Bottoms: Excavate trenches 4 inches deeper than bottom of pipe elevation to allow for bedding course. Hand excavate for bell of pipe.
1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Rock in trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

Size of Pipe Line, Inches	Depth of Excavation Below Bottom of Pipe, Inches	
	Sewer Pipe	Water Pipe
4 to 12 incl.	**6**	6
15 to 33 incl.	**8**	8
36 and over	**12**	12

The space below grade for pipe sewers shall then be backfilled with 3/8 inch crushed rock or gravel or other approved material and tamped to the proper grade. Where pipe sewers are constructed on concrete cradles rock shall be excavated to the bottom of the cradle as shown on the Plans.

E. Rock excavation for all structures and adjacent trenches under this Contract and any other rock excavation directed by the Engineer shall be completed before construction of any

structure is started in the vicinity.

3.09 APPROVAL OF SUBGRADE

A. Notify Architect when excavations have reached required subgrade.

B. If Architect or Soils Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.

C. Proof roll subgrade with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

D. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect.

E. Avoid overcompaction and smearing of subgrade below infiltrations areas such as pervious pavement and bio-retention. Rake or rip subgrade as necessary to remove any smearing of subgrade.

3.10 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.
   1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

B. Where width of trench exceeds industry standard width, provide stronger pipe or special installation procedures, as required by the Architect at no cost to the Owner.

3.11 STORAGE OF SOIL MATERIALS

A. Stockpile borrow materials and satisfactory excavated soil materials. Stockpile soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
   1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.12 BACKFILL

A. Place and compact backfill in excavations promptly, but not before completing the following:
   1. Construction below finish grade including, where applicable, dampproofing, waterproofing, and perimeter insulation.
   2. Surveying locations of underground utilities for record documents.
   3. Inspecting and testing underground utilities.
   5. Removing concrete formwork.
   6. Removing trash and debris.
   7. Removing temporary shoring and bracing and sheeting.
   8. Installing permanent or temporary horizontal bracing on horizontally supported walls

3.13 UTILITY TRENCH BACKFILL

A. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

B. In areas where trench is under paved areas, backfill remainder of trench with Bedding or Engineered fills to subgrade.

C. Backfill trenches excavated under footings and within 18 inches of bottom of footings; fill with concrete to elevation of bottom of footings.

D. Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches

below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase.

E. Place and compact initial backfill of satisfactory soil or subbase material, free of particles larger than 1 inch, to 12 inches over pipe or conduit.

F. Where sewers, water lines, etc. are to be installed within the street right-of-way, they shall be backfilled full depth with stone per local code. The trenches under the building and at least 5 feet beyond the building limits shall be backfilled with low plasticity and low permeability soils per the geotechnical reports. If sewer is located in fill and backfill is six feet or over from the top of pipe to finished subgrade, backfill in accordance with paragraph above.
   1. Carefully compact material under pipe haunch and backfill evenly on both sides and along pipe or conduit to avoid damage or displacement of system.

G. Fill voids with approved backfill materials as shoring and bracing and sheeting is removed.

H. Place and compact final backfill of satisfactory soil material to final subgrade.

I. Coordinate backfilling with utilities testing.

J. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.14 FILL

A. Preparation: Remove vegetation, topsoil, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface before placing fills. Areas receiving fill shall be proof rolled in the presence of a Geotechnical Engineer prior to fill placement. Areas identified as unacceptable by the Geotechnical Engineer shall be excavated (undercut) and backfilled prior to fill placement.
   1. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. When subgrade or existing ground to receive fill has density less than required for fill, break up surface to depth required, pulverize, moisture-condition or aerate soil and recompact to required density.

C. Place and compact fill material in layers to required elevations as follows:
   1. Under grass and planted areas, use satisfactory soil material.
   2. Under walks and pavements, use subbase or base material, or satisfactory soil material.
   3. Under steps and ramps, use engineered fill.
   4. Under building slabs, use drainage fill over subgrade and engineered fill to bring to subgrade.
   5. Under footings and foundations, use engineered fill.

D. Compact rock in accordance with the Geotechnical Engineer’s recommendations

3.15 MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.
   1. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
   2. Remove and replace, or scarify and air-dry, otherwise satisfactory soil material that exceeds optimum moisture content by 3 percent and is too wet to compact to specified dry unit weight.

3.16 COMPACTION OF BACKFILLS AND FILLS

A. Place backfill and fill materials in layers not more than 8 inches in loose depth for material

compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
   1. Under structures, building slabs and steps, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 100 percent standard Proctor compaction.
   2. Under pavements, scarify and recompact top 24 inches of existing subgrade and each layer of backfill or fill material at 100 percent standard Proctor compaction.
   3. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 95 percent standard Proctor compaction.
   4. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent standard Proctor compaction.

3.17 GRADING

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

B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to required elevations within the following tolerances:
   1. Lawn or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1/2 inch.
   3. Pavements: Plus or minus 1/2 inch.

C. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch when tested with a 10-foot straightedge.

3.18 SUBSURFACE DRAINAGE

A. Subsurface Drain: Place a layer of drainage fabric around perimeter of drainage trench as indicated. Place a 6-inch course of filter material on drainage fabric to support drainage pipe. Encase drainage pipe in a minimum of 12 inches of filter material and wrap in drainage fabric, overlapping sides and ends at least 6 inches.
   1. Compact each course of filter material to 95 percent of maximum dry unit weight according to ASTM D 698.

B. Drainage Backfill: Place and compact filter material over subsurface drain, in width indicated, to within 12 inches of final subgrade. Overlay drainage backfill with one layer of drainage fabric, overlapping sides and ends at least 6 inches.
   1. Compact each course of filter material to 95 percent of maximum dry density according to ASTM D 698.

3.19 SUBBASE AND BASE COURSES

A. Under pavements and walks, place subbase course on prepared subgrade and as follows:
   1. Place base course material over subbase.
   2. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry density according to ASTM D 698.
   3. Shape subbase and base to required crown elevations and cross-slope grades.
   4. When thickness of compacted subbase or base course is 6 inches or less, place

materials in a single layer.

5. When thickness of compacted subbase or base course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.20 DRAINAGE COURSE

A. Under slabs-on-grade, place drainage course on prepared subgrade and as follows:
   1. Compact drainage course to required cross sections and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 698.
   2. When compacted thickness of drainage course is 6 inches or less, place materials in a single layer.
   3. When compacted thickness of drainage course exceeds 6 inches, place materials in equal layers, with no layer more than 6 inches thick or less than 3 inches thick when compacted.

3.21 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a Geotechnical engineering firm to perform field quality assurance testing.

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

C. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design-bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Engineer.

D. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
   1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. or less of paved area or building slab, but in no case fewer than three tests.
   2. Footing Subgrade: At footing subgrades, perform at least one test of each soil stratum to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on visual comparison of each subgrade with related test strata when acceptable to the Geotechnical Engineer.
   3. Foundation Wall Backfill: At each compacted backfill layer, at least one test for each 100 feet or less of wall length, but no fewer than two tests.
   4. Trench Backfill: At each compacted initial and final backfill layer, at least one test for each 150 feet or less of trench length, but no fewer than two tests.

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

3.22 PROTECTION

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

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
   1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to the greatest extent possible.

3.23 DISPOSAL OF SURPLUS AND WASTE MATERIALS

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

END OF SECTION

SECTION 31 50 00
EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.01 Performance Requirements: Design, provide, monitor, and maintain an anchored and braced excavation support and protection system capable of resisting soil and hydrostatic pressure and supporting sidewalls of excavations.

A. System design and calculations must be acceptable to authorities having jurisdiction.

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

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards that could develop during excavation support and protection system operations.

3.02 Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

3.03 Locate excavation support and protection systems clear of permanent construction and to permit forming and finishing of concrete surfaces.

3.04 Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure excavation support and protection systems remain stable.

3.05 Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.06 Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures as determined by a registered soils engineer. Remove in stages to avoid disturbing underlying soils and damaging structures, pavements, facilities, and utilities.

A. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.

END OF SECTION

SECTION 32 11 00
SUB-GRADE AND BASE COURSE PREPARATION

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Sub-grade preparation.

B. Crushed stone or crushed gravel compacted base course.

1.02 RELATED WORK

A. Section 32 13 13 – Portland Cement Concrete Paving

B. Section 32 12 16 – Hot Mix Asphalt Paving

1.03 REFERENCES

A. Where Georgia Department of Transportation Specifications are referred to, the applicable requirements of that Section shall be considered a part of these specifications and all materials and construction methods prescribed therein shall be as binding as if herein specified. The Sections referred to are from Georgia, current edition with latest supplements.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Base Courses: Comply with Georgia Department of Transportation specifications, Section 310.

PART 3 - EXECUTION

3.01 SUB-GRADE PREPARATION

A. Grade sub-grade to lines and grades indicated. Preparation of sub-grade shall be in compliance with Georgia DOT Specifications sections referenced herein.

3.02 BASE COURSE

A. Construct crushed stone or crushed gravel base course to thickness indicated on drawings and in compliance with Georgia DOT Specifications, Section 310.

B. All areas to receive paving shall be graded to the indicated sub-grade elevation and proof-rolled as outlined below.

C. All areas (sub-grade) to receive compacted fill, pavements or slabs on grade shall be proof-rolled in the presence of the Owner's Representative or Testing Agency to detect any soft areas that may exist. A four-wheeled, pneumatic-tired roller of not less than 25 tons, or its equivalent, shall be used for this operation. At least four passes shall be made two in each of two directions at right angles. Any soft areas thus disclosed should be stabilized or undercut and replaced with properly compacted material as approved by the Owner's Representative or Testing Agency.

D. Proof rolling should be conducted only on soils in their approximate natural moisture condition. Proof-rolling should not be undertaken after rains while soils are still in a high moisture condition (well above the natural moisture content) or on soils which are desiccated by prolonged drying.

END OF SECTION

SECTION 32 12 16
HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Striping in public right of way shall conform with latest addition of Manual on Uniform Traffic Control Devices (MUTCD).

1.02 SUMMARY

A. This Section includes the following:
1. Hot-mix asphalt paving.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt overlays.
4. Pavement-marking paint.
5. Wheel Stops

B. Related Sections include the following:
1. Section 32 13 73 – Pavement Joint Sealants
2. Section 31 20 00 – Earthwork
3. Section 31 11 00 – Subgrade and Base Course Preparation

1.03 SYSTEM DESCRIPTION

A. Provide hot-mix asphalt pavement according to the materials, workmanship, and other applicable requirements of the standard specifications of the state or of authorities having jurisdiction.
1. Standard Specification: As indicated.

1.04 SUBMITTALS

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

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

C. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

D. Material Certificates: Certificates signed by manufacturers certifying that each material complies with requirements.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed hot-mix asphalt paving similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Manufacturer Qualifications: Engage a firm experienced in manufacturing hot-mix asphalt similar to that indicated for this Project and with a record of successful in-service performance.
1. Firm shall be a registered and approved paving mix manufacturer with authorities having jurisdiction or with the DOT of the state in which Project is located.

C. Regulatory Requirements: Conform to applicable standards of authorities having jurisdiction for asphalt paving work on public property.

D. Asphalt-Paving Publication: Comply with AI's "The Asphalt Handbook," except where more

stringent requirements are indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

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

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

1.07 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if substrate is wet or excessively damp or if the following conditions are not met:
   1. Slurry Coat: Comply with weather limitations of ASTM D 3910.
   2. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
   3. Asphalt Surface Course: Minimum surface temperature of 60 deg F at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.01 AGGREGATES

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

B. Coarse Aggregate: Sound; angular crushed stone; crushed gravel complying with ASTM D 692.

C. Fine Aggregate: Sharp-edged natural sands or sand prepared from stone, gravel, or combinations thereof complying with ASTM D 1073.
   1. For hot-mix asphalt, limit natural sand to a maximum of 20 percent by weight of the total aggregate mass.

D. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D 242.

2.02 ASPHALT MATERIALS

A. Asphalt Cement: ASTM D 3381 for viscosity-graded material; ASTM D 946 for penetration-graded material.

B. Asphalt Cement: ASTM D 3381 for viscosity-graded material.

C. Under-sealing Asphalt: ASTM D 3141, pumping consistency.

2.03 AUXILIARY MATERIALS

A. Herbicide: Commercial chemical for weed control, registered by Environmental Protection Agency (EPA). Provide granular, liquid, or wetable powder form.

B. Sand: ASTM D 1073, Grade Nos. 2 or 3.

C. Paving Geotextile: Non-woven polypropylene, specifically designed for paving applications, resistant to chemical attack, rot, and mildew.

D. Pavement-Marking Paint: Alkyd-resin type, ready-mixed, complying with FS TT-P-115, Type I, or AASHTO M-248, Type N.

E. Pavement-Marking Paint: Latex, water-base emulsion, ready-mixed, complying with FS TT-P-1952.
   1. Color: As indicated.

F. Wheel Stops: Pre-cast, air-entrained concrete, 2500-psi minimum compressive strength, approximately 6 inches high, 9 inches wide, and 84 inches long. Provide chamfered corners and drainage slots on underside, and provide holes for anchoring to substrate.
   1. Dowels: Galvanized steel, diameter 3/4 inch, minimum length 10 inches.

2.04 MIXES

A. Provide mixes compiling with typical specifications of Tennessee Department of Transportation.

Surface Course: Surface course shall conform to Tennessee Department of Transportation standard specifications, Section 411, Asphalt Concrete Surface (Hot Mix) with aggregates meeting requirements of subsection 903.11, Grading E used as surface for traffic lanes (50-55% crushed limestone and 45-50% natural sand, sand slag, or sand manufactured from gravel.

B. Asphalt Binder Course: Binder course shall conform to TDOT Standard Specification Sections 3307-B, 307-BM, or 307-C.

C. The base shall be a dense graded mineral aggregate base, compacted to 95 percent of the Standard Proctor maximum dry density. The base shall meet the requirements conforming to all Tennessee Department of Transportation specification 303, class A. The base shall be placed in a way that prevents segregation.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that sub-grade is dry and in suitable condition to support paving and imposed loads.

B. Proof-roll sub-base using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

C. Notify Architect in writing of any unsatisfactory conditions. Do not begin paving installation until these conditions have been satisfactorily corrected.

3.02 COLD MILLING

A. Clean existing paving surface of loose and deleterious material immediately before cold milling. Remove existing asphalt pavement, including hot-mix asphalt and, as necessary, unbound-aggregate base course, by cold milling to grades and cross sections indicated.
   1. Repair or replace curbs, manholes, and other construction damaged during cold milling.

3.03 PATCHING AND REPAIRS

A. Patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Re-compact new sub-grade. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically.
   1. Tack coat faces of excavation and allow to cure before paving.
   2. Fill excavation with dense-graded, hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.
   3. Partially fill excavation with dense-graded, hot-mix asphalt base mix and compact while still hot. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.

B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
   1. Pump hot under-sealing asphalt under rocking slabs until slab is stabilized or, if necessary, crack slab into pieces and roll to reseat pieces firmly.
   2. Remove disintegrated or badly broken pavement. Prepare and patch with hot-mix asphalt.

C. Leveling Course: Install and compact leveling course consisting of dense-graded, hot-mix asphalt surface course to level sags and fill depressions deeper than 1 inch in existing pavements.
   1. Install leveling wedges in compacted lifts not exceeding 3 inches thick.

D. Crack and Joint Filling: Remove existing filler material from cracks or joints to a depth of 1/4 inch. Refill with asphalt joint-filling material to restore watertight condition. Remove excess filler that has accumulated near cracks or joints.

E. Tack Coat: Apply uniformly to existing surfaces of previously constructed asphalt or portland cement concrete paving and to surfaces abutting or projecting into new, hot-mix asphalt pavement. Apply at a uniform rate of 0.05 to 0.15 gal./sq. yd. of surface.

1. Allow tack coat to cure undisturbed before paving.

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.04 SURFACE PREPARATION

A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared sub-grade is ready to receive paving.
1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

B. Prime Coat: Apply uniformly over surface of compacted-aggregate base at a rate of 0.15 to 0.50 gal./sq. yd.. Apply enough material to penetrate and seal, but not flood, surface. Allow prime coat to cure for 72 hours minimum.
1. If prime coat is not entirely absorbed within 24 hours after application, spread sand over surface to blot excess asphalt. Use just enough sand to prevent pickup under traffic. Remove loose sand by sweeping before pavement is placed and after volatiles have evaporated.
2. Protect primed substrate from damage until ready to receive paving.

C. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared sub-grade or surface of compacted-aggregate base before applying paving materials.
1. Mix herbicide with prime coat when formulated by manufacturer for that purpose.

3.05 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt mix on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness, when compacted.
1. Place Binder.
2. Place hot-mix asphalt base course in number of lifts and thicknesses indicated.
3. Spread mix at minimum temperature of 250 deg F.
4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes, unless otherwise indicated.
5. Regulate paving machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips not less than 10 feet wide, except where fill-in edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete asphalt base course for a section before placing asphalt surface course.

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

3.06 JOINTS

A. Construct joints to ensure continuous bond between adjoining paving sections. Construct joints free of depressions with same texture and smoothness as other sections of hot-mix asphalt course.

1. Clean contact surfaces and apply tack coat.
2. Offset longitudinal joints in successive courses a minimum of 6 inches.
3. Offset transverse joints in successive courses a minimum of 24 inches.
4. Construct transverse joints by bulkhead method or sawed vertical face method as described in AI's "The Asphalt Handbook."
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within 2 percent of specified course density.

3.07 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.
   1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Accomplish breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Repair surfaces by loosening displaced material, filling with hot-mix asphalt, and re-rolling to required elevations.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling, while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
   1. Average Density: 96 percent of reference laboratory density according to ASTM D 1559, but not less than 94 percent nor greater than 100 percent.
   2. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

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

E. Edge Shaping while surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while still hot, with back of rake or smooth iron. Compact thoroughly using tamper or other satisfactory method.

F. Repairs: Remove paved areas that are defective or contaminated with foreign materials. Remove paving course over area affected and replace with fresh, hot-mix asphalt. Compact by rolling to specified density and surface smoothness.

G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.08 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:
   1. Base Course: Plus or minus 1/2 inch.
   2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
   1. Base Course: 1/4 inch.
   2. Surface Course: 1/8 inch.
   3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch.

3.09 SURFACE TREATMENTS

A. Fog Seals: Apply fog seal at a rate of 0.10 to 0.15 gal. /sq. yd. to existing asphalt pavement and allow to cure. Lightly dust areas receiving excess fog seal with fine sand.

B. Slurry Seals: Apply slurry coats in a uniform thickness according to ASTM D 3910 and allow curing.
   1. Roll slurry seal to smooth ridges and provide a uniform, smooth surface.

3.10 PAVEMENT MARKING

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

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

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

D. Apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturers recommended rates to provide a minimum wet film thickness of 15 mils.
   1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb./gal.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing agency to perform field inspections and tests and to prepare test reports.
   1. Testing agency will conduct and interpret tests and state in each report whether tested Work complies with or deviates from specified requirements.

B. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with specified requirements.

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

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

E. In-Place Density: Samples of uncompacted paving mixtures and compacted pavement will be secured by testing agency according to ASTM D 979.
   1. Reference laboratory density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 1559, and compacted according to job-mix specifications.
   2. Reference maximum theoretical density will be determined by averaging results from 4 samples of hot-mix asphalt-paving mixture delivered daily to site, prepared according to ASTM D 2041, and compacted according to job-mix specifications.
   3. In-place density of compacted pavement will be determined by testing core samples according to ASTM D 1188 or ASTM D 2726.
      a. One core sample will be taken for every 1000 sq. yd. or less of installed pavement, but in no case will fewer than 3 cores be taken.
      b. Field density of in-place compacted pavement may also be determined by nuclear method according to ASTM D 2950 and correlated with ASTM D 1188 or ASTM D 2726.

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

END OF SECTION

SECTION 32 13 13
PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Concrete sidewalks, roads, aprons, door pads, curbs and gutters.

B. Reinforcement.

C. Surface finish.

D. Curing.

1.02 RELATED WORK

A. Section 32 11 00 - Sub-grade and Base Course Preparation

B. Section 32 13 73 - Pavement Joint Sealants

C. Section 31 20 00 - Earthwork

D. Division 3 Section “Cast-in-Place Concrete”

1.03 REFERENCES

A. ACI 211.1 - Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete.

B. ACI 211.2 - Recommended practice for Selecting Proportions for Structural Lightweight Concrete.

C. ACI 301 - Specifications for Structural Concrete for Buildings.

D. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.

E. ACI 305R - Hot Weather Concreting.

F. ACI 306R - Cold Weather Concreting.

G. ACI 315 - Details and Detailing of Concrete Reinforcement.

H. ACI 318 - Building Code Requirements for Reinforced Concrete.

I. ACI 347 - Recommended Practice for Concrete Formwork, Concrete Reinforcing Steel Institute, Manual of Standard Practice.

J. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

K. ASTM A497 - Welded Deformed Steel Wire Fabric for Concrete Reinforcement.

L. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.

M. ASTM C31 - Standard Method of Making and Curing Concrete Test Specimens in the Field.

N. ASTM C33 - Standard Specification for Concrete Aggregates.

O. ASTM C39 - Standard Test Method of Compressive Strength of Cylindrical Concrete Specimens.

P. ASTM C78 - Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).

Q. ASTM C94 - Ready Mixed Concrete.

R. ASTM C143 - Slump of Portland Cement Concrete.

S. ASTM C150 - Portland Cement.

T. ASTM C172 - Sampling Fresh Concrete.

U. ASTM C173 - Air Content of Freshly Mixed Concrete by the Volumetric Method.

V. ASTM C192 - Making and Curing Concrete Test Specimens in the Laboratory.

W. ASTM C231 - Air Content Of Freshly Mixed Concrete by the Pressure Method.

X. ASTM C260 - Air-Entraining Admixtures for Concrete.

Y. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

Z. ASTM C494 - Chemical Admixtures for Concrete.

AA. ASTM C1116 - Standard Specification for Fiber-Reinforced

BB. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

CC. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

DD. Tennessee Department of Transportation – Standard Specifications for Road and Bridge Construction.

1.04 QUALITY ASSURANCE

A. Perform work in accordance with ACI 301.

B. Obtain materials from same source throughout.

C. Submit laboratory test reports for concrete materials and mix design test as specified.

D. Provide material certificates in lieu of materials laboratory test reports when permitted by Owner's Representative. Material certificates shall be signed by manufacturer and Contractor, certifying that each material item meets specified requirements.

E. Use of Synthetic Fibers shall be approved by the owner or architect.

1.05 TESTS

A. As the work progresses, sample concrete in accordance with ASTM C172.

B. Make slump tests according to ASTM C143, one slump test for each set of test cylinders.

C. Test air content of concrete made with normal-weight aggregates having low water absorption according to either ASTM C231 or ASTM C173. For lightweight aggregates or aggregates with high absorptions, use latter test method.

D. Make compression test specimens and cure according to ASTM C31. Each test shall consist of one set of laboratory cured cylinders. A set shall consist of four cylinders. Minimum number of tests shall be one for 100 cubic yards of concrete for each class. Make at least one test per day of each class of concrete used that day.

E. Cure specimens under laboratory conditions. Specimens cured under job conditions may be required when, in Owner's Representative's opinion, there is a possibility of the surrounding air temperature falling below 40°F, or rising above 90°F.

F. Test cylinders according to ASTM C39.

G. Test laboratory cured cylinders one at seven days, two at 28 days, and one at 56 days, if required.

H. Strength level of concrete will be considered satisfactory if averages of any three consecutive strength test results of laboratory cured cylinders equal or exceed specified strength f'c, and no individual strength test result falls below specified strength f'c by more than 500 psi.

I. Make reports on cylinder tests to Owner's Representative and show dates placed and tested, name of job, proportions of cement and aggregate, quantity of water, slump, air content, admixtures, location of concrete in the project, type of concrete, compressive

strength in pounds per square inch and atmospheric and concrete temperature at time of sampling.

J. In cases where strength of laboratory cured cylinders shown by tests for any portion of paving falls below required compressive strengths specified, Owner's Representative shall have the right to order change in mix or in cement content for remaining portion of the paving.

K. Make and cure flexural test beam specimens according to ASTM C78. Each test shall consist of one set of laboratory cured beams. A set shall consist of two beams. Minimum number of tests shall be one for each 100 cubic yards of concrete placed, at least one per day. Cure specimens under laboratory conditions.

L. Test beams according to ASTM C78, simple beam with third-point loading. Test beams shall have six inch by six inch cross-section.

M. Test beams at 14 days.

N. Flexural strength level of concrete shall be considered satisfactory as long as averages of any three consecutive test results of laboratory cured beams equal or exceed specified strength, and no individual strength test result falls below specified strength by more than 100 psi.

O. Concrete cylinder and flexural tests shall be made by an independent testing laboratory selected by Owner. Cost of initial tests shall be paid for by Owner. Subsequent tests required as a result of improper strength shall be paid for by Contractor.

PART 2 - MATERIALS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Normal-Type I, gray color.

B. Fine and Coarse Aggregates: ASTM C33. Provide aggregates from single source for exposed concrete.

1. For grading tests of fine and coarse aggregates, use square mesh wire cloth complying with ASTM E11.
2. Fine Aggregate:
   a. Provide washed natural sand of strong, hard durable particles.
   b. Grade from coarse to fine within following limits:

Sieve Size	Percentage by Weight Passing Sieve	
	Minimum	Maximum
3/8"	100	---
No. 4	95	100
No. 8	65	95
No. 16	45	75
No. 30	30	50
No. 50	10	22
No. 100	2	8

3. Coarse Aggregate:

a. Provide coarse aggregate consisting of clean, hard, fine-grained, sound crushed rock or washed gravel, or combination of both.

b. Any piece having length in excess of five times average thickness shall be considered flat or elongated.

c. The maximum size coarse aggregate shall 1½ " with the minimum size being 1 inch.

d. Grade combined aggregates within following limits:

Sieve Size or Percentage by Weight Passing Sieve				
Size in Inches	1½" Aggregate		1" Aggregate	
	Min.	Max.	Min.	Max
1½"	95	---	---	---
1"	75	90	90	100
¾"	55	77	70	90
3/8"	40	55	45	65
No. 4	30	0	31	7
No. 8	22	35	23	40
No. 16	16	30	17	35
No. 30	0	20	10	23
No. 50	2	8	2	10
No. 100	0	3	0	3

e. Water: Clean, not detrimental to concrete, and conforming to ACI 318, Article 3.4.

f. Form Materials.

1. Conform to ACI 301.

C. Reinforcement

1. Reinforcing Steel: ASTM A615; 60 ksi yield grade; deformed billet steel bars.
2. Welded Steel Wire Fabric: Plain type, ANSI/ASTM A185; in flat sheets; uncoated finish.
3. Tie Wire: Annealed steel, minimum 16 gauge size.
4. Dowels: ASTM A615; 40 ksi yield grade, plain steel, uncoated finish.
5. Synthetic fiber reinforcement: manufactured in ISO 9001:2000 certified facility.
6. Minimum 10-year satisfactory performance history of specified synthetic fiber reinforcement.

D. Accessories

1. Curing Compound: FS TT-C-800, Type 1, 30% solids; ASTM C309, Kurey DR, manufactured by Euclid Chemical Company and L&M Cure Resin by L&M Construction Materials, or approved equal.
2. Expansion Joint Filler: Non-extruding, non-bituminous, resilient type complying with AASHTO M153 and ASTM D1752.
3. Joint Sealant for Pavements Unless Noted Otherwise on Drawings: Urethane complying with ASTM D1850 and ASTM C290 such as "Urexpan NR-200" by Pecora Corp., "VULKEM-245" by Mameco International, "THC-900" by Tremco or approved equal.

F. Admixtures

1. Air Entrainment: Conform to ASTM C260.
2. Water Reducing Admixture: Conform to ASTM C494, Type A, containing not more than 1% chloride ions.
3. High Range Water Reducing Admixture (Super Plasticizer): Conform to ASTM C494, Type F or G, containing not more than 1% chloride ions.
4. Non-Chloride Accelerator Admixture: Conform to ASTM C494, Type C or E. Provide long-term test data proving non-corrosive effect on reinforcing steel.

G. Concrete Mix Design
1. Design concrete for flexural strength of 650 pounds per square inch at 14 days, compressive strength of (f'c) of 3,000 pounds per square inch at 28 days unless otherwise directed on plans.
2. Concrete shall contain no calcium chloride nor shall admixtures contain more than 1 % chloride ions or air entraining cement, unless approved by Owner's Representative.
3. Concrete shall be air entrained and conform to air content limits of Table 1 below.

Table 1 – Air Content for Air-Entrained Concrete	
Maximum Size Coarse Aggregate Inches	Air Content Percent by Volume
1 1 ½"	5.5±1 5.0±1

4. Concrete shall have a slump of 3", plus or minus ½".
5. Methods of measuring concrete materials shall be such that proportions can be accurately controlled and easily checked. Measurement of materials for ready-mixed concrete shall conform to ASTM C94.
6. Use accelerating admixtures in cold weather only when approved by Owner's Representative. Use of admixtures will not relax cold weather placement requirements.
7. Use set-retarding admixtures during hot weather only when approved by Owner's Representative.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify compacted subgrade ready to support paving and imposed loads.

B. Verify correct gradients and elevations of base.

C. Beginning installation implies acceptance of existing conditions.

3.02 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Notify Owner's Representative minimum 24 hours before start of concreting operations.

3.03 FORMING

A. Place and secure forms to correct location, dimension, and profile.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint fillers vertical in position, in straight lines. Secure to formwork during concrete placement.

3.04 REINFORCEMENT

A. Where noted on drawings, reinforce concrete paving with welded steel wire fabric.

B. Provide chairs, supports, spacers, bolsters and other devices to keep reinforcement at proper elevations and in place.

C. Interrupt reinforcement at control, contraction and expansion joints.

D. Synthetic Fiber Reinforcement if used shall be added to concrete mixture in accordance with manufacturer's instructions.

3.05 FORMED JOINTS

A. Place joints as shown on plans to correct elevation and profile.

3.06 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Hot Weather Placement: ACI 305R

C. Cold Weather Placement: ACI 306R

D. Ensure reinforcements, inserts, embedded parts, formed joints and are not disturbed during concrete placement.

E. Place concrete continuously between predetermined construction joints. Do not break or interrupt successive pours such that cold joints occur.

F. Place concrete to pattern indicated. Saw cut contraction joints at an optimum time after finishing. Saw joints in accordance with details on plans.

G. Chamfer exposed corners of concrete using wood, metal, PVC, or rubber chamfer strips fabricated to produce smooth lines and tight edge strips.

3.07 FINISHING

A. Road and Apron Paving: Light broom.

B. Sidewalk Paving: Light broom and trowel joint edges.

C. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.08 FIELD QUALITY CONTROL

A. Field testing will be performed by an independent testing company as selected by the Owner.

B. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.09 PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, and mechanical injury.

END OF SECTION

SECTION 32 13 73
PAVEMENT JOINT SEALANTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Expansion and contraction joints within portland cement concrete pavement.
   2. Joints between portland cement concrete and asphalt pavement.

B. Related Sections include the following:
   1. Division 32 Section "Portland Cement Concrete Paving" for constructing joints in concrete paving.

1.03 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required. Install joint-sealant samples in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: Signed by manufacturers of joint sealants certifying that products furnished comply with requirements and are suitable for the use indicated.

D. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Compatibility and Adhesion Test Reports: From joint sealant manufacturer indicating the following:
   1. Materials forming joint substrates and joint-sealant backer materials have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials to comply with manufacturer's written instructions to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.06 PROJECT CONDITIONS

A. Environmental Limitations: Do not proceed with installation of joint sealants under the following conditions:
   1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer.
   2. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 deg F.
   3. When joint substrates are wet.

B. Joint-Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than that allowed by joint sealant manufacturer for application indicated.

C. Joint-Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.01 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.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range for this characteristic.

2.02 COLD-APPLIED JOINT SEALANTS

A. 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.

B. Multicomponent Low-Modulus Sealant for Concrete and Asphalt: Proprietary formulation consisting of reactive petropolymer and activator components producing a pourable, self-leveling sealant.

C. Available Products: Subject to compliance with requirements, cold-applied joint sealants that may be incorporated into the Work include, but are not limited to, the following:
   1. Type SL Silicone Sealant for Concrete and Asphalt:
      a. 890-SL; Dow Corning Corp.
      b. Roadsaver Silicone SL; Crafco, Inc.
      c. Sika-1C SL; Sika Corp.
      d. Or Equivalent
   2. Multicomponent Low-Modulus Sealant for Concrete and Asphalt:
      a. SOF-SEAL; W.R. Meadows, Inc.
      b. Roadsaver Silicone; Crafco, Inc.
      c. 888; Dow Corning Corp.
      d. Or Equivalent

2.03 JOINT-SEALANT BACKER 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. Round Backer Rod for Cold- and Hot-Applied Sealants: ASTM D 5249, Type 1, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Sealants: ASTM D 5249; Type 2; of thickness and width required to control sealant depths, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

D. Round Backer Rods for Cold-Applied Sealants: ASTM D 5249, Type 3, of diameter and density required to control sealant depths and prevent bottom-side adhesion of sealant.

2.04 PRIMERS

A. 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.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

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

3.02 PREPARATION

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. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.03 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install backer materials of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
   1. Do not leave gaps between ends of backer materials.
   2. Do not stretch, twist, puncture, or tear backer materials.
   3. Remove absorbent backer materials that have become wet before sealant application and replace them with dry materials.

D. Install sealants by proven techniques to comply with the following and at the same time backings are installed:
   1. Place sealants so they directly contact and fully wet joint substrates.
   2. Completely fill recesses provided for each joint configuration.
   3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
   1. Remove excess sealants from surfaces adjacent to joint.
   2. Use tooling agents that are approved in writing by joint sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint sealant manufacturer's written instructions, unless otherwise indicated.

3.04 CLEANING

A. 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.

3.05 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION

SECTION 32 18 23
TENNIS COURT SURFACING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Asphalt tennis court surface color coating system.

1.2 RELATED REQUIREMENTS

A. Section 32 11 00 – Subgrade and Base Course Preparation

B. Section 32 12 16 – Hot Mix Asphalt Paving

1.3 REFERENCE STANDARDS

A. American Sports Builders Association (ASBA).

B. United States Tennis Association (USTA) Rules of Tennis.

C. National Federation of State High School Associations (NFHS). Rules of Tennis

1.4 SUBMITTALS

A. Comply with Section 01 33 00 – Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including surface and crack preparation and application instructions.

C. Samples: Submit manufacturer's color samples of color coating.

D. Test Reports:
1. Submit independent test results for solar reflectance index.
2. Submit independent test results for 2000 Hour ASTM G154, accelerated weathering UV test, to demonstrate long-term durability and fade resistance.
3. Submit independent test results for 2000 Hour, accelerated weathering ASTM G155 Xenon Arc test, to demonstrate long-term fade resistance and quality of pigment.

E. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application.

F. Manufacturer's Project References: Submit manufacturer's list of successfully completed asphalt tennis court surface color coating system projects, including project name, location, and date of application.

G. Applicator's Project References: Submit applicator's list of successfully completed asphalt tennis court surface color coating system projects, including project name, location, type and quantity of color coating system applied, and date of application.

H. Warranty Documentation: Submit manufacturer's standard warranty.

I. Authorized Installer Certificate: Submit manufacturer's authorized installer certificate.

J. ASBA Certified Tennis Court Builder: Submit name and contact of installing contractor's staff member having this certification.

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
1. Manufacturer regularly engaged, for past 5 years, in manufacture of asphalt tennis court surface color coating systems of similar type to that specified.
2. United States owned company.
3. Member: ASBA.
4. Manufacturer has surfaces that are classified by the ITF's (International Tennis Federation) pace classification program.

B. Applicator's Qualifications:
   1. Applicator regularly engaged, for past 3 years, in application of tennis court surface color coating systems of similar type to that specified.
   2. Employ persons trained for application of tennis court surface color coating systems.
   3. Applicator must be authorized installer of the surfacing brand used.
   4. Applicating contractor must have an ASBA Certified Tennis Court Builder on staff.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until application.
   3. Store materials in clean, dry area indoors.
   4. Store materials out of direct sunlight.
   5. Keep materials from freezing.
   6. Protect materials during storage, handling, and application to prevent contamination or damage.
   7. Close containers when not in use.
   8. Retain manufacturer batch codes on each container and application dates, for warranty purposes.

1.7 AMBIENT CONDITIONS

A. Do not apply asphalt tennis court surface color coating system when air or surface temperatures are below 50°F (10°C) during application or within 24 hours after application.

B. Do not apply asphalt tennis court surface color coating system when rain is expected during application or within 24 hours after application.

PART 2- PRODUCTS

2.1 MATERIALS

A. Asphalt Tennis Court Surface Color Coating System: SportMaster Color Coating System.

B. Crack Sealant: SportMaster "Crack Magic", or equivalent by NovaSports USA or Laykold.
   1. 100 percent acrylic emulsion elastomeric crack sealant.
   2. Seals cracks up to 1/2 inch wide in asphalt pavement.
   3. Weight per Gallon at 77 Degrees F: 8.8 lbs., plus or minus 0.5 lbs.
   4. Non-Volatile Material: 61 percent, plus or minus 5 percent.
   5. Color: Match Finished Surface Color

C. Crack Filler: SportMaster "Acrylic Crack Patch", or equivalent by NovaSports USA or Laykold.
   1. 100 percent acrylic emulsion trowel-grade crack filler.
   2. Fills cracks in asphalt pavement up to 1 inch wide.
   3. Chemical Characteristics, by Weight, Minimum:
      a. Acrylic Emulsion: 10.0 percent.
      b. Hiding Pigment: 0.2 percent.
      c. Mineral Inert Fillers: 78.0 percent.
      d. Film Formers, Additives: 1.8 percent.
      e. Water: 8.5 percent.
   4. Weight per Gallon at 77 Degrees F: 15.2 lbs., plus or minus 1.0 lbs.
   5. Non-Volatile Material: 80 percent, plus or minus 5 percent.
   6. Color: Match Finished Surface Color

D. Patch Binder: SportMaster "Acrylic Patch Binder", or equivalent by NovaSports USA or Laykold.

1. 100 percent acrylic emulsion liquid binder.
2. Mix on-site with sand and cement.
3. Levels and repairs low spots and depressions up to 3/4 inch deep in asphalt pavement.
4. Fills Cracks in Asphalt up to 1" in width.
5. Weight per Gallon at 77 Degrees F: 8.8 lbs., plus or minus 0.5 lbs.

E. Color Coating: SportMaster "ColorPlus System" or equivalent by NovaSports USA or Laykold.
1. 100 percent acrylic emulsion coating.
2. Mix on-site with silica sand and water.
3. Color coats tennis and multipurpose courts.
4. Weight per Gallon at 77 Degrees F: 9.2 lbs., plus or minus 0.5 lbs.
5. Color: Green out of bounds and Blue in bounds (submit samples for owner review)

F. Line Markings Primer: SportMaster "Stripe-Rite", or equivalent by NovaSports USA or Laykold
1. 100 percent acrylic emulsion primer, clear drying.
2. Primes line markings and prevents bleed-under for sharp lines.
3. Chemical Characteristics, by Weight, Nominal:
   a. Acrylic Emulsion: 38.0 percent.
   b. Hiding Pigment: 0.0 percent.
   c. Mineral Inert Fillers: 7.0 percent.
   d. Film Formers, Additives: 1.5 percent.
   e. Water: 50.0 percent.
4. Weight per Gallon at 77 Degrees F: 8.9 lbs., plus or minus 0.5 lbs.
5. Non-Volatile Material: 29 percent, plus or minus 5 percent.

H. Line Paint: SportMaster "Textured Line Paint", or equivalent by NovaSports USA or Laykold
1. Pigmented, 100 percent acrylic emulsion line paint.
2. Line marking on asphalt tennis courts.
3. Chemical Characteristics, by Weight, Nominal:
   a. Acrylic Emulsion: 25.89 percent.
   b. Pigment: 14.90 percent.
   c. Mineral Inert Fillers: 13.12 percent.
   d. Additives: 4.73 percent.
   e. Water: 41.36 percent.
4. Weight per Gallon at 77 Degrees F: 10.65 lbs., plus or minus 0.75 lbs.
5. Non-Volatile Material: 45.17 percent, plus or minus 5 percent.
6. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine asphalt tennis court surfaces to receive color coating system.

C. Verify asphalt tennis courts meet ASBA construction requirements.

C. Notify Architect of conditions that would adversely affect application or subsequent use.

D. Do not begin surface preparation or application until unacceptable conditions are corrected.

3.2 SURFACE PREPARATION

A. Protection of In-Place Conditions: Protect adjacent surfaces and landscaping from contact with asphalt tennis court surface color coating system.

B. Prepare surfaces in accordance with manufacturer's instructions.

C. Cure new asphalt surfaces a minimum of 14 to 30 days before application of asphalt tennis court surface color coating system.

D. Remove dirt, dust, debris, oil, grease, vegetation, loose materials, and other surface contaminants which could adversely affect application of asphalt tennis court surface color coating system. Pressure wash entire surface.

E. Repair cracks, depressions, and surface defects in accordance with manufacturer's instructions before application of filler course and color coating.

F. Level depressions 1/8 inch and deeper with patch binder in accordance with manufacturer's instructions.

G. Apply 1 or 2 coats of filler course as required by surface roughness and porosity to provide smooth underlayment for application of color coating.

H. Ensure surface repairs are flush and smooth to adjoining surfaces.

3.3 APPLICATION

A. Apply asphalt tennis court surface color coating system in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Mix materials in accordance with manufacturer's instructions.

C. Apply Filler Course and Color Coating with a 50-60 durometer, soft rubber squeegee.

D. Filler Course:
   1. Apply 2 coats on new asphalt or existing acrylic surfaces with extensive cracks or low spot repair.
   2. Apply 1 coat on existing acrylic surfaces with minimal repairs.

E. Color Coating: Apply a minimum of 2 coats of color coating to prepared surfaces in accordance with manufacturer's instructions.

F. Allow material drying times in accordance with manufacturer's instructions before applying other materials or opening completed surface to foot traffic.

3.4 LINE MARKINGS

A. Lay out tennis court markings in accordance with NFHS Rules of Tennis.

B. Apply line markings primer, after masking tape has been laid, to seal voids between masking tape and tennis court surface to prevent bleed-under when line paint is applied.

C. Apply a minimum of 1 coat of line paint in accordance with manufacturer's instructions.

3.5 PROTECTION

A. Allow a minimum of 24 hours curing time before opening courts for play.

B. Protect applied asphalt court surface color coating system to ensure that, except for normal weathering, coating system will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 32 31 13
PVC COATED CHAIN LINK FENCES, POSTS AND GATES

PART 1 - GENERAL

1.01 SCOPE

A. Summary*:* The work covered by this section includes furnishing all labor, materials, and equipment required to install Class 2b Fused and Adhered, Poly Vinyl Chloride (PVC) Coated, Steel Chain Link Fence, including all excavation, concrete, and accessories, as shown on the Drawings or specified herein.

B. General*:* Like items of materials provided hereafter shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance and replacement.

C. Delivery, Storage and Handling*:* Deliver material to the site in an undamaged condition. Carefully store material off the ground to provide proper protection against oxidation caused by ground moisture.

1.02 SUBMITTALS

A. Shop Drawings: Include complete details of fence and gate construction, fence height, post spacing, dimensions and unit weights of framework and concrete footing details. Actual samples and certificates of compliance may be requested.

B. Product Data*:* Provide manufacturer's catalog cuts with printed specifications. Manufacturer shall provide certification of compliance with material specifications. Actual samples of the material may be requested.

1.03 STANDARDS

A. ASTM B 6 Slab Zinc

B. ASTM F567 Installation of Chain Link Fence

C. ASTM F668 Poly(Vinyl Chloride) (PVC) and Other Organic Polymer-Coated Steel Chain Link Fence Fabric, Class 2b

D. Federal Specification RR-F-191K/1D Fencing, Wire and Post Metal (Chain-Link Fence Fabric), Type IV

E. American Association of State Highway Transportation Officials (AASHTO) M-181 Chain Link Fence, Type IV, Class A

F. ASTM F1043 Strength and Protective Coating on Metal Industrial Chain Link Fence Framework Group I-A and Group I-C Heavy Industrial

G. ASTM F934 Standard Colors for Polymer-Coated Chain Link Fence Materials

H. Federal Specification RR-F-191K/3D Fencing, Wire and Post Metal (Chain-Link Fence Posts, Topsails and Braces), Class 1, Grade A or B

I. American Association of State Highway Transportation Officials (AASHTO) M-181 Chain Link Fence, Grades 1 and 2

PART 2 - PRODUCTS

2.01 FENCE FABRIC

A. The base metal of the chain link fence fabric shall be composed of commercial quality, medium-carbon galvanized (zinc coated) steel wire. The vinyl coating shall be thermally bonded to a thermoset-bonding layer over a galvanized steel wire. Vinyl coating thickness, coating weight, and wire tensile strength conform to Federal specification RR-F-191K/1D, ASTM F668, Class 2b and (AASHTO) M-181, Type IV, Class A, as shown in Table 1. The wire is PVC coated before weaving, is free and flexible at all joints, and is knuckled at both

selvages.

Table 1-PVC Coated Steel Wire Characteristics

Zinc Coated Core Wire Size			PVC Coated Finished Wire Size	PVC Coated Wire Allowable Variance		Core Wire Zinc Coating Weight, Min		PVC Coating Thickness		Breaking Strength, minimum		Tensile Strength, min	
ga	inch	mm	ga	Inch	mm	oz/ft^2	g/m^2	Inch	mm	lbf	N	ksi	MPa
9	0.148	3.76	8	+- 0.005	+-0.13	0.30	92	0.006 to 0.010	0.15 to 0.25	1,290	5,740	75	515

B. Coating: Only plasticized poly(vinyl chloride) (PVC) with a low temperature (-20°C, -4°F) plasticizer and no extenders or extraneous matter other than the necessary stabilizers and pigments, is used. The PVC coating resists attack from prolonged exposure to dilute solutions of most common mineral acids, seawater, and dilute solutions of most salts and alkali. The vinyl coating is thermally bonded to a thermoset-bonding layer over a galvanized steel wire. The wire is PVC coated before weaving and is free and flexible at all joints.

C. Color: Shall Conform to ASTM F934, Black

2.02 FENCE POSTS AND RAILS

A. The base metal of the posts and rails shall be commercial steel conforming to ASTM F1043 Group I-A and I-C, Heavy Industrial Fence, and also conform to Federal specification RR-F-191, Class 1, Grades A and B and ASSHTO M181 Grades 1 and 2. The thickness of the PVC coating shall be a minimum 0.010 to 0.015 in.

B. Coating: Only plasticized poly(vinyl chloride) (PVC) with a low temperature (-20°C, -4°F) plasticizer and no extenders or extraneous matter other than the necessary stabilizers and pigments, is used. The PVC coating resists attack from prolonged exposure to dilute solutions of most common mineral acids, seawater, and dilute solutions of most salts and alkali.

2.03 FITTINGS

A. Fittings and other accessories shall be zinc-coated (galvanized) pressed steel, cast steel or malleable iron, as specified and are coated with matching PVC by the same process as post and rails. PVC coating thickness shall be a minimum 0.006 mils. Painted fittings are not acceptable.

B. Color: Shall Conform to ASTM F934, Black

2.04 FENCE MATERIALS

A. Fabric

Fused and Adhered Poly(Vinyl Chloride)-PVC Coated Steel Chain Link Fence Fabric
1. 9 gauge zinc coated core wire with 8 gauge PVC coated finished wire size
2. 1.75-inch mesh
3. Knuckled at both selvages unless otherwise specified.

B. Posts: Steel pipe, ASTM F1043, capped
1. Line post: 2 1/2 inch O.D.
2. Corner, end, angle, and pull posts: 3 inch O.D., Schedule 40
3. Gate posts, 4 inch O.D. Schedule 40

C. Top rail: 1 5/8 inch O.D., with expansion couplings spaced at not less than 10 feet intervals.

D. Mid rail: 1 5/8 inch O.D., with expansion couplings spaced at not less than 10 feet intervals.

E. Bottom rail: 1 5/8 inch O.D., with expansion couplings spaced at not less than 10 feet intervals.

F. Fittings: pressed steel, cast steel or heavy malleable iron.

2.05 GATE

A. Pedestrian Type: 4 foot minimum, single swing

B. Frames
1. 2 inch O.D. pipe
2. Material: Galvanized steel.
3. Construction: Welded corners or assembled with corner fittings and 3/8-inch steel truss rods.
4. Provide horizontal 2 inch brace rail and 3/8-inch truss rod for gates 5 feet wide or greater.
5. Provide vertical 2 inch brace rail for gates 6 feet wide or wider, spacing not to exceed 5-foot centers.

C. Hinges
1. Standard type.
2. Size to accommodate gate frame and post.

D. Latches
1. Industrial gate latch with drop rod or center stop.
2. See plan for latches at playgrounds

E. Keepers
1. Mechanical keeper for each gate leaf.
2. Secure free end of gate when in full open position.

2.06 CONCRETE

A. Posts shall be placed in masonry wall as shown on the details. Concrete shall be a min. 3000 psi.

PART 3 - EXECUTION

3.01 PREPARATION

A. Verify that final grading in fence location is complete without irregularities, which would interfere with fence installation.

B. Measure and lay out complete fence line.

C. Locate line posts at equal distance spacing, not exceeding 10-foot centers.

D. Use corner posts at positions where fence changes direction more than 10 degrees.

E. Contractor to grout entire length of masonry wall to the top of last block after installation of fence posts, fabric, and net poles.

3.02 INSTALLATION

A. Install Fence, Fence Posts and Gates in accordance with ASTM practice 567.

3.03 ADJUST AND CLEAN

A. Adjust brace rails for rigid installation.

B. Tighten hardware, fasteners and accessories.

C. Level and smooth all disturbed areas.

END OF SECTION

SECTION 32 90 00
LANDSCAPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Lawns.
   2. Topsoil and soil amendments.
   3. Fertilizers and mulches.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 31 Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
   2. Division 31 Section "Earthwork" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

1.03 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product certificates signed by manufacturers certifying that their products comply with specified requirements.
   1. Manufacturer's certified analysis for standard products.

C. Certification of grass seed from seed vendor for each grass-seed mixture stating the botanical and common name and percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
   1. Certification of each seed mixture for sod, identifying sod source, including name and telephone number of supplier.

D. Material test reports from qualified independent testing agency indicating and interpreting test results relative to compliance of the following materials with requirements indicated.
   1. Analysis of existing surface soil.
   2. Analysis of imported topsoil.

E. Maintenance instructions recommending procedures to be established by Owner for maintenance of landscaping during an entire year. Submit before expiration of required maintenance periods.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful landscape establishment.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery and while stored at site.

B. Seed: Deliver seed in original sealed, labeled, and undamaged containers.

1.06 PROJECT CONDITIONS

A. Utilities: Determine location of above grade and underground utilities and perform work in a manner which will avoid damage. Hand excavate, as required. Maintain grade stakes until removal is mutually agreed upon by parties concerned.

B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.

1.07 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

1.08 LAWN MAINTENANCE

A. Begin maintenance of lawns immediately after each area is planted and continue until acceptable lawn is established, but for not less than the following periods:
   1. Seeded Lawns: 60 days after date of Substantial Completion.
      a. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established at that time, continue maintenance during next planting season.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, re-grade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth lawn.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources and to keep lawns uniformly moist to a depth of 4 inches (100 mm).
   1. Water lawn at the minimum rate of 1 inch (25 mm) per week.

D. Mow lawns as soon as there is enough top growth to cut with mower set at specified height for principal species planted. Repeat mowing as required to maintain specified height without cutting more than 40 percent of the grass height. Remove no more than 40 percent of grass-leaf growth in initial or subsequent mowing. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

E. Post-fertilization: Apply fertilizer to lawn after first mowing and when grass is dry.
   1. Use fertilizer that will provide actual nitrogen of at least 1 lb per 1000 sq. ft. (0.5 kg per 100 sq. m) of lawn area.

PART 2 - PRODUCTS

2.01 GRASS MATERIALS

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with the Association of Official Seed Analysts' "Rules for Testing Seeds" for purity and germination tolerances.
   1. Seed Mixture: Provide seed of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on drawings.

2.02 TOPSOIL

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch (25 mm) or larger in any dimension, and other extraneous materials harmful to plant growth.
   1. Topsoil Source: Reuse surface soil stockpiled on the site. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement

with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

2. Topsoil Quantity: Provide topsoil to a minimum depth of 4” in all lawn and landscaped areas.

2.03 SOIL AMENDMENTS

A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 (2.36 mm) sieve and a minimum 75 percent passing a No. 60 (250 micrometer) sieve.

1. Provide lime in the form of dolomitic limestone.

B. Aluminum Sulfate: Commercial grade, unadulterated.

C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.

D. Perlite: Horticultural perlite, soil amendment grade.

E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.5, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.

F. Sawdust or Ground-Bark Humus: Decomposed, nitrogen-treated, of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

1. When site treated, mix with at least 0.15 lb (2.4 kg) of ammonium nitrate or 0.25 lb (4 kg) of ammonium sulfate per cu. ft. (cu. m) of loose sawdust or ground bark.

G. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

H. Herbicides: EPA registered and approved, of type recommended by manufacturer.

I. Water: Potable.

2.04 FERTILIZER

A. Bonemeal: Commercial, raw, finely ground; minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

C. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

1. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing agency.

2.05 MULCHES

A. Fiber Mulch: Biodegradable dyed-wood cellulose-fiber mulch, nontoxic, free of plant growth- or germination-inhibitors, with maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

B. Non-asphalt Emulsion Tackifier: Nontoxic and free of plant growth- or germination-inhibitors.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas to receive landscaping for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until

unsatisfactory conditions have been corrected.

3.02 PLANTING SOIL PREPARATION

A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

B. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.

C. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting.
   1. Mix lime with dry soil prior to mixing fertilizer. Prevent lime from contacting roots of acid-tolerant plants.
   2. Apply phosphoric acid fertilizer, other than that constituting a portion of complete fertilizers, directly to subgrade before applying planting soil and tilling.

3.03 LAWN PLANTING PREPARATION

A. Limit subgrade preparation to areas that will be planted in the immediate future.

B. Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous materials.

C. Spread planting soil mixture to depth required to meet thickness, grades, and elevations shown, after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen.
   1. Place approximately 1/2 the thickness of planting soil mixture required. Work into top of loosened subgrade to create a transition layer and then place remainder of planting soil mixture.

D. Preparation of Unchanged Grades: Where lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare soil as follows:
   1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns.
   2. Till surface soil to a depth of at least 6 inches (150 mm). Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.
   3. Clean surface soil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.
   4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property.

E. Grade lawn and grass areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit fine grading to areas that can be planted in the immediate future. Remove trash, debris, stones larger than 1-1/2 inches (38 mm) in any dimension, and other objects that may interfere with planting or maintenance operations.

F. Moisten prepared lawn areas before planting when soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

G. Restore prepared areas if eroded or otherwise disturbed after fine grading and before planting.

3.04 SEEDING NEW LAWNS

A. Sow seed with a spreader or a seeding machine. Do not broadcast or drop seed when wind

velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other.

1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

B. Sow seed at the following rates:

1. Seeding Rate: 3 to 4 lb. per 1000 sq. ft. (1.5 to 2 kg per 100 sq. m).

C. Rake seed lightly into top 1/8 inch (3 mm) of topsoil, roll lightly, and water with fine spray.

D. Protect seeded areas with slopes less than 1:6 against erosion by spreading straw mulch after completion of seeding operations. Spread uniformly at a minimum rate of 2 tons per acre (45 kg per 100 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.

E. Hydroseeding is an acceptable alternative, at Contractor's option.

3.05 RECONDITIONING LAWNS

A. Recondition existing lawn areas damaged by Contractor's operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required.

B. Remove vegetation from diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

C. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of it off the Owner's property.

D. Till stripped, bare, and compacted areas thoroughly to a depth of 6 inches (150 mm).

E. Apply required soil amendments and initial fertilizers and mix thoroughly into top 4 inches (100 mm) of soil. Provide new planting soil as required to fill low spots and meet new finish grades.

F. Apply seed as required for new lawns.

G. Water newly planted areas and keep moist until new grass is established.

3.06 CLEANUP AND PROTECTION

A. During landscaping, keep pavements clean and work area in an orderly condition.

B. Protect landscaping from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed.

3.07 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property.

3.08 SEED MIXTURES SCHEDULE

A. Sun and Partial Shade: Provide certified grass-seed blends or mixes, proportioned by weight, as follows:

Proportion	Name	Min. Pct. Germ.	Min. Pct. Pure Sd.	Max. Pct. Weed Sd.
50 %	Kentucky 31	80%	85%	0.5%
30 %	Chewings red fescue	85%	98%	0.5%
10 %	Perennial rye grass	90%	98%	0.5%
10 %	Redtop	85%	92%	1%

END OF SECTION

SECTION 33 40 00
STORM DRAINAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. Adhere to the City of Ringgold standards for work in public right of ways.

1.02 SUMMARY

A. This Section includes storm drainage outside the building.

B. Related Sections include the following:
   1. Division 33 Section "Foundation Drainage Systems" for foundation drains connecting to storm drainage.
   2. Division 33 Section "Cast-in-Place Concrete" for concrete structures.

1.03 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. EPDM: Ethylene-propylene-diene-monomer rubber.

C. PE or HDPE: Polyethylene plastic, or High Density Polyethylene plastic.

D. PVC: Polyvinyl chloride plastic.

E. CMP: Corrugated Metal Pipe

F. RCP: Reinforced Concrete Pipe

1.04 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.05 SUBMITTALS

A. Shop Drawings: Include plans, elevations, details, and attachments for the following:
   1. Precast concrete manholes and other structures, including frames, covers, and grates.
   2. Cast-in-place concrete manholes and other structures, including frames, covers, and grates.

B. Design Mix Reports and Calculations: For each class of cast-in-place concrete.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Do not store plastic structures, pipe, and fittings in direct sunlight.

B. Protect pipe, pipe fittings, and seals from dirt and damage.

C. Handle precast concrete manholes and other structures according to manufacturer's written rigging instructions.

1.07 PROJECT CONDITIONS

A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

B. Locate existing structures and piping to be closed and abandoned.

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

PART 2 - PRODUCTS

2.02 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe and fitting materials.

2.03 PIPES AND FITTINGS

A. PVC Sewer Pipe and Fittings: According to the following:
   1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
   2. PVC Sewer Pipe and Fittings, NPS 18 and Larger: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
   3. Perforated PVC Subdrain Pipe: ASTM D1785, Schedule 40.
      a. Hole Pattern: ASTM F-758/ ASSHTO M278, Hole Size 3/8”, Hole Spacing 3” ±1/4”

B. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76, Class III, Wall B, for gasketed joints.
   1. Gaskets: ASTM C 443, rubber.

C. HDPE Sewer Pipe and Fittings: Shall be Double Wall, according to the following:
   1. HDPE Sewer Pipe and Fittings, NPS 4 through NPS 60: ASTM F 2648, for solvent-cemented or gasketed joints.
      a. Gaskets: ASTM F 477, elastomeric seals.
      b. Fittings: ASTM F 2306, bell and spigot connections shall utilize a pun-on or welded bell and valley or saddle gasket meeting the soil tight performance requirements of ASTM F 2306.

2.04 SPECIAL PIPE COUPLINGS AND FITTINGS

A. Sleeve-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric sleeve and band assembly fabricated to mate with OD of pipes to be joined, for nonpressure joints.
   1. Sleeve Material for Concrete Pipe: ASTM C 443, rubber.
   2. Sleeve Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
   3. Sleeve Material for Plastic Pipe: ASTM F 477, elastomeric seal.
   4. Sleeve Material for Dissimilar Pipe: Compatible with pipe materials being joined.

B. Bushing-Type Pipe Couplings: ASTM C 1173, rubber or elastomeric bushing fabricated to mate with OD of smaller pipe and ID of adjoining larger pipe, for nonpressure joints.
   1. Material for Concrete Pipe: ASTM C 443, rubber.
   2. Material for Cast-Iron Soil Pipe: ASTM C 564, rubber.
   3. Material for Plastic Pipe: ASTM F 477, elastomeric seal.
   4. Material for Dissimilar Pipe: Compatible with pipe materials being joined.

C. Ductile-Iron Expansion Joints: Three-piece assembly of telescoping sleeve with gaskets and restrained-type, ductile-iron, bell-and-spigot end sections complying with AWWA C110 or AWWA C153. Include rating for 250-psig minimum working pressure and for expansion indicated. Include PE film, pipe encasement.

2.05 MANHOLES

A. Normal-Traffic Precast Concrete Manholes: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.

1. Diameter: 48 inches minimum, unless otherwise indicated.
2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation.
3. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
4. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Gaskets: ASTM C 443, rubber.
7. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
8. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
9. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Heavy-Traffic Precast Concrete Manholes: ASTM C 913; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.
1. Ballast: Increase thickness of one or more precast concrete sections or add concrete to structure, as required to prevent flotation.
2. Gaskets: Rubber.
3. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
4. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into base, riser, and top section sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.
5. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

C. Cast-in-Place Concrete Manholes: Construct of reinforced-concrete bottom, walls, and top; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, dimensions, and appurtenances indicated.
1. Ballast: Increase thickness of concrete, as required to prevent flotation.
2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and cover.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast or anchor into sidewalls with steps at 12- to 16-inch intervals. Omit steps for manholes less than 60 inches deep.

D. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, ductile-iron castings designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter cover. Include indented top design with lettering "STORM SEWER" cast into cover.

2.06 CATCH BASINS

A. Normal-Traffic, Precast Concrete Catch Basins: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
1. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
2. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide

depth indicated.

3. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
4. Gaskets: ASTM C 443, rubber.
5. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
6. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

B. Heavy-Traffic, Precast Concrete Catch Basins: ASTM C 913, precast, reinforced concrete; designed according to ASTM C 890 for A-16, heavy-traffic, structural loading; of depth, shape, and dimensions indicated, with provision for rubber gasketed joints.

1. Gaskets: Rubber.
2. Grade Rings: Include two or three reinforced-concrete rings, of 6- to 9-inch total thickness, that match 24-inch-diameter frame and grate.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into base, riser, and top section sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.
4. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.

C. Cast-in-Place Concrete, Catch Basins: Construct of reinforced concrete; designed according to ASTM C 890 for structural loading; of depth, shape, dimensions, and appurtenances indicated.

1. Bottom, Walls, and Top: Reinforced concrete.
2. Channels and Benches: Concrete.
3. Steps: Fiberglass, individual steps or ladder. Include width that allows worker to place both feet on one step and is designed to prevent lateral slippage off step. Cast steps or anchor ladder into sidewalls at 12- to 16-inch intervals. Omit steps for catch basins less than 60 inches deep.

D. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service. Include flat grate with small square or short-slotted drainage openings.

1. Size: 24 by 24 inches minimum, unless otherwise indicated.
2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

E. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service. Include 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter flat grate with small square or short-slotted drainage openings.

1. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

F. PVC Surface Inlets: PVC surface drainage inlets shall include the drain basin type as indicated on the contract drawing and referenced within the contract specifications. The ductile iron grates for each of these fittings are to be considered an integral part of the surface drainage inlet and shall be furnished by the same manufacturer.

2.07 STORMWATER INLETS

A. Curb Inlets: Made with vertical curb opening, of materials and dimensions according to utility standards.

B. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions according to utility standards. Include heavy-duty frames and grates.

C. Frames and Grates: Heavy-duty frames and grates according to utility standards.

2.08 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
   1. Cement: ASTM C 150, Type II.
   2. Fine Aggregate: ASTM C 33, sand.
   3. Coarse Aggregate: ASTM C 33, crushed gravel.
   4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious ratio.

   1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.

   2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious ratio.
   1. Include channels and benches in manholes.
      a. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
         1) Invert Slope: 1 percent through manhole.
      b. Benches: Concrete, sloped to drain into channel.
         1) Slope: 4 percent.
   2. Include channels in catch basins.
      a. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
         1) Invert Slope: 1 percent through catch basin.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious ratio.
   1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
   2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

PART 3 - EXECUTION

3.01 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 31 Section "Earthwork."

3.02 PIPING APPLICATIONS

A. General: Include watertight, silttight, or soiltight joints, unless watertight or silttight joints are indicated.

B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to applications indicated.

C. Gravity-Flow Piping: Use the following:
   1. NPS 4 and NPS 6: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
   2. NPS 8 to NPS 15: PVC sewer pipe and fittings, solvent-cemented joints, or gaskets and gasketed joints.
   3. NPS 4 to NPS 60: HDPE Double Wall Sewer Pipe pipe and fittings; corrugated, soiltight couplings; and coupled joints. Manning N=0.012 or lower.

3.03 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS

A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
   1. Use the following pipe couplings for nonpressure applications:
      a. Sleeve type to join piping, of same size, or with small difference in OD.

b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.

B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

3.04 INSTALLATION, GENERAL

A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.

C. Use manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

D. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

E. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.
1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.

F. Extend storm drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

3.05 PIPE JOINT CONSTRUCTION AND INSTALLATION

A. General: Join and install pipe and fittings according to installations indicated.

B. Refer to Division 2 Section "Utility Materials" for basic piping joint construction and installation.

C. PVC Pressure Pipe and Fittings: Join and install according to AWWA M23.

D. PVC Sewer Pipe and Fittings: As follows:
1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
2. Install according to ASTM D 2321.

E Concrete Pipe and Fittings: Install according to ACPA's "Concrete Pipe Installation Manual." Use the following seals:
1. Round Pipe and Fittings: ASTM C 443, rubber gaskets.

F. System Piping Joints: Make joints using system manufacturer's couplings, unless otherwise indicated.

G. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

3.06 MANHOLE INSTALLATION

A. General: Install manholes, complete with appurtenances and accessories indicated.

B. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise

indicated.

C. Install precast concrete manhole sections with gaskets according to ASTM C 891.

D. Construct cast-in-place manholes as indicated.

E. Install fiberglass manholes according to manufacturer's written instructions.

3.07 CATCH-BASIN INSTALLATION

A. Construct catch basins to sizes and shapes indicated.

B. Set frames and grates to elevations indicated.

C. The specified PVC surface drainage inlet shall be installed using conventional flexible pipe backfill materials and procedures. The backfill material shall be crushed stone or other granular material meeting the requirements of class 2 material as defined in ASTM D2321. Bedding and backfill for surface drainage inlets shall be placed and compacted uniformly in accordance with ASTM D2321. The drain basin body will be cut at the time of the final grade. No brick, stone or concrete block will be required to set the grate to the final grade height. For H-20 load rated installations, a concrete ring will be poured under and around the grate and frame. The concrete slab must be designed taking into consideration local soil conditions, traffic loading, and other applicable design factors. For other installation considerations such as migration of fines, ground water, and soft foundations refer to ASTM D2321 guidelines.

3.08 STORM DRAINAGE INLET AND OUTLET INSTALLATION

A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.

B. Construct riprap of broken stone, as indicated.

C. Install outlets that spill onto grade, anchored with concrete, where indicated.

D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

E. Construct energy dissipators at outlets, as indicated.

3.09 CONCRETE PLACEMENT

A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.10 DRAINAGE SYSTEM INSTALLATION

A. Assemble and install components according to manufacturer's written instructions.

B. Install with top surfaces of components, except piping, flush with finished surface.

C. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.

D. Embed channel sections and drainage specialties in 4-inch minimum concrete around bottom and sides.

E. Fasten grates to channel sections if indicated.

F. Embed trench sections and drainage specialties in 4-inch minimum concrete around bottom and sides.

3.11 CLEANOUT INSTALLATION

A. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
   1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.

2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use extra-heavy-duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.

C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.12 DRAIN INSTALLATION

A. Install type of drains in locations indicated.

B. Fasten grates to drains if indicated.

C. Set drain frames and covers with tops flush with pavement surface.

3.13 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
1. Close open ends of piping with at least 8-inch-thick, brick masonry bulkheads.

B. Abandoned Structures: Excavate around structure as required and use one procedure below:
1. Remove structure and close open ends of remaining piping.
2. Backfill to grade according to Division 31 Section "Earthwork."

3.14 FIELD QUALITY CONTROL

A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
1. In large, accessible piping, brushes and brooms may be used for cleaning.
2. Place plug in end of incomplete piping at end of day and when work stops.
3. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
1. Submit separate reports for each system inspection.
2. Defects requiring correction include the following:
   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.
3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
4. Reinspect and repeat procedure until results are satisfactory.

C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to authorities having jurisdiction.
3. Leaks and loss in test pressure constitute defects that must be repaired.
4. Replace leaking piping using new materials, and repeat testing until leakage is within

allowances specified.

END OF SECTION

March 4, 2024

Hamilton County Department of Education
2501 Dodds Avenue
Chattanooga, TN 37407

ATTENTION: Mr. Justin Witt
witt_justin@hcde.org

Subject: **REPORT OF GEOTECHNICAL EXPLORATION**
Proposed Tennis Courts Addition
Signal Mountain Middle-High School
Signal Mountain, Tennessee
UES Project No. A24110.00147

Dear Mr. Witt:

We are submitting the results of the geotechnical exploration performed for the subject project. The geotechnical exploration was performed in general accordance with the UES Proposal, dated February 13, 2024. The following report presents our findings and recommendations for the proposed tennis courts addition in Signal Mountain, Tennessee.

UES Professional Solutions 19, LLC (UES) sincerely appreciates the opportunity to serve as your geotechnical consultant. Should you have any questions regarding this report, or if we can be of any further assistance, please contact us at your convenience.

Sincerely,
UES Professional Solutions 19, LLC

Derek K. Kilday, P.E.
V.P. – Chattanooga Area Manager

JEREMY T. HALEY
REGISTERED ENGINEER
AGRICULTURE
3-4-24
COMMERCE
No. 117997
STATE OF TENNESSEE

Jeremy T. Haley, P.E.
Senior Geotechnical Engineer
TN #117,997

REPORT OF GEOTECHNICAL EXPLORATION

Proposed Tennis Courts Addition

Signal Mountain Middle-High School
Signal Mountain, Tennessee

UES Project No. A24110.00147

Submitted to:

Hamilton County Department of Education
2501 Dodds Avenue
Chattanooga, TN 37407

Submitted by:

UES
6607 Mountain View Road
Suite 139
Ooltewah, TN 37363

Phone (423) 614-6471
Fax (423) 614-6479

UES™

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this geotechnical exploration was to characterize the subsurface conditions for the design and construction of the proposed tennis courts addition at the existing Signal Mountain Middle-High School campus in Signal Mountain, Tennessee. This report provides recommendations for general site preparation, excavation and fill requirements, pavement recommendations, and retaining wall recommendations for the proposed tennis courts addition.

1.2 PROJECT INFORMATION AND SITE DESCRIPTION

Project information, including a proposed site plan prepared by DH&W Architecture, was provided by Mr. Joseph Parks with March Adams & Associates. UES understands that a new tennis courts addition is planned at the existing Signal Mountain Middle-High School campus located at address 2650 Sam Powell Trail in Signal Mountain, Tennessee. Based on the provided plan, the proposed additions will include eight new tennis courts, a new parking area, the associated infrastructure, and four new infiltration areas. The area for the new construction is located to the west of the existing school structure and north of the existing soccer fields. The site is bordered by the existing school structure to the east, by existing soccer fields to the south, and by wooded parcel to the north and west. The site currently exists as a wooded parcel with a central ridge that slopes downward to the east and to the west from the ridge. Based on provided topographic information, grades within the construction area currently range from approximately 1790 feet along the western portion to approximate 1807 feet along the central ridge. Grading information hasn't been finalized at this time; however, based on the existing grades and the proposed site plan, we anticipate the maximum earthwork cuts and fills will be on to order of 5 feet or less in order to achieve the proposed grades. Additionally, in order to facilitate the proposed grades, we understand that retaining walls will likely need to be constructed on the east and west sides of the proposed tennis courts to achieve these proposed grades.

1.3 SCOPE OF STUDY

This geotechnical exploration involved site reconnaissance, field exploration, laboratory testing, and engineering analysis. The following sections of this report present discussions of the field exploration, site conditions, and conclusions and recommendations. Following the text of this report, Appendix A presents figures and test pit records. Appendix B presents the laboratory test results.

The scope of services did not include an environmental assessment for determining the presence or absence of wetlands, or hazardous or toxic materials in the soil, bedrock, surface water, subsurface water, or air, on or below, or around this site. Any statements in this report or on the test pit logs regarding odors, colors, and unusual or suspicious items or conditions are strictly for informational purposes.

2.0 EXPLORATION AND TESTING PROGRAMS

2.1 FIELD EXPLORATION

The site subsurface conditions were explored with a total of six soil test pits (TP-1 through TP-6). Three of the test pits (TP-1, TP-3, and TP-6) were performed within the footprint of the proposed tennis courts. One of the test pits (TP-4) was performed within the proposed parking areas. The remaining two test pits (TP-2 and TP-5) were performed along the proposed retaining wall alignments adjacent to the proposed tennis courts. The test pit locations and depths were selected by March Adams and UES personnel in conjunction with the proposed site plan prepared by March Adams. Locations are shown on the Test Pit Location Plan, Figure 3 presented in Appendix A. The test pit locations were located and staked in the field by UES personnel. Excavation of the test pits was performed on February 22, 2024, using a small, tracked excavator provided by Moore Excavating. Dynamic cone penetrometer (DCP) testing was performed in each test pit at selected depths. The test pits were backfilled with the excavated material before leaving the site. Detailed test pit records are presented in Appendix A.

2.2 LABORATORY TEST PROGRAM

Soil samples collected during drilling were transported to our laboratory for visual classification and laboratory testing. The following laboratory testing was performed on select samples to determine various properties of the soil:

- Natural Moisture Content (ASTM D2216): Moisture content determinations were performed on five (5) samples for this project. The natural moisture content is defined as the ratio of the weight of water present in the soil to the dry weight of soil.

The test results for the soil samples obtained during the field exploration are presented on a Laboratory Summary Sheet, presented in Appendix B.

3.0 SUBSURFACE CONDITIONS

3.1 GEOLOGIC CONDITIONS

The project site, and most of East Tennessee, lies in the Appalachian Valley and Ridge Physiographic Province. The province is characterized by elongated, northeasterly-trending ridges formed on highly resistant sandstones and shales. Between ridges, broad valleys and rolling hills are formed primarily on less resistant limestones, dolomites and shales.

A common geologic hazard in the East Tennessee area is the development of karst conditions in areas underlain by carbonate bedrock. Karst is a general term that describes the typical carbonate hazards of irregular weathering, cave and cavern conditions, and overburden sinkholes. Carbonate rock, while appearing very hard and resistant, is soluble in slightly acidic water. This characteristic, plus differential weathering of the bedrock mass, is responsible for the hazards. Of these hazards, the occurrence of sinkholes is potentially the most damaging to soil supported structures. In East Tennessee, sinkholes occur primarily due to differential weathering of the bedrock and "flushing" or "raveling" of overburden soils into the cavities in the bedrock. The loss of solids creates a cavity or "dome" in the overburden. Growth of the dome over time or excavation over the dome can create a condition in which rapid, local subsidence or collapse of the roof of the dome occurs.

Published geologic information indicates that the site is underlain by bedrock of the Crab Orchard Mountains Group, which is not differentiated into its individual formations in this area. The Crab Orchard Mountains Group generally consists of sandstone, conglomeratic sandstone, siltstone, and shale. Some of the formations within this group contain various amounts of coal. These rock units weather to produce a thin residual clay overburden. Bedrock from this group is generally not susceptible to the development of karst conditions and has a low potential for the development of overburden sinkholes.

3.2 SUBSURFACE CONDITIONS

The following subsurface description is of a generalized nature to highlight the major subsurface stratification features and material characteristics. The test pit logs included with this report should be reviewed for specific information at individual locations. The depth and thickness of the subsurface strata indicated on the test pit cross-sections were generalized from and interpolated between test locations. The transition between materials will be more or less gradual than indicated and may be abrupt. Information on actual subsurface conditions exists only at the specific test pit locations and is relevant to the time the exploration was performed. Variations may occur and should be expected between test pit locations. The stratification lines were used for our analytical purposes and, unless specifically stated otherwise, should not be used as the basis for design or construction cost estimates.

3.2.1 Surficial Materials

A surficial layer of topsoil ranging from 8 to 12 inches was encountered in each of the six test pits (TP-1 through TP-6). Please note that the surficial material thickness will vary away from the test pit locations and the contractor should determine the topsoil thickness for construction and bidding purposes. Beneath the surficial topsoil layer, residual soils were encountered to excavator refusal depths ranging from 3.5 to 6 feet.

3.2.2 Residual Soils

Beneath the surficial topsoil layer in each of the six test pits (TP-1 through TP-6), residual soils were encountered to excavator refusal depths ranging from 3.5 to 6 feet. Residual soils are classified as soils which have been formed in place from the weathering of the underlying bedrock. The residual soils generally consisted of red brown, light brown, and tan clays with varying amounts of sand and sandstone fragments. Average DCP values of the residuum ranged from 2 to 11 blows per increment (bpi), indicating a consistency of very soft to stiff. The residuum was generally soft to firm in the upper layers and generally increased in consistency with depth. The natural moisture contents of the residuum ranged from 11 to 25 percent.

3.2.3 Subsurface Water

Subsurface water was not observed in any of the six test pits at the time of exploration. Subsurface water levels may fluctuate due to seasonal changes in precipitation amounts and the amount of water within any nearby low-lying areas. Additionally, discontinuous zones of perched water may exist within the overburden and/or at the contact with bedrock. The groundwater information presented in this report is the information that was collected at the time of our field activities.

3.2.4 Excavator Refusal Conditions

Excavator refusal materials were encountered in each of the six test pits at depths ranging from 3.5 to 6 feet during the field exploration. Refusal is a designation applied to any material that cannot be penetrated by the excavator. Excavator refusal may indicate dense gravel or cobble layers, boulders, rock ledges or pinnacles, or the top of continuous bedrock. A summary of the excavator refusal depths encountered in the test pits is shown below:

Table 1 – Excavator Refusal Summary

Test Pit No.	Excavator Refusal Depth (Feet)
TP-1	4.5
TP-2	4.5
TP-3	5.0
TP-4	3.5
TP-5	6.0
TP-6	5.0

Note: Depths reference the existing ground elevations at the time of the exploration.

3.3 INFILTRATION TESTING

In addition to the soil test pits, eight (8) infiltration tests (I-1 through I-8) were performed. Each of the infiltration tests were performed at the requested locations within the four proposed infiltration areas for the proposed construction (two per area). The test locations were selected by March Adams personnel based on the proposed site plan. The tests were performed at a depth of approximately 3 feet below the

existing ground surface elevation. At each location, the casing was filled with two feet of water and the water was allowed to presoak for an initial period. After presoaking, the two-foot water level was re-established, with readings taken every hour, and the process repeated for a total of four hours. The final infiltration test results were completed on February 23, 2024. The following table presents the findings recorded during the final test interval:

Table 2 – Infiltration Testing Summary

Location	Depth (ft)	Infiltration Rate (in./hr)
I-1	3	0.32
I-2	3	0.12
I-3	3	0.36
I-4	3	0.60
I-5	3	0.24
I-6	3	0.12
I-7	3	0.06
I-8	3	0.12

Note: Depths reference the existing ground elevations at the time of the exploration.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 SITE ASSESSMENT

The results of the field exploration indicate that the site is adaptable for the proposed construction; however, there are some challenges associated with the development of this site. These challenges include the potentially difficult excavations, the very soft to firm surficial residual soils, and the karst geology.

4.1.1 Potentially Difficult Excavations

As previously mentioned, excavator refusal materials were encountered in each of the six test pits (TP-1 through TP-6) at depths ranging from 3.5 to 6 feet during field exploration. A detailed grading plan was not yet available at the time of this report; however, based on the existing grades, we anticipate that portions of the refusal materials may be near planned excavations for the proposed tennis courts and/or underground utilities. This is especially likely if excavations exceed 3 to 5 feet. If encountered, these materials may require difficult excavation techniques such as excavators with rock teeth, hoe-ramming, or blasting. Additionally, if there are areas where any bearing areas (tennis courts or retaining walls) transition from soil to competent bedrock support, we recommend that the bedrock be removed to a minimum depth of 12 inches below the bearing elevation and be backfilled with dense graded aggregate. This will help to create a "cushion" and lessen the likelihood for differential settlement due to different bearing conditions. Once grading plans are finalized, UES should be given the opportunity to review this information and determine if any additional recommendations need to be made for the proposed construction.

4.1.2 Very Soft to Firm Residual Soils

Soft to firm surficial residual soils (average DCP-values ranging from 2 to 8 bpi) were encountered in each of the six test pits (TP-1 through TP-6), typically within the upper 2 to 3 feet from the existing ground surface. Depending on when the construction is performed, there is a possibility that the upper softer residual soils may need to be scarified, dried, and recompacted or undercut prior to placement of new fill over these areas or if they are at planned subgrade elevations. Additionally, an alternative to the above remediation methods is a soil-cement treatment of subgrade prior to placement of rock beneath tennis court or pavement areas. There is the potential of encountering softer, saturated soils between the test pit locations. This is particularly

true if the grading/construction is performed between November and March. Additionally, if retaining wall excavations bear near the levels of these softer soils undercutting will likely be required.

4.1.3 Karst Geology

A certain degree of risk with respect to sinkhole formation and subsidence should be considered with any site located within geologic areas underlain by potentially soluble rock units. While a rigorous effort to assess the potential for sinkhole formation on this site was beyond the scope of this evaluation, our test pits did not encounter obvious indications of sinkhole development. Additionally, a review of the USGS topographic map of the area did not reveal the presence of any closed depression, which may denote past sinkhole activity, in the vicinity of the project site. Based on these findings and our experience with this formation at other sites, we consider that this site has a low risk for sinkhole activity.

4.2 SITE PREPARATION

4.2.1 Subgrade

Gravel, topsoil, rock fragments greater than 6 inches, and other debris should be removed from the proposed construction areas. After completion of any stripping operations and any required excavations to reach subgrade level, we recommend that the subgrade be proofrolled with a fully-loaded, tandem-axle dump truck or other pneumatic-tired construction equipment of similar weight. The geotechnical engineer or their qualified representative should observe proofrolling. Areas judged to perform unsatisfactorily should be remediated at the geotechnical engineer's discretion. As such, there is a high probability that portions of these surficial fill soils will need to be scarified, dried, and recompacted or undercut prior to placement of new fill over these areas. There is a good likelihood that the upper soils currently covering the site may require some scarifying and drying due to exposure to weather (precipitation and freeze/thaw) for an extended period of time.

4.2.2 Structural Soil Fill

Material considered suitable for use as compacted fill should be clean soil free of organics, wood, trash, and other deleterious material, containing no rock fragments greater than 6 inches in any one dimension. Preferably, borrow material to be used as structural soil fill should have a standard Proctor maximum dry

density of 90 pounds per cubic foot (pcf) or greater and a plasticity index (PI) of 35 percent or less. All material being used as soil fill should be tested and confirmed by the geotechnical engineer to be in accordance with the project requirements before being placed. Based on limited laboratory testing, we anticipate the on-site residual soils are suitable for use as structural soil fill, provided that any necessary moisture conditioning is performed. Structural fill should be placed in loose, horizontal lifts not exceeding 8 inches in thickness. Each lift should be compacted to at least 95 percent of maximum dry density per the standard Proctor method (ASTM D698) and within the range of minus 2 percent to plus 3 percent of the optimum moisture content. Each lift should be compacted and tested by geotechnical personnel to confirm that the contractor's method is capable of achieving the project requirements before placing any subsequent lifts. Any areas which have become soft or frozen should be removed before additional structural fill is placed. This information is summarized in Table 2 below.

Table 3 – Structural Soil Fill Recommendations

Subject	Property
Maximum Dry Density	90 pcf or greater
Plasticity Index	35% or less
Maximum Particle Size	6 inches
Compaction Standard	Standard Proctor, ASTM D698
Required Compaction	95% of Maximum Dry Density
Moisture Content	-2 to +3% of the soil's optimum moisture content
Lift Thickness	8 inches or less

4.2.3 Compacted Crushed Stone Fill

Compacted crushed stone fill should be Type A, Class A, and Grading D in accordance with Section 903.05 of the Tennessee Department of Transportation specifications. The crushed stone fill should be placed in loose, horizontal lifts not exceeding 10 inches in loose thickness. Each lift should be compacted to at least 98 percent of maximum dry density per the standard Proctor method (ASTM D698). Each lift should be compacted and tested by geotechnical personnel to confirm that the contractor's method is capable of achieving the project requirements before placing any subsequent lifts.

4.3 PAVEMENT DESIGN RECOMMENDATIONS (PARKING AREAS)

Our recommendations are based upon the assumption that the subgrade has been properly prepared as described in previous report sections and that any off-site soil borrow to be used to backfill to the final subgrade meets the requirements for structural soil fill.

All paved areas should be constructed with positive drainage to direct water off-site and to minimize surface water seeping into the pavement subgrade. The subgrade should have a minimum slope of 1 percent. In down grade areas, the basestone should extend through the slope to allow any water entering the basestone a path to exit. For rigid pavements, water-tight seals should also be provided at formed construction and expansion joints.

4.3.1 Flexible Pavement Design

AASHTO flexible pavement design methods have been utilized for pavement recommendations. Our recommendations are based on the assumptions that the subgrade has been properly prepared as described previously. Traffic loading has not been provided at the time this report was prepared; however, we anticipate that it will be mainly passenger cars with occasional heavy delivery trucks or garbage trucks. Based on our experience with similar projects with flexible pavement, we recommend the following light duty and medium duty flexible pavement sections:

Table 4 – Flexible Pavement Section Summary

Recommended Thickness (Inches)		
Pavement Materials	**Light Duty**	**Medium Duty**
Bituminous Asphalt Surface Mix	1.5	1.5
Bituminous Asphalt Base Mix	2.0	2.5
Compacted Crushed Aggregate Base	6.0	8.0

We recommend a base stone equivalent to a Type A, Class A and Grading D in accordance with Section 903.05 of the Tennessee Department of Transportation specifications. The bituminous asphalt pavement should be

Grading "E" as per Section 411 for the surface mix and Grading “B” as per section 307 for the binder mix. Compaction requirements for the crushed aggregate base and the bituminous asphalt pavement should generally follow Tennessee Department of Transportation specifications.

The recommended pavement thickness’ presented in this report section are considered typical and minimum for the assumed parameters in the general site area. We understand that budgetary considerations sometimes warrant thinner pavement sections than those presented. However, the client, the owner, and the project designers should be aware that thinner pavement sections may result in increased maintenance costs and lower than anticipated pavement life.

4.3.2 Rigid Pavement Design

If areas could possibly be subjected to heavy vehicle loads, these areas may require the use of rigid pavement. If rigid pavement is required, we recommend the following rigid pavement section:

Table 5 – Rigid Pavement Section Summary

Pavement Materials	Recommended Thickness (Inches)
4,000 psi Type I Concrete	5.0
Compacted Crushed Aggregate Base	6.0

Consideration should be given to adjusting the thickness of the compacted crushed aggregate base to match the total thickness of the adjacent asphalt areas so that the soil subgrade is at the same elevation for both the concrete and medium duty asphalt pavement. Also, consideration should be given to extending any concrete dumpster pads the full length of the garbage truck, so the all the tires of the truck are able to sit on the concrete pad while dumping the dumpster. Concrete should be reinforced with welded wire fabric or reinforcing bars to assist in controlling cracking from drying shrinkage and thermal changes. Sawed or formed control joints should be included for each 225 square feet of area or less (15 feet by 15 feet). Saw cuts should not cut through the welded wire fabric or reinforcing steel and dowels should be utilized at formed and/or cold joints.

4.4 RETAINING WALL RECOMMENDATIONS

4.4.1 Lateral Earth Pressures

As mentioned previously, we understand that retaining walls will likely need to be constructed on the east and west sides of the proposed tennis courts in order to achieve any proposed grades. Therefore, we are providing equivalent fluid pressures for three backfill conditions for cantilever-type walls. These are 1) active earth pressure for granular backfill (clean sand or gravel), 2) at-rest earth pressure for granular backfill, and 3) at-rest earth pressure for fine-grained (silt or clay) backfill.

Condition 1 - The active earth pressure for granular backfill (free draining) will result in an equivalent fluid pressure of 30 pounds per cubic foot (pcf). If the granular backfill is to develop active earth pressure conditions, walls must be flexible and/or free to rotate or translate at the top approximately one inch laterally for every 20 feet of wall height.

Condition 2 - The at-rest earth pressure for granular backfill (free draining) will result in an equivalent fluid pressure of 45 pcf. For retaining walls that will not rotate or translate, such as building walls or other walls rigidly connected to structures, at-rest conditions will develop.

Condition 3 - Walls backfilled with fine-grained material (silt or clay) should be designed using the at-rest earth pressure whether restrained at the top, or not. Fine-grained soils typically creep over time which produces additional lateral stresses to the wall. The equivalent fluid pressure for this case is 70 pcf.

In all cases, forces from any expected surcharge loading including sloping backfill should be added to the equivalent fluid pressures. The walls should be properly drained to remove water or hydrostatic pressure should be added to the design pressure. Also, all backfill for the walls should be placed in accordance with the structural fill recommendations described hereinafter.

Table 6 – Earth Pressure Summary

Earth Pressure Condition	Backfill Type	Unit Weight (pcf)	Earth Pressure Coefficient
Active (Ka)	Granular	105	0.271
	On-Site Silts and Clays	120	0.390
At-Rest (Ko)	Granular	105	0.426
	On-Site Silts and Clays	120	0.562
Passive (Kp)	Granular	105	3.690
	On-Site Silts and Clays	120	2.561

Note: In each instance the earth pressure coefficients provided are unfactored.

For rigid, cast-in-place concrete walls, a friction factor of 0.35 between foundation concrete and the bearing soils may be used when evaluating friction. If a stone leveling course is utilized beneath the foundation, a friction factor of 0.50 between foundation concrete and the dense graded aggregate base may be used when evaluating friction. Also, an ultimate passive earth pressure resistance of well-compacted soil fill can be utilized to resist sliding (in conjunction with friction). However, to limit deformation when relying on passive strength, we recommend using a minimum safety factor of 3.0 applied to the ultimate passive resistance value. Additionally, this is based on the upper 2 feet of soil being neglected during the calculation of passive resistance.

4.4.2 Foundation Construction

All foundations for any retaining walls should either bear fully in residual soils/new fill soils or bear fully on the underlying bedrock layer. As previously mentioned, if there are areas where any bearing areas transition from soil to competent bedrock support, we recommend that the bedrock be removed to a minimum depth of 12 inches below the bearing elevation and be backfilled with dense graded aggregate. If the foundations are bearing in residual soils, new fill soils or “cushion” materials, the recommended maximum allowable bearing capacity for design of the foundations is 2,500 pounds per square foot (psf). If the foundations are bearing on the underlying sandstone layer, the recommended maximum allowable bearing capacity for design of the foundations is 3,500 psf. Additionally, the foundations should bear on

a relatively level bearing surface, which means that portions of the rock may need to be hammered to generate a level bearing surface. We recommend that continuous foundations be a minimum of 18 inches wide and isolated spread footings be a minimum of 24 inches wide to reduce the possibility of a localized punching shear failure. All exterior footings should be designed to bear at least 12 inches below finished exterior grade to protect against frost heave. Foundation subgrade observations should be performed by a GEOServices geotechnical engineer, or his qualified representative, so that the recommendations provided in this report are consistent with the site conditions encountered. This is of elevated importance due to the potential for differential bearing conditions within the foundation alignment.

5.0 CONSTRUCTION CONSIDERATIONS

5.1 EXCAVATIONS

Excavations should be sloped or shored in accordance with local, state, and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. The contractor is usually solely responsible for site safety. This information is provided only as a service and under no circumstances should UES be assumed to be responsible for construction site safety.

As previously mentioned, excavator refusal materials were encountered in each of the six test pits (TP-1 through TP-6) at depths ranging from 3.5 to 6 feet during field exploration. A detailed grading plan was not yet available at the time of this report; however, based on the existing grades, we anticipate that portions of the refusal materials may be near planned excavations for the proposed tennis courts and/or underground utilities. This is especially likely if excavations exceed 3 to 5 feet. If encountered, these materials may require difficult excavation techniques such as excavators with rock teeth, hoe-ramming, or blasting.

5.2 MOISTURE SENSITIVE SOILS

The fine-grained soils encountered at this site will be sensitive to disturbances caused by construction traffic and changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. Construction traffic patterns should be varied to prevent the degradation of previously stable subgrade. In addition, plastic soils which become wet, may be slow to dry and thus significantly retard the progress of grading and compaction activities. We caution if site grading is performed during the wet weather season, methods such as discing and allowing the material to dry will be required to meet the required compaction recommendations. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather. Climate data for nearby Chattanooga, Tennessee obtained from Weatherbase indicate in the following table the average monthly precipitation. The average amount of

precipitation does not vary much throughout the year. However, December through March is typically the difficult grading period due to the limited drying conditions that exist.

Table 7 – Average Precipitation Summary

Month	Monthly Precipitation Average (Inches)	Month	Monthly Precipitation Average (Inches)
January	4.9	July	4.9
February	4.8	August	3.5
March	5.0	September	4.0
April	4.0	October	3.3
May	4.1	November	5.0
June	4.1	December	4.9

5.3 DRAINAGE AND SURFACE WATER CONCERNS

To reduce the potential for undercut and construction induced sinkholes, water should not be allowed to collect in the foundation excavations, on floor slab areas, or on prepared subgrades of the construction area either during or after construction. Undercut or excavated areas should be sloped toward one corner to facilitate removal of any collected rainwater, subsurface water, or surface runoff. Positive site surface drainage should be provided to reduce infiltration of surface water around the perimeter of the building and beneath the floor slabs. The grades should be sloped away from the building and surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas of the building.

5.4 SINKHOLE CONSIDERATIONS

There is some inherent risk associated with building on any site underlain by carbonate rock. This risk can be reduced but not eliminated by preparing the site as described in this report. At this site, control of surface water during construction and over the project life will be very important to reduce the potential for sinkhole development. If a sinkhole develops, the appropriate corrective action is dependent on the

size and location of the sinkhole. As described herein, UES should be retained to observe site and subgrade preparation activities. If sinkhole conditions are observed, the type of corrective action is most appropriately determined by UES on a case-by-case basis.

6.0 LIMITATIONS

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. This report is for our geotechnical work only, and no environmental assessment efforts have been performed. The conclusions and recommendations contained in this report are based upon applicable standards of our practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

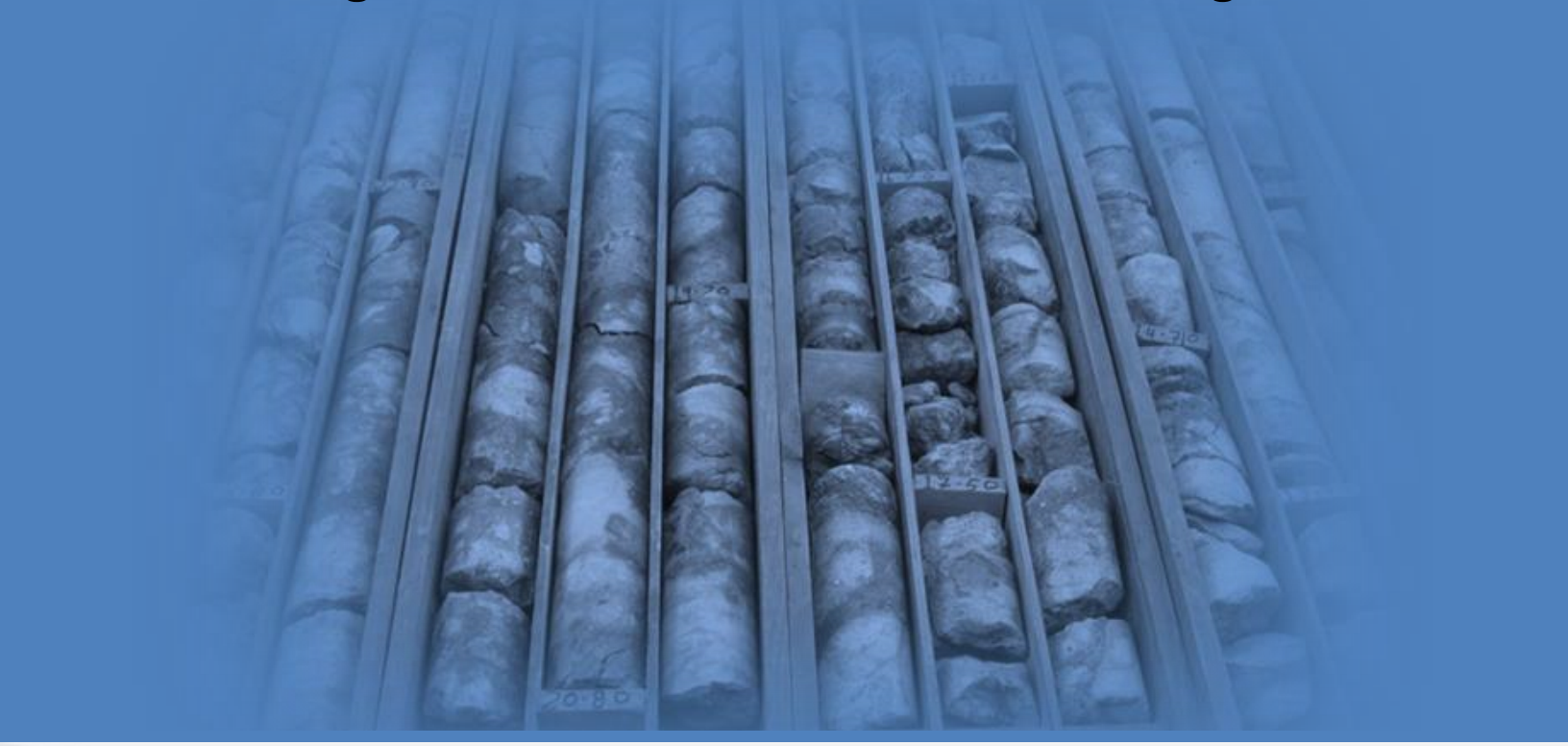
The analyses and recommendations submitted herein are based, in part, upon the data obtained from the exploration. The nature and extent of variations between the test pits will not become evident until construction. We recommend that UES be retained to observe the project construction in the field. UES cannot accept responsibility for conditions which deviate from those described in this report if not retained to perform construction observation and testing. If variations appear evident, then we will re-evaluate the recommendations of this report. In the event that any changes in the nature, design, or location of the project are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and conclusions modified or verified in writing. Also, if the scope of the project should change significantly from that described herein, these recommendations may have to be re-evaluated.

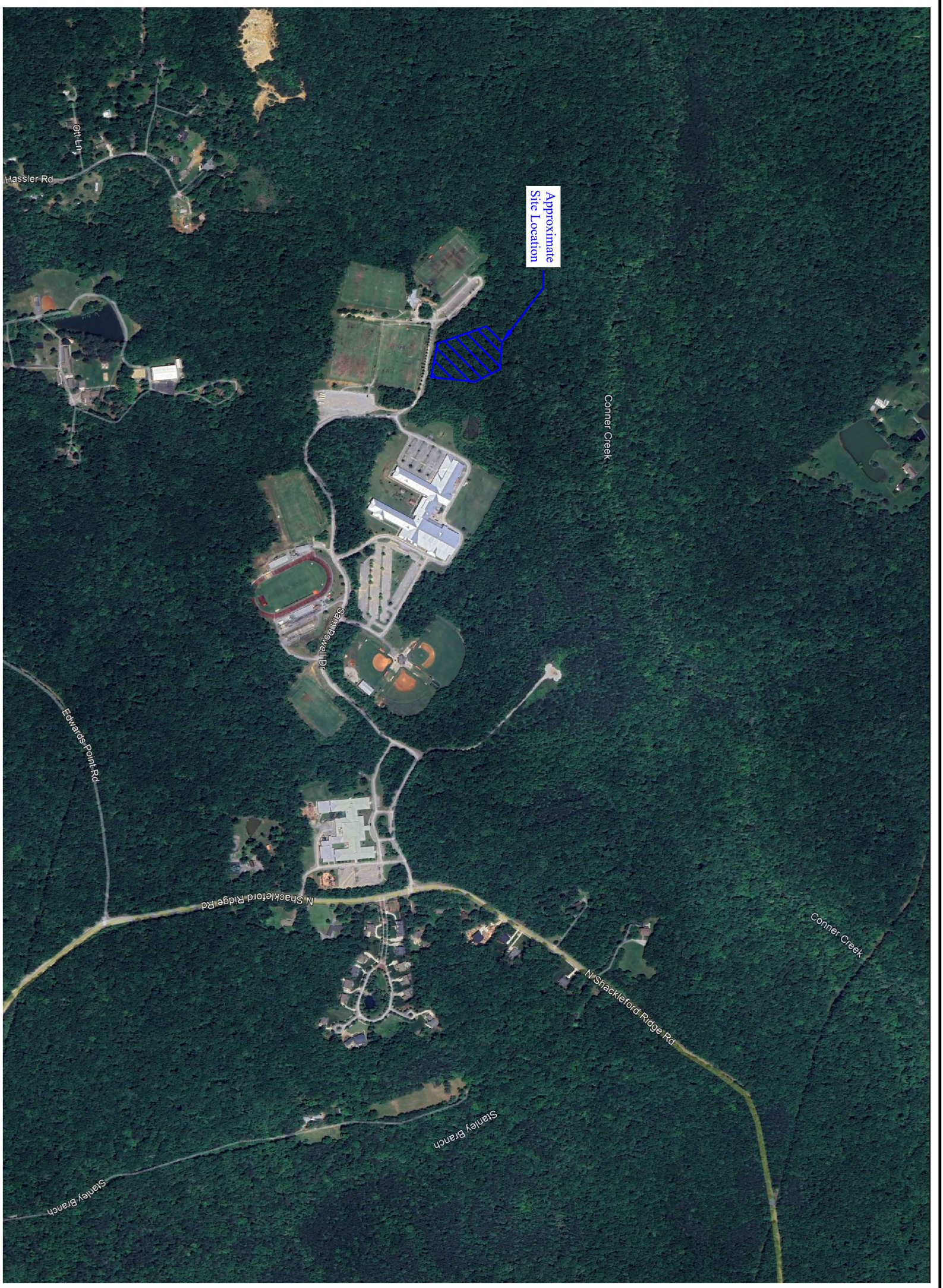
APPENDICES

UES™

APPENDIX A

Figures, General Notes, & Test Pit Logs





N

FIGURE 1

UES™

DRAWN BY:	LAS
APPROVED BY:	DKK
SCALE:	NTS
JOB NO.:	A24110.00147
DATE:	02/16/2024

SITE VICINITY MAP

Signal Mountain Middle High School Tennis Courts

Signal Mountain, Tennessee

NOTES:

1.) BASE MAP PROVIDED BY GOOGLE EARTH PRO (6/2022).

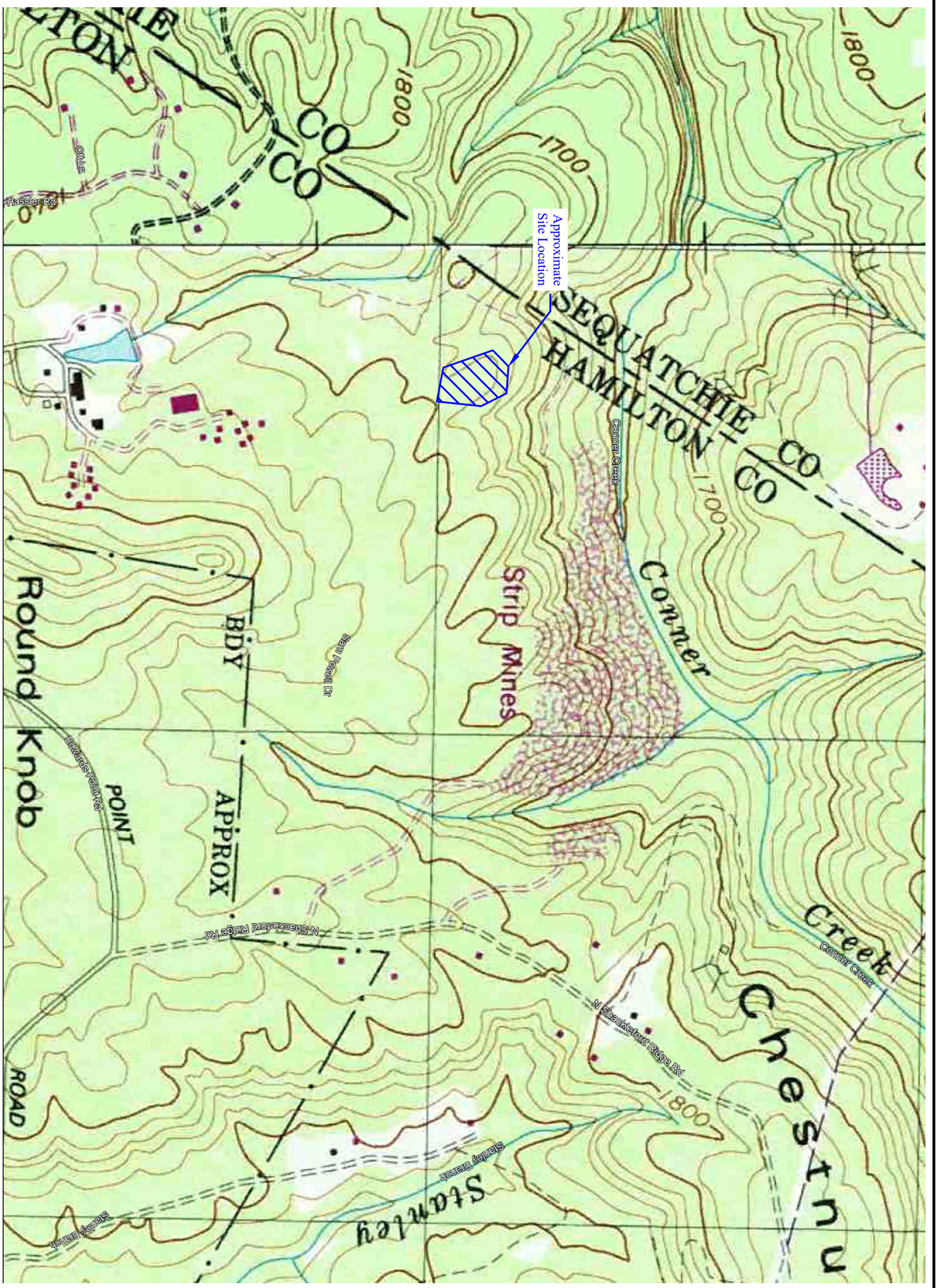


FIGURE 2

UES™

DRAWN BY:	LAS
APPROVED BY:	DKK
SCALE:	NTS
JOB NO.:	A24110.00147
DATE:	02/16/2024

USGS TOPOGRAPHIC MAP

Signal Mountain Middle High School Tennis Courts

Signal Mountain, Tennessee

NOTES:

1.) BASE MAP PROVIDED BY USGS TOPOGRAPHIC MAP (1969) - FAIRMOUNT QUADRANGLE (TN). (1943) - KETNER GAP QUADRANGLE (TN).

NOTES:

1.) BORING LOCATIONS ARE SHOWN IN GENERAL ARRANGMENT ONLY.
2.) DO NOT USE BORING LOCATIONS FOR DETERMINATIONS OF DISTANCES OR QUANTITIES.
3.) BASE MAP PROVIDED BY DH&W ARCHITECTURE.

LOCATION OF TEST PIT BORING
LOCATION OF INFILTRATION TEST BORING

BORING LOCATION PLAN

Signal Mountain Middle High School Tennis Courts
Signal Mountain, Tennessee

DRAWN BY:	LAS
APPROVED BY:	DKK
SCALE:	NTS
JOB NO.:	A24110.00147
DATE:	02/16/2024

UES TM

FIGURE 3

GENERAL NOTES

FINE AND COARSE GRAINED SOIL PROPERTIES

PARTICLE SIZE

BOULDERS:	GREATER THAN 300 mm
COBBLES:	75 mm to 300 mm
GRAVEL:	4.74 mm to 75 mm
COARSE SAND:	2 mm to 4.74 mm
MEDIUM SAND:	0.425 mm to 2 mm
FINE SAND:	0.075 mm to 0.425 mm
SILTS & CLAYS:	LESS THAN 0.075 mm

COARSE GRAINED SOILS (SANDS & GRAVELS)

N-VALUE	RELATIVE DENSITY
0 - 4	VERY LOOSE
5 - 10	LOOSE
11 - 30	MEDIUM DENSE
31 - 50	DENSE
OVER 50	VERY DENSE

FINE GRAINED SOILS (SILTS & CLAYS)

N-VALUE	CONSISTENCY	Qu, PSF
0 - 2	VERY SOFT	0 - 500
3 - 4	SOFT	500 - 1000
5 - 8	FIRM	1000 - 2000
9 - 15	STIFF	2000 - 4000
16 - 30	VERY STIFF	4000 - 8000
OVER 31	HARD	8000 +

STANDARD PENETRATION TEST (ASTM D1586)

THE STANDARD PENETRATION TEST AS DEFINED BY ASTM D1586 IS A METHOD TO OBTAIN A DISTURBED SOIL SAMPLE FOR EXAMINATION AND TESTING AND TO OBTAIN RELATIVE DENSITY AND CONSISTENCY INFORMATON. THE 1.4 INCH I.D./2.0 INCH O.D. SAMPLER IS DRIVEN 3-SIX INCH INCREMENTS WITH A 140 LB. HAMMER FALLING 30 INCHES. THE BLOW COUNTS REQUIRED TO DRIVE THE SAMPLER THE FINAL 2 INCREMENTS ARE ADDED TOGETHER AND DESIGNATED THE N-VALUE. AT TIMES, THE SAMPLER CAN NOT BE DRIVEN THE FULL 18 INCHES. THE FOLLOWING REPRESENTS OUR INTERPRETATION OF THE STANDARD PENETRATION TEST WITH VARIATIONS.

BLOWS/FOOT (N-VALUE)	DESCRIPTION
25	25 BLOWS DROVE SAMPLER 12" AFTER INITIAL 6" SEATING
75/10"	75 BLOWS DROVE SAMPLER 10" AFTER INITIAL 6" SEATING
50/PR	PENETRATION REFUSAL OF SAMPLER AFTER INITIAL 6" SEATING

SAMPLING SYMBOLS

ST:	UNDISTURBED SAMPLE
SS:	SPLIT SPOON SAMPLE
CORE:	ROCK CORE SAMPLE
AU:	AUGER OR BAG SAMPLE

SOIL PROPERTY SYMBOLS

N:	STANDARD PENETRATION, BPF
M:	MOISTURE CONTENT %
LL:	LIQUID LIMIT %
PI:	PLASTICITY INDEX %
Qp:	POCKET PENETROMETER VALUE, TSF
Qu:	UNCONFINED COMPRESSIVE STRENGTH, TSF
DUW:	DRY UNIT WEIGHT, PCF

ROCK PROPERTIES

ROCK QUALITY DESIGNATION (RQD)

PERCENT	QUALITY
90 TO 100	EXCELLENT
75 TO 90	GOOD
50 TO 75	FAIR
25 TO 50	POOR
0 TO 25	VERY POOR

ROCK HARDNESS

VERY SOFT:	ROCK DISINTEGRATES OR EASILY COMPRESSES TO TOUCH: CAN BE HARD TO VERY HARD SOIL.
SOFT:	ROCK IS COHERANT BUT BREAKS EASILY TO THUMB PRESSURE AT SHARP EDGES AND CRUMBLES WITH FIRM HAND PRESSURE.
MODERATELY HARD:	SMALL PIECES CAN BE BROKEN OFF ALONG SHARP EDGES BY CONSIDERABLE HARD THUMB PRESSURE: CAN BE BROKEN BY LIGHT HAMMER BLOWS.
HARD:	ROCK CAN NOT BE BROKEN BY THUMB PRESSURE, BUT CAN BE BROKEN BY MODERATE HAMMER BLOWS.
VERY HARD:	ROCK CAN BE BROKEN BY HEAVY HAMMER BLOWS.

UES™

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.: TP-1	UES
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	LEAN CLAY (CL) with trace sand - red brown; soft; moist (RESIDUUM)					
		3-2-2 @2'				25
2.0						
3.0	LEAN CLAY (CL) with sand - red brown; moist (RESIDUUM)					
						11
4.0						
5.0	Excavator Refusal at 4.5 Feet					
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments:

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.:	TP-2
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (10 inches)					
1.0	LEAN CLAY (CL) with trace sand - light brown and tan; firm; moist (RESIDUUM)					
		6-6-9 @2'				23
2.0	LEAN CLAY (CL) with sand and sandstone fragments at depth - red brown and light brown; moist (RESIDUUM)					
3.0						
						21
4.0						
	Excavator Refusal at 4.5 Feet					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments:

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.: TP-3	UES™
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	LEAN CLAY (CL) with trace sand - light brown; firm; moist (RESIDUUM)					
2.0		5-7-8 @ 2'				
3.0						
	LEAN CLAY (CL) with sand and sandstone fragments (increasing with depth) - red brown and light brown; stiff; moist (RESIDUUM)					
4.0		10-11-12 @ 4'				
5.0						
	Excavator Refusal at 5 Feet					
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: _____

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.: TP-4	UES
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	LEAN CLAY (CL) with trace sand - light brown; soft; moist (RESIDUUM)					
2.0		3-3-3 @ 2'				22
3.0	LEAN CLAY (CL) with sand - red brown; moist (RESIDUUM)					
4.0	Excavator Refusal at 3.5 Feet					
5.0						
6.0						
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments: _____

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.: TP-5	UES
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (12 inches)					
1.0						
	LEAN CLAY (CL) with trace sand - light brown; stiff; moist (RESIDUUM)	8-8-10 @ 2'				
2.0						
	LEAN CLAY (CL) with sand - red brown; stiff; moist (RESIDUUM)					
3.0						
		9-10-10 @ 4'				
4.0	LEAN CLAY (CL) with sand and sandstone fragments - red brown and light brown; moist (RESIDUUM)					
5.0						
6.0	Excavator Refusal at 6 Feet					
7.0						
8.0						
9.0						

Excavated test pit

Excavated material

Comments:

Signal Mountain MHS Tennis Courts	TEST PIT OBSERVATION RECORD	
Signal Mountain, Tennessee	Test Pit No.: TP-6	UES
UES Project No. A24110.00147		
Date Excavated: February 22, 2024	**Observed By:** Chad Shaughnessy	

Depth (feet)	Material Description	DCP Values	LL	PL	PI	%M
	Topsoil (8 inches)					
1.0	LEAN CLAY (CL) trace sand - light brown and tan; firm; moist (RESIDUUM)					
		6-6-7 @ 2'				
2.0	LEAN CLAY (CL) with sand - red brown; stiff; moist (RESIDUUM)					
3.0						
		8-10-9 @ 4'				
4.0	LEAN CLAY (CL) with sand and sandstone fragments - red brown; moist (RESIDUUM)					
5.0	Excavator Refusal at 5 Feet					
6.0						
7.0						
8.0						
9.0						

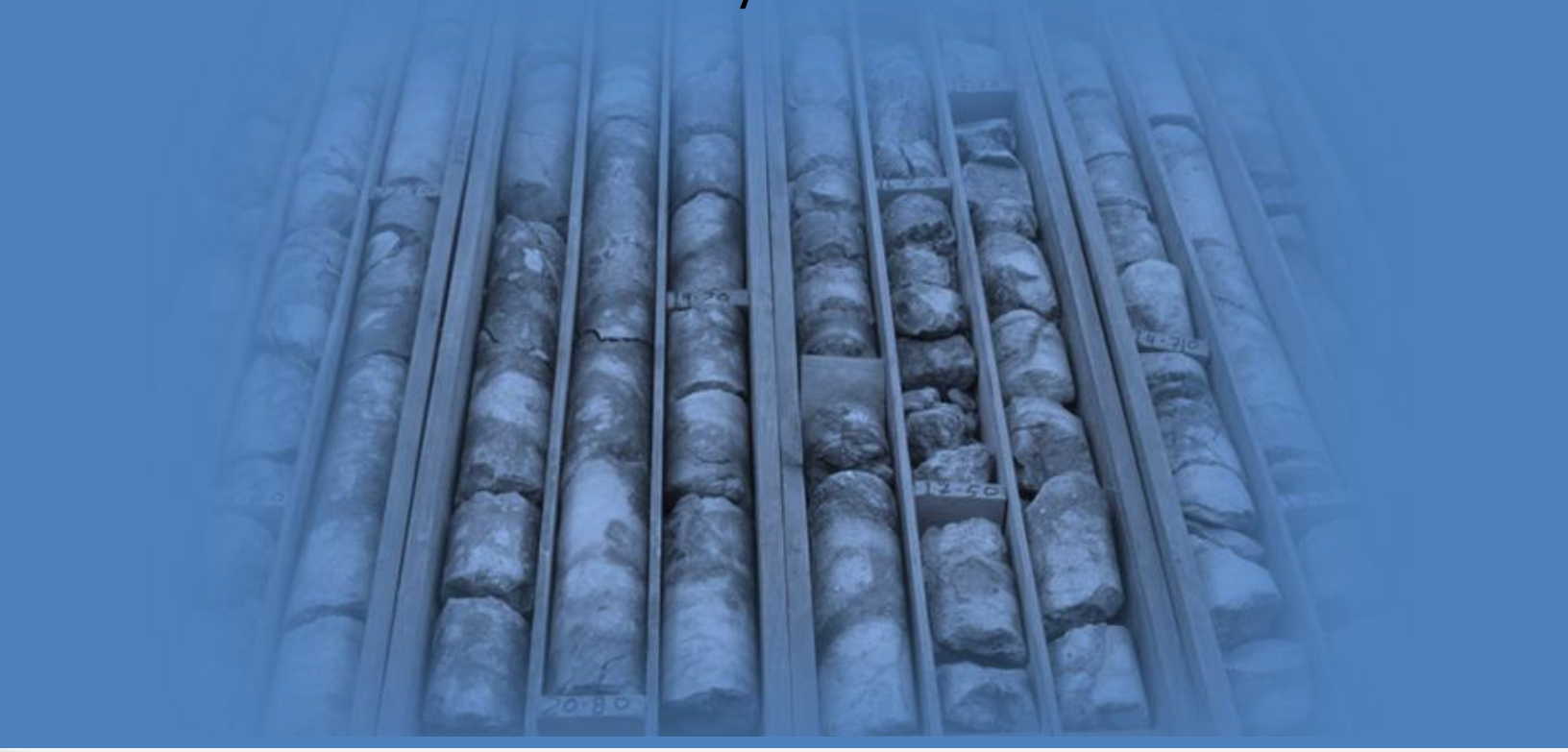
Excavated test pit

Excavated material

Comments:

APPENDIX B

Laboratory Test Results



Signal Mountain MHS Tennis Courts
Signal Mountain, Tennessee
A24110.00147
February 27, 2024

LABORATORY SUMMARY SHEET

Boring Number	Sample Number	Depth (feet)	Natural Moisture Content	Atterberg Limits			Soil Type
				LL	PL	PI	
TP-1	1	2	24.7%				
		4	10.6%				
TP-2	1	2	22.7%				
	2	4	20.7%				
TP-4	1	2	21.7%				