PROJECT MANUAL

for

Park Hill School District
Middle School Track & Field Construction
Lakeview and Plaza Middle Schools

Kansas City, Missouri

Bid Set: January 8, 2019

Prepared by:

VSR Design
Kaw Valley Engineering
Smith & Boucher
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END OF SECTION
REQUEST FOR PROPOSALS

Sealed proposals for the Park Hill School District (Owner) for a Sports Field Renovation/Construction project at the Park Hill High School, will be received at the Park Hill School District, 8500 NW River Park Drive, Pillar 116, Riverside, Missouri 64152 until **10:00 a.m. local time, Monday, January 29, 2019**, at which time and place the bids will be opened and read aloud (*fax bids are not accepted*). Bids received after the time stated above will be returned un-opened.

Project name: Park Hill High School ArtificialTurf Replacement and Artificial Turf construction

Project Address: 7701 NW Barry Rd, Kansas City, MO 64153

Project Description: Remove and replace the existing football stadium artificial turf, construction of a new artificial turf soccer field, track repairs, track structural spray and re-stripe, baseball sports lighting, alternate bids for a softball field and parking lot. This project is TAX EXEMPT.

Contractors shall submit Contractor’s Qualification Statement, AIA Document A305 with the sealed bid. This qualification Statement document is available at the office of the American Institute of Architects (AIA) at 104 West ninth Street, Kansas City, MO 64105. Upon review of the Qualification Statement document, the Owner shall have the right to take such steps as he deems necessary to determine the ability of the Contractor to perform the work, and the Contractor shall furnish to the Owner such additional information and data for this purpose, as they may request. The right is reserved to reject any Bid after an investigation or consideration of the information and data submitted by such Contractor.

Bid Documents: Bid Documents are available from VSR Design, vance@vsrdesign.net, 913-484-5211. A set of plans and specifications will be provided to each bidder electronically in pdf format.

**A VOLUNTARY pre-bid conference will be held in the football stadium press box on Tuesday, January 15, 2019 at 11:00 a.m. All interested contractors are STRONGLY ENOURAGED to attend.**

All bidders shall visit the site prior to submitting bids. Site visits, other than the scheduled pre-bid conference must be coordinated with VSR Design, Contact Vance Rzepka, 913-484-5211.

The owner reserves the right to waive any defects and informalities in Bids, to reject any or all Bids, to take any or all Bids under advisement, or to accept any Bid as may be deemed in its interest of meeting the standards of lowest responsible Bid.

Questions can be directed to the attention of Vance Rzepka at VSR Design via email, vance@vsrdesign.net **Deadline to submit questions is Tuesday, January 22, 2019.** Questions will not be taken verbally or in person.

Project Completion: Construction shall be complete as indicated in Specification Section 01010.

END OF SECTION
AIA 201 – GENERAL CONDITIONS


B. Sample of the Agreement may be obtained from: Kansas City AIA, 1801 McGee, Suite 100, Kansas City, MO 64108 Phone: 816-221-3485 www.aiakc.org
CONTRACTOR AGREEMENT

THIS CONTRACTOR AGREEMENT (this “Agreement”) is made and entered into this ______ day of ____________, 2019 by and between Park Hill School District, a Missouri public school district (“Owner”), and ________________________, a Missouri corporation (“Contractor”).

WHEREAS, on ____________, 2019, Owner released a request for bid containing Owner’s Contract Documents, along with drawings, plans, and/or specifications prepared by ________________________, (collectively, the “Project Specifications”), each attached hereto as Exhibit A and incorporated herein, to obtain bids from contractors for ________________________, (the “Project”);

WHEREAS, bids for the Project were due by ____________, 2019; and

WHEREAS, upon Owner’s completion of its bid selection process, Owner selected Contractor’s bid response attached hereto as Exhibit B and incorporated herein (the “Bid”, and together with this Agreement and the Project Specifications, the “Project Documents”), as the most acceptable bid and Owner now desires to hire Contractor to perform the construction work (the “Work”) required for the Project.

NOW, THEREFORE, in consideration of the mutual covenants and other considerations contained herein, the parties hereto agree as follows:

1. **Contract Amount.** The parties acknowledge and agree that the Project is a lump sum project. The lump sum amount shall include, but not be limited to, all costs, permit fees, profit, overhead, supervision, labor, materials, equipment, taxes, utilities, insurance, bonds, expenses, and compensation of every kind related to the Work and shall be referred to as the “Contract Amount.” Provided that Contractor performs all Work in accordance with the Project Documents, Owner will pay Contractor the lump sum Contract Amount of ________________________ Dollars ($______________).

2. **Payment.** For purposes of payment of the contract amount, the procedure under this Agreement will be as follows:

   (i) **Notice of Substantial Completion.** Contractor shall give written notice to Owner upon substantial completion of the Project, or a designated portion thereof. Subsequently, Owner shall provide to Contractor a list the items of Work to be corrected or completed prior to final payment (i.e. punch list work).

   (ii) **Punch List Completion.** Contractor shall, as soon as possible, correct or complete the items or work noted on the punch list. Owner’s Representative shall inspect the corrected or completed items of Work within five (5) days after notice of final correction or final completion of each such item of Work and, if acceptable, shall promptly provide notice of acceptance of such items of Work to Contractor.
(iii) **Pay Application.** Following final inspection and acceptance of the Work, including acceptance of all Project closeout documents by Owner’s Representative, Contractor shall submit an application for payment for the Contract Amount. The application for payment shall be due and paid by Owner within thirty (30) days of the date of said application. Upon Contractor’s receipt of the entire payment, Contractor will issue a duly executed final release and waiver of lien. Full payment of the application for payment shall constitute a waiver of all claims and disputes under this Agreement, except those relating to warranty work and those confirmed in writing at the time of payment.

3. **Subcontractors.** The Work shall be performed by Contractor and/or Subcontractors selected by and subcontracted to Contractor. Contractor shall select competent Subcontractors and shall be responsible for the management of the Subcontractor’s performance of their work. A “Subcontractor” as used herein is a person or entity which has a direct written contract with Contractor to perform portions of the Work in connection with the Project. The term Subcontractor does not include any separate contractor employed by Owner or their subcontractors. The parties agree that Owner has the right to reject a Subcontractor at any time for any reason.

4. **Pre-Construction Investigation.** Owner and Contractor agree that Owner has selected Contractor for this Project because of Contractor’s expertise in constructing similar projects and knowledge of this Project. Before executing this Agreement, Contractor has fully reviewed the Project Specifications and conducted all reasonable site inspections and testing to become familiar with existing conditions, including, without limitation, (1) the location, condition, layout, and nature of the Project sites and surrounding areas, (2) generally prevailing climatic conditions, (3) labor supply and costs, and (4) availability and cost of materials, tools, and equipment. Owner shall not be required to make any adjustment in either the Contract Amount or the time for performance of the Work because of Contractor’s failure to do so.

5. **Owner Responsibilities and Representations.** Owner shall designate an Owner’s representative (“Owner’s Representative”) who shall be acquainted with the Project and who shall have authority to approve changes in the scope of the Project, render approvals and decisions promptly to avoid unreasonable delay, and furnish information expeditiously and in time to meet the dates set forth in the construction schedule. Owner shall assist Contractor as needed to secure necessary permits, approvals, easements, and like items required for the construction, connection, use, or occupancy of permanent structures or for permanent changes in existing facilities. In its review and inspection, if Owner becomes aware of any error, omission, fault or defect in the Work, or non-conformance, it shall give prompt notice thereof to Contractor. Owner shall have no contractual obligation to Contractor’s Subcontractors and shall at all times communicate with such Subcontractors only through Contractor. Owner represents and warrants that it has all requisite power and authority to execute, deliver, and perform its obligations under this Agreement, and the execution, delivery, and performance by it of this Agreement has been duly authorized by all necessary action on its part, and the execution, delivery, and performance of this Agreement will not result in a breach or violation of or conflict with, or constitute a default under, any term or provision of any mortgage, license, agreement or other instrument, or any judgment, decree, governmental order, statute, rule or regulation, by which Owner is bound.
6. **Contractor Representations.** Contractor represents and warrants that it maintains all necessary licenses, registrations, competence, and experience to perform all the Work and that it has all requisite power and authority to execute, deliver, and perform its obligations under this Agreement, and the execution, delivery, and performance by it of this Agreement has been duly authorized by all necessary action on its part, and the execution, delivery, and performance of this Agreement will not result in a breach or violation of or conflict with, or constitute a default under, any term or provision of any mortgage, license, agreement or other instrument, or any judgment, decree, governmental order, statute, rule or regulation, by which Contractor is bound.

7. **Pre-construction Services and Progression.** The parties anticipate a pre-construction phase. During this time, Contractor will:

   (a) Coordinate all zoning and construction approvals;

   (b) Obtain all required building permits;

   (c) Produce and update the Project schedule; and

   (d) Contract with qualified Subcontractors.

Owner agrees that Owner’s Representative will be available and have authority to make decisions during the pre-construction phase.

8. **Project Completion.** The parties agree that time is of the essence in completing the Project. Contractor shall fully complete the Work for acceptance by Owner by August 5, 2019 (“Completion Deadline”) and shall meet any other deadlines set forth in the Project Specifications. The parties agree that should Contractor be delayed by Owner, or Owner’s inability to meet its Project obligations, Contractor will be entitled to a reasonable time extension. If Contractor believes it is being delayed by Owner it must provide written notice within 3 days of the event giving rise to the delay. If Contractor fails to give written notice, it waives any claim for additional time.

9. **Liquidated Damages.** Contractor and Owner recognize that time is of the essence as stated in Section 9 above, and that Owner will suffer financial and other loss if the Work is not completed by the Completion Deadline. The parties also recognize the delays, expense, and difficulties involved in proving in a legal, arbitration, or similar proceeding the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty), Contractor shall pay Owner $1,000 for each day that expires after the Completion Deadline until the Work is fully complete. At Owner’s option, any liquidated damages can be reduced from the Contract Amount.

10. **Performance of the Work.** Contractor agrees to furnish efficient business administration and superintendence, and to use every commercially reasonable effort to perform the Work in a diligent and safe manner, to keep upon the Work at all times an adequate supply of qualified workers, machinery, and materials and to promote the progress of the Work consistent with Contractor’s construction schedule. Contractor shall employ and direct all persons performing any Work covered by this Agreement. It is the intention of this Agreement that Contractor shall
be and remain an independent contractor and nothing herein is intended to be construed as inconsistent with that status. Contractor shall be free to control the manner and method by which the Work shall be performed and shall inform all persons employed by it and any Subcontractor that they are employed by and work for Contractor or Subcontractor and not Owner.

11. **Insurance.** Contractor agrees to provide and maintain the following insurance for the duration of this Agreement.

   (a) Comprehensive General Liability Insurance with policy limits of no less than $1,000,000 per occurrence and $2,000,000 aggregate for bodily injury and property damage.

   (b) Automotive Liability Insurance covering owned or rented vehicles operated by Contractor with policy limits of no less than $1,000,000 combined single limit and aggregate for bodily injury and property damage.

   (c) Workers’ Compensation Insurance at statutory limits and Employer’s Liability Insurance with a policy limit of not less than $500,000.

Contractor shall furnish to Owner Certificates of Insurance or duplicate policies of insurance described above. The Certificates must name Owner as an additional insured under the policies and provide an endorsement under the terms of which the insurer specifically agrees not only to pay any claims incurred by or resulting to Owner, but also agrees to enter a defense on behalf of Owner. The defense includes any and all suits or actions, in which the liability of Owner is vicarious and is predicated upon allegation of some act of omission by Contractor, subcontractor, or his or her agents. Purchase order(s) will not be issued until Certificates of Insurance are received. Such certification must contain a provision for notification of Owner thirty (30) days in advance of any material change in coverage or cancellation. Notification shall be in writing and signed in ink by a duly authorized officer of the Insurer. Insurance Companies are subject to approval and may be rejected by Owner without stated cause.

   (d) **Insurance Required of Subcontractors.** Contractor shall require all Subcontractors to provide and maintain Worker’s Compensation and Employers’ Liability Insurance as required by law of an employer. Contractor shall also require all Subcontractors to provide and maintain insurance including but not limited to the insurance covering the operation of automobiles, trucks and other vehicles protecting Owner from liability arising from injuries, including death suffered by persons other than Subcontractor’s employees and liability for damages to property arising from and growing out of the Subcontractor’s operations in connection with the performance of its subcontract. Such insurance covering personal injuries or death shall be in the sum of not less than $200,000 per occurrence and $500,000 aggregate, and the insurance covering damage to property shall be in the sum of not less than $200,000 for one accident and $500,000 aggregate.

12. **Surety Bond.** Contractor will provide a Performance and Payment Bond, with surety and on forms approved by Owner, in the amount of $_________________ (100% of the Contract Amount), that Contractor will promptly and faithfully perform all obligations under the Agreement.

13. **Indemnification.** Contractor shall indemnify and hold harmless Owner, its agents, and employees from or on account of any injuries or damages, received or sustained by any person
or persons, during or on account of the performance of work or any operation connected with this Agreement; or by consequence of any negligence (excluding negligence by Owner, its agents, or employees) in connection with the same; or by use of any improper materials or by or on account of any act or omission of said Contractor or its subcontractors, agents, servants, or employees. Contractor further agrees to indemnify and hold harmless Owner, its agents, or employees, against claims or liability arising from or based upon the violation of any federal, state, county, city, or other applicable laws, bylaws, ordinances, or regulations by Contractor, its agents, associates, or employees. Contractor is obligated to defend at its own expense or to provide for such defense, at Owner’s option, of any and all claims of liability and all suits and actions of every name and description that may be brought against Owner which may result from work, the operations and activities under this Agreement whether or not the installation operations be performed by Contractor, subcontractor, or by anyone directly or indirectly employed or directed by them.

14. **Termination.**

(a) **By Owner for Cause.** If Contractor fails to perform in accordance with the provisions of this Agreement, refuse or should fail to supply enough properly skilled workers or proper materials, or if it should fail to make prompt payment when due to Subcontractors or for material or labor or persistently disregard laws, ordinances, and should Contractor fail to correct such condition within seven (7) days after receipt of written notice thereof from Owner, then Owner may, without prejudice to any other right or remedy it may have at law or in equity, terminate this Agreement and take possession of the premises and of all materials, tools, and appliances thereon (excluding equipment owned or rented by Contractor), and finish the Work by whatever method it may deem expedient.

(b) **By Contractor for Cause.** If Owner fails to perform in accordance with the provisions of this Agreement and fails to correct such condition within seven (7) days after receipt of written notice thereof from Contractor, then Contractor may, without prejudice to any other right or remedy it may have at law or in equity, terminate this Agreement and recover from Owner payment for Work performed.

(c) **By Owner for Convenience.** In addition to any other rights Owner may have at law or in equity or under this Agreement, Owner may, without cause, terminate this Agreement in whole or in part, if Owner determines that a termination is appropriate for its convenience. Contractor will be entitled to payment for the Work performed but shall not be entitled to anticipated profit on Work unperformed.

15. **Title to Work.** Title to all Work completed in the course of construction and to which payment has been received by Contractor, shall be in the name of Owner.

16. **Warranty.**

(a) **Warranty Period.** Contractor shall exercise high professional skill, care, and diligence in the performance of the Work, and shall carry out its responsibilities in accordance with customarily accepted good professional practices. Contractor warrants and guarantees for one (1) year from the date of completion and acceptance of the Work that the completed Work is free from all defects due to faulty materials or workmanship. Contractor shall promptly make such
corrections as may be necessary by reason of such defects including the repair of any other
damages that were caused by defects in the Work, at its own expense. Owner will give notice of
observed defects with reasonable promptness. In the event that Contractor fails to make such
repairs, adjustments, or other work that may be necessary by such defects, Owner may do so and
charge Contractor the cost thereby incurred. In an emergency where, in the judgment of Owner,
delay would cause serious loss or damage, repairs and replacement of defects in the Work and
damage caused by defects may be made without notice being sent to Contractor, and Contractor
shall pay the cost thereof. The performance bond shall remain in full force and effect through the
warranty period.

(b) **Warranty Exclusions.** The warranty does not include defects or non-
conformance caused by: (1) normal wear and tear; (2) modifications, abuse, improper maintenance
or repair, or improper operation on the part of someone other than Contractor; or (3) fire, flood,
earthquake or other casualty or property losses.

(c) **Correction.** If within the warranty period, Contractor receives notice from
Owner that any of the Work is found to be not in accordance with the requirements of the Project
Documents, and such Work was in fact performed in conflict with the requirements of the Project
Documents, Contractor shall correct it after receipt of written notice from Owner to do so. Owner
shall give such notice promptly after discovery of the condition.

(d) **Manufacturers’ Warranties.** If available, any manufacturers’ extended
warranties concerning equipment or materials installed, will run to the benefit of Owner and be
assigned to Owner by Contractor.

17. **Additional Provisions.**

(a) **Safety.** Contractor shall take necessary precautions for the safety of its
employees on the Work, and shall comply with applicable provisions of federal, state and
municipal safety laws and shall include in all subcontracts provisions requiring that its
Subcontractors be responsible for the safety of their employees on the Work, and to comply with
all applicable provisions of federal, state and municipal safety laws.

(b) **Clean-up.** Contractor shall keep the Project sites reasonably free from the
accumulation of waste materials caused by Contractor’s operations. At the completion of the
Work, Contractor shall remove from the Project sites its tools, surplus materials, construction
equipment, machinery, and waste materials and shall restore the Project sites to their original
condition.

(c) **Unreasonable Interference.** Contractor shall use all reasonable efforts to
not unreasonably interfere with the business of Owner on the sites where the Project is located.

18. **Prevailing Wage.** Contractor agrees that it, and its Subcontractors, will comply with
the applicable requirements of Missouri Prevailing Wage Law on the Project.

19. **Miscellaneous.**

(a) **Successors and Assigns.** This Agreement shall be binding on the
successors, assigns, and legal representatives of Owner and Contractor. Neither party shall assign or transfer this Agreement or an interest in this Agreement without the written consent of the other.

(b) **Governing Law and Venue.** This Agreement shall be governed by the laws of the State of Missouri. Venue for any dispute under this Agreement will be the Circuit Court of Platte County, Missouri.

(c) **Interpretation.** Any and all headings of this Agreement are for convenience of reference only and do not modify, define or limit the provisions thereof. Words importing the singular number shall include the plural number and vice versa. All addendums and exhibits attached hereto, or referenced herein, are incorporated herein by this reference. All references to any person or entity shall be deemed to include any person or entity succeeding to the rights, duties and obligations of such person or entity in accordance with the terms of this Agreement.

(d) **Attorneys’ Fees.** In any proceeding (judicial or otherwise) brought by one party hereto against the other to enforce or interpret the terms of this Agreement or to resolve any dispute concerning any part of the Work or the construction of the Project, the party prevailing in the proceeding shall be entitled, in addition to any other relief, to an award of all its costs incurred in connection with the proceeding, including the reasonable fees and disbursements of its attorneys.

1.1. **Notice.** All notices, requests, demands, directions and other communications (collectively “notices”) required or permitted by this Agreement to be given in writing shall be transmitted by first class mail, registered or certified mail, return receipt requested, postage prepaid; overnight courier service; e-mail; or facsimile:

If to Contractor:

____________________
Attention: ____________
Telephone: ____________
Facsimile: ____________

If to Owner:

Park Hill School District
7703 NW Barry Road
Kansas City, MO 64153
Attention: Director of Operations
Telephone: (816) 359-6477
E-Mail: RichJ@parkhill.k12.mo.us
Facsimile: 816-359-4109

Any notice properly given shall be effective upon receipt.

(e) **Severability.** In the event that any provision of this Agreement shall, for any reason, be determined to be invalid, illegal, or unenforceable in any respect, the other
provisions of this Agreement shall remain in full force and effect so as to give effect as nearly as possible to the parties’ original intent.

(f) **Counterparts.** This Agreement may be executed in one or more counterparts, each of which shall be considered an original and all of which shall constitute but one and the same instrument. Delivery of any such counterpart by facsimile transmission or electronic transmission shall constitute legal delivery. Facsimile and electronically scanned signatures shall be deemed to constitute originals.

(g) **Entire Agreement and Modification.** This Agreement supersedes all prior agreements between the parties with respect to its subject matter and, together with the Project Specifications and Bid, constitutes the entire agreement and understanding between Owner and Contractor. The parties agree that the Project Specifications and Bid attached hereto as Exhibit A and Exhibit B, respectfully, are material requirements of the Project and are fully incorporated into this Agreement as if fully set forth herein. This Agreement may be amended or modified only by a written amendment to the Agreement signed by both parties except that Contractor may be furnished with additional instructions and detail drawings as necessary to carry out the Work required by the Project Documents. The additional drawings and instructions thus supplied will become a part of the Project Documents. In the event of any conflict between the Project Specifications, the Bid, and this Agreement, the terms and provisions of this Agreement shall control.

[Remainder of Page Intentionally Left Blank – Signature Page to Follow]
IN WITNESS WHEREOF, the parties hereto have executed this instrument, through their authorized officers, effective the date first above written.

OWNER:

PARK HILL SCHOOL DISTRICT,
a Missouri public school district

By: ________________________________
    Name: __________________________
    Title: __________________________

CONTRACTOR:

________________________________________,
a _________(state) corporation

By: ________________________________
    Name: __________________________
    Title: __________________________
EXHIBIT A

Project Specifications
EXHIBIT B

Bid Response Form
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End of Section
PROPOSAL FORM

PROPOSAL for:

Park Hill High School Athletic Complex Renovation

PROPOSAL OF:

(Hereinafter called “Bidder”),

A CORPORATION* ORGANIZED AND EXISTING UNDER THE LAWS
OF THE STATE OF___________________________________________________

A PARTNERSHIP* CONSISTING OF________________________________________

AN INDIVIDUAL* TRADING AS_________________________________________

*Complete applicable designation.

TO: PARK HILL MISSOURI PUBLIC SCHOOLS
4500 NW River Park Drive
Parkville, MO

1. The undersigned, having familiarized itself with local conditions affecting the cost of the work at the place where the work is to be done and with all Bidding Documents, including the Instructions to Bidders, Plans and Specifications, General and Supplementary Conditions, the Standard Form of Agreement and the other Contract Documents, and having examined the location of the proposed work and considered the availability of labor and materials, hereby proposes and agrees to perform everything required to be performed, and to provide and furnish any and all labor, materials, supervision, necessary tools, equipment, and all utility and transportation service necessary to perform and complete in a workmanlike and timely manner all of the work required for the project, all in strict conformance with the Instructions to Bidders and other Contract Documents (including Addenda Nos. ______, through _______, the receipt of which is hereby acknowledged), for the lump sums hereinafter specified.

2. FOR BASE BID

Lump Sum price to: Football Stadium - remove and dispose of the artificial turf field inside running track, installation of turf and pad matching Park Hill South (Shaw & Brock) and installation of new concrete curb around long/triple jump sand pits, new concrete sidewalks and drainage improvements around the track, removal and replacement of pole vault runway and pad, including base mat and structural spray on runway, structural spray and re-stripe existing track and runways and D-zone. Soccer Field - Excavation and grading for new soccer field, softball field, and parking lot, installation of field drainage pipe, gravel, filter fabric, perimeter nailer, perimeter fencing, and sidewalks. Baseball Field Lighting – Installation of a new Musco sports lighting system around the existing baseball field (center field fencing will be installed by the District).

The Lump Sum of_______________________________________________________

_________________________________________ Dollars ($_____________________

(THIS PROJECT IS A PREVAILING WAGE LABOR RATE JOB. ALL WAGES FOR THIS PROJECT MUST COMPLY WITH STATE OF MISSOURI, PLATTE COUNTY, MOST CURRENT ANNUAL WAGE ORDER #25. RECORDS OF COMPLIANCE SHALL BE KEPT BY CONTRACTOR AND SUBMITTED TO OWNER WITH EACH PAY APPLICATION)
Additional breakdown requirements are described in Section 01010 Summary of Work, Part 1.11 – Additional Owner Requested Bid Breakdown. The Owner intends to evaluate each bid in its entirety and will make its decision based on the information included described in the Summary of Work Part 1.11, as well as the price included above.

3. **Alternate Proposals:** The Owner intends to consider multiple turf types and companies in their evaluation of the overall proposal. Bidder will complete the work designated by the alternates that follow and accept in full payment for those parts of the work at the following Bid Prices. Bidders are encouraged to submit additional voluntary alternates.

1. Softball Field and Parking Lot- Lump Sum price to construct the softball field and parking lot. (Grading for Softball field and site detention/water quality structures are part of base bid)
   
   Lump Sum price of: ________________________________
   
   Dollars ($__________________________).

2. Voluntary Alternative.
   
   Description ________________________________
   
   Lump Sum Add or (Deduct) price of: ________________________________
   
   Dollars ($__________________________).

   
   Description ________________________________
   
   Lump Sum Add or (Deduct) price of: ________________________________
   
   Dollars ($__________________________).

   
   Description ________________________________
   
   Lump Sum Add or (Deduct) price of: ________________________________
   
   Dollars ($__________________________).

5. Voluntary Alternative.
   
   Description ________________________________
   
   Lump Sum Add or (Deduct) price of: ________________________________
   
   Dollars ($__________________________).

Additional voluntary alternates may be submitted on separate pages.
4. **Unit Prices:**

1. Replacement of rotted or otherwise defective perimeter nailer (Football).

   Per foot price (100 LF minimum): ________________________________

   Dollars ($______________________________).

2. Per ton replacement of top gravel due to unstable conditions or excessive fines causing reduced drainage (Football Stadium).

   Cubic Yard price of: ________________________________

   Dollars ($______________________________).  

5. **TAX EXEMPTION**

   This project shall be considered Tax Exempt. Federal, State and local taxes shall not be included with the Bid. Subsequent to the award of the construction contract, the District will obtain from the State of Missouri a sales tax exemption certificate number. The sales tax exemption certificate will permit the Contractor to purchase materials for incorporation into this project without paying sales tax, provided that the Contractor furnishes the certificate number to the material supplier.

7. **CHANGES IN THE WORK**

   Changes in the work shall be as established in the Contract Documents. The following fees shall be used for lump sum pricing and actual cost pricing of additions and deletions to the work included in the Bid, Namely:

   Not to Exceed

   A. To Contractor for work performed by his own forces 10%
   B. To Contractor for work performed by other than his own forces 5%
   C. To Subcontractor for work performed by his own forces 10%
   D. To Subcontractor for work performed by other than his own forces 5%

   Percentages for overhead and profit will not be allowed on bond premiums.

8. A. In the execution of the Agreement, no person shall on the grounds of race, color, religion, sex, disability, or national origin be excluded from full employment rights, be denied the benefits of, or otherwise subject to discrimination under any program, service or activity under the provisions of any and all applicable Federal and state laws against discrimination. Bidder shall furnish all information and reports required by the rules, regulations, and order of the Secretary of Labor for purposes of investigating to determine compliance with such laws.

   B. Bidder shall not discriminate against any person in the performance of work under the Agreement because or race, religion, color, sex, physical handicap unrelated to such person’s ability to engage in the particular work, national origin or ancestry.

   C. In all solicitations or advertisements for employees, Bidder shall include the phrase, “equal opportunity employer”, or similar phrase approved by the Owner.

   D. If bidder is found guilty of a violation of Discrimination under a decision or order of Owner that has become final, bidder shall be deemed to have breached the present Agreement and it may be canceled, terminated, or suspended in whole or in part, by Owner.
E. Bidder shall include the provisions of paragraphs A through D above in every subcontract or purchase order so that such provisions shall be binding upon all subcontractors and vendors.

9. The undersigned hereby proposes and agrees to substantially and/or finally complete the work or segments of the work on or before the scheduled dates listed in Section 01010-Summary of Work, and to pay as liquidated damages the corresponding amount stipulated in Section 01010-Summary of Work for each consecutive calendar day thereafter that the work or segment of the work remains substantially and/or finally incomplete in accordance with the Contract Documents. This provision shall be applied, and the daily liquidated damages amount(s) shall be calculated separately as to each substantial and/or final complete date stated.

10. Accompanying the Bid is Bid Security of at least 5% of the bid in the form of a Bid Bond in the amount of ____________________________ Dollars ($_____________________), payable without condition to the Owner, which it is agreed shall be retained as liquidated damages for the delay and extra expense caused the Owner, if the undersigned fails to execute the Contract and furnish the bonds required by the Contract Documents, within the time stated in the Contract Documents.

11. In submitting the Bid it is understood that the right to reject any and all bids has been reserved by the Owner and that this bid may not be withdrawn for a period of sixty (60) days from the opening.

Date this________________________ day of_____________________________, 20______.

______________________________________________________________
Name of Bidder

______________________________________________________________
Address of Bidder

______________________________________________________________
Authorized Officer

______________________________________________________________
Title

______________________________________________________________
Telephone Number

(Seal)

ATTESTED:

______________________________________________________________
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Description of the Work.
B. Work under other contracts.
C. Products furnished by the owner.
D. Contractor use of site (and premises).
E. Code of Conduct.
F. Existing conditions.
G. Work sequence, Schedule for Completion and liquidated damages.
H. Time extensions for adverse weather.
I. Owner occupancy.
J. Time extension for factors other than weather.
K. Additional owner requested bid breakdown.

1.02  DESCRIPTION OF THE WORK

A. The Contractor shall furnish; all labor, materials, facilities, insurance, management, equipment, services, employee training and testing, permits and agreements necessary to perform the work required for the Park Hill High School Athletic Complex Renovation.

B. The work includes, but is not necessarily limited to the following:

1. Base Bid includes; Removal, disposal and replacement of the existing artificial turf at the Football Stadium, removal of natural turf field on the west side of campus and installation of drainage and artificial turf “base”, sidewalks, curbs, storm sewer, electrical utilities, earthwork and grading, 400 meter running track, runway and D-zones structural spray and re-stripe, new pole vault pad and runway, sod and seed.
   i. The Owner will purchase the artificial turf and installation from the same vendor as Park Hill South (Shaw).

2. Alternates include a new softball field and parking lot.

1.03  WORK UNDER OTHER CONTRACTS.

A. There are other contractors on site. Other Contractors may be present to perform repair work on adjacent facilities.

B. Items noted ‘NIC’ (Not in Contract), will be furnished and installed by owner.

C. Owner will remove and retain possession of the following items prior to start of building and/or demolition activities: NONE

D. The owner has paid $0 for plan check fee with the applicable City. The contractor is responsible for the balance of fee required to obtain the building permit. All other permits required remain the contractor’s responsibility.

1.04  CONTRACTOR USE OF SITE AND PREMISES

A. Limit use of site and premises to allow owner occupancy and use of the existing building, parking lots, during construction.
B. The contractor shall coordinate the use of the site and locations for all equipment storage, job trailers, portable lavatory facilities, generators, etc., with the architect and owner. The owner shall have the final approval for all site use by the contractor.

**1.05 CONTRACTOR AND VENDOR EMPLOYEES CODE OF CONDUCT**

Park Hill Missouri Public Schools requests that all contractor and vendor employees conduct themselves in an acceptable manner while performing work on school district property. The following items are prohibited on school district property:

1. No physical or verbal contact is to be made with students or non-designated staff.
2. No smoking in public or student occupied areas of the building or areas of the site.
3. No drugs and/or alcohol are to be consumed or present on district sites.
4. No firearms, or hunting items, are to be present on the site.
5. Foul and/or abrasive language is not to be used.
6. All workers are to wear clothing on all parts of their body; no shirtless workers. Apparel should be appropriate to a school campus.
7. Utilize designated areas for vehicle access and parking, material storage, etc.
8. All workers are to wear a nametag, which identifies the company name and the individual’s name.

**1.06 EXISTING CONDITIONS**

A. The contract drawings are based on information taken from original construction drawings and from inspections of the site.

B. Bidders are advised that "as-built" conditions may vary from those shown on the drawings. Bidders shall not later request, nor expect to receive, additional payment for work related to variations which can be determined by examination of the existing building and site, by the date set for receipt of Bids for this Contract.

**1.07 WORK SEQUENCE AND SCHEDULING**

A. The Contractor and all Subcontractors, sub-subcontractors and Suppliers shall furnish sufficient forces, supervision, construction plant and equipment, and shall work such hours as may be required to insure the prosecution of the work in accordance with the Progress Schedule stated herein. If in the opinion of the Owner, the Contractor falls behind the Progress Schedule, the Contractor shall take such steps as may be necessary to improve the progress and the Owner may require them to increase the number of shifts, and/or overtime operations, days of work including holidays, Saturdays and Sundays, all without additional costs to the Owner.

B. Schedule requirements for each Option and Phase are outlined as follows:
   1. The soccer and softball field and parking lot sites will be made available to the contractor on or about April 1, 2019. The stadium site will be made available on or about May 25, 2019. Mobilization and set-up prior to the start date will be allowed. Parking and Material storage will be coordinated with the District staff.
   2. Substantial Completion shall be achieved on or before August 5, 2019.

C. Liquidated Damages (See Contractor Agreement)

**1.08 ADVERSE WEATHER**

A. The Contractor understands that “time is of the essence” and therefore completion dates must be met.

**1.09 OWNER OCCUPANCY**
A. The existing building, parking lots and adjacent play areas will be used and occupied by the Park Hill School District during portions of the Contract Time. Occupants will include, but not be limited to: students, faculty, parents, and other groups so authorized to use the building and/or site by the school district.

B. School will be in session from 7:30 a.m. to 2:40 p.m., Monday through Friday, spring and fall semesters, throughout the contract time.

C. The work shall be confined to limited areas of the site. The contractor shall work with the Project Team to develop a schedule of areas to receive work. The schedule will identify specific areas of the building and site to receive work at specific times. This schedule shall be submitted by the Contractor to the Architect for approval before the work begins.

1.10 TIME EXTENSION FOR FACTORS OTHER THAN WEATHER

A. If the contractor incurs a delay due to factors out of his control, the contractor shall submit a claim within twenty-one (21) days after the occurrence for additional time to the architect and project team.

B. If a proposal request for additional work causes the contractor additional time to perform the original contract requirements the contractor may submit a claim for additional time to the Architect and Project Team. The Contractor shall include in his proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.

C. The determination that delays have occurred beyond the Contractor’s control does not automatically mean an extension of time will be granted. The Contractor must substantiate the delay by indicating suspended work activities on the critical portion of the project schedule.

1.11 ADDITIONAL OWNER REQUESTED BID BREAKDOWN

A. The following listing of major subcontractors/material suppliers performing work on the project is to be submitted within 72 hours of the bid. Substitutions in the submitted list require the owner’s written permission.

<table>
<thead>
<tr>
<th>Work Scope</th>
<th>Subcontractor/Material Supplier</th>
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<tbody>
<tr>
<td>Concrete</td>
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<td>Asphalt</td>
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<td>Turf Drainage</td>
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<td>Laser Grading</td>
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<td>Track surfacing</td>
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END OF SECTION
SECTION 01020

CONTRACT CONSIDERATIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Cash Allowances.
B. Schedule of values.
C. Bid Cost Breakdown.
D. Application for Progress Payment.
E. Application for Final Payment
F. Change Orders and/or Clarifications.
G. Conflicts

1.02 RELATED SECTIONS
A. N.A.

1.03 CASH ALLOWANCES
A. See section 01210A – CASH ALLOWANCES

1.04 SCHEDULE OF VALUES
A. The Contractor will submit to the Architect, a Schedule of Values that includes all major categories of work and per building if applicable. The Schedule of Values will annotate a value for the construction schedules and progress meeting notes required by the contract documents. The dollar amounts are to include all labor, material, overhead and profit applicable to each item in the breakdown. As a sub-breakdown, each item is to be separated into an estimated labor and materials line item. The Contractor must submit an estimated total value for the projected cost of supplies, materials, and equipment required. Submit typed schedule on AIA Form G703 - Application and Certificate for Payment Continuation Sheet. Contractor's standard from of electronic media printout will be considered as an alternate form of submission.

B. Submit Schedule of Values in triplicate within fourteen (14) calendar days after contract for construction is executed. Schedule shall list the installed value of the component parts of the work, broken down in sufficient detail to serve as a basis for computing values for progress payments during construction.

C. Format: At a minimum, use the Table of Contents in this Project Manual to identify each line item with number and title of the major specification section.

D. Add to the Schedule of Values approved Change Orders, with each Application for Payment. List Change Orders in numerical sequence with each Application for Payment.

E. Correlate line items in the Schedule of Values with other required additional schedules and forms including:
   a. Contractor's construction schedule
   b. Contract payment request form
   c. List of subcontractors.
   d. List of products.
   e. List of principle suppliers and fabrications.
   f. Schedule of submittals.

F. Prior to making application for the first progress payment, the Contractor must submit the Schedule of Values. No progress payments will be made until the schedule of values has
been received, reviewed and approved by the Architect and Park Hill School District. The costs assigned to the breakdown are to total the contract sum. The approved Schedule of Values is to be used by the Contractor on their Application for Payment.

1.05 BID COST BREAKDOWN
(See Bid Form for any applicable requirements)

1.06 APPLICATION FOR PROGRESS PAYMENTS
A. At a time consistent with the requirements of this section, the General Conditions, and the Owner-Contractor Agreement, and for each calendar month during the progress of the work, submit three (3) copies of a properly notarized itemized Application for Payment prepared in a manner consistent with the Schedule of Values.

B. The amount shown on the Application for Payment shall be established by the value of work completed through the last day of the application period based upon the Contractor's estimate of labor and materials incorporated in the work and of materials suitably stored in accordance with the contract through the last day of the previous application, less the aggregate of previous payments, and less the retainage as specified in this section.


D. Provide the following itemized data on Continuation Sheet:
   a. Format, schedules, line items, and values shall be from the Schedule of Values accepted by Architect.
   b. Include names, trades and amount for subcontractors.

1. Application Form:
   a. Fill in required information, including that for change orders executed prior to the date of submittal application.
   b. Fill in summary of dollar values to agree with the respective totals indicated on the continuation sheet.
   c. Execute certificate with the signature of a responsible officer of the contractor's firm.

2. Continuation sheets:
   a. Fill in total list of all scheduled component items of work, with each number and the scheduled dollar value of each item.
   b. Fill in the dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar, or as specified in the Schedule of Values.
   c. List each change order executed prior to the date of submission, at the end of the continuation sheets. List by change order number, description, and breakdown of costs as for an original component item of work.

E. Substantiating Data for Progress Payments:
1. Substantiating data is required to verify a payment request. Contractors are to include a cover letter identifying:
   a. Project.
   b. Application number and date.
   c. Detailed list of enclosures.
   d. For stored products: Item number and identification as shown on application, and description of specific material. Include Bill of Sale, Non-Negotiable Bailment Receipt (see form at the end of this section) and
applicable insurance certificate.
2. Submit one copy of the data cover letter for each of the applications.

F. Applications for Payment shall be accompanied by cost breakdowns from the contractor, subcontractors and sub-sub-contractors.

G. The three notarized copies of the application for payment will be transferred to the architect to be certified for payment. Provide a copy (non-notarized) to the owner’s representative.

1.07 APPLICATION FOR FINAL PAYMENT
A. Submit final Application for Payment following the procedures specified above for progress payments.

B. Before submitting final Application for Payment, forward concurrently to the Architect, the written warranties and guarantees, Record and Information Manuals and other documents required by the contract documents, and place properly in approved storage at the site the extra stock and spare parts specified. Contractor will obtain the signature of the Architect verifying receipt of the extra stock and spare parts.

C. Properly executed "Final Lien Waiver and Release" and Contractor's "Affidavit" shall be submitted to the Architect in duplicate prior to final payment.

D. Application for Final Payment shall be accompanied by a properly executed "Consent of Surety Company to Final Payment: AIA Document G707, April, 1970 edition."

E. In addition to the responsibilities specified for the Architect in the General Conditions, the Architect will also recommend to the Owner that the Owner record the Notice of Completion within ten (10) calendar days of the date the Architect finds the Contract fully performed.

1.08 CHANGES AND/OR CLARIFICATIONS
A. Request for Information (RFI)
1. If during the construction of the project, clarification of the documents is required, it shall be brought to the attention of the Architect. The Architect will either provide clarification or the Contractor will issue a Request for Information (RFI) to the Architect. Each RFI will be dated and sequentially numbered. The Architect shall provide his written response to the RFI and return to the Contractor for distribution to all affected contractors.

2. Responses to RFI's are not authorization to proceed with work requiring additional compensation. If additional compensation is required, the Contractor shall immediately advise the Architect, and Owner.

3. In instances where conflicts arise between plans, specifications, reports, and/or all documents that make up the construction documents for the project, the Contractor shall assume the most expensive alternative. The Owner has the option to select the less expensive alternative and receive a credit for the difference between the two items.

B. Proposal Request (PR)
1. Should the Owner contemplate making a change in the work, the architect will issue a Proposal Request (PR) to the Contractor. If the described change impacts cost and/or time, the Contractor will prepare a proposal for submission to the Architect. The Contractor’s proposed bid shall be broken down completely giving quantity and unit costs by each trade of each item, labor cost with hourly rates, allowable overhead and profit (both adds and deducts). The Owner and Architect will review the pricing to determine if a change order will be issued.
C. Change Orders (CO)

1. If the Owner determines that a Proposal Request will be accepted, the Architect will prepare a change order (CO) which will be dated and numbered sequentially. The change order will describe the change or changes, will refer to the Proposal Request and Proposal number and becomes valid when signed by the Owner, the Architect and the Contractor.

2. Where unit prices are not required by the bid documents and value of changes or extra work is determined by estimate and acceptance in a lump sum, by cost and percentages, or by cost and a fixed fee, the percentages for overhead and profit, or commission to be allowed for net increases shall in no case exceed the figures identified on the bid form.

3. Estimates for material shall be based on reasonable current market value at which materials are available to the Contractor and Subcontractor. Upon request, submit satisfactory evidence of such costs. Labor unit costs shall include associated insurance.

4. When authorized by the Owner, time and material accounting of a change in work may be used. The Contractor shall maintain an accurate account of labor and material involved in each change. Such time and material records are subject to verification. Notify Architect and Owner when work on each change is to start and when it has been completed. To receive full recognition, labor assigned to Contract changes must, insofar as possible, work continuously on the change, rather than interchanging between contract work and the change.

1.09 CONFLICTS WITHIN THE CONSTRUCTION DRAWINGS

A. In instances where conflicts arise between plans, specifications, reports, and/or all documents that make up the construction documents for the project, the Contractor shall assume the most expensive alternative. The Owner has the option to select the less expensive alternative and receive a credit for the difference between the items.
FINAL LIEN WAIVER AND RELEASE

Reference that certain Agreement between _____________, as Contractor, and _____________ as Owner, dated ____________, on the project known as _____________ located at _____________ for work to be performed by said Contractor.

Reference also that certain invoice of Contractor to said Owner in the Amount of $______________ for work, labor and materials installed in or furnished for said project by and through _____________.

The receipt by Contractor of Owner’s remittance for the amount said invoice, contingent upon the final clearance and payment of said remittance, shall constitute payment for the full contract amount, including change orders and all other claims or demands of any nature whatsoever which Contractor has or may have in connection with the Project or Contract referenced herein, of $______, for which Contractor (a) agrees to and does hereby waive and release said property, project and the Owner from; and (b) does hereby agree to protect, indemnify, defend and hold harmless said property, project, Owner, sureties and guarantors against;

(1) any and all liens, statutory or otherwise, and

(2) any and all other claims whatsoever, statutory or otherwise,

for any and all work, labor and materials furnished by or through said Contractor, its subcontractors and material suppliers for the entirety of said project.

The remittance of the Owner, identified as payment of said above invoice and endorsed by Contractor and marked “paid” or otherwise canceled by the bank against which said remittance was drawn shall constitute conclusive proof that said invoice was paid and the payment thereof was received by the Contractor, and thereupon, this final lien waiver shall become effective automatically and without requirement of any further act, acknowledgment or receipt of the part of said Contractor.

Contractor does further warrant that Contractor has not and will not assign its claims for payment nor its right to perfect a lien against said property and project, and the undersigned representative of the contractor has the right to execute this waiver and release thereof.

The undersigned representative of Contractor does hereby certify under oath that he is fully authorized and empowered to execute this instrument for and in behalf of said Contractor and to bind them hereto and does in fact so execute this final lien release.

Dated this ____________ day of ____________, 20__.

Contractor:

By:

Title:

Subscribed and affirmed to before me, the undersigned Notary Public within and for the State of ____________, and the County of ____________, this ____________ day of ____________, 20__, in the City of ____________.

Notary Public within and for said County and State
NON-NEGOTIABLE
BAILMENT RECEIPT

Receipt Number

BAILOR: Owner________________________

BAILEE: Contractor/Supplier________________

PROJECT: ________________________________

LOCATION OF STORAGE: ____________________

The goods and materials described below are held and stored pursuant to the Contract by and between Bailee, as Contractor/Supplier, and Bailer as Owner for Work to be performed at the above referenced Project location. Said goods and materials are to be transferred or delivered to the project site in conjunction with the performance of Bailee's contract referenced above or upon the direction of Bailor or the Architect and no other. The Bailee acknowledges that it has no ownership rights or title in, nor shall claim any lien or interest in or upon, said goods and materials.

QUANTITY DESCRIPTION OF ITEM

Received and Acknowledged
Contractor/Supplier

DATED: ______________  BY: ______________  Authorized Signature
SECTION 01040
COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Coordination.

B. Coordination Drawings.

C. Cleaning & Protection.

1.02 COORDINATION

A. Coordinate scheduling, submittals, and Work of the various sections of specifications to assure efficient and orderly sequence of the project.

B. Verify that utility requirements for the project have been properly installed and that such water, phone, and electrical hookup is compatible with other construction and demolition operations occurring at the site. Coordinate Work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

C. Coordinate space requirements and installation of all Work including mechanical and electrical Work that is indicated diagrammatically on drawings prior to initiating Work on site. Bring discrepancies to the attention of the Architect in a timely manner, follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

D. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

E. The Contractor is to coordinate his Work with the Work of the Owner's Contractors.

F. Coordinate completion and clean up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner’s partial occupancy.

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. This will include off-hour Work to avoid conflict with Owner’s activities.

H. Coordinate construction activities included under various sections of these specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different sections of the specifications that are dependent upon each other for proper installation, connection, and operations.

1. Where installation of one part of the Work is dependent on installation of other components either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.
2. Where availability of space is limited, coordinate installation of different components to assure maximum accessibility for required maintenance, service and repair.

I. Where necessary, prepare memoranda for distribution to each party involved outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1. Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

J. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of schedules.
2. Installation and removal of temporary facilities.
3. Delivery and processing of submittals.
4. Conducting progress meetings.
5. Orchestrating pre-installation and quality assurance meetings.
6. Project closeout activities.

1.03 COORDINATION DRAWINGS

A. Coordination Drawings: Prepare and submit coordination drawings where close and careful coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space availability necessitates maximum utilization of space for efficient installation of different components.

1. Show the interrelationship of components.
2. Indicate required installation sequences.
3. Comply with requirements contained in Section “Submittals”.
4. Refer to Division-15 Section “Basic Mechanical Requirements”, and Division-16 Section “Basic Electrical Requirements” for specific coordination drawing requirements for mechanical and electrical installations.
5. In addition to coordination drawings listed in the individual sections, prepare coordination drawings for:
   a. Mechanical equipment rooms.
   b. Electrical equipment rooms.
   c. Elevator equipment rooms.
   d. Roof plan with ALL penetrations, equipment supports, etc., including mechanical and electrical items.
   e. Ductwork, piping, electrical conduit.
6. Submit coordination drawings to the Architects as an “Informational Submittal”. The Architect will not take responsive action.

1.04 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major Work component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
B. Manufacturer’s Instructions: Comply with manufacturer’s installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in contract documents.

1. Where applicable, comply with manufacturer’s instructions, including each step in sequence.
2. Should manufacturer’s instructions with contract documents, request clarification from Architect before proceeding.
3. Installation must be performed to conform to the requirements of manufacturer’s warranty.

C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.


F. Recheck measurements and dimensions, before starting each installation.

G. Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

I. Mounting Heights: Where mounting heights are not indicated (install individual components at standard mounting heights recognized within the industry for the particular application indicated). Refer questionable mounting height decisions to the Architect for final decision.

1.05 CLEANING AND PROTECTION

A. Clean and maintain construction area as frequently as necessary throughout the project. Contractor to provide up to and have use of at least one dumpster during the course of the Work. The dumpster to be located as coordinated with the Owner. The Contractor shall be responsible for any damages and shall repair and/or replace grass sod, concrete curbing, sidewalks, paved surfaces or other items if damaged due to the Contractor’s activities.

B. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

1. Excessive static or dynamic loading.
2. Excessive internal or external pressures.
3. Excessively high or low temperatures.
4. Thermal shock.
5. Excessively high or low humidity.
6. Air contamination or pollution.
7. Water or ice.
8. Solvents.
10. Light.
11. Radiation.
12. Puncture.
13. Abrasion.
14. Heavy traffic.
15. Soiling, staling and corrosion.
16. Bacteria.
17. Rodent and insect infestation.
19. Electrical current.
20. High speed operation.
21. Improper lubrication.
22. Unusual wear or other misuse.
23. Contact between incompatible materials.
24. Destructive testing.
25. Misalignment.
26. Excessive weathering.
27. Unprotected storage.
28. Improper shipping or handling.
29. Theft.
30. Vandalism.

PART 2 - PRODUCTS

Not used.

PART 3 - EXECUTION

Not used.

END OF SECTION
SECTION 01095

REFERENCE STANDARDS AND DEFINITIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Related documents
B. Definition
C. Specification Format and Content Explanation
D. Industry Standards
E. Governing Regulations/Authorities
F. Submittals

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.03 DEFINITIONS

A. Indicated: The term “indicated” refers to graphic representations, notes, or schedules on the drawings, other paragraphs or schedules in the specifications, and similar requirements in the contract documents. Where terms such as “shown”, “noted”, “scheduled”, and “specified” are used, it is to help the reader locate the reference; no limitation on locating is intended.

B. Directed: Terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean “directed by the architect/consultant”, “requested by the architect/consultant”, and similar phrases.

C. Approve: The term “approved”, where used in conjunction with the architect/consultant’s action on the Contractor’s submittals, applications, and requests, is limited to the architect/consultant’s duties and responsibilities as stated in General, Supplementary, and Special Provisions.

D. Regulation: The term “Regulations” includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the asbestos removal, hazardous waste, and construction industries that control performance of the work.

E. Furnish: The term “furnish” is used to mean “supply and deliver to the project site, ready for unloading, unpacking, assembly, installation, and similar operations”.

F. Install: The term “install” is used to describe operations at project site including the actual “unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations”.

G. Provide: The term “provide” means “to furnish and install, complete and ready for the intended use”.

H. Installer: An “Installer” is the Contractor or an entity engaged by the Contractor, either as an employee, Subcontractor, or sub-subcontractor, for performance of a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

1. The term “experienced” when used with the term “Installer” means having a minimum of five previous projects similar in size and scope to this project, being familiar with the precautions required, and having complied with requirements of the authority having jurisdiction.

2. Trades: Use of titles such as “carpentry” is not intended to imply that certain construction activities must be performed by accredited or unionized individuals of...
a corresponding generic name, such as “carpenter”. It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

I. Assignment of Specialists: Certain sections of the specifications require that specific construction activities shall be performed by specialists who are recognized experts in the operations to be performed. The specialists must be engaged for those activities, and assignments are requirements over which the Contractor has no choice or option. Nevertheless, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.

1. This requirement shall not be interpreted to conflict with enforcement of building codes and similar regulations governing the work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.

J. Project Site is the space available to the Contractor for performance of activities, either exclusively or in conjunction with others performing other work as part of the project. The extent of the Project Site is shown on the drawings and may or may not be identical with the description of the actual Project Site. All dimensions and locations should be field verified and noted by the Contractor.

K. Testing Laboratories: A “testing laboratory” is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.04 SPECIFICATION FORMAT AND CONTENT EXPLANATION

A. Specification Format: The specifications are organized into divisions and sections based somewhat on the Construction Inspection Institute’s 16-Division format and MASTER FORMAT numbering system.

B. Specification Content: This specification uses certain conventions in the use of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in specifications and other contract documents is the abbreviated type. Implied words and meanings will be appropriately interpreted. Singular words will be interpreted as plural and plural words interpreted as singular where applicable and the full context of the contract documents so indicates.

2. Imperative and streamlined language is used generally in the specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the test, for clarity, subjective language is used to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.

   a. The words “shall be” shall be included by inference wherever a colon (:) is used within a sentence or phrase.

1.05 INDUSTRY STANDARDS

A. Applicability of Standards: Except where the contract documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the contract documents. Such standards are made a part of the contract documents by reference.

B. Publication Dates: Where the date of issue of a referenced standard is not specified, comply with the standard in effect as of date of contract documents.

C. Conflicting Requirements: Where compliance with two or more standards is specified, and the standards establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different, but apparently equal, and uncertainties to the consultant for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity level shown or specified shall be the minimum provided or performed. In complying with these requirements,
indicated numeric values are minimum or maximum, as appropriate for the context of the requirement. Refer uncertainties to the consultant for a decision before proceeding.

D. Copies of Standards: Each entity engaged in activities on the project is required to be familiar with industry standards applicable to that entity's construction activity. Copies of applicable standards are not bound with the contract documents.

1. Where copies of standards are needed for performance of a required activity, the Contractor shall obtain copies directly from the publication source.

E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the specifications or other contract documents, they mean the recognized name of the trade association, standards generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations", published by Gale Research Co., available in most libraries.

1.06 GOVERNING REGULATIONS/AUTHORITIES

A. The architect has contacted authorities having jurisdiction to obtain information necessary for preparation of contract documents. Contact authorities having jurisdiction directly for information and decisions having a bearing on the work.

1.07 SUBMITTALS

A. Permits, Licenses, and Certificates: For the Owner’s records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence, and records established in conjunction with compliance with standards and regulations bearing upon performance of the work.
SECTION 01200

PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES:
   A. Related Documents
   B. Summary
   C. Pre-Construction Conference
   D. Pre-Installation Conference
   E. Progress Meetings

1.02 RELATED DOCUMENTS
   A. Drawings and general provisions of the contract, including General and Supplementary
      Conditions and other Division-1 specification sections, apply to this section.

1.03 SUMMARY
   A. This section specifies administrative and procedural requirements for project meetings
      including, but not limited to:
      1. Preconstruction conference.
      2. Preinstallation conferences.
      3. Coordination meetings.
      4. Progress meetings.

   B. Construction schedules are specified in another Division-1 section.

1.04 PRECONSTRUCTION CONFERENCE
   A. The Contractor shall schedule a preconstruction conference and organizational meeting
      at the project site or other convenient location within fourteen (14) days of contract
      execution, and at least seven (7) days prior to commencement of any construction
      activities. The Contractor shall conduct the meeting to review responsibilities and
      personnel assignments.

   B. Attendees: Park Hill School District, Owner, the Architects/Consultants, the Contractor
      and its superintendent, major subcontractors, manufacturers, suppliers and other
      concerned parties shall each be represented at the conference by persons familiar with
      and authorized to conclude matters relating to the work.

   C. Agenda: Discuss items of significance that could affect progress, including such topics
      as:
      1. Tentative construction schedule.
      2. Critical work sequencing.
      3. Designation of responsible personnel.
      4. Procedures for processing field decisions and change orders.
      5. Procedures for processing applications for payment.
      7. Submittal of Shop Drawings, Product Data and Samples.
      8. Preparation of record documents.
      9. Use of the premises.
      10. Office, work and storage areas.
      11. Equipment deliveries and priorities.
      12. Safety procedures.
      13. First aid.
      15. Housekeeping.
      16. Working hours.
      17. Testing agencies and procedures.
18. Temporary utilities; water, electric, phone.
19. Temporary lavatory facilities.
20. Quality control.

D. The Contractor shall record meeting minutes and distribute copies to everyone in attendance and to others affected by decisions of actions resulting from the meeting.

1.05 PREINSTALLATION CONFERENCES

A. The General Contractor shall convene a preinstallation conference at the site before each construction activity that requires coordination with other construction. The Installer and representatives of manufacturers and fabricators involved in or affected by the installation, ad its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise the architect and Owner of scheduled meeting dates.

B. Review the progress of the construction activities and preparations for the particular activity under consideration at each preinstallation conference, including requirements for:
   2. Options.
   3. Related Change Orders.
   4. Purchases.
   5. Deliveries.
   6. Shop drawings, product data and quality control samples.
   7. Possible conflicts.
   9. Time schedules.
  10. Weather limitations.
  11. Manufacturer's recommendations.
  14. Temporary facilities.
  15. Space and access limitations.
  17. Safety.
  18. Inspection and testing requirements.
  20. Recording requirements.

C. Notify architect and Owner four days in advance of meeting date when their attendance is required by individual section.

D. The Contractor shall prepare agenda, preside at the conference and record significant discussions and agreements and disagreements of each conference, along with the approved schedule. The Contractor shall distribute the record of the meeting to everyone concerned, promptly, including the Owner and architect.

E. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of work and reconvene the conference at the earliest feasible date.

1.06 PROGRESS MEETINGS

A. Conduct progress meetings at the Project Site at a minimum of bi-monthly intervals or as directed by the Architect. Notify the Owner and Architect of scheduled meeting dates. Coordinate dates of meetings with preparation of the payment request.

B. Attendees: In addition to representatives of the Owner and Architect, each subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meeting by persons familiar with the Project and authorized to conclude matters relating to progress.
C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the project.

1. Contractor’s Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor’s schedule, whether on time or ahead or behind schedule. Determine how operations behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the contract time.

2. Review the present and future needs of each entity present, including such items as:
   a. Interface requirements.
   b. Time.
   c. Sequences.
   d. Deliveries.
   e. Off site fabrication status.
   f. Access.
   g. Site utilization.
   h. Temporary facilities and services.
   i. Hours of work.
   j. Hazards and risks.
   k. Housekeeping.
   l. Quality and work standards.
   m. Change orders.
   n. Documentation of information for payment requests.
   o. Outstanding items; submittals, proposal requests, RFIs.
   p. Quality assurance.
   q. Safety.

D. Reporting: No later than three days after each progress meeting date, the Contractor is to distribute copies of minutes of the meeting to each party present and to other parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and reports.

PART 2 - PRODUCTS
Not used

PART 3 - EXECUTION
Not used.
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.02 SUMMARY

A. This section includes administrative and procedural requirements for unit prices.

B. Related Sections: The following sections contain requirements that relate to this section:
   1. Division 1 Section “Contract Modification Procedures” for procedures for submitting and handling change orders.
   2. Division 1 Section “Quality Requirements” for general inspection requirements.

1.03 DEFINITIONS

A. Unit price is an amount proposed by bidders, stated on the bid form, as a price per unit of measurement for materials or services added to or deducted from the contract sum by appropriate modification, if the estimated quantities of work required by the contract documents are increased or decreased.

1.04 PROCEDURES

A. The Owner reserves the right to accept or reject the unit cost bid by the Contractor for each scheduled unit price. Acceptance or rejection of unit prices shall be determined by the Owner prior to the execution of the contract for construction.

B. Unit prices include all necessary material, plus cost for delivery, installation, insurance, overhead, profit, and applicable taxes.

C. Measurement and Payment: Methods of measurement and payment for unit prices are specified on the bid form.

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

E. Schedule: A “Unit Price Schedule” is included at the end of this section. Specification sections referenced in the schedule contain requirements for materials described under each unit price.
Part 2 – Products (Not Applicable)

Part 3 - Execution

3.01 Unit Price Schedule

1.

End of Section
PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Related Documents.
B. Summary.
C. Submittal Procedures.
D. Contractor’s Construction Schedules.
E. Submittal Schedule.
F. Daily Construction Reports.
G. Preexisting Conditions Video Survey.
H. Shop Drawings.
I. Product Data.
J. Samples.
K. Communications Facilitating Contract Administration.
L. Architect’s Action.
M. Contractor’s Action on Returned Submittals.

1.02 RELATED DOCUMENTS
A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this section.

1.03 SUMMARY
A. This section specifies administrative and procedural requirements for submittals required for performance of the work, including:
   1. Submittal procedures.
   2. Contractor’s construction schedule.
   3. Submittal schedule.
   4. Daily construction reports.
   5. Construction photographs.
   7. Product data.
   8. Samples.
   9. Informational submittals.
  10. Communications.
B. Administrative Submittals: Refer to other Division-1 sections and other contract documents for requirements for administrative submittals. Such submittals include, but are not limited to:
   1. Permits.
   2. Applications for payment.
   3. Insurance certificates.
   4. List of subcontractors.
C. The “Schedule of Values” submittal is included in Division-1 Section “Applications for Payment.”
D. Inspection and test reports are included in Division-1 Section “Quality Control Services.”
E. The “Product List” submittal is included in Division-1 Section “Materials and Equipment.”
1.04 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related activities to avoid delay and to allow sufficient review time.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
      a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received. Such action shall not be grounds for an extension of time or delay by the Contractor.
   3. The Architect may request submittals in addition to those indicated in the technical sections when deemed necessary to adequately describe the work covered in the respective section.
   4. Units of weights and measurements used on all submittals shall be the same as used in the contract documents.
   5. Processing: Allow sufficient review time so that the work will not be delayed as a result of the time required to process submittals, including time for resubmittals.

The Architect shall be responsible for reviewing and certifying that submittals are in compliance with the contract requirements. The approving authority on submittals is the Architect unless otherwise specified for the specific submittal.

   a. Allow at least seven (7) working days in Architect’s office for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination with work by others.
   b. If an intermediate submittal is necessary, process in the same manner as the initial submittal.
   c. Allow at least four (4) working days for reprocessing each submittal.
   d. No extension of contract time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the work to permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

   1. Provide a space approximately 4” x 5” on the label or beside the title block on shop drawings, product data and samples to record the Contractor’s review and approval markings and the action taken.
   2. Include the following information on the label for processing and recording action taken:
      a. Project name.
      b. Date.
      c. Name and address of Architect.
      d. Name and address of Contractor.
      e. Name and address of subcontractor.
      f. Name and address of supplier.
      g. Name of manufacturer.
      h. Number and title of appropriate specification section.
      i. Drawing number and detail references, as appropriate.
C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect including the information below. Submittals received by Architect from sources other than the Contractor will be returned without action.
1. Record relevant information and requests for data on the transmittal. On the form, or separate sheet, record deviations from contract document requirements, including minor variations and limitations. Include Contractor’s signed certification that information complies with contract document requirements.
2. Submit to Architect at business address.

1.05 CONTRACTOR’S CONSTRUCTION SCHEDULES
A. The Contractor shall provide Critical Path Method (CPM) scheduling services, including planning, evaluating and reporting; subcontractors shall participate in scheduling.

B. Interim Schedules: The Contractor, within ten (10) calendar days after execution of the contract, shall submit an interim construction schedule to the Owner’s representative and Architect. The schedule shall be in the form of a bar chart or a Critical Path Method (CPM) schedule. The schedule shall include as many activities as necessary to sufficiently detail the work to be performed during the first thirty (30) working days of construction. The interim schedule shall also detail, in general, the balance of the construction work past the first thirty (30) work days.

C. CPM Construction Schedule: The Contractor, within thirty (30) calendar days after execution of contract, shall submit a detailed construction schedule to the Owner’s representative and Architect. The schedule shall be in the form of a Critical Path Method (CPM) schedule. The CPM shall be in the arrow diagram method where the activity and duration is represented on the arrow. The CPM schedule shall include logic drawings and corresponding computer printouts. The CPM schedule shall be updated monthly. A narrative report shall be submitted with each update. In addition, the Contractor will provide a time scaled summary chart.

D. Scope: The CPM schedule as a minimum, shall provide for 1) work sequence as identified in Section 01010 Summary of Work; 2) provisions for adverse weather as identified in the General Conditions; and, 3) the following:
1. Long lead time procurement activities.
2. Contractor phasing activities.
3. Activation and testing activities.
4. Milestone dates for contract phasing requirements.
5. Owner furnished equipment activities.
6. Logic restraints reflecting the flow of manpower.
7. Utility tie-in activities.
8. Clean-up and punchlist activities and Owner move-in activities.
9. Activity durations in working days.
10. The project shall be broken down into logical building areas by floor levels, elevations, functional spaces, and addition or renovation, and as required.
11. Work activities performed by subcontractors.
12. Concurrent work activities under separate contract.
13. Shop drawing, submittals and approval.
15. Change orders.

E. Logic Drawings: The CPM logic drawings shall be 30" x 42" and shall, as a minimum, include:
1. The activity description.
2. Activity duration.
3. Marked critical path.
4. Marked complete activities.
5. Highlighted milestone dates.
6. Update number and date.

F. Computer Printouts: The CPM computer printouts shall, as a minimum, include:
   1. The activity I-J designation.
   2. The activity description.
   3. The activity duration (in working days).
   4. Activity early start date.
   5. Activity late start date.
   6. Activity early finish date.
   7. Activity late finish date.
   8. Slack or total float.
   9. Subcontract or trade designation.

G. Developing the Schedule: The Contractor shall meet jointly with the subcontractors, suppliers, and the Architect when developing the CPM schedule.

H. Owner’s Review: Within five (5) working days after receipt of the Contractor’s CPM schedule, the Owner and Architect shall meet with the Contractor for the final review of the CPM schedule. Review of the schedule by the Owner does not relieve the Contractor’s responsibility for the schedule’s accuracy or the ability of the Contractor to meet the dates set forth therein, nor does such review constitute an acknowledgement or admission by the Owner of the reasonableness of durations or logic of the schedule.

I. Important of Update Submittals: The updated CPM submittal, including a written schedule recovery statement if required, shall accompany the Contractor’s Application for Payment. The Contractor’s Application for Payment will not be processed until the update CPM schedule has been received by the Owner.

J. Narrative Report: The Contractor shall prepare a narrative report as a part of each schedule update, in a form agreed upon by the Architect. The narrative report shall include a description of the current status of the work, problem areas, current and anticipated delaying factors and their estimated impact on performance of other activities and completion dates; and an explanation of corrective action taken or proposed.

K. Schedule Slippage: Whenever the current schedule update reflects that the project is five (5) or more working days behind schedule, the Contractor shall submit a written statement to the Architect describing the cause of the slippage and the actions being considered by the Contractor to recover the time slot. The written schedule recovery statement shall be submitted with the monthly schedule update.

L. Update Submittals: For each update, the Contractor shall submit the following:
   1. Three copies of updated logic drawings – blueprints.
   2. Three copies of updated computer printouts I-J, ascending order sort.
   3. Three copies of narrative report.
   4. Three copies of an updated time scaled summary chart.

M. The progress schedule shall indicate the monthly anticipated adverse weather days, if any, pursuant to the Supplemental and General Conditions and indicate the constraints of anticipated adverse weather on planned activities. Update submittals of the progress schedule shall indicate actual adverse weather days and their impact on planned activities.

N. Any adjustments in Contract Time executed by Change Order shall be included in the update submittals of the project schedule.

1.06 SUBMITTAL SCHEDULE
A. After development and acceptance of the Contractor’s schedule, prepare a complete schedule of submittals. Submit the schedule within ten (10) days of the date required for establishment of the Contractor’s construction schedule.
   1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor’s Construction Schedule.
2. Prepare the schedule in chronological order; include submittals required during the construction. Provide the following information.
   a. Scheduled date for the first submittal.
   b. Related section number.
   c. Submittal category.
   d. Name of subcontractor.
   e. Description of the part of the work covered.
   f. Scheduled date for resubmittal.

B. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the project meeting room and field office.
   1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the work and are no longer involved in project activities.

C. Schedule Updating: Revise the submittal schedule after each meeting or activity, where revisions have been recognized or made relating to submittals. Issue the updated schedule concurrently with report of each such meeting.

1.07 DAILY CONSTRUCTION REPORTS
A. The Contractor’s Superintendent shall prepare a daily construction report, recording the following information, in a narrative format, concerning events at the site; and submit original documents to the Architect at weekly intervals.
   1. List of subcontractors at the site.
   2. Approximate count of personnel at the site, identifying the number of workers and supervisors.
   3. High and low temperatures, general weather conditions.
   4. Accidents and unusual events.
   5. Meetings and significant decisions.
   7. Emergency procedures.
   8. Orders and requests of governing authorities.
   9. Change orders received, implements.
   10. Services connected, disconnected.
   11. Equipment or system tests and start-ups.
   12. Partial completions and occupancies.
   13. Type and usage of major pieces of heavy equipment.

1.08 PRE-EXISTING CONDITIONS VIDEO SURVEY
A. Submit a pre-existing condition list and/or video with the initial application for payment. Specifically note any pre-existing conditions which may result in a potential dispute with the Owner.

1.09 SHOP DRAWINGS
A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the contract documents. Do not reproduce contract documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings. Shop drawings' quality is subject to approval.

B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:
   1. Dimensions.
   2. Relationship to building grids or coordinates.
   3. Interface with adjacent construction.
   4. Identification of products and materials included.
   5. Compliance with specified standards.
6. Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full-size drawings, submit shop drawings on sheets 8½" x 11", 11" x 17", 24" x 36", or 30" x 42". No other sizes will be accepted.

D. Submittal: Submit at least three prints. Two of the blue-line prints will be retained by the Architect. The Contractor shall be responsible for making appropriate number of copies for distribution to other affected parties.

E. Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.

1.10 PRODUCT DATA

A. Collect product data into a single submittal for each specified product. Product data includes printed information such as catalog cuts, Material Safety Data Sheets (MSDS), and other performance information.

1. Mark each copy to show applicable choices and options. Where printed product data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
   a. Manufacturer’s printed recommendation.
   b. Compliance with recognized trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimensions verified by field measurement.
   f. Notation of coordination requirements.
   g. Any limitations on warranty or guarantee of manufacturer.

2. Do not submit product data until compliance with requirements of the contract documents has been confirmed.

B. Submittals: Submit three (3) copies. Submit two (2) additional copies where required for maintenance manuals. The Architect will return one copy marked with action taken and corrections or modifications required.

1. Unless noncompliance with contract documents provisions is observed, the submittal may serve as the final submittal.

C. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal form.

1. Do not proceed with installation until a copy of the applicable product data is in the Installer’s possession.

2. Provide copies for record documents described in Section 01700 – Project Closeout.

D. Do not permit use of unmarked copies of product data in connection with construction.

1.11 SAMPLES

A. Submit full-size, full fabricated samples cured and finished as specified (where applicable) and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or container of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated.

Prepare samples to match the Architect’s sample. Include the following:

a. General description of the sample.

b. Sample sources

c. Product name or name of manufacturer.

d. Compliance with recognized standards.

e. Availability and delivery time.
2. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
   a. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than three), that show approximate limits of the variations.
   b. Refer to other specification sections for requirements for samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation and similar construction characteristics.
   c. Refer to other sections for sample to be returned to the Contractor for incorporation in the work. Such samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of sample submittals.

B. Submittals: Except for samples illustrating details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three sets: One set will be returned with comments.

C. Maintain sets of samples, as returned, at the project site, for quality comparisons throughout the course of construction.
   1. Unless non-compliance with contract documents provisions is observed, the submittal may serve as the final submittal.
   2. Sample sets may be used to obtain final acceptance of the construction associated with each set.

D. Distribution of Samples: prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the work. Show distribution on transmittal forms.

E. Field Samples: Field samples specified in individual sections are special types of samples. Field samples are full-size samples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.
   1. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.
   2. Allow at least seven (7) days after completion and curing (where applicable) of field sample for Architect’s review. Notify Architect in writing upon completion of field sample.
   3. Where required, give Architect notice and an opportunity to observe field erection or application of field sample.

1.12 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

A. Except as otherwise provided in the contract documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate through the Architect. Communications by and with subcontractors and material suppliers shall be through the Contractor.

B. All requests for information regarding or clarification of the plans and specifications shall be made in writing referencing the specification section and statement requiring clarification. Deliver to Architect’s business address.

1.13 ARCHITECT’S ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
   1. Compliance with specified characteristics is the Contractor’s responsibility.
B. Submittal Stamp: The Architect will stamp each submittal with a uniform, self-explanatory submittal stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Action A – Reviewed: Where submittals are marked “Reviewed”, that part of the work covered by the submittal may proceed provided it complies with requirements of the contract documents; final acceptance will depend upon that compliance.

2. Action B – Reviewed – Additional Information Required: Where submittals are marked “Reviewed – Additional Information Required”, the information submitted has been reviewed and approved as noted. However, additional information as noted and/or required by contract documents need to be submitted.

3. Action C – Furnish as Corrected: When submittal is marked “Furnish as Corrected”, that part of the work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the contract documents; final acceptance will depend on that compliance.

4. Action D – Revise and Resubmit: When submittal is marked “Revise and Resubmit”, do not proceed with that part of the work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked “Revise and Resubmit” to be used at the project site, or elsewhere where work is in progress.

5. Action E – Rejected: When submittal is marked “Rejected”, information submitted is not in compliance with contract documents. Resubmit submittal as required by contract documents.

D. Meaning of Architect’s Approval: Review is only for conformance with the design concept and for compliance with the information given in the contract documents. Approval does not authorize changes involving additional cost unless stated in separate change order or letter. Contractor is not relieved of responsibility for any deviations in submittals from requirements of the contract documents. Contractor is responsible for dimensions to be confirmed and correlated at the site; for information that pertains solely to the fabrication processes or to means, methods, techniques, sequences and procedures of construction; and for coordination of the work of all trades. Approval of a specific item does not indicate approval of an assembly of which the item is a component.

1.14 CONTRACTOR’S ACTION ON RETURNED SUBMITTALS
A. The Contractor shall coordinate distribution of all product data and samples for the project.

B. The Contractor is responsible to reproduce and distribute copies of stamped returned submittals as required for this use in abatement, or in corrections for resubmittal.

C. The Contractor is responsible to reproduce and distribute copies of stamped returned submittals as required for his use and subcontractor’s use in preparing and submitting other submittals such as, close-out, maintenance manuals, etc., Refer to other sections of the specifications for requirements.

The Contractor shall maintain a current set of abatement plans and specifications which shall be available to the Architect at the job site during the course of the work.

PART 2 -- PRODUCTS
Not applicable.

PART 3 -- EXECUTION
Not applicable.

END OF SECTION
SECTION 01400
QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES
A. Contractor's Quality Control
B. Contractor's Quality Control Program
C. Pre-Installation Conferences
D. Initial and Follow-up Inspections
E. Mock Up
F. Field Samples
G. Manufacturer's Field Services and Reports
H. References
I. Inspection and Testing Laboratory Services
J. Quality Assurance and Control of Installation
K. Safety

1.02 RELATED SECTIONS
A. Section 01040 - Coordination and Meetings
B. Section 01300 - Submittals
C. Section 01700 - Contract Closeout

1.03 CONTRACTOR'S QUALITY CONTROL
A. The quality of all work shall be the responsibility of the Contractor. Sufficient inspections and tests of all items of work, including that of subcontractors, to ensure conformance to applicable specifications and drawings with respect to the quality of materials, workmanship, construction finish, functional performance, and identification shall be performed on a continuing basis. The Contractor shall furnish qualified personnel, appropriate facilities, instruments and testing devices necessary for the performance of the quality control function. The controls shall be adequate to cover all construction operations both on and off site, shall be keyed to the proposed construction sequence and shall be correlated by the Contractor's quality control personnel.

1.04 CONTRACTOR'S QUALITY CONTROL PROGRAM
A. The Contractor shall submit to the Architect a copy of the proposed written quality control program prior to submission of the Contractor's first application and certificate for payment. The Contractor's written quality control plan shall include as a minimum:

1. Identification of the project team for this project. Team members include, but are not necessarily limited to, the Owner’s Project Manager, Architect, Mechanical Consultant, Electrical Consultant, Site Engineer, Structural Consultant, General Contractor and major subcontractors. List company name, address, contact and telephone number.

2. Name and identification of the Contractor’s key representatives from this project. Include the contract executive, Project Manager, Superintendent, Assistant Superintendents (if applicable), and Quality Control representative (may be the superintendent or other key contract representative). Also include a brief description of proposed duties and qualifications. The quality control representative must have the authority to make all decisions relating to quality control issues.

3. General summary and mission statement outlining general procedures for implementation of the program.

4. List by specification section the method of performing, documenting and enforcing quality control operations of both prime and subcontract work including...
proposed and required inspection and testing. Include preinstallation conferences, follow-up inspections, mockups, field samples and manufacturer’s inspection.

5. The Contractor’s quality control program shall be submitted and accepted prior to consideration of the Contractor’s first certificate and application for payment.

1.05 PREINSTALLATION CONFERENCES
A. Pre-installation conferences shall be performed prior to beginning each feature of work for any on-site construction work. Preparatory inspections for the applicable feature of work shall include: review of submittal requirements and all other contract requirements with the foreman or supervisors directly responsible for the performance of the work; check to assure that provisions have been made to provide required field control testing; examine the work area to ascertain that all preliminary work has been completed; verify all field dimensions and advise the project Architect of any discrepancies; and perform a physical examination of materials and equipment to assure that they conform to approved shop drawings or submittal data and that all materials and/or equipment are on hand; review special requirements, review shop drawings and sample construction mockups as appropriate.
B. The Contractor shall prepare agenda, preside at conference, record minutes, and distribute copies within five (5) days after conference to participants, with copies to the Architect and Owner.

1.06 INITIAL AND FOLLOW UP INSPECTIONS
A. An initial inspection shall be performed as soon as a representative portion of the particular feature of the work is complete and shall include examination of the quality of workmanship as well as a review of the work for compliance with contract requirements. The initial inspection shall be performed by the Contractor’s Quality Control representative and results noted in the Contractor’s daily reports. Any deviations from the contract requirements shall be brought to the immediate attention of the Architect.

1.07 MOCK UP
A. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals and finishes.
B. Where mock up is specified in individual sections to be removed, clear area after mock up has been accepted by the Architect.

1.08 FIELD SAMPLES
A. Install field samples at the site as required by individual specifications sections for review.
B. Acceptable samples represent a quality level for the work.
C. Where field sample is specified in individual sections to be removed, clear area after field sample has been accepted by the Architect.

1.09 MANUFACTURERS’ FIELD SERVICES AND REPORTS
A. Submit qualifications of observer to Architect thirty (30) days in advance of required observations. Observer subject to approval of Architect and Owner.
B. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start up of equipment, and test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.
C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer’s written instructions.
D. Submit report within thirty (30) days of observation to the Architect for review.
1.10 REFERENCES
A. Conform to reference standard by date of issue or current date of contract documents.
B. Obtain copies of standards when required by contract documents.
C. Should specified reference standards conflict with contract documents, request clarification from Architect before proceeding.
D. The contractual relationship of the parties to the contract shall not be altered from the contract documents by mention or inference otherwise in any reference document.

1.11 INSPECTION AND TESTING LABORATORY SERVICES
A. Architect will appoint, employ, and pay for services of an independent firm to perform inspection and testing, except when a specification section specifically states that testing of that work be provided for by the Contractor.
B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Architect.
C. Reports will be submitted by the independent firm to the Architect, in duplicate, indicating observations and results of tests and indicating compliance or noncompliance with contract documents.
D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
1. Notify Architect and independent firm forty-eight hours prior to expected time for operations requiring services.
2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor’s use.
E. Retesting required because of nonconformance to specified requirements shall be performed by the same independent firm on instructions by the Architect. Payment for retesting will be charged to the Contractor by deducting inspection or testing charges from the contract sum.

1.12 QUALITY ASSURANCE/CONTROL OF INSTALLATION
A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
B. Comply fully with manufacturer’s instructions, including each step in sequence.
C. Should manufacturer’s instructions conflict with contract documents, request clarification from Architect before proceeding.
D. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Perform work by persons qualified to produce workmanship of specified quality. Work that properly should be done by skilled labor shall not be attempted with common laborers. The Contractor shall have on the job, at all times, ample equipment to carry on the work properly, including such tools as may be necessary to meet emergency requirements.

1.13 SAFETY
A. Contractors who perform any work under this contract will fully comply with the provisions of the Federal Occupational Safety and Health Act of 1970 and to the rules and regulations promulgated pursuant to this Act.
1. Contractor must submit a safety program to the Architect prior to starting work on the site. This program should indicate the Contractor’s plan to comply with OSHA requirements for the various conditions of the project. The Contractor shall appoint a safety representative on site. The safety program and Contractor’s representative names must both be posed.
2. The Architect will take no action on the Contractor’s safety program, but will forward it to the Owner for information only. The Contractor is responsible for safety on the project site per the contract documents.
B. Hazardous Material: In the event the Contractor encounters material on the site, reasonably believe to be asbestos or polychlorinated biphenyl (PCB) that has not been rendered harmless, the Contractor shall immediately stop work and notify the Architect and Owner. Such notification shall be documented in writing.

C. Provide any and all measures of protection required by the applicable local municipality for the protection of the public and employees during excavation operations and at completion of work. Measures taken shall include, but not be limited to, sidewalks, barricades, warning lights and signs/ and shall comply with American Standard Safety Code and all local laws and ordinances. Maintain in good condition during operations.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION
SECTION 01500
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Related Documents
B. Summary
C. Submittals
D. Quality Assurance
E. Project Conditions
F. Temporary Construction and Support Facilities
G. Security and Protection Facilities Installation
H. Operation, Termination, and Removal

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including general and supplementary conditions and other Division-1 Specification sections, apply to this section.

1.03 SUMMARY

A. This section specifies requirements for temporary services and facilities, including utilities, construction and support facilities, security and protection.
B. Temporary utilities that may be required include, but are not limited to:
   1. Water service and distribution.
   2. Temporary electric power and light.
   3. Gas service.
   4. Telephone service.
   5. Storm sewer.

C. Temporary construction and support facilities that may be required include, but are not limited to:
   1. Temporary heat.
   2. Field offices and storage sheds.
   3. Temporary roads and paving.
   4. Sanitary facilities, including drinking water.
   5. Dewatering facilities and drains.
   6. Temporary enclosures.
   7. Hoists and lifts.
   8. Temporary project identification signs and bulletin boards.
   9. Waste disposal services.
   10. Rodent and pest control.
   11. Construction aids and miscellaneous services and facilities.

D. Security and protection facilities required include, but are not limited to:
   1. Temporary fire protection.
   2. Barricades, warning signs, lights.
   3. Environmental protection.

1.04 SUBMITTALS

A. Temporary Utilities: Submit reports of tests, inspections, meter readings and similar procedures performed on temporary utilities.
1.05 QUALITY ASSURANCE

A. Regulations: Comply with industry standards and applicable laws and regulations if authorities having jurisdiction, including but not limited to:
   1. Building Code requirements.
   2. Health and safety regulations.
   3. Utility company regulations.
   4. Police, Fire Department and Rescue Squad rules.
   5. Environmental protection regulations.

   1. Refer to “Guidelines for Bid Conditions for Temporary Job Utilities and Services”, prepared jointly by AGC and ASC, for industry recommendations.

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

1.06 PROJECT CONDITIONS

A. Temporary Utilities: Prepare a schedule indicating dates for implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of the permanent service.

B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.
D. Heating Facilities: Except where use of the permanent system is authorized, provide vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
   1. Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.

E. Field Offices: provide insulated, weather tight temporary offices of sufficient size to accommodate required office personnel at the project site. Keep the office clean and orderly for use of small progress meetings. Furnish and equip offices.

F. Storage Trailers: Place storage trailers, sized, furnished and equipped to accommodate materials and equipment involved, including temporary utility service. Trailers are to be fully enclosed and placed on the site with prior approval of the Owner.

G. Temporary Roads: Construct and maintain temporary roads to adequately support the construction activity and loading, during the construction period. Locate temporary roads, storage areas and parking where the same permanent facilities will be located, if possible.
   1. Coordinate temporary road development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
   2. Install temporary roads to minimize the need to rework the installations and to result in permanent roads and paved areas that are without damage or deterioration when occupied by the Owner.
   3. Extend temporary roads in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration and supervision.

H. Sanitary facilities include temporary toilets and drinking water fixtures. Comply with regulations and health codes for the type, number, location, operations and maintenance of fixtures and facilities. All sanitary conveniences shall be satisfactory to the Owner and shall conform to the regulations of the City, County, and State Health Departments.
   1. Install where facilities will best serve the project's needs.
   2. Provide toilet tissue, paper cups and similar disposable materials for each facility. Provide covered waste containers for used material.

I. Toilets: Install well-contained toilet units. Shield toilets to ensure privacy. Use of pit-type privies will not be permitted.

J. Dewatering Facilities and Drains: For temporary drainage and dewatering facilities and operations not directly associated with construction activities included under individual sections, comply with dewatering requirements of applicable Division-2 sections. Where feasible, utilize the same facilities. Maintain the site, excavations and construction free of water.

K. Temporary Enclosures: Provide temporary enclosure of protection of construction in progress and completed, from exposure, foul weather, other construction operations and similar activities.
   1. Where heat is needed and the permanent building enclosure is not complete, provide temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
   2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
   3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

L. Temporary Lifts and Hoists: Provide facilities for hoisting materials and employees. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

M. Project Identification and Temporary Signs: The Contractor will not erect free-standing or post any signs on property under the control of the Park Hill School District without prior approval by the Owner. This includes signs on construction trailers, portable sheds, etc., which might legitimately be temporarily parked on said property by and for the Contractor's use as part of this project. The Owner may provide and erect one or more project signs as they deem necessary.

and debris. Enforce requirements strictly. Do not hold materials more than seven days
during normal weather or three days when the temperature is expected to rise above 80
degrees. Handle hazardous, dangerous, or unsanitary waste materials separately from
other waste by containerizing properly. Dispose of material in a lawful manner.

O. Stairs: Until permanent stairs are available, provide temporary stairs where ladders are
not adequate. Cover finished permanent stairs with a protective covering of plywood or
similar material so finish will be undamaged at the time of acceptance.

3.02 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Except for use of permanent fire protection as soon as available, do not change over from
use of temporary security and protection facilities to permanent facilities until Substantial
Completion, or longer, as requested by the Architect.

B. Temporary Fire Protection: Until fire protection needs are supplied by permanent facilities,
install and maintain temporary fire protection facilities of the types needed to protect
against reasonable predictable and controllable fire losses. Comply with NFPA 10
“Standard for Portable Fire Extinguisher”, and NFPA 241 “Standard for Safeguarding
Construction, Alterations and Demolition Operations.”
1. Locate fire extinguisher where convenient and effective for their intended purpose,
   but not less than one extinguisher on each floor at or near each usable stairwell.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguisher, fire hydrants, temporary fire
   protection facilities, stairways and other access routes for fighting fires. Prohibit
   smoking in hazardous fire exposure areas.
4. Provide supervision of welding operations, combustion type temporary heating
   units, and similar sources of fire ignition.

C. Permanent Fire Protection: At the earliest feasible date in each area of the project,
complete installation of the permanent fire protection facility, including connected services,
and place into operations and use. Instruct key personnel on use of facilities.

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

E. Enclosure Fence: When excavation begins, install an enclosure fence with lockable
entrance gates. Locate where indicated, or enclose the entire site or the portion
determined sufficient to accommodate construction operations. Install in a manner that will
prevent people, dogs and other animals from easily entering the site, except by the
entrance gates.

F. Security Enclosure and Lockup: Install substantial temporary enclosure of partially
completed areas of construction. Provide locking entrances to prevent unauthorized
entrance, vandalism, theft and similar violations of security.
1. Storage: Where materials and equipment must be stored, and are of value or
   attractive for theft, provide a secure lockup. Enforce discipline in connection with
   the installation and release of material to minimize the opportunity for theft and
   vandalism.

G. Environmental Protection: Provide protection, operate temporary facilities and conduct
construction in ways and by methods that comply with environmental regulations, and
minimize the possibility that air, waterways and subsoil might be contaminated or polluted,
or that other undesirable effects might result. Avoid use of tools and equipment that
produce harmful noise. Restrict use of noise making tools and equipment harmful to
humans so as to minimize complaints from persons or firms near the site.
1. Contractor shall comply with all Federal, state and local laws and regulations
   relating to environmental protection. Daily clean up of adjacent streets, sidewalks,
   and public structures due to construction debris shall be required at Contractor’s
   expense.

3.03 OPERATION, TERMINATION AND REMOVAL
A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.
   1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
   2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

B. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or not later than substantial completion. Complete, or if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

   1. Materials and facilities that constitute temporary facilities are property of the Contractor. The Owner reserves the right to take possession of project identification signs.
   2. At substantial completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
      a. Replace air filters and clean inside of ductwork and housings.
      b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
      c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION
SECTION 01600
MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES:

A. Related Documents
B. Summary
C. Definitions
D. Submittals
E. Quality Assurance
F. Product Delivery, Storage and Handling
G. Installation of Products

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.03 SUMMARY

A. This section specifies administrative and procedural requirements governing the Contractor's selection of products for use on the project.
B. The Contractor's construction schedule and the schedule of submittals are included under Division 1 Section "Submittals."
C. Standards: Refer to Division 1 Section "Reference Standards and Definitions" for applicability of industry standards to products specified.
D. Administrative procedures for handling requests for substitutions made after award of the contract are included under Division 1 Section "Product Substitutions."

1.04 DEFINITIONS

A. Definitions used in this article are not intended to change the meaning of other terms used in the contract documents, such as "specialties," "systems," "structure," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.
1. "Products" are items purchased of incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
   a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or utilized to form a part of the Work.
3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.05 SUBMITTALS

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Architect. Include generic names of products required. Include the manufacturer's name and proprietary product names of each item listed.
1. Coordinate the product list schedule with the Contractor’s Construction Schedule and the Schedule of Submittals.

2. Form: Prepare the product listing schedule with information of each item tabulated under the following column headings:
   a. Related Specification Section Number.
   b. Generic Name Used in Contract Documents.
   c. Proprietary Name, Model Number and Similar Designations.
   d. Manufacturer’s Name and Address.
   e. Supplier’s Name and Address.
   f. Installer’s Name and Address.
   g. Projected Delivery Date, or Time Span of Delivery Period.

3. Initial Submittal: Within twenty (20) days after date of commencement of the work, submit three (3) copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from contract requirements.

4. Architect’s Action: The Architect will respond in writing to the Contractor within two weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or product, but does not constitute a waiver of the requirement that products comply with contract documents. The Architect’s response will include the following:
   a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.06 QUALITY ASSURANCE

A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the project, the product selected shall be compatible with products previously selected products that were also options.

C. Nameplates: Except for required labels and operating data, do not attached or imprint manufacturer’s or producer’s nameplates or trademarks on exposed surfaces or products which will be exposed to view in occupied spaces or on the exterior.

   1. Labels: Locate required product labels and stamps on a concealed surface or, where required of observation after installation, on an accessible surface that is not conspicuous.

   2. Equipment Nameplates: Provide a permanent nameplate on each item of service-connected or power-operated equipment. Locate on an easily accessible surface that is inconspicuous in occupied spaces. The nameplate shall contain the following information and other essential operating data:
      a. Name of product and manufacturer.
      b. Model and serial number.
      c. Capacity.
      d. Speed.
      e. Ratings.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

   1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.

   2. Standard products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
B. Product Selection Procedures: Product selection is governed by the Contract Documents and government regulations, not previous project experience. Procedures governing product selection include the following:

1. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

2. Semi-Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

3. Non-Proprietary Specifications: When the specifications list products or manufacturers that are available and may be incorporated in the work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with contract requirements. Comply with contract document provisions concerning “substitutions” to obtain approval for use of an unnamed product.

4. Descriptive Specification Requirements: Where specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with contract requirements.

5. Performance Specification Requirements: Where specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.

   a. Manufacturer’s recommendations may be contained in published product literature, or by the manufacturer’s certification of performance.

END OF SECTION
SECTION 01631

POST-BID PRODUCT SUBSTITUTIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES:

A. Related Documents
B. Summary
C. Definition
D. Submittals
E. Substitution

1.02 RELATED DOCUMENTS

a. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.03 SUMMARY

A. This section specifies administrative and procedural requirements for handling requests for substitutions made after award for the contract.
   1. Certain materials, products or systems are specified for which no substitutions are allowed. Refer to individual specification sections for specific items.
B. Refer to AIA Document A701 “Instructions to Bidders” for substitution requirements made prior to bid opening.
C. The Contractor’s construction schedule and the schedule of submittals are included under Division-1 Section “Submittals”.
D. Standards: Refer to Division-1 Section “Reference Standards and Definitions” for applicability of industry standards to products specified.
E. Procedural requirements governing the Contractor’s selection of products and product options are included under Division-1 Section “Materials and Equipment:

1.04 DEFINITIONS

A. Definitions used in the article are not intended to change or modify the meaning of other terms used in the contract documents.
B. Substitutions: Requests for changes in product, materials, equipment, and methods of constructing required by Contract Documents proposed by the Contractor after award of the contract are considered requests for post-bid product substitutions. The following are NOT considered substitutions:
   1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of contract, are considered as included in the contract documents and are not subject to requirements specified in this section for post-bid substitutions.
   2. Revisions to contract documents requested by the Owner or Architect.
   4. The Contractor’s determination of and compliance with governing regulations and orders issued by governing authorities.
1.05 SUBMITTALS

A. Post Bid Substitution Request Submittal: Only one request for post bid substitution will be considered for each product.
   1. Submit three (3) copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures stated herein. Use form depicted at end of this section. Contractor is responsible for reproduction of forms.
   2. Identify the product, or the fabrication or installation method to be replaced in each request. Include related specification section and drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following information, as appropriate:
      a. Product data, including drawings and descriptions of products, fabrication and installation procedures.
      b. Samples, where applicable or requested.
      c. A detailed comparison of significant qualities of the proposed substitution with those of the work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect. Units of weights and measure shall be the same as used in the contract documents.
      d. Coordination information, including a list of changes or modifications needed to other parts of the work and to construction performed by the Owner and separate Contractors that will become necessary to accommodate the proposed substitution.
      e. A statement indicating the substitution’s effect on the Contractor’s Construction Schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall contract time.
      f. Cost information, including a proposal of the net change, if any, in the Contract Sum.
      g. Certification by the Contractor that the substitution proposed is equal to or better in every significant respect to that required by the contract documents, and that it will perform adequately in the application indicated. Include the Contractor’s waiver of rights to additional payment or time that may subsequently become necessary because of the failure of the substitution to perform adequately.

3. Architect’s Action: Within one week of receipt of the request for substitution, the Architect will request additional information or documentation necessary for evaluation of the request. Within two weeks of the receipt of the request, or one week of the receipt of the additional information or documentation, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, the contractor shall use the product specified in the contract documents.

PART 2 -- PRODUCTS

2.01 SUBSTITUTIONS

A. Conditions: The Contractor’s post bid substitution request will be received and considered by the Architect when all of the following conditions 1, 2 and 3 and one or more of the following conditions 4, 5, 6, 7, 8 and 9 are satisfied, as determined by the Architect; otherwise requests will be returned without action except to record noncompliance with these requirements.
   1. Revisions to contract documents are not required.
   2. Proposed changes are in keeping with the general intent of contract documents.
   3. The request is timely, fully documented and properly submitted.
   4. The specified product or method of construction cannot be provided within the contract time.
5. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.

6. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Architect for redesign and evaluation services, increased cost of other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

7. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.

8. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

9. The specified product or method of construction cannot provide a warrant required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warrant.

B. The Contractor’s submittal and Architect’s acceptance of Shop Drawings, Product Data or sample that related to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION
POST-BID SUBSTITUTION REQUEST FORM

ONE ITEM PER FORM
FILL IN ALL BLANKS

Project: ___________________________ Date: ___________________________

We hereby submit for your review the following post-bid substitution for the following specified material for the above project.

Section   Page   Paragraph   Specified Material

PROPOSED POST-BID SUBSTITUTION:

Attach complete technical data, including laboratory tests, if applicable. Include complete information on changes to drawings and/or specifications which proposed substitution will require for its proper installation.

A. Does the substitution effect dimensions shown on drawings in any way?

B. Will the undersigned pay for any changes to the building design, including engineering and detailing costs caused by the requested substitution?

C. What effect does substitution have on schedule or other trades?

D. What effect does substitution have on cost?

E. Differences between proposed substitution and specified items are:
   ______ Same ________ Different (Explain)

F. Contractor represents that he has investigated the proposed product and determined that it meets or exceeds the quality of the specified product.

SUBMITTED BY:   ___________________________   ___________________________   ___________________________
   (Firm)   Accepted   Accepted as Noted
   ___________________________   (By)   (Date)
   Not Accepted   Received Too Late
   ___________________________   (Telephone)   ___________________________
   ___________________________   (Remarks)
   ___________________________   (Signature)

Post Bid Substitution
Section 01631 - 4
PART 1 – GENERAL

1.01 SECTION INCLUDES:

A. Starting systems.
B. Demonstration and instructions.
C. Testing, adjusting, and balancing.

1.02 RELATED SECTIONS

A. Section 01400 – Quality Control: Manufacturer’s field reports.
B. Section 01700 – Contract Closeout: System operations and maintenance data and extra materials.

1.03 STARTING SYSTEMS

A. Coordinate schedule for start-up of various equipment and systems.
B. Notify Architect and Owner fourteen (14) days prior to start up of each item.
C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
E. Verify wiring and support components for equipment are complete and tested.
F. Execute start up under supervision of responsible manufacturer’s representative in accordance with manufacturer’s instructions.

1.04 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner’s personnel two weeks prior to date of substantial completion. Contractor will prepare and distribute meeting minutes of each demonstration and associated instruction.
B. For equipment or systems requiring seasonal operation, perform demonstration for other season as soon as practical prior to the season. Demonstration shall be performed under applicable seasonal conditions.
C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner’s personnel in detail to explain all aspects of operation and maintenance.
D. Demonstrate start up, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at a scheduled agreed upon time, at designated location.
E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
F. The minimum amount of time required for instruction on each item of equipment and system may be specified in individual sections. Reference individual sections for requirements.
1.05 TESTING, ADJUSTING AND BALANCING

A. Contractor will appoint, employ, and pay for services of an independent firm to perform testing, adjusting and balance.

B. The independent firm will perform services specified in Section 15950.

C. Reports will be submitted by the independent firm to the Architect indicating observations and results of tests and indicating compliance or noncompliance with specified requirements and with the requirements of the contract documents.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION
SECTION 01700
PROJECT CLOSEOUT

PART 1 - GENERAL

1.01 SECTION INCLUDES:
A. Related documents.
B. Summary.
C. Completion of a building and/or phase.
D. Final completion and final payment.
E. Record document submittals.
F. Starting systems.
G. Operating and maintenance instructions.
H. Final cleaning.

1.02 RELATED DOCUMENTS
A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.03 SUMMARY
A. This section specifies administrative and procedural requirements for project closeout, including but not limited to:
   1. Inspection procedures.
   2. Project record document submittal.
   3. Operating and maintenance manual submittal.
   4. Submittal of warranties.
   5. Final cleaning.
   6. Record vellum drawings.
B. Closeout requirements for specific construction activities are included in the appropriate sections in Divisions-2 through 16.
C. Refer to Division-1 Section “Warranties” for specific requirements.

1.04 SUBSTANTIAL COMPLETION
A. Substantial Completion:
   1. The Contractor and each Subcontractor shall carefully and regularly check their work for conformance with the contract documents as the Work is being done. Unsatisfactory work shall be corrected as the Work progresses and not be permitted to remain and become a part of the punch list.
   2. The Contractor shall conduct a pre-punch list inspection. The written pre-punch list shall be distributed to affected subcontractors, Architect and Owner’s representative. The Contractor shall advise the Architect in writing upon completion of the pre-punch list. This notification shall so serve to notify the Architect that the work is ready for the punch list inspection.
   3. The Architect shall make arrangements for his punch list inspection at the earliest possible date following Contractor notification of completion of the pre-punch list. Transmittal of the Punch List to the Contractor shall set the date for a reinspection prior to issuance of a Certificate of Substantial Completion. Upon receipt of the Punch List, the Contractor shall, within seven (7) days, bring to the attention of the Architect, in writing, any questions that he or any of his subcontractors may have concerning the requirements of the Punch List.
4. When advised by the Contractor that the Punch List items have been completed, the Architect shall conduct a reinspection with the Contractor, any needed subcontractors (and the Owner’s representative where applicable) to determine whether the Certificate of Substantial Completion can be issued. A Certificate of Substantial Completion will only be issued after codes administration authorities document final approval and permit occupancy of the building or phase.

5. When issued, the Certificate of Substantial Completion shall name the date, triggering the beginning of the warranty period (with any items to have a later starting date specifically noted). The certificate shall also have attached to it the uncompleted Punch List items, and shall name the date for their final completion. The Certificate of Substantial Completion shall also state the responsibilities of the Owner and the Contractor for maintenance, heat, air conditioning, utilities, insurance and building security.

6. Acknowledgement of the date of substantial completion by the signature of all parties on the certificate implies possession of the premises by the Owner. The subsequent completion of incomplete punch list items by the Contractor and the subcontractors shall occur at the Owner’s convenience. The Owner shall cooperate in permitting the Contractor access to the work for the completion of punch list items.

7. A Certificate of Substantial Completion for the work, or portion of work as applicable, will only be issued after the requirements for the demonstration and instruction of operation and maintenance procedures as defined elsewhere by the Contract Documents, to the Owner’s personnel have been satisfied by the Contractor.

8. A list of items required for submission at Substantial Completion is listed at the end of this section. This list may include specific maintenance agreements, maintenance manuals, tools, keys, spare parts, extra stock materials, operational instruction to Owner’s operating personnel, etc. Any items not here-in specifically listed as required at Substantial Completion shall be submitted at Final Completion.

9. Substantial Completion Cleaning: At Substantial Completion for each project or portion of the project, clean the entire work area to a level acceptable to the Owner, for finish cleaning by the Owner’s custodial personnel. Remove non-permanent protection and labels, polish glass, clean exposed finishes, touch-up minor finish damage, clean or replace filters of mechanical systems, remove debris and broom clean non-occupied spaces, sanitize plumbing/food service facilities, clean light fixtures and replace burned out/dimmed lamps, sweep and wash paved areas, police yards and grounds. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Mop VCT or seamless floor surfaces clean. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

B. Final Completion:
1. Submit executed warranties, remaining maintenance agreements, inspection certificates and similar required documentation for specific units of work, enabling Owner’s unrestricted occupancy and use.
2. Submit maintenance manuals, tools, keys, spare parts, extra stock materials not required at substantial completion.

3. Complete instruction of Owner's operating personnel with start up of all systems, not previously required at substantial completion.

4. Complete final cleaning and remove temporary facilities.
   a. Final Cleaning: At closeout time of each building, or applicable portion, reclean the work affected by punch list corrections. Remove non-permanent protection, polish glass, clean exposed finishes, touch-up minor finish damage, remove debris and broom clean non-occupied spaces, sanitize plumbing/food service facilities, clean light fixtures, sweep and wash paved areas, police yards and grounds, and perform similar clean up operations needed to produce a “clean” condition as judged by Architect and Owner.

5. All punch list work must be completed, reviewed and accepted by the Architect.

1.05 FINAL COMPLETION AND FINAL PAYMENT

A. Provide submittals to Architect that are required by governing or other authorities. Confirm that all submittals required by the construction documents have been transmitted.

B. Final Completion: For the purpose of determining a date at which the project is finished, final completion may be defined to include, but is not limited to:
   1. Substantial completion.
   2. Submission and acceptance by the Architect of project record drawings.
   3. Operation and maintenance data (including all air and water balance reports).
   4. All applicable Owner training sessions with meeting notes distributed (video tapes, if applicable).
   5. Final cleaning.
   6. Adjusting (hardware, HVAC, etc.)
   7. Warranties submitted by General Contractor and accepted by Architect.
   8. Spare parts and maintenance materials turned over to proper District personnel.
   9. All Punch List work completed, reviewed and accepted by the Architect.
      a. All of the above items are as required by individual specification requirements as found in the contract documents. These individual requirements shall take precedence over this definition if any conflict should arise.

C. Upon written notice by the Contractor that the reinspection punch list items are completed, the Architect shall verify this by inspection and shall issue to the Owner a final certificate of payment state that, to the best of their knowledge, information and belief, the work has been completed in accordance with the terms and conditions of the contract documents, and that the entire balance found to be due the Contractor, and noted in said final certificate of payment, is due and payable. The Owner shall endeavor to make final payment within thirty (30) days.

1.06 RECORD DOCUMENT SUBMITTAL

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect’s reference during normal working hours.

B. Record Drawings: A set of blue- or black-line drawings of the original bidding documents will be provided by the Architect to the Contractor for the following use:
   1. If the Contractor elects to vary the work from the Contract Documents, and secures prior approval from the Architect, he shall record in a neat,
readable manner, all such variances on the blue- or black-line drawings furnished.

2. For plumbing; heating; ventilating; and air conditioning; electrical and fire protection work, record document drawings shall be maintained by the Contractor as the work progresses and as follows:
   a. All deviations from the sizes, locations, and from all other features of all installations showing the contract documents shall be recorded.
   b. In addition, it shall be possible, using these drawings, to correctly and easily locate, identify and establish sizes of piping, direction etc., as well as all other features of work that will be concealed.

1. Locations of underground work shall be established by dimensions to column lines or walls, by locating all turns, etc., and by properly referenced centerline or invert elevations and rates of fall.
   a. All deviations from the sizes, locations, and from all other features of all installations showing the contract documents shall be recorded.
   b. In addition, it shall be possible, using these drawings, to correctly and easily locate, identify and establish sizes of piping, direction etc., as well as all other features of work that will be concealed.

2. For work concealed in the building, sufficient information shall be given so it can be located with reasonable accuracy and ease. In some cases this may be by dimension; in others, it may be sufficient to illustrate the work on the drawings in relation to the spaces in the building near which it was actually installed. Architect’s decision in this matter shall be final.

3. Blue- or black-line record drawings shall be kept up to date during the entire course of the work and shall be available upon request for examination by the Architect.

4. The following requirements apply to all record document drawings:
   a. They shall be maintained at the Contractor’s expense.
   b. All such drawings shall be done carefully and neatly by a competent drafter and in an approved form.
   c. Additional drawings shall be provided as necessary for clarification.
   d. The record document drawings (both blue- and black-line and reproducible) shall be returned to the Architect upon completion of the work and are subject to the approval of the Architect.
   e. Delete Architect title block and seal from record document drawings.

C. Record Specifications: Maintain one complete copy of the project manual, including addenda, and one copy of other written construction documents such as change orders and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and product data.

1. Legibly mark and record at each product section description of actual products installed, including the following:
   a. Manufacturer’s product name and product model number.
   b. Product substitutions or alternates utilized.
   c. Changes made by addenda and modifications.

2. Upon completion of the work, submit record specifications to the Architect for the Owner’s records.

3. Record project manual shall be maintained at the Contractor’s expense.

4. Record project manual shall be maintained in a neat, readable manner. Contract work variations shall be recorded in the correct corresponding technical section of the project manual.

5. Delete Architect seal from record project manual.

4. Complete final cleaning and remove temporary facilities.
D. Record Shop Drawings: Maintain a clean, undamaged set of blue or black line white prints of shop drawings as finally approved. Mark the set to show the actual installation where the installation varies substantially from the work as originally shown. Mark drawings accurately; record a cross reference at the corresponding location on the contract drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
   1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the work.
   2. Mark new information that is important to the Owner, but was not shown on shop drawings.
   3. Note related change order numbers where applicable.
   4. Organize record shop drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

E. Record Product Data: Maintain one copy of each product data submittal. Mark these documents to show significant variations in actual work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer’s installation instruction and recommendations. Give particular attention to concealed products and portions of the work that cannot otherwise be readily discerned later by direct observation. Note related change orders and mark up of record drawings and specifications.
   1. Upon completion of mark ups, submit complete set of record product data to the Architect for the Owner’s records.

F. Record Documents and Shop Drawings: Contractor to supply one complete set of approved shop drawings. Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to fine (main) floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenance, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenance concealed in construction, referenced to visible and accessible features of the work.
   4. Field changes of dimension and detail.
   5. Details not on original contract drawings.

G. Record Sample Submitted: Immediately prior to the date or dates of substantial completion, the Contractor will meet at the site with the Architect and the Owner’s personnel to determine which of the submitted samples that have been maintained during progress of the work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner’s sample storage area.

H. Miscellaneous Record Submittal: Refer to other specification sections for requirements of miscellaneous recordkeeping and submittal in connection with actual performance of the work. Immediately prior to the date or dates of substantial completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner’s records.

I. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Submit two sets prior to Substantial C o m p l e t i o n or final inspection, as applicable. Bind properly indexed data in individual heavy-duty, three inch, three ring vinyl-covered binders, 8½ x 11 inch test page format, with pocket folders for folded sheet information.
   1. Prepare binder covers with printed title “OPERATION AND MAINTENANCE INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.
   2. Internally subdivide the binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
3. Contents: Prepare a Table of Contents for each volume, with each product or system description identified.

4. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, subcontractors, and major equipment suppliers where they can be reached for emergency service at all times, including nights, weekends, and holidays.

5. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of subcontractors and suppliers. Identify the following:
   a. Significant design criteria.
   b. List of equipment.
   c. Parts list for each component.
   d. Operating instructions.
   e. Maintenance instructions for equipment and systems.
   f. Maintenance instructions.
   g. Emergency instructions.
   h. Spare parts list.
   i. Wiring diagrams.
   j. Recommended "turn around" cycles.
   k. Inspection procedures.

6. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Air and water balance reports.
   c. Certificates.
   d. Photo copies of warranties.

7. Submit one copy of completed volumes in final form fifteen (15) days prior to the applicable submission requirement. This copy will be returned after review, with Architect comments. Revise content of documents as required prior to final submittal for the applicable submission requirement.

8. Submit final volumes revised, within the (10) days after Architect review and comment.

J. Record reproducible vellum drawings. Contractor shall submit one copy of all record contract drawings to the Owner in the form of reproducible vellum sheets.

PART 2 -- PRODUCTS (NOT APPLICABLE)

PART 3 -- EXECUTION

3.01 STARTING SYSTEMS
   A. Coordinate schedule of start up of various equipment and systems.
   B. Notify Architect and Owner seven (7) days prior to start up of each item.
   C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions that may cause damage.
   D. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
   E. Verify wiring and support components for equipment are complete and tested.
   F. Execute start up under supervision of responsible manufacturer's representative (Contractor's personnel) in accordance with manufacturer's instructions.
   G. When specified in individual specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check and approve equipment or system installation prior to start up, and to supervise placing equipment or system in operation.
H. Submit a written report in accordance with Section 01400 that equipment or system has been properly installed and is functioning correctly.

3.02 OPERATING AND MAINTENANCE INSTRUCTIONS
A. General: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner’s personnel to provide instruction in proper operation and maintenance, if applicable. If Installers are not experienced in procedures, provide instruction by manufacturer’s representatives. Include a detailed review of the following items:
1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:
1. Start up.
2. Shutdown.
3. Emergency operations.
5. Safety procedures.
7. Effective energy utilization.

END OF SECTION
FINAL LIEN WAIVER AND RELEASE

Reference that certain Agreement between ________________, as Contractor, and ________________, as Owner, dated ________________.

on the project known as ________________, located at ________________, for work to be performed by said Contractor.

Reference also that certain invoice of Contractor to said Owner in the Amount of $__________ for work, labor and materials installed in or furnished for said project by and through ________________.

The receipt by Contractor of Owner’s remittance for the amount said invoice, contingent upon the final clearance and payment of said remittance, shall constitute payment for the full contract amount, including change orders and all other claims or demands of any nature whatsoever which Contractor has or may have in connection with the Project or Contract referenced herein, of $__________, for which Contractor (a) agrees to and does hereby waive and release said property, project and the Owner and payment sureties and guarantors from; and (b) does hereby agree to protect, indemnify, defend and hold harmless said property, project, Owner, sureties and guarantors against;

(1) any and all liens, statutory or otherwise, and.
(2) any or all obligations under any guaranty for payment furnished by or to said Owner, whether pursuant to agreement or requirement of law, and
(3) any and all other claims whatsoever, statutory or otherwise.

for any and all work, labor and materials furnished by or through said Contractor, its subcontractors and material suppliers for the entirety of said project.

The remittance of the Owner, identified as payment of said above invoice and endorsed by Contractor and marked “paid” or otherwise canceled by the bank against which said remittance was drawn shall constitute conclusive proof that said invoice was paid and the payment thereof was received by the Contractor, and thereupon, this final lien waiver shall become effective automatically and without requirement of any further act, acknowledgement or receipt of the part of said Contractor.

Contractor does further warrant that Contractor has not and will not assign its claims for payment nor its right to perfect a lien against said property and project, and the undersigned representative of the Contractor has the right to execute this waiver and release thereof.

The undersigned representative of Contractor does hereby certify under oath that he is fully authorized and empowered to execute this instrument for and in behalf of said Contractor and to bind them hereto and does in fact so execute this final lien release.

Dated this ________________, day of ________________, 2008.

Contractor:

By: ____________________________

Title: ____________________________

Subscribed and affirmed to before me, the undersigned Notary Public within and for the State of __ and the County of ____________, this Day of ____________, in the City of ________________.
Notary Public within and for said County and State
SECTION 01731
CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES:
A. Summary
B. Submittals
C. Quality Assurance
D. Products
E. Cleaning
F. Renovation Supplemental Project Procedures

1.02 SUMMARY
A. This section specifies administrative and procedural requirements for cutting and patching.
B. Refer to other sections for specific requirements and limitations applicable to cutting and patching individual parts of the work.
1. Requirements of this section apply to mechanical and electrical installations. Refer to Division 15 and Division 16 sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.03 SUBMITTALS
A. Cutting and Patching Description: Where approval of procedures for cutting and patching is required before proceeding, submit a description of the procedures well in advance of the time cutting and patching will be performed and request approval to proceed. Include the following information, as applicable, in the proposal:
1. Describe the extent of cutting and patching required and how it is to be performed; indicate why it cannot be avoided.
2. Describe anticipated results in terms of changes to existing construction; include changes to structural elements and operating components as well as changes in the building’s appearance and other significant visual elements.
3. List products to be used and firms or entities that will perform work.
4. Indicate dates when cutting and patching is to be performed.
5. List utilities that will be disturbed or affected, including those that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6. Where cutting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations signed and sealed by a qualified profession engineer licensed in the State of Missouri to show how reinforcement is integrated with the original structure.
7. Approval by the Architect to proceed with cutting and patching does not waive the Architect’s right to later require complete removal and replacement of a part of the work found to be unsatisfactory.

1.04 QUALITY ASSURANCE
A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.
1. Obtain approval of the cutting and patching description before cutting and patching the following structural elements:
   a. Foundation construction.
b. Bearing and retaining walls.
c. Structural concrete.
d. Structural steel.
e. Lintels.
f. Structural decking.
g. Miscellaneous structural metals.
h. Equipment supports.
i. Piping, ductwork, vessels and equipment.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, or result in increase maintenance, or decreased operational life or safety.

   1. Obtain approval of the cutting and patching description before cutting and patching the following operating elements or safety related systems:

   a. Primary operational systems and equipment.
   b. Air or smoke barriers.
   c. Water, moisture, or vapor barriers.
   d. Membranes and flashings.
   e. Fire protection systems.
   f. Noise and vibration control elements and systems.
   g. Control systems.
   h. Communication systems.
   i. Electrical wiring systems.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces, in a manner that would, in the Architect’s opinion, reduce the building’s aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace work that has been cut and patched in a visually unsatisfactory manner.

   1. If possible, retain the original installer or fabricator to cut and patch the following categories of exposed work; or if it is not possible to engage the original installer or fabricator, engage another recognized experience and specialized firm:

   a. Processed concrete finishes.
   b. Stonework.
   c. Ornamental metal.
   d. HVAC enclosures, cabinets or covers.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Use materials that are identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials whose installed performance will equal or surpass that of existing materials.
A. Temporary Support: Provide temporary support of work to be cut.
B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the project that might be exposed during cutting and patching operations.
C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
D. Take all precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.03 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.
   1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.
B. Cutting: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with the original installer; comply with the original installer’s recommendations.
   1. In general, where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
   3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
   4. Comply with requirements of applicable sections of Division-2.
   5. By-pass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after by-passing and cutting.
C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.
   1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
   2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

3.04 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove completely paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.

3.04 RENOVATION SUPPLEMENTAL PROJECT PROCEDURES

A. Materials: As specified in Product Sections; match existing products and work for patching and extending work.
B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
C. Remove, cut and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original condition.
D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
E. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work to match existing adjacent work in texture and appearance.
F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
G. Where a change of plane of \( \frac{1}{4} \) -inch or more occurs, submit recommendation for providing a smooth transition for Architect review.
H. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
I. Finish surfaces as specified in individual product sections.

END OF SECTION
SECTION 01732
SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General Conditions and other Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY
A. This Section includes the following:
   (Architect to provide listing of items affected.)
B. Related Sections include the following:
   1. Division 1 Section “Summary of Work” for use of the premises and phasing requirement.
   2. Division 1 Section “Construction Facilities and Temporary Controls” for temporary construction and environmental-protection measures for selective demolition operations.
   3. Division 1 Section “Cutting and Patching” for cutting and patching procedures for selective demolition operations.
   4. Applicable sections for demolishing, cutting, patching, or relocating mechanical and plumbing items.
   5. Applicable sections for demolishing, cutting, patching, or relocation electrical items.

1.03 DEFINITIONS
A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
B. Remove and Salvage: Detach items from existing construction and deliver them to Owner ready for reuse.
C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
D. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 MATERIALS OWNERSHIP
A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner’s property, demolished materials shall become Contractor’s property and shall be removed from Project site.
B. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to owner that may be encountered during selective demolition remain Owner's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Owner.

1. Coordinate with Owner to establish special procedures for removal and salvage.

C. Specific items may be identified for salvage and turn-over to the Owner at the completion of the project. Any items so identified, are the property of the Owner but shall be protected and maintained by the Contractor for the duration of the construction project. Carefully remove and salvage each item or object in a manner to prevent damage, and protect such items in a secure location for prompt delivery to the Owner at the conclusion of the project.

1.05 SUBMITTALS

A. Proposed Dust-Control and Noise-Control Measures: Submit plan or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate.

B. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
2. Interruption of utility services.
3. Coordination for shutoff, capping and continuation of utility services.

C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

D. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI A10.6 and NFPA 241.

C. Predemolition Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings." Review methods and procedures related to selective demolition including, but not limited to, the following:

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

1.07 PROJECT CONDITIONS

A. Owner will occupy portions of the site/building in and around the demolition area. Conduct selective demolition so Owner’s operations will not be disrupted. Provide not less than 72 hours’ notice to Owner of activities that will affect Owner’s operations.

B. Maintain access to existing occupied or used facilities.
   1. Do not close or obstruct access way, or other occupied or used facilities without written permission from authorities having jurisdiction.

C. Owner assumes no responsibility for condition of areas to be selectively demolished.
   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

D. Hazardous Materials: It is not expected that hazardous materials, other than possible lead bearing materials, will be encountered during the work.
   1. Hazardous materials will be removed by Owner before start of the Work, except lead based paints and coatings.
   2. If other non-lead containing materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Not-lead bearing hazardous materials will be removed by Owner under a separate contract.
   3. The Contractor shall be fully and solely responsible for work involving lead bearing materials.

E. Storage or sale of removed items or materials on-site will not be permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
   1. Maintain fire protection facilities in service during selective demolition operations.

PART 2 – PRODUCTS

A. Use repair materials identical to existing materials.
   1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   2. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installed requirements specified

PART 3 -- EXECUTION
3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped.

B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

E. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.

B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized by Owner and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and to authorities having jurisdiction.

1. Provide at least 72 hours (3 working days) notice to Owner if shutdown of service is required during changeover.

C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated utilities when requested by Contractor.
2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition; provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of the building.
3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

3.03 PREPARATION

A. Dangerous Materials: Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.
3.04 POLLUTION CONTROLS

A. Dust Control: Use suitable methods to limit spread of dust and dirt. Comply with governing environmental protection regulations.
   1. Do not use water when it may create hazardous or objectionable conditions, such as ice, flooding, and pollution.

B. Disposal: Remove and transport debris in a manner that will prevent damage to adjacent surfaces and areas.

C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.05 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   1. Proceed with selective demolition systematically.
   2. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
   3. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire suppression devices during flame-cutting operations.
   4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off site.
   5. Dispose of demolished items and materials promptly.
   6. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

B. Existing Facilities: Comply with Owner’s requirements for using and protecting walkways, driveways, entries, and other facilities during selective demolition operations.

C. Removed and Salvaged Items: Comply with the following:
   1. Clean salvaged items.
   2. Pack or crate items after cleaning. Identify contents of containers.
   3. Store items in a secure area until delivery to Owner.
   4. Transport items to Owner’s storage area designated by Owner.
   5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items: Comply with the following:
   1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
   2. Pack or crate items after cleaning and repairing. Identify contents of containers.
   3. Protect items from damage during transport and storage.
   4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.

F. Existing Items to be Abandoned in Place: Fill underground piping systems to be abandoned with sand or flowable fill as required to prevent future collapse.

G. Concrete: Demolish in small sections. Cut concrete to a depth of at least ¾ inch at junctures with construction to remain, using power-driven saw. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete indicated for selective demolition. Neatly trim openings to dimensions indicated.

3.06 PATCHING AND REPAIRS

A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Patching: Comply with Division 1 Section “Cutting and Patching”.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on site.

B. Burning: Do not burn demolished materials.

C. Disposal: Transport demolished materials off Owner’s property and legally dispose of them.

3.08 SELECTIVE DEMOLITION SCHEDULE

A. Existing Construction to be Removed: (Architect to provide list of applicable items.)

B. Existing Items to be Removed and Salvaged: (Architect to provide list of applicable items.)

C. Existing Items to Remain: (Architect to provide list of applicable items.)

END OF SECTION
PART 1 - GENERAL

1.01 SECTION INCLUDES:
A. Related Documents
B. Summary
C. Definitions
D. Warranty Requirements
E. Submittals

1.02 RELATED DOCUMENTS
A. Drawings and general provisions of the contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.03 SUMMARY
A. This section specifies general administrative and procedural requirements for warranties required by the Contract Documents, including manufacturers’ standard warranties on products and special warranties.
   1. Refer to the general conditions of the contract for construction of terms of Contractor’s warranty of workmanship and materials.
   2. General closeout requirements are included in Division-1, Section “Project Closeout”.
   3. Specific requirements for warranties for the work and products and installations that are specified to be warranted, are included in the individual sections of Divisions-2 through 16.
   4. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.
B. Disclaimers and Limitations: Manufacturer’s disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the work that incorporated the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.04 DEFINITIONS
A. Standard product warranties are reprinted written warranties published by individual manufacturers for particular product and are specifically endorsed by the manufacturer to the Owner.
B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.05 WARRANTY REQUIREMENTS
A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted work.
B. Reinstatement of Warranty: When Work covered by a warranty has failed and has been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
C. Replacement Cost: Upon determination that work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. The Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefited from use of the work through a portion of its anticipated useful service life.
D. Owner’s Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

E. The Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.06 SUBMITTAL
A. Submit written warranties to the Architect prior to the date certified for Substantial Completion. If the Architect’s certificate of substantial completion designates a commencement date for warranties other than the date of Substantial Completion of the Work, or a designated portion of the Work, submit written warranties upon request of the Architect.

1. When a designated portion of the Work is completed and occupied or used by the Owner, by separate agreement with the Contractor during the construction period, submit properly executed warranties to the Architect within fifteen (15) days of completion of that designated portion of the Work.

2. In all other instances, warranty periods will not begin prior to Substantial Completion, regardless of equipment use prior to dates of Substantial Completion.

B. When a special warranty is required to be executed by the Contractor, or the Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to the Owner through the Architect for approval prior to final execution.

1. Refer to individual sections of Divisions-2 through 16 for specific content requirements, and particular requirements of submittal of special warranties.

C. Form of Submittal: At final completion, compile two copies of each required warranty properly executed by the Contractor, or the Contractor, subcontractor, supplier or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the project manual.

D. Bind warranties in heavy-duty, commercial quality, durable three-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8½” x 11” paper.

1. Provide heavy paper dividers with celluloid covered tabs for each separate warranty. Mark the tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product, and the name, address and telephone number of the installer.

2. Identify each binder on the front and the spine with the typed or printed title “WARRANTIES”, the project title or name, and the name of the Contractor.

3. When operating and maintenance manuals are required for warranted constitution, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 – PRODUCTS (NOT APPLICABLE)

PART 3 – EXECUTION (NOT APPLICABLE)

END OF SECTION
**SECTION 03301 - CONCRETE FOR TRACK SURFACES**

**Part 1 - General**

1.1 **SUMMARY**
A. This section includes labor, furnishing and installation of all materials, and testing necessary to provide cast-in-place concrete.

B. All concrete that will receive synthetic track surfacing shall be installed with coordination/approval of the track surfacing installer. All admixtures, curing agents and any other chemicals shall be approved by track surfacing installer prior to execution.

1.2 **REFERENCES**
A. American Concrete Institute (ACI):
   2. ACI 301-89: Specifications for Structural Concrete for Buildings.
   3. ACI 302.1R-89: Guide for Concrete Floor and Slab Construction.
   5. ACI 305R-91: Hot weather Concreting.
   7. ACI 308-92: Standard Practice for Curing Concrete.
   8. ACI 309R-87 Guide for Consolidation of Concrete.

B. American Society for Testing and Materials
   1. ASTM C31-91: Standard Practice for making and curing concrete test specimens in the field.
   9. ASTM C231-91b: Standard test method for air content of freshly mixed concrete by the pressure method.
   17. ASTM E1155-87: Standard test method for determining floor flatness and levelness using the F-number system.

1.3 **SUBMITTALS**
A. Submit the following:
1. Manufacturer’s Data: Submit manufacturer’s product data with application and installation instruction for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint materials, curing materials and others as requested by Architect.

2. Laboratory Test Results: Submit 2 copies of laboratory’s trial mix designs proposed in accordance with ACI 318-89, Chapter 5 or one copy each of 30 consecutive test results and the mix design used from a record of past performance in accordance with ACI 318-89, Chapter 5.

3. Submit written report to Architect, for each material sampled and tested, prior to the start of work.

4. Certificates of material properties and compliance with specified requirements may be submitted in lieu of testing, when acceptable to the Architect. Certificates of compliance must be signed by materials producer and the Contractor.

5. Show drawings for fabrication, bending and placement of concrete reinforcement complying with ACI 315.

6. Submit list of track or tennis court installations with references with similar tolerances. List by governing body, i.e. IAAF, NCAA, NFHS.

1.4 QUALITY ASSURANCE

B. Concrete Testing Services: Employ and pay for the services of an independent Testing Agency acceptable to the Architect for preparing and reporting proposed mix design.

C. Quality control testing during Construction: The owner may employ a testing laboratory to perform field quality control testing. Testing does not relieve Contractor of responsibility of providing concrete in compliance with specifications. Test shall conform to the following standards:

2. Slump: ASTM C 143, one test for each concrete load at point of discharge; and one test for each set of compressive strength test specimens.
3. Air Content: ASTM C 173, volumetric method for lightweight concrete; ASTM C 231 pressure for normal weight concrete; one for each set of compressive strength test specimen. When air entrained concrete is used, first batch of each placement shall be tested and as often thereafter as required.
4. Concrete temperature: Test hourly when air temperature is 40 deg F. and below, when 80 deg F. and above; and each time a set of compression test specimens are made.
5. Compression Test Specimen: ASTM C 32 and ASTM C 172; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
6. Compression Strength Test: ASTM C 39, one set for each 50 cu. Yds. or fraction thereof, of each concrete class placed in any one day or for each 5,000 sq. ft of flatwork place; 1 specimen tested 7 days 2 specimens tested 28 days.

D. Test results will be reported in writing to Architect and the Contractor within 24 hours after tests are made.

E. On surfaces that receive rubberized track material, slope and planarity tolerances must conform to the appropriate governing body (IAAF, NCAA, NFHS) guidelines for certification.

Part 2 - PRODUCTS

2.1 FORM MATERIALS
A. Provide form materials with sufficient stability to withstand pressure of placed concrete without bow or deflection. Construct forms for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth,
exposed surfaces. Furnish in largest practicable sizes to minimize number of joints and to conform to joint system shown on Drawings.

B. Plywood for forms shall be ¾” BB Grade plywood, unoiled, sanded, Class I, EXP-DFPA grade trademarked American plywood Association, PSI-66. Maximum deflection shall be 1-360.

2.2 CONCRETE MATERIALS
A. Portland Cement: ASTM C 150, Type 1, unless otherwise acceptable to Architect. Type III cement shall be used only with prior written approval from the Architect.
C. Fly Ash: ASTM C618, Type C, except that ignition loss shall not exceed 2.0%. Limit use of fly ash in concrete mix design not to exceed 25 percent of cement by weight.
D. Water: Clean, fresh drinkable and free of deleterious materials.

2.3 ADMIXTURES
B. Water reducing Admixture: ASTM C 494, type as required to suit project conditions. Use only admixtures that have been tested and accepted in mix designs.

2.4 RELATED MATERIALS
A. Membrane-Forming Curing Compound: ASTM C 309, Type I.
B. Form Coatings: provide commercial formulation form-coating compounds that will not bond with, stain nor adversely affect concrete surfaces requiring bond or adhesion, and will not impair subsequent treatments of concrete surfaces to be cured with water or curing compound. Form coating shall be applied with a power sprayer as recommended by the manufacturer.
C. Joint fillers: Refer to Section 07901 Joint Sealants.

2.5 REINFORCING MATERIALS
A. Deformed Reinforcing Bars: Deformed billet-steel bars conforming to ASTM A 615, or axle-steel deformed bars conforming to ASTM A 617, Grade 60.
B. Welded Wire Fabric: ASTM A 185

2.6 PROPORTIONING AND DESIGN OF MIXES
A. Normal Weight Concrete: Where proportioning is based on trial mixes, prepare design mixes for each type and strength of concrete in accordance with applicable provisions of ACI 211.1 and ACI 318, Chapter 5. Employ and pay for the services of an independent Testing Agency acceptable to the Architect for preparing and reporting proposed mix design.
B. Test the proposed aggregate and design mixes in accordance with ASTM C 192. Such tests shall show 28 day average strengths in accordance with ACI 318, Chapter 5.
C. Test aggregates per ASTM C 33.

2.7 CONCRETE STRENGTHS
A. Design mixes to provide normal weight concrete with the following properties, as indicated on Drawings and schedules:

<table>
<thead>
<tr>
<th>Mix of Concrete</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. comprehensive strength at 28 days</td>
<td>4000</td>
</tr>
<tr>
<td>Minimum sacks of cement per cu. yd.</td>
<td>5.50</td>
</tr>
<tr>
<td>Maximum water-cement ratio</td>
<td>0.50</td>
</tr>
</tbody>
</table>

B. Aggregate size: Maximum size of coarse aggregates:
1. 1-1/2": Footings
2. 3/8": For all sections 3-1/2" and less in thickness
3. ¾": All other concrete
C. Slump: The amount of slump shall be determined by standard test method ASTM C 143 and shall be as follows:
   1. For slabs on grade, the slump shall not be less than 2" nor more than 4".
   2. For footings and walls, the slump shall not be less than 3" nor more than 4".
D. Air entrainment: Use air-entraining admixture in all exterior exposed concrete and in all concrete exposed to freezing and thawing during prosecution of work. Provide air content of 6%; with a permissible variation from specified air content of plus or minus one percent.

2.8 FORMING AND PLACING CONCRETE
A. Mixing: All concrete shall be ready mixed concrete provided by a central batch plant. Mixing and transportation shall be by agitating type trucks in accordance with ASTM C 94.
B. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.
   1. When the air temperature is between 85 deg.F, reduce the mixing and delivery time from 1-1/2 hours to 1-1/4 hours, and when the air temperature is above 90 deg.F, reduce the mixing and delivery time to 60 minutes.

PART 3 – EXECUTION

3.1 FORM REQUIREMENTS
A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied without displacement, warping or bowing until such loads can be supported by the concrete structure. Formwork shall be readily removable without damage to cast-in-place surfaces and adjacent materials.
B. Construct forms complying with ACI 347-78, to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures.
C. Provide openings in formwork to accommodate work of other trades. Accurately place and securely support items built into forms.
D. Clean and adjust forms prior to concrete placement. Apply form release agents or wet forms, as required. Tighten forms during concrete placement if required to eliminate mortar leaks.
E. Reinforcement: Comply with the specified codes and standards, and Concrete Reinforcing Steel Institute’s recommended practice for “Placing Reinforcing Bars”, for details and methods of reinforcement placement and supports, and as herein specified. Comply with tolerances specified in ACI 301-84.
F. Position, support and secure reinforcement against displacement. Locate and support with metal chairs, runners, bolsters, spacers and hangars, as required. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Do not rebend reinforcement unless specifically permitted according to details on the drawings.
G. Install welded wire fabric in as long lengths as practicable, lapping at least one mesh and lace splices with wire. Rolled reinforcing shall be reverse rolled prior to installation.
H. Joints: Provide construction, isolation, and control joints as indicated or required. Locate construction joints so as not to impair strength and appearance of structure. Place isolation and control joints in slabs-on-grade to stabilize differential settlement and random cracking.

3.2 CONCRETE PLACEMENT
A. The contractor is responsible for notifying the Architect a minimum of 24 hours prior to any concrete pour. Place concrete in compliance with the practice and recommendation of ACI 301-84, and as herein specified.
B. Deposit concrete as nearly as practicable to its final location to avoid segregation due to re-handling or flowing.
C. Consolidate placed concrete using mechanical vibrating equipment with hand rodding and tamping, so that concrete is worked around reinforcement and other embedded items and into forms.
D. Protect concrete from physical damage or reduced strength due to weather extremes during mixing, placement and curing.
   1. In cold weather comply with ACI 306.
   2. In hot weather comply with ACI 305.
3.3 CONCRETE FINISHES

A. exposed-to-view Surfaces: It is the intent of this Specification to require forms, mixtures of concrete and workmanship so that concrete surfaces, when exposed, will require no patching except for plugging holes. However, where patching is acceptable to Architect/Engineer, ACI-301-84 shall be the minimum standard.

B. Slab trowel finish: Except when otherwise indicated or specified, concrete floor slabs shall be monolithically finished at required level by screeding, floating, and troweling to provide smooth, even, non-porous finish, free of trowel marks.

C. Finish Tolerances: Shall be true planes ¼” in 10 ft. as determined by a 10 foot straightedge placed anywhere on the slab in any direction.

D. Broom Finish: All paths.

E. Procedure for broom finish shall be in accordance with ACI 301-66. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route.

F. Curing Methods: Perform curing of concrete by moist curing, by membrane curing, or by combinations thereof, as herein specified.
   1. Moist Curing: Start initial curing as soon as free water has disappeared from concrete surfaces after placing and finishing. Protect from premature drying and excessively hot or cold temperatures, and maintain to provide a continuous moist cure at a temperature above 50 deg. F for at least 7 days, or in the case of exposed slabs, for at least 14 days. Avoid rapid drying at end of final curing period.
      a. Provide moisture curing by one of the following methods:
         1) Keep concrete surface continuously wet by covering with water.
         2) Continuous water-fog spray.
         3) Covering concrete surface with absorptive cover, thoroughly saturating cover with water and keeping continuously wet.
   2. Membrane-Forming Curing Compound: Start initial curing as soon as free water has disappeared from concrete surfaces after placing and finishing. Protect from premature drying.
      a. provide membrane-forming curing compound to slabs as follows:
         1) Apply membrane-forming curing compound to concrete surfaces as soon as final finishing operations are complete (within 2 hours).

G. Concrete to receive Track Surfacing: Coordinate finishes of all concrete to receive track surfacing with track installer for requirements.

END OF SECTION 03300
SECTION 11 6803
ATHLETIC EQUIPMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY
A. This Section includes the following athletic equipment:
   1. Track and Field Equipment

B. Related Sections include the following:
   1. Concrete for all poured in place concrete.
   2. Resilient Track Surfacing, Synthetic Turf Base Construction, Synthetic Turf Surfacing.

1.3 PERFORMANCE REQUIREMENTS
A. Structural Performance: Design and install all equipment to meet or exceed all applicable governing codes.

1.4 SUBMITTALS
A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

B. Product Certificates: For each type of athletic equipment, signed by product manufacturer.

C. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.

D. Qualification Data: For installer and professional engineer.

E. Maintenance Data: For athletic equipment include applicable data in maintenance manuals.

1.5 QUALITY ASSURANCE
A. Installer Qualifications: A qualified installer employing workers trained and approved by manufacturer.

B. Source Limitations: Obtain each type of athletic equipment through one source from a single manufacturer.

C. Standards: Provide athletic equipment complying with or exceeding requirements of authorities having jurisdiction.

D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Meetings."
1.6 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. 8' offset Football Goal Set of Two.
   a. Sportsfield Specialties, Model GP830HS30 with optional access frame, 1-888-975-3343, www.sportsfieldspecialties.com
   b. Or approved equal

2. Aluminum Pole Vault Box.
   c. Or approved equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, and conditions with Installer and Owner present. Layout all components with installation tolerances, operational clearances, and other conditions affecting performance in field prior to actual installation.

1. Verify critical dimensions.
2. Inspect all surfaces and materials in which athletic equipment is to me installed for unsatisfactory conditions.

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

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions. Complete equipment field assembly, where required.

B. Unless otherwise indicated, install athletic equipment after other finishing operations, including painting, have been completed.

C. Permanently Placed Athletic Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with field layout.

1. Finish Grade Elevation: Coordinate installed heights of equipment with specified finish grades.
D. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed athletic equipment to structural support and for properly transferring load to in-place construction.

3.3 CLEANING AND PROTECTION

A. After completing athletic equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer’s written instructions.

B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure athletic equipment is without damage or deterioration at time of Substantial Completion.

C. Replace athletic equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 116803
SECTION 11 6803a
ATHLETIC EQUIPMENT - SOFTBALL FIELD ALTERNATE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following athletic equipment:
   2. Foul Poles
   5. Batting Tunnel
   6. Dugout Roofs

B. Related Sections include the following:
   1. Division 2 Section "Chain Link Fencing and Gates" for field fencing.
   2. Division 3 Section “Concrete” for all poured in place concrete.
   3. Division 16 Sections “Sports Lighting” for field light poles.

1.3 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design and install all equipment to meet or exceed all applicable governing codes.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, features, and finishes. Include details of anchors, hardware, and fastenings. If applicable, include assembly, disassembly, and storage instructions.

B. Shop Drawings:
   1. Backstop Netting: Show location and extent of fully assembled backstop netting and cabling with pole locations. Include elevations, sections, and details not shown in Product Data. Show method of field assembly, connections, installation details, mountings and, attachments to other Work, operational clearances, and relationship to adjoining work.
      A. Guy wires and Reinforcement: Show locations of blocking and reinforcement required for support of athletic equipment.
      B. Design Calculations: Signed and sealed by a qualified professional engineer. Calculate requirements for supporting the backstop netting. Verify capacity of members and connections to support loads and verify loads, point reactions, and locations for attachment of backstop netting and cabling to structure.
   2. Foul Pole: Show location and extent of fully assembled Foul Pole.
4. Batting Cage: Provide drawings of the manufacturers recommended installation and foundation requirements of Batting Tunnel prior to actual field installation.
5. Dugouts: Roofing material, fence enclosure, opening locations, footing requirements, etc.

C. Coordination Drawings: Field layout plans and elevations drawn to scale and coordinating dimension with surrounding work.

D. Samples for Initial Selection: For each type of athletic equipment indicated.

E. Samples for Verification: For the following products:
   1. Backstop Net: Not less than 6 inches (160 mm) square.
   2. Backstop Cabling: Not less than 6 inches (160 mm) in length
   3. Batting Cage Net: Not less than 6” square.
   4. Batting Cage Turf: Not less than 6” square.

F. Product Certificates: For each type of athletic equipment, signed by product manufacturer.

G. Manufacturer Certificates: Signed by manufacturers certifying that they comply with requirements. Include evidence of manufacturing experience.

H. Qualification Data: For installer and professional engineer.

I. Maintenance Data: For athletic equipment include applicable data in maintenance manuals.

1.5 QUALITY ASSURANCE
A. Installer Qualifications: A qualified installer employing workers trained and approved by manufacturer.
B. Source Limitations: Obtain each type of athletic equipment through one source from a single manufacturer.
C. Standards: Provide athletic equipment complying with or exceeding requirements of authorities having jurisdiction.
D. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section “Project Meetings.”

1.6 PROJECT CONDITIONS
A. Field Measurements: Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Backstop Netting Equipment:
      A. Empire Netting
      B. West Coast Netting, Inc.
      C. Douglas Industries, Inc.
      D. Sportsfield Specialties
      E. Or approved Equivalent
   2. Bases/Plates/Rubber suppliers:
Park Hill High School Athletic Complex Renovation
Kansas City, MO

A. Hollywood Bases
B. Or approved Equal

3. Foul Poles
   A. Sportsfield Specialties
   B. Beacon Athletics
   C. MASA Equipment
   D. Or approved Equal

4. Baseball Batting Tunnel: LGOBT 'Long Gone' Baseball Batting Tunnel as manufactured by:
   Sportsfield Specialties Inc.
   P.O. Box 231
   41155 State Highway 10
   Delhi, NY 13753
   p. 888-975-3343
   f. 607-746-8481

5. Artificial Turf for batting tunnel:
   A. Astro Turf System 12
   B. Or approved equal

6. Dugout Basis of design: Sportsfield Specialties 8’ Gameshade, 8’ x 40’, wind rated 140
   mph, including surrounding chain link fence.
   Approved Manufacturers:
   A. Sportsfield Specialties
   B. Beacon Athletics
   C. Or approved Equal

2.2 BASES/PLATES/RUBBERS

A. Bases
   2. Or approved equal

B. Home Plate
   1. Bolco 300AS 3” In-Ground Home Plate, with Hardwood Core.
   2. Or approved equal.

C. Pitchers Plate
   1. Bolco Four Sided pitching Rubber Model - Inside tube to be packed with Home Plate Clay.
   2. Or approved equal.

2.3 BACKSTOP MATERIALS, GENERAL

A. Steel Poles:

   1. Cold-Formed Steel Posts: ASTM A 36, Grade B, hot dip galvanized unless another
      grade is required by structural loads, field prepped to receive paint.
   2. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M, hot-dip galvanized
      A. Include ⅜” top cap, lifting ears, bottom cap.
      B. Predrill for installation of hardware.

B. Cabling: 1x7 galvanized steel aircraft cable with a breaking strength as follows:
   1. Main Load Cable: ¼” with tensile strength of 26,900 lbs minimum.
   2. Bottom Cable: 3/8” with tensile strength of 15,400 lbs minimum.
   3. Vertical Cable: ¼” with tensile strength of 6,650 lbs minimum.
4. Provide fittings complying with cable manufacturer’s written recommendations for size, number, and method of installation.

C. Backstop Netting:
   1. K 36 treated polyester, minimum.
   2. 1 ¾” square knotted mesh.
   3. Tensile strength of 250 lbs, minimum.
   4. 3/8” Rope Binding.
   5. 7% Solid Wind Load.

D. Anchors, Fasteners, Fittings and Hardware: To be heavy duty galvanized hardware.
   1. Netting to be attached to backstop cable with #9 screen rings attached approximately 6 to 12 inches on center.

2.4 Foul Poles
   1. 20’ tall
   2. 3-1/2” or larger Steel poles.
   3. 22’ x 18” visual wing. Steel angle frame with expanded steel mesh welded in place.
   5. Footing: Provide footing design per manufacturer complying with local codes.

2.5 Baseball Batting Tunnel.

A. COMPONENTS:
   1. Overall Dimensions: 14.0ft H x 20.0ft W x 75.0ft L
      Net Dimensions: 12.0ft H x 14.0ft W x 75.0ft L
   2. #7000 Upright Posts Fabricated with 4.0in OD x .125in Wall Rolled Aluminum Tube:
      A. 14.0ft Above Ground Height
      B. 36.0in Rolled Offset
      C. Aluminum Mill Finish
   3. #7010 Upright Ground Sleeves Fabricated with 4.30in OD (4.10in ID) Aluminum Tube:
      A. 30.0in Length
      B. Silver Mill Finish
      C. Aluminum Ground Sleeve Caps
   4. #7020 Baseball Batting Tunnel Net:
      A. 12.0ft H x 14.0ft W x 75.0ft L
      B. #36 Black Nylon 1-3/4” Mesh
      C. 50.0ft Tethers
   4. Accessories:
      A. #7015 Hardware Kit
         a. Stainless Steel Assembly Bolts
         b. Black Vinyl Coated Wire Rope
      B. #7005 Net Attachment Extension Arms

2.4 Artificial Turf for batting tunnel:
   A. The turf system shall consist of a short surface pile (1/2”), which shall be knitted/tufted into a polyester backing, which is coated with acrylic/urethane.
   B. Face weight +/-44 oz/yd2.
   C. Primary and secondary backing +/-32 oz/yd2.
   D. The entire system shall be resistant to weather, insects, rot, mildew, and fungus growth, and will be non-allergic and non-toxic.
   E. The entire system shall be constructed for porous standards as specified.
   F. The pile surface shall provide good traction in all types of weather with the use of conventional sneakers type shoes, composition mold sole athletic shoes, and baseball spikes.
G. The fabric surface will be installed in 15-foot rolls. One roll will be required for each cage. Anchor perimeter of rolls with mechanical attachment (no glue) to prevent movement by wind.

H. The entire system will be constructed to maximize dimensional stability, to resist damage, resistant to ultraviolet radiation, and sustain normal wear and tear for its designated uses.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, and conditions with Installer and Owner present. Layout all components with installation tolerances, operational clearances, and other conditions affecting performance in field prior to actual installation.
   1. Verify critical dimensions.
   2. Inspect and coordinate with manufacturer for cabling and netting connections to poles.
   3. Inspect all surfaces and materials in which athletic equipment is to me installed for unsatisfactory conditions.

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

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written installation instructions. Complete equipment field assembly, where required.

B. Unless otherwise indicated, install athletic equipment after other finishing operations, including painting, have been completed.

C. Permanently Placed Athletic Equipment and Components: Rigid, level, plumb, square, and true; anchored securely to supporting structure; positioned at locations and elevations indicated on Shop Drawings; in proper relation to adjacent construction; and aligned with field layout.
   1. Finish Grade Elevation: Coordinate installed heights of equipment with specified finish grades.
   2. Layout. Place bases so that 1st base to home plate to 3rd base is 90 degrees. Three sets of base anchors will be installed.

D. Anchoring to In-Place Construction: Use anchors and fasteners where necessary for securing built-in and permanently placed athletic equipment to structural support and for properly transferring load to in-place construction.

E. Base Anchors: Install bases in concrete per mfg. recommendations. Concrete anchor shape used, shall prevent twisting or overturning from normal use (round form shall not be used i.e. coffee can).

F. Pitching Rubber: Install pitching rubber at distance from Home Plate as determined by NWKTC

3.3 CLEANING AND PROTECTION

A. After completing athletic equipment installation, inspect components. Remove spots, dirt, and debris and touch up damaged shop-applied finishes according to manufacturer's written instructions.
B. Provide final protection and maintain conditions acceptable to manufacturer and Installer that ensure athletic equipment is without damage or deterioration at time of Substantial Completion.

C. Replace athletic equipment and finishes that cannot be cleaned and repaired, in a manner approved by Architect, before time of Substantial Completion.

END OF SECTION 116803
SECTION 31 2001 – FINE GRADING (NON-PLAYING FIELD AREAS)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section covers preparing the ground surface and furnishing and applying fertilizer and other additives to all disturbed areas to be seeded or sodded in accordance with this specification at the locations indicated on the Drawings.

B. All areas are to be final graded by the Contractor. Grading machinery shall be equipped with flotation type tires. No machinery with farm type tires will be allowed to perform grading or fertilizer operations. This operation shall be completed and acceptable to the Landscape Architect. Contractor shall be responsible for repair of damaged finish graded areas until seeding operations begin.

C. Fine grading and fertilizing includes, but is not limited to, the following:

1. Removal of all weed growth. All noxious weeds shall be identified and sprayed prior to clearing.
2. Thorough cultivation of the soil to a weed free condition.
3. Re-establishment of final grade.
4. Performance of fine grading as herein specified.

PART 2 - PRODUCTS

2.1 N/A

PART 3 - EXECUTION

3.1 FINE GRADING

A. All areas are to be laser graded using dual plane laser technology and machinery equipped with flotation type turf tires. This operation shall be completed and acceptable to the Architect prior to sodding. Contractor shall be responsible for repair of damaged, finished graded areas until sodding operations are complete.

B. The surfaces to be seeded or sodded shall be cleared of all stones, roots or other objects larger than 1 inch in diameter, and of all wire, brush, debris, or other objects that may interfere with subsequent planting or maintenance operation.

C. Loosen topsoil of lawn areas to a minimum depth of 2”

D. Eliminate surface irregularities by use of a weighted drag, making passes at 90 degrees to each other.
E. Portions not readily worked by machine shall be worked by hand. Areas adjacent to curbs, walks, signs, existing trees, light poles and other site items shall be hand worked and blended into adjacent grades.

F. No fine grading shall be done when the soil is in a muddy or frozen condition.

3.2 FINAL GRADING

A. Finished Grading: The words "finished grading", as used herein, mean the establishment of the required final grade elevations indicated on the Drawings. All surfaces shall be brought to the indicated grades and contours, and left in a "fine-graded" condition, free of all clods, stones larger than 1” or weeds and other debris, ready for seeding or sodding.

1. The finished grading of areas to be seeded must be verified and re-established at the time just prior to the placement of seed or sod.

B. Grading Tolerances:

1. All playing field surfaces shall be laser graded to a tolerance of +/- 0.02’ (1/4 inch) as measured with a 25’ string line.
2. Non-playing field areas shall be graded to a tolerance of +/- 0.08’ (1 inch).
3. All surfaces shall be smooth and free draining without low or high spots that may cause ponding of water regardless of grading tolerances.

C. All areas are to be final graded by the Contractor. This operation shall be completed and acceptable to the Architect prior to seeding or sodding.

D. Contractor shall be responsible for completion of surface preparation, and fertilizing operations, and immediately prior to sowing seed or placing sod. The areas shall be given a final grading as needed to correct irregularities in the surface, due to the above operations or other causes, and to restore the prescribed grades.

3.3 PREPARATION OF UNCHANGED GRADES

A. Where seeding or sodding is to be done in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows:

1. Till to a depth of not less than 6 inches.
2. Apply fertilizers as specified for disturbed areas.
3. Remove high areas and fill in depressions.
4. Till soil to a fine texture, free of lumps, clods, stones, roots and other extraneous matter.

B. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of owner’s property. Do not turn existing vegetation over into soil being prepared for lawns.

C. Apply specified commercial fertilizer at rates specified and thoroughly mix into upper two inches of topsoil.

D. Fine grade area to smooth, even surface with loose, uniformly fine texture. Remove ridges and depressions.

E. Moisten prepared lawn areas prior to seeding or sodding if soil is dry. Water thoroughly and allow to dry before seeding or sodding.

F. Restore area to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.
3.4 CLEANING UP

A. Any topsoil or other dirt which may be brought on to pavements as a result of grading shall be removed from the pavement promptly.

END OF SECTION 312001
PART 1 - GENERAL

1.1 Fly Ash will be applied under the artificial turf field.
1.2 Contractor is responsible for submitting existing site soil to a geo-technical lab for Proctor Density testing and determination of mix design. It is anticipated that Fly-Ash will be incorporated to a depth of 8” (Refer to Geo-Tech Report). (Contractor may substitute Cement or Code L lime as deemed appropriate by the testing lab)
1.3 Sufficient equipment shall be in operation on the project so that all operations can be carried on in their proper sequence without delay and so that final compaction, rolling and finishing can be completed during daylight hours.
1.4 At the end of each day's operations, or in case of construction delays that will cause operations to cease, and at a point where satisfactory construction has been completed, a straight transverse construction joint shall be formed by cutting back into the completed work to form a true vertical face. A protective covering of earth shall be placed on the newly constructed base course for a distance back of the joint required for the turning of equipment used on the following day's work. The thickness of the covering shall be such that the equipment will not mar or damage completed work

PART 2 – MATERIALS

2.1 Materials: Fly ash shall comply with the physical requirements of ASTM International D-5239 6.4, maintaining a minimum compressive strength of 345 MPa (500 psi) at 7 days, and the chemical requirements of ASTM C618, Table 1, for Class "C" fly ash. Self cementing ash not meeting the above requirements can be used provided the sulfur trioxide content does not exceed 10% and the self cementing properties have been demonstrated to provide the required degree of stabilization. The source of the ash shall be identified and approved in advance of the stabilization operations so that laboratory tests can be completed prior to commencing work.
2.2 Equipment: Perform operations using suitable, well maintained equipment capable of excavating subsoil, mixing and placing materials, wetting, consolidation and compaction of material.

PART 3 – EXECUTION

3.1 MIXING AND COMPACTION - FLY ASH:
3.1.1 Mixing: Mixing of the fly ash with the sub grade soil shall follow application and spreading as a continuous construction operation. Mixing lifts shall not exceed plan lift thickness unless previously approved. Work areas for mixing shall not exceed 5,000 square yards unless otherwise authorized by the Engineer.
3.1.2 The mixing procedure shall be as hereinafter described:
   a) First mixing. The moisture content of the sub grade soil shall not exceed eighty percent (80%) of optimum at the time of first mixing. The soil and fly ash shall be mixed until a uniform mixture is obtained in which all clods and non-aggregate lumps are reduced to a maximum of two and one-half inches (2.5") diameter size. The addition of water will not be permitted during first mixing. First mixing operations shall begin no later than four (4) hours after application of the fly ash. When deemed necessary by the Engineer, any portion of the work area shall be re-scarified and additional fly ash added to insure adequate soil modification. The fly ash and soil shall be thoroughly mixed to the satisfaction of the Engineer prior to the beginning of final mixing operations.
   b) Final mixing. After the dry soil and fly ash have been satisfactorily mixed, additions of water shall be made in the final mixing operations to initiate soil-fly ash reaction. The method of mixing shall be an approved procedure utilizing a traveling rotary mixing plan which
demonstrates uniform dispersion of fly ash and water throughout the soil materials. The quantity of water necessary for the final mixing operations will vary with the nature of the materials, normally two to five percentage (2-5%) points above the optimum moisture content of the compacted modified soil. Sufficient water in any case shall be added in the final mixing process to insure chemical reaction between the fly ash and soil.

All clods shall be reduced in size by mixing until the soil-fly ash mixture meets the following size requirements when tested with laboratory sieves:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 ½ inch</td>
<td>100</td>
</tr>
<tr>
<td>¾ inch</td>
<td>50-100</td>
</tr>
</tbody>
</table>

c) **Optional:**
The following alternate mixing procedure may be used at the option of the Contractor and with the approval of the Engineer in lieu of the procedure described in the above paragraphs. The moisture content of the soil shall be adjusted to between two (2) and five (5) percentage points above optimum prior to application of any fly ash. Fly ash shall then be applied and mixing shall begin immediately. The soil and fly ash shall be mixed until a uniform mixture is obtained in which all clods and non-aggregate lumps are reduced to a size such that one hundred percent (100%) will pass a one and one-half inch (1 ½") screen and fifty percent (50%) to one hundred percent (100%) will pass a three quarters inch (3/4") screen. Sufficient water shall be added in this mixing process to insure chemical reaction between the fly ash and water throughout the soil materials. Compaction shall begin immediately after the mixing is completed when this prescribed procedure is used.

3.2 COMPACTATION:
3.2.1 Compaction of the soil-fly ash mixture shall be performed immediately after final mixing, wherein the compaction operation shall be a continuation of the final mixing operation. Each lift of mixed fly ash-soil material shall be compacted full depth to a density of not less than ninety-five percent (95%) of standard compaction of the fly-ash soil material as determined by the Engineer.

3.2.2 The soil-fly ash mixture shall be compacted without delay and before any appreciable loss of mixing moisture occurs. Mixing and compaction operations shall be performed in such a manner that the mixture will be compacted within plus or minus three percentage (3%) points of optimum moisture content. However, when deemed necessary by the Engineer during the course of construction, changes or adjustments in the specified moisture requirements to meet field conditions may be authorized.

3.2.3 Compaction shall continue until the entire depth of the mixture is uniformly compacted. The rate of operation and the number of rollers shall be sufficient to compact uniformly the section of roadway being processed within two (2) hours after introduction of water.

3.2.4 During the early stages of sub grade construction, the Engineer will work closely with the Contractor by reporting compaction test results promptly for each stage of fly ash modified sub grade construction as an aid to the Contractor to establish a construction procedure that will attain the required density within the prescribed two (2) hours.

3.2.5 The material shall be sprinkled and rolled. All irregularities, depressions or weak spots which develop shall be corrected immediately by scarifying the areas affected, adding or removing material as required, and reshaping and recompacting by sprinkling and rolling.

3.2.6 In addition to the requirements specified for density, the full depth of the material shown on the Plans shall be uniformly compacted to the extent necessary to remain firm and stable under construction equipment. After each section is completed, density tests as necessary will be made by the Engineer. If the material fails to meet the density requirements, it shall be reworked as necessary to meet these requirements. Rework shall include the addition of more fly ash at a rate determined by the Engineer. Throughout this entire operation, the shape of the course shall be maintained and the surface upon completion shall be smooth and in conformity with the typical
sections shown on the Plans and to the established lines and grades. Should the material, due to any reason or cause, lose the required stability, density or finish before the next course is placed or the work is accepted it shall be recompacted and refinished at the sole expense of the Contractor.

3.3 CURING AND PROTECTION:

3.3.1 The completed cement/fly ash/code L lime treated sub grade shall be protected against loss of moisture for a period of seven (7) days. The curing time may be reduced to a minimum period of three (3) days only when approved by the Engineer and as further determined by individual project conditions. The completed cement/fly ash treated sub grade shall be protected against loss of moisture by covering with an approved moisture barrier such as moist burlap or polyethylene sheet, or at the option of the Contractor and at his own expense, an application of emulsified asphalt may be applied, using approved pressure-distributing equipment immediately after the completion of the finishing operations. The asphalt emulsion shall contain not less than forty percent (40%) of asphalt and shall preferably be of the quick-breaking type of emulsion.

3.3.2 Immediately prior to the application of the bituminous curing membrane, however, the surface shall be thoroughly wetted by means of approved pressure-distributing equipment. No free water shall remain on the surface when the bituminous material is applied. The Contractor shall keep all traffic off the cement/fly ash-treated sub grade after the curing medium has been applied and until the base has cured for the specified length of time.

3.3.3 The Contractor shall be required to maintain, at his own expense, the entire roadway within the limits of the improvement, in good condition, satisfactory to the Engineer, from the time he first starts work until all work has been completed. Maintenance shall include immediate repair of any defects that may occur either before or after the cement/fly ash is applied to the sub grade soil.

3.3.4 Stabilized sub grades shall be constructed to elevations such that it will not be necessary to cut or trim in excess of one inch (1") of material off the sub grade.

END OF SECTION 31 2150
SECTION 32 1313 - CURB AND SIDEWALKS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Combination concrete curb and gutter
B. Concrete Curb
C. Concrete Sidewalk

1.2 APPLICABLE PUBLICATIONS AND STANDARDS

A. “Standard Specifications for Road and Bridge Construction” latest edition, Missouri Department of Transportation, hereinafter referred to as the “Standard Specifications.”
B. Construction Drawings.
C. ACI 304 Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
ANSI/ASTM D 1751 Preformed Expansion Joint Fillers for Concrete Paving and Structural construction.
ANSI/ASTM D 1752 Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
ASTM C 33 Concrete Aggregates.
ASTM C 94 Ready Mix Concrete.
ASTM C 150 Portland Cement.
ASTM C 260 Air-Entraining Admixtures for Concrete.
ASTM C 309 Liquid Membrane-Forming Compounds for Curing Concrete.
ASTM C 494 Chemical Admixtures for Concrete.
FS TT-C-800 Curing Compound, Concrete, for New and Existing Surfaces.

1.3 PERFORMANCE REQUIREMENTS

Contractor shall maintain access for vehicular and pedestrian traffic as required for other construction activities. Utilize temporary striping, flagmen, barricades, warning signs, and warning lights as required.

PART 2 PRODUCTS

2.1 MATERIALS

A. Forms: Steel, wood, or other suitable material of size and strength to resist movement during concrete placement and to retain horizontal and vertical alignment until removal. Use straight forms, free of distortion and defects. Use flexible spring steel forms or laminated boards to form radius bends as required. The forms shall be of a depth equal to the depth of curbing or sidewalk, and so designed as to permit secure fastening together at the tops. Coat forms with nonstaining type coating that will not discolor or deface surface of concrete.
B. Concrete Materials: Comply with requirements of Standard Specifications for concrete materials, admixtures, bonding materials, curing materials, and others as required.
C. Joint Fillers: Resilient premolded bituminous impregnated fiberboard units complying with ASTM D 1751 FS HH-F-341, Type II, Class A; or AASHTO M 153, Type I.

2.2 MIX AND DESIGN AND TESTING

A. Concrete mix design and testing shall comply with requirements of Standard Specifications.

B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce the following properties:
   1. Compressive Strength: 4,000 psi, minimum at 28 days, unless otherwise indicated on the Drawings.
   2. Slump Range: 2"-5" at time of placement.
   3. Air Entrainment: 5% to 8%.

C. Tests taken during concrete placement shall be in accordance with requirements of Section "Portland Cement Concrete" in these specifications.

PART 3 EXECUTION

3.1 PREPARATION

A. Proof-roll prepared base material surface to check for unstable areas. The paving work shall begin after any unsuitable areas have been corrected and are ready to receive paving. Compaction testing for the base material shall be completed prior to the placement of the paving.

B. Surface Preparation: Remove loose material from compacted base material surface to produce a firm, smooth surface immediately before placing concrete.

3.2 INSTALLATION

A. Form Construction
   1. Set forms to required grades and lines, rigidly braced and secured.
   2. Install sufficient quantity of forms to allow continuance of work and so that forms remain in place a minimum of 24 hours after concrete placement.
   3. Check completed formwork for grade and alignment to following tolerances:
      - Top of forms not more than 1/8" in 10'-0".
      - Vertical face on longitudinal axis, not more than 1/4" in 10'-0".
   4. Clean forms after each use, and coat with form release agent as often as required to ensure separation form concrete without damage.

B. Concrete Placement
1. Comply with applicable requirements of Standard Specifications.

2. Do not place concrete until base material and forms have been checked for line and grade. Moisten base material if required to provide uniform dampened condition at time concrete is placed. Concrete shall not be placed around manholes or other structures until they are at the required finish elevation and alignment.

3. Place concrete using methods which prevent segregation of mix. Consolidate concrete along face of forms and adjacent to transverse joints with internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Consolidate with care to prevent dislocation of dowels, and joint devices.

4. Deposit and spread concrete in continuous operation between transverse joints, as far as possible. If interrupted for more than 30 minutes, place construction joint. Automatic machine may be used for curb and gutter placement at Contractor’s option. Machine placement must produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete. If results are not acceptable, remove and replace with formed concrete as specified.

C. Joint Construction

1. Contraction Joints: Concrete curb, concrete gutter or concrete curb and gutter, where specified on the plans, shall be constructed in uniform sections of the length specified on the plans. Unless otherwise noted, joints shall be at 20 feet intervals. The joints between sections shall be formed either by steel templates 1/8 inch in thickness, of a length equal to the width of the gutter and/or curb, and with a depth which will penetrate at least 2 inches below the surface of the curb and/or gutter; or with 3/4 inch thick preformed expansion joint filler cut to the exact cross section of the curb and/or gutter; or by sawing to a depth of at least 2 inches while the concrete is between 4 to 24 hours old. If steel templates are used, they shall be left in place until the concrete has set sufficiently to hold its shape, but shall be removed while the forms are still in place.

2. Longitudinal Construction Joints: Concrete curb, concrete curb and gutter, where specified on the plans, shall be tied to concrete pavement with 1/2 inch round deformed reinforcement bars of the length and spacing shown on the plans.

3. Transverse Expansion Joints: Transverse expansion joint in curb, curb and gutter, gutter or sidewalk shall have the filler cut to the exact cross section of the curb, curb and gutter, gutter or sidewalk. The joints shall be similar to the type of expansion joint used in the adjacent pavement.

D. Joint Fillers: Extend joint fillers full width and depth of joint, and not less than 1/2,” or more than 1” below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together.

E. Joint Sealants: All joints shall be sealed with approved exterior pavement joint sealants and shall be installed per manufacturer’s recommendations.

3.3 CONCRETE FINISHING

A. After striking off and consolidating concrete, smooth surface by screeding and floating. Adjust floating to compact surface and produce uniform texture. After floating, test surface for trueness with 10’-0” straightedge. Distribute concrete as required to remove surface irregularities, and refloat repaired areas to provide continuous smooth finish.
B. Work edges of sidewalks, gutters, back top edge of integral curb, and formed joints with an edging tool, and round to 1/2" radius. Eliminate tool marks on concrete surface. After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:

1. Inclined Slab Surfaces: Provide coarse, nonslip finish by scoring surface with stiff-bristled broom perpendicular to line of traffic.

2. Curbs, gutters, and walks: Broom finish by drawing fine-hair broom across surface perpendicular to line of traffic. Repeat operation as necessary to produce a fine line texture.

C. Do not remove forms for 24 hours after concrete has been placed. After form removal, clean ends of joints and point up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed.

D. Protect and cure finished concrete paving using acceptable water-curing methods, or sealing materials in conformance with ACI 308-81.

3.4 BACKFILL

After the concrete has set sufficiently, the spaces in front and back of the curb and gutter or sidewalk shall be refilled to the required elevation with suitable material which shall be compacted until firm and solid and neatly graded.

3.5 CLEANING AND ADJUSTING

A. Sweep concrete pavement and wash free of stains, discolorations, dirt, and other foreign material just prior to final inspection.

B. Protect concrete from damage and vandalism until acceptance of work. Exclude traffic from pavement for at least 7 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials.
SECTION 32 1824 - SOFTBALL INFIELD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Provisions, Supplemental General Conditions and Division - 1 Specifications, apply to work of this section.

1.2 SUMMARY

A. This section covers the preparation of the skinned infield areas located in each of the softball fields. The work includes:
   1. Site grading including all necessary stripping, stockpiling, cutting and filling to achieve proposed grading indicated on drawings.
   2. Finish Grading and dragging of finish material.
   3. Pitchers rubber installation.
   4. Pitchers clay installation.

1.3 SUBMITTALS REQUIRED WITH BID

A. Bidders Qualification Requirements: Each bidder shall provide proof of ten (10) or more recent sports field installations which have been in use successfully for three (3) or more years. Bidder shall have grading equipment with cone shaped laser and turf type flotation tires or tracks. If this cannot be adequately shown as stated above, the bidder shall submit the following additional information.
   1. Listing of work similar to that required under this contract with phone numbers, client contacts and installation dates. Construction photographs showing operations and equipment used should be submitted and will be returned after Owner / Architect review.
   2. Listing of employees to be used on this project and their experience level.
   3. Listing of equipment proposed to use for construction, including equipment loading in pounds per square inch. (No equipment with tire loading greater than 10 psi will be allowed to work on the field)
   4. This information shall be reviewed by the Architect and Owner for acceptance or rejection of the proposed Bidder.

1.4 PROJECT CONDITIONS

A. Site Information: All utility lines indicated on the drawings are for information only. Contractor is responsible for verifying all utility locations prior to commencing work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and stockpile on-site. Protect materials from deterioration during delivery, and while stored at site.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MATERIALS:

Infield Base:
   Ballfield Fines(Limestone Screenings)
   APAC/Reno Quarries
   Louisburg, KS 66210
   Or Approved Equal
Infield Surface:
Red Shale*
More’s Excavating
29223 W. 87th South
Viola, Kansas 67149
Contact: (620) 584-6539

*Amend sand with a medium-coarse sand. For bidding purposes assume ½” over entire infield surface (+/- 30 tons).

Infield Conditioner:
Profile Soil Products
“Turface Pro League - Heritage Red”
750 Lake Cook Rd., Suite 440
Buffalo Grove, IL  60089
(800) 207-6457

Home plate Mix Suppliers:
Diamond Pro Mound/Home Plate Clay or bricks.
Profile Products (Turface) bricks.
or approved Equal

PART 3 - EXECUTION

3.1 EXAMINATION AND PROTECTION

A. Unanticipated Conditions: Notify the Architect immediately upon finding evidence of previous structures, filled materials which penetrate below designated excavation levels, or other conditions which are not shown or which cannot be reasonably assumed from existing information. Secure the Architect's instruction before proceeding with further work in such areas.

3.2 EARTHWORK EXECUTION

A. General: Remove material of every nature or description encountered in obtaining required lines and grades. Excavate and/or place and compact fill to provide for elevation(s) required by Drawings. Excavation is all considered unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

1. Conform to elevations and grades shown within a tolerance of plus or minus one-quarter inch in 25 feet in all directions.

3.3 PLACEMENT AND COMPACTION OF SOIL MATERIALS

A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.
B. Before compaction of subgrade, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
C. Failings: If, based on the testing and observation agency reports and observations, compacted subgrade or fills are found to be below specified density, provide additional compaction and testing in accordance with specifications.
D. Moisture Control: Where subgrade soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity
as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
E. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

3.4 INFIELD INSTALLATION

A. Subgrade Preparation: Excavate to a subgrade depth of 4" to allow for the placement 4" of shale below the proposed finish grade.
B. Red Shale installation: Spread 2" (compacted, watered and settled depth) of Red Shale across entire infield, irrigate, roll and compact. Use drag mat or similar equipment and hand water to break up shale and provide “game ready” playing surface. Repeat with an additional 2" layer of shale.
C. Sand incorporation: Send Sample of Shale to testing agent (Turf & Soil Diagnostics, Linwood, KS) to determine the appropriate amount of sand to be added. Till sand into top 2" of Red Shale in small amounts (1/4") and fine grade and roll infields and have Owner/Architect review prior to additional additions. Fine grade per plans to positively shed water while maintaining flat enough slopes to provide a playable surface. Adjustments of grading will be allowed to accomplish the best possible conditions.
D. Infield Conditioner: Spread 240 bags (or bulk equivalent) evenly over entire surface and nail drag/disk/harrow into top 2” on infield material. Re-grade and roll to achieve final grade.
E. Grade Verification: Contractor will conduct a walk-through with Groundskeeper using Contractor’s survey equipment to randomly check grades at the architect’s discretion.

3.5 FIELD LAYOUT INSTALLATION

A. General: Layout of the field regarding all painted lines shall be by the Owner following Substantial Completion.
B. Install base anchors and home plate on playing fields as indicated on drawings.

3.6 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Remove excess materials from fields, and stockpile in a location on property to be determined by Owner. No off-site hauling or disposal of material is required in this contract.

END OF SECTION
SECTION 32 1825 – WARNING TRACK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Provisions, Supplemental General Conditions and Division - 1 Specifications, apply to work of this section.

1.2 SUMMARY

A. This section covers the preparation of the skinned infield areas located in each of the softball fields. The work includes:
   1. Site grading including all necessary stripping, stockpiling, cutting and filling to achieve proposed grading indicated on drawings.
   2. Finish Grading and dragging of finish material.

1.3 SUBMITTALS REQUIRED WITH BID

A. Bidders Qualification Requirements: Each bidder shall provide proof of three (5) or more recent sports field installations which have been in use successfully for three (3) or more years. Bidder shall have grading equipment with cone shaped laser and turf type flotation tires. If this cannot be adequately shown as stated above, the bidder shall submit the following additional information.
   1. Listing of work similar to that required under this contract with phone numbers, client contacts and installation dates. Construction photographs showing operations and equipment used should be submitted and will be returned after Owner / Architect review.
   2. Listing of employees to be used on this project and their experience level.
   3. Listing of equipment proposed to use for construction, including equipment loading in pounds per square inch. (No equipment with tire loading greater than 10 psi will be allowed to work on the field)
   4. This information shall be reviewed by the Architect and Owner for acceptance or rejection of the proposed Bidder.

1.4 PROJECT CONDITIONS

A. Site Information: All utility lines indicated on the drawings are for information only. Contractor is responsible for verifying all utility locations prior to commencing work.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and stockpile on-site. Protect materials from deterioration during delivery, and while stored at site.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MATERIALS:

Warning Track Base
   2” Limestone screenings

Warning Track Surface:
   2” Red Shale
   More’s Excavating
   29223 W. 87th South
PART 3 - EXECUTION

3.1 EXAMINATION AND PROTECTION

A. Unanticipated Conditions: Notify the Architect immediately upon finding evidence of previous structures, filled materials which penetrate below designated excavation levels, or other conditions which are not shown or which cannot be reasonably assumed from existing information. Secure the Architect’s instruction before proceeding with further work in such areas.

3.2 EARTHWORK EXECUTION

A. General: Remove material of every nature or description encountered in obtaining required lines and grades. Excavate and/or place and compact fill to provide for elevation(s) required by Drawings. Excavation is all considered unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.
   1. Conform to elevations and grades shown within a tolerance of plus or minus one-quarter inch in 25 feet in all directions.

3.3 PLACEMENT AND COMPACTION OF SOIL MATERIALS

A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.
B. Before compaction of subgrade, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.
C. Failings: If, based on the testing and observation agency reports and observations, compacted subgrade or fills are found to be below specified density, provide additional compaction and testing in accordance with specifications.
D. Moisture Control: Where subgrade soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
E. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

WARNING TRACK INSTALLATION

A. Subgrade Preparation: In areas of cut, excavate to a subgrade elevation that is 4” below proposed finish grade. In areas of fill, use existing infield material to fill in low areas to elevations that are 4” below proposed finish grade. Roll and compact subgrade.
B. Limestone Screenings Installation: Spread 2” of Ballfield Fines material across entire Infield, roll and compact.
C. Red Razum installation: Spread 2” (settled depth) of Red Razum across entire track, roll and compact. Use drag mat or similar equipment and hand water to break up shale and provide “game ready” playing surface. Fine grade infields per plans to positively shed water while maintaining flat enough slopes to provide a playable surface. Slight adjustments will be allowed to plan grading to accomplish the best possible playing conditions.
D. Grade Verification: Contractor will conduct a walk-through with architect using Contractor’s survey equipment to randomly check grades at the architect’s discretion.

3.5 FIELD LAYOUT INSTALLATION

A. General: Layout of the field regarding all painted lines shall be by the Owner following Substantial Completion.

3.7 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Remove excess materials from fields, and stockpile in a location on property to be determined by Owner. No off-site hauling or disposal of material is required in this contract.

END OF SECTION
SECTION 32 2000
RESILIENT TRACK SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Related Sections: The following sections contain requirements that relate to this section:
   1. Division 31 Section “Earth Moving” for soils sterilization.
   2. Division 32 Section “Asphalt Paving for asphalt paving.”

1.2 SUMMARY

A. Base mat track work consists of installation of a section of track (new asphalt surface) as illustrated in the drawings.

B. Structural spray and re-stripe entire track, D area and jump runways.

C. Re-stripe shall match existing striping. Consult with coaches to confirm layout and colors.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Weather: Construct resilient track surfacing only when the surface area is dry, the weather is not rainy, and the temperature of the material and ambient air is at least 45 deg F.

1.4 SUBMITTALS

A. Certification: Upon request, submit documents to the Architect certifying that the resilient track surfacing subcontractor has installed this type of surfacing, and is qualified to do this type of work. The installer shall be approved by the material supplier to install the track system. The manufacturer shall have installed a minimum of three tracks using the material specified. The installer shall have installed a minimum of one track. Provide reference projects, contact name, and contact phone number for representative track installations. If the installer has installed less than three tracks, the manufacturer shall have a representative on the site with experience in the installation of the type of surface specified.

1. The Owner may reject any subcontractor that does not meet the qualifications stated herein. Under no circumstances will additional costs be approved to replace a non-qualified contractor.

2. Contractors may submit qualification documents to the Architect prior to ten days before the Bid Opening date for Architect’s review and approval. Documents submitted after ten days before the Bid Opening may or may not be reviewed, at the Architect’s discretion.
B. Layout Certification: Submit documents to the Architect-Engineer certifying that the paint striping as installed meets the dimensions shown on the Drawings and The Course Measurement Requirements of Rule 5, Section 2, of the latest edition of the National Federation of State High School Associations Track and Field Rule Book.

C. Shop Drawings: Submit track layout drawing to match existing striping for approval by school officials.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: The General Contractor shall employ a Certified Track Builder as certified by the American Sports Builders Association who has completed resilient track surfacing similar in material, design, and extent to that indicated for this Project, that is acceptable to the manufacturer, and whose work has resulted in installations with a record of successful in-service performance.

B. Pre-installation Conference: Conduct conference at the Project site. Comply with requirements in Division 01 Section “Project Management and Coordination.” Review methods and procedures related to resilient track surfacing system including, but not limited to, the following:

1. Review methods and procedures and asphalt installation requirements related to resilient track installation, with the asphalt installer and Owner, including manufacturer’s written instructions.
2. Coordinate with asphalt paving installer for asphalt surface tolerances to ensure asphalt substrate conditions and finishes are met for compliance with requirements, including flatness, slope, and imperfections.
3. Be available on-site during asphalt paving installation and review track installation and any repair procedures after installation.

1.6 WARRANTY

A. Resilient surfaces shall be warranted for a period of five years from the date of Substantial Completion against defects in materials and workmanship including defects such as delamination, bubbling, cracking, loss of integrity or excessive wear. The manufacturer shall review the asphalt pavement mix design and installation and accept the base before installation of the surfacing. The manufacturer shall immediately notify the Contractor and the Architect-Engineer of any deficiencies in the asphalt pavement mix design upon award of the Contract. The guarantee does not cover vandalism, neglect, improper care, improper footwear, or acts of God. The manufacturer’s recommendations for maintenance shall be followed. The manufacturer shall submit full and complete maintenance instructions to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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


2.2 STRUCTURALLY SPRAYED BLACK MAT SYSTEM

A. Product: Poured in place polyurethane and rubber running track system. Industry standard thickness of 1/2 inch. Permeable running track system consists of the following:

1. Base primer.
2. 10 MM EPDM or SBR rubber and polyurethane shock mat.
3. 3 mm textured coat.
4. Line striping.
5. Basis of Design: Spurtan BS, Beynon BSS 100 or approved equal.

B. Materials:

1. Primers: Polyurethane based primers specifically formulated to be compatible with the base and track surfacing material.
2. Black SBR Granules: The rubber granules for the base mat shall be recycled SBR (styrene Butadiene Rubber) rubber, processed and chopped to 1-3 mm size containing less than 4% dust.
3. EPDM Granules: The rubber granules for the structural spray wearing coats shall be EPDM peroxide cured, man-made rubber containing a minimum of 20% EPDM and having a specific gravity of 1.5 ± 0.1. The EPDM rubber will be 0.5mm to 1.5mm EPDM granules. EPDM granules shall be of the same color as chosen by the owner for the track surface.
4. Polyurethane Binder: Binder for the black rubber mat shall be an MDI-based mono-component, polyurethane binding agent. The binding agent shall not have a free TDI monomer level above 0.2%, must be clear in color, not milky, and must be solvent free. The binding agent must be specially formulated for compatibility with SBR stranded or rubber crumb.
5. Structural Spray Coating: The spray coating shall be the MDI-based mono-component, moisture cured, pigmented polyurethane, specifically formulated for compatibility with EPDM granules. The finish coat shall include ultraviolet inhibitors added to protect the surface. The coating shall be the color red.
6. Line Marking Paint: The line marking paint shall be polyurethane-based paint specifically manufactured to be compatible with polyurethane synthetic track surfaces.

C. Execution:

1. Sub-Base: The Synthetic Track Surfacing System shall be laid on an approved sub-base.

   a. For National Federation of State High School Association’s (NFHS) certification the following criteria must be followed: The track surface i.e., asphalt substrate, shall not vary from planned cross slope by more than + 0.1% with a maximum lateral slope outside to inside of 2% and a maximum slope of 0.1% in any running direction. The existing asphalt shall not vary under a 10’ straight edge more than 1/4 inch.
   b. Any oil spills (hydraulic, diesel, motor oil, etc.) must be completely removed, either by chipping out or removing and replacing with new, keyed in asphalt. The minimum depth of any asphalt replacement shall be one inch. It shall be the responsibility of the surfacing contractor to determine if the asphalt substrate has cured sufficiently prior to the application of polyurethane surfacing system.
c. Concrete runways and/or “D” areas that are to be surfaced with the synthetic running surface system shall NOT contain curing agents that reduce adhesion of the synthetic surfacing system to the concrete. Coordinate specific requirements regarding concrete mixture and surfacing requirements directly with the Concrete installer.

d. It shall be the responsibility of the Contractor to determine if the asphalt substrate meets all design specifications, i.e. cross, planarity and specific project criteria. After all the above conditions are met, the synthetic surfacing contractor must, in writing, accept the planarity of the asphalt-receiving base, before work can commence.

2. Curing: Before application of the synthetic surface can begin, all new asphalt patches shall be cured for at least 14 days, and a concrete base a minimum of 28 days.

3. Cleaning: The area to be surfaced shall be clean and free of any loose or foreign particles (dirt, oil, etc.) prior to commencement of the work. The surface is usually cleaned by use of a power blower and/or high-pressure washer.

4. Priming: The primer shall be spray-applied in accordance with the manufacturer's specifications. Only those areas that can be installed the same day should be primed.

5. Mixture Composition: Job mix formulas shall be as follows:

   a. Black Mat: Manufactured from polyurethane binder and industrial grade rubber. The polyurethane and rubber shall be mixed in a continuous mixer M-6000 at a ratio of 14.5 lb. EPDM rubber to 3.19 lb. of polyurethane. Batch mixing will not be allowed. Shock mat shall be applied with a sports paver specifically designed for running surfaces with a heated vibrating screed. SMG Plano Matic, 1993 or approved equal. Industrial grade rubber granules processed to a size of between 1mm to 4mm free of fabric and foreign material with less than 3% dust. Recycled tire rubber will not be allowed. Moisture content shall not be more than 3%.

   b. Structural Spray Texture Coat: Using a structural spray machine, apply a mixture of polyurethane and EPDM rubber. This mixture shall be 60 parts colored polyurethane to 40 parts 0.5 mm to 1.5 mm rubber granules by weight. The polyurethane and rubber shall be completely mixed to insure complete encapsulation of each granule. Spray apply a minimum of 2 coats, each coat shall be 1.8 lb per square yard. The minimum amount of polyurethane and rubber for the spray coat shall be 3.6 lb. per square yard.

6. Line Markings: All line and event markings shall be applied by experienced personnel utilizing two-part urethane-based paint compatible with the synthetic track surfacing. All marking dimensions will be certified in accordance with the specifications issued by the appropriate sanctioning or governing body such as IAAF, NCAA, NFHS, etc.

   a. Engineer’s pins shall be buried 9 inches deep at both radius points. All markings in the curves shall be laid out with a theodolite and shall be accurate to within 20 seconds of 1 degree. A typical transit is not considered suitable for layout. Straights shall be laid out and marked using a steel engineer’s tape with proper allowances for temperature.

7. Physical Properties (ASTM):

   a. Thickness: 1/2 inch (12-13 mm) or as specified.
   c. Elongation at Break (ASTM D-412): Approximately 90%.
   d. Tensile Strength (ASTM D-412): 0.75 N/mm² at 70 degrees F.
e. Compression Set Recovery (ASTM D-412): 90% to 95% at 70 degrees F. over a 24-hour period.
g. Chalking (ASTM D-822): No change after 1000 hours in weather meter.
h. Coefficient of Friction (ASTM D-1984):
   1) Dry: 0.70 to 0.75.
   2) Wet: 0.60 to 0.65.
i. Resilience (ASTM D-2632): 37% to 39%.
k. Color: Red.

2.3 ASPHALT PAVEMENT
A. Asphalitic base and leveling course shall meet specified tolerances prior to installation of resilient track surfacing.

2.4 CONCRETE PAVEMENT
A. Concrete Runways and/or “D” Area, shall meet specified tolerances prior to installation of resilient track surfacing.

PART 3 - EXECUTION

3.1 PREPARATION
A. Install asphalt paving base and leveling course as specified on the Drawings. In addition to tolerances specified, continue testing of leveling course by flooding the surface with water. Remove roller marks and depressions that hold water deeper than the thickness of a nickel. Repair depressions by removing leveling course and replacing to specified levels. Grind roller marks to re-establish drainage. Repairs to the leveling course shall meet the requirements of the resilient paving manufacturer.


C. Clean the surfaces to receive resilient track surfacing of oils, dirt, and material deleterious to the resilient track surfacing. Clean the surface using pressure washers. The Contractor shall coordinate who cleans the asphalt surface.

D. Allow new asphalt to cure a minimum of 14 days or as required by the track surfacing manufacturer before laying resilient track surfacing.

E. Notify the Architect-Engineer at least 72 hours in advance of initial laying of resilient track surfacing. The Architect-Engineer will be present at the jobsite during initial laydown operations.
F. Lay resilient surfaces during daylight hours.

G. Use high pressure blowers to remove dirt, dust, and debris from all surfaces to be coated with structural spray.

H. A representative of the track surfacing manufacturer shall be present during layout operations.

3.2 INSTALLATION OF POLYURETHANE-BOUND RUBBERIZED SURFACING

A. Provide a sharp cutting tool to cut back and remove existing track surfacing designated to be replaced.

B. Spray on a polyurethane primer compatible with the asphalt base. Apply at rates recommended by the manufacturer. Mask areas which are not to be coated.

C. Installation of the base mat shall be applied by mechanical means where possible, hand troweling smaller areas to be repaired is acceptable. The blended base materials shall be applied to the substrate using a mechanical screed finisher. The screed bar must be electronically heated. All hand rollers shall be electronically heated, if used.

D. All joint work shall be troweled flush with adjacent base mat. Cured joints shall have their edges primed with the base mat priming agent prior to application of the base mat repair material.

E. The pot life of the base mat material mixture shall be not less than 60 minutes from the time of the completed mix. All trowel work shall be completed within this time. Any areas that are rough, high, uneven, or open in texture shall be sanded and filled prior to any finish work and application of structural spray.

F. Structural Spray Texture Coating: Using a structural spray machine, apply a mixture of polyurethane and EPDM rubber. Mixture shall be 60 parts colored polyurethane to 40 parts 0.55 mm to 1.5 mm rubber granules by weight. The polyurethane and rubber shall be completely mixed to ensure complete encapsulation of each granule. Spray a minimum of two (2) coats in two directions, 90 degrees from each other. Each coat shall be 1.8 lbs. per square yard. The minimum amount of polyurethane and rubber for the spray coat shall be 3.6 lbs. per square yard.

G. Apply a final coat of U.V. resistant urethane at the rate of 0.05 gallon per square yard minimum.

H. The above installation techniques are general in nature. The manufacturer's instructions shall be followed during installation.

3.3 LINE PAINTING

A. Line painting shall be done by a workman experienced with the painting of track lines and the type of material being used. Clean the surface of dirt, grease, or other objectionable material. Actual painting of the lines shall be according to the manufacturer's requirements. Lines shall be sharp and free of overspray.
3.4 FIELD QUALITY CONTROL

A. Test profile, grade, and tolerances of finished surface. Correct variations to meet the manufacturer’s recommendations.

B. Densities shall be according to the manufacturer’s recommendations.

END OF SECTION 32 2000
PART 1 - GENERAL

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

1.2 SUMMARY
A. Work included in this Section includes design, procurement, and installation of the base construction below a new synthetic playing field system for the football and soccer fields. The turf and installation shall be provided by the Owner. Base contractor is responsible for preparing the perimeter nailer and finished gravel surface to the satisfaction of the turf installer (Shaw), including but not limited to grade, planarity, stability, etc.

B. Related Sections: The following Sections contain requirements that relate to this Section.
1. Division 11 – Athletic Equipment

1.3 SYSTEM DESCRIPTION
A. General: Synthetic playing field system shall be comprised of subgrade drainage system and synthetic turf with infill material of sand and ground rubber.

1. Components include, but are not limited to:
   a. Soccer Base bid will require removal of all grass and soil of the existing field to meet proposed grades, removal of goal posts and footings, grading entire subgrade, installation of perimeter drain, subgrade fabric, installation of new panel drains, installation of base gravel, finish gravel, and grading of each layer.
   
   b. Stadium Base bid will require removal of artificial turf, removal of goal posts and footings, installation of new goal posts, re-grading entire surface, repair of any perimeter nailer as necessary.
   
   c. Earthwork Requirements:
      1) Excavation, trenching, grading, filling, backfilling, and compaction.
      2) Graded and compacted subgrade.
   
   d. Porous aggregate layer:
      1) Removal of existing gravel in areas being demolished and re-grade existing gravel as necessary to meet new grades.
      2) Gravel and grading as necessary to match new grades.

   e. Subdrainage System:
1) Filter fabric.
2) Gravel and drainage material.
3) Composite drain, collector drain, main line pipe and fittings.

f. Installation of two (2) Goal Posts and associated boxes. See 11 6803 – Athletic Equipment.

1.4 PROJECT CONDITIONS

A. Site Information: Existing design drawings are based on field surveys and record documents of subsurface conditions. Architect/Owner cannot guarantee subsurface conditions. Contractor is responsible for establishing benchmarks and providing new field that fits existing elements indicated to remain in place.

1. Contractor may perform additional test borings and other exploratory operations, at the Contractor’s option; however, no change in the Contract Sum will be authorized for such additional exploration. Such investigation shall be done under the supervision of the Owner’s maintenance staff and with the understanding that scheduled events must not be interrupted.

B. Use of Explosives: Use of explosives is not permitted.

C. Protection of Persons and Property: Barricade open excavations occurring as part of this Work and post with warning lights.

1. Operate warning lights as recommended by authorities having jurisdiction.
2. Protect structures, utilities and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

D. Existing Benchmarks: Carefully preserve and maintain existing benchmarks, vertical/horizontal control, monuments, property line pipes and pins, and other reference points. If disturbed or destroyed, restore or replace at no additional cost to the Owner.

E. Field Measurements: Each bidder is encouraged to visit the site of the Work to verify the existing conditions. No adjustments will be made to the Contract Sum for variations in the existing conditions.

F. Environmental Limitations: Do not delivery surfacing material if either ambient air temperature or material temperature is below 32 degrees F.

1. Do not proceed with installation until weather conditions are satisfactory according to the manufacturer’s recommendations.
2. Polyethylene Pipe Installation: Pipe shall be installed in dry weather when temperature is above 40 degrees F.

1.5 SUBMITTALS

A. Submittals required with bid:
1. Contractor’s base construction warranty.
2. Contractor Qualifications.

B. Product Data: For each product specified. Include details of construction relative to materials, dimension of individual components.
1. Submit manufacturer’s product data on drainage pipe material and geotextile fabric.

C. Samples: Provide samples of the following components:
   1. Drainage Aggregate Mixture: 1 quart of each size.

D. Shop Drawings: Show detail of installation, including plans, sections, and interfaces with existing construction.
   1. Provide details of all edge conditions for playing surface.

E. Certified Conformance Survey – Submit three (3) copies of subgrade, and top of finish rock elevations at 50” O.C., sealed by professional surveyor licensed in the State of Missouri, responsible for their preparation. Two surveys are required.

1.6 WARRANTY

A. General Warranty: The special warranty specified in this Article shall not deprive the Owner or 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.

B. Base Warranty: Provide warranty for all subsurface grading and drainage work performed for the installation of the field.

1.7 QUALITY ASSURANCE

A. Contractor Qualifications: A firm that complies with the following requirements and is experienced in constructing the bases for synthetic playing surfaces similar to those indicated for this Project and with a record of successful in-service performance.
   1. Has provided base work and drainage for synthetic turf playing surface components for at least 10 athletic fields at the high school level or higher.
   2. Contractor shall be a member of the American Sports Builders Association and have a Certified Field Builder working on this project.
   3. Contractor shall use equipment that has surface load characteristics of 10 psi or less. Wheeled road grading equipment is not allowed.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of synthetic playing surfaces that are similar to those indicated for this Project in material, design, and extent.

C. Soil Testing and Observation: Contractor shall proof roll the subgrade with a fully loaded tandem truck. Deflection of the subgrade of more than 1” will require removal and replacement with suitable material.

D. Pre-Installation Conference: Conduct conference at the job site for coordination of schedule, access, procedures and security with the Owner, Architect, Construction Manager, Contractor and other related subcontractors.
PART 2 - PRODUCTS

2.1 SUBSOIL MATERIALS

A. General: All fill material, regardless of intended use category, shall be clean and free from organic matter, roots, brush or other vegetation, trash, debris or other detrimental substances, and rocks or unbroken lumps larger than 3 inches, and shall be tested and approved by the soil testing and observation agency prior to placement.

B. Trench Backfill: Existing soils obtained from playing field system excavations, excluding broken and pulverized weathered bedrock.

C. Unacceptable Soil Materials: Existing on-site material or asphalt materials not suitable for fill.

2.2 DRAINAGE OF SYSTEM MATERIALS

A. Gravel Drainage Material: The gravel shall consist of clean crushed stone that meets the following criteria. Gravel components shall not exceed 12 percent loss of materials as determined by a sulfate soundness test (ASTM C 88). The gravel shall be installed in two layers to the thickness indicated on the Drawings. The gravel shall conform to the following:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Base Course Percent Passing</th>
<th>Finish Course Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.24 inch</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>3/4 inch</td>
<td>70 – 100</td>
<td></td>
</tr>
<tr>
<td>3/8 inch</td>
<td>35 – 50</td>
<td></td>
</tr>
<tr>
<td>1/4 inch</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>1/8 inch</td>
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<td>80 – 100</td>
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<tr>
<td>#4</td>
<td>20 – 35</td>
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<tr>
<td>#100</td>
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<td>5 – 9</td>
</tr>
<tr>
<td>#200</td>
<td>1 – 5</td>
<td>1 - 5</td>
</tr>
</tbody>
</table>

B. Collector Drains: Collector Drains: Perforated, corrugated, smooth interior, polyethylene pipe meeting requirements for Type S pipe (ADS N-12); ASHTO M225CP, for 3-inch to 10-inch diameters; and ASHTO M294CP for 12-inch to 36-inch diameters. Provide drainage pipe complete with bends, reducers, adapters, couplings, collars, and joint materials. Perforated pipe shall have a minimum inlet area equal to 1.5 square inches per linear foot of pipe.

C. Panel Drain Lines: Pipe shall meet ASTM D 695, D 1621. The pipe; 1-inch x 12-inch flat panel pipe; shall be installed on subgrade as illustrated on the drawings. The perforated pipe shall have a minimum inlet area equal to 10 square inches per linear foot of pipe. Provide pipe complete with adapters, couplers, caps, collars, and joint materials as may be required for installation and connection to collector pipe.

1. Lateral drain lines shall be placed on filter fabric on top of the subgrade as indicated on the Drawings.
D. Geotextile Filter Fabric: Nonwoven filter fabric consisting of long-chain synthetic polymers, composed of at least 85 percent by weight polyolefins, polyesters, or polyamides and exhibiting the following physical properties:

<table>
<thead>
<tr>
<th>Test</th>
<th>Performance</th>
<th>Reference Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grab Strength</td>
<td>90 lb. minimum</td>
<td>ASTM D 4632</td>
</tr>
<tr>
<td>Puncture Resistance</td>
<td>50 lb. minimum</td>
<td>ASTM D 4833</td>
</tr>
<tr>
<td>Mullen Burst Strength</td>
<td>195 psi minimum</td>
<td>ASTM D 3786</td>
</tr>
<tr>
<td>Trapezoid Tear Strength</td>
<td>40 lb. minimum</td>
<td>ASTM D 4533</td>
</tr>
<tr>
<td>Permeability</td>
<td>0.1 cm/sec. minimum</td>
<td>ASTM D 4491</td>
</tr>
<tr>
<td>Apparent Opening Size</td>
<td>#50 sieve size</td>
<td>ASTM D 4751</td>
</tr>
</tbody>
</table>

2.3 FOOTBALL AND SOCCER GOALS

A. Install Football Goal Posts.

PART 3 - EXECUTION

3.1 CONSTRUCTION LAYOUT

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

B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels as necessary to locate each element of Project.
2. Establish dimensions within tolerance indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location and level of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and level exceed allowable tolerance.
6. Close site surveys with an error closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including grading, fill and topsoil placement, utility slopes, and invert elevations.

D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.2 EARTHWORK EXECUTION

A. General: Remove material of every nature of description encountered in obtaining required lines and grades. Excavate and/or place and compact fill to provide for elevation(s) required by
Drawings. Excavation is considered unclassified and includes exaction to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

1. Conform to elevations and grades indicated on Drawings within a tolerance of ± 1/2 inch in 25 feet in either direction.

B. Drainage System and Conduit Trenching: Dig trenches to depth and width indicated on the Drawings. Abnormal conditions such as large cobbles or unstable conditions that may cause trench to lose integrity shall be reported to Architect immediately. Excavate trenches to uniform width, sufficiently wide to provide ample working room and a minimum width of twice the pipe diameter.

1. Excavate trenches and conduit to depth indicated or required to establish indicated slope and invert elevations and to support bottom of pipe or conduit on undisturbed soil.
2. Only perform trenching, pipe or conduit installation and backfilling operations that can be completed in one day. Crib or brace trenches to prevent cave-in. Exposed trenches that collapse due to rain or other occurrences shall be widened and filled as specified or refilled with subgrade materials, compacted and retrenched.
3. Compact the bottoms of all trenches to the density described in this Section for placement and compaction.

3.3 PLACEMENT AND COMPACTION OF SOIL MATERIALS

A. Ground Surface Preparation: Remove vegetation, debris, unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placement of fills.

1. When existing subgrade ground surface has a density less than that specified under “Compaction” for particular area classification, break up ground surface. Scarify existing subgrade to depth of 8 inches prior to compacting. Moisture condition between 3 percent below and 2 percent above optimum moisture content, and re-compact to at least 95 percent of standard Proctor density (ASTM D 698).

B. Before compaction of subgrade, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density. Do not place backfill or fill material on surfaces that are muddy, frozen, or contain frost or ice.

C. Failings: If, based on the testing and observation agency reports and observations, compacted subgrade or fills are found to be below specified density, provide additional compaction and testing in accordance with specifications.

D. Place backfill and fill materials evenly adjacent to structures, piping, or conduit to required elevations. Prevent wedging action of backfill against structure or displacement of piping or conduit by carrying material uniformly around structure, piping, or conduit to approximately same elevation in each life.

1. Subgrade Ground Surface and Bottom of Trench Compaction Requirements: Compact soil to not less than 95 percent of standard Proctor density, with a moisture condition between 3 percent below and 2 percent above optimum moisture content in accordance with ASTM D 698.

E. Moisture Control: Where subgrade soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer soil material. Apply water in minimum quantity as necessary to prevent free water from appearing on surface during or subsequent to compaction operations.
1. Remove and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density.

F. Subgrade Conformance Survey: A certified survey shall be performed at 50 foot centers to verify grade and elevation of the subgrade immediately prior to gravel.

3.4 FIELD DRAINAGE INSTALLATION

A. Subgrade Grading: Shape surface of areas under gravel drainage material to line, grade, and cross-section, with finish surface not more than 1 inch in 25 feet either direction above or below required subgrade elevation.

1. The Contractor shall utilize laser-controlled equipment for subgrade grading to ensure accuracy in grading tolerances.

B. Installation of Geotextile Filter Fabric: Install filter fabric on bottom and sides of trenches and over entire surface of playing field subgrade. Overlap fabric a minimum of 12 inches at each side of trenches on top of the subgrade.

C. Laying Pipe Materials: Provide full bearing for each pipe section throughout its length with drainage fill material to true grades and alignment and continuous slope in direction of flow.

1. Lay perforated pipe in accordance with pipe manufacturer’s recommendations. Provide collars and couplings as required.
2. Install locator tape around or on the drainage pipe for future detection after field installation is complete.

D. Testing Drain Lines: Test or check lines before placing drainage fill material to assure free flow. Remove obstructions, replace damaged components, and retest system until satisfactory.

E. Drainage Fill: Place drainage fill material after testing of drainage system in a single layer. Place material around drainage pipe located in French areas until drainage material is level with the surrounding subgrade. After filling of trench areas, place drainage fill to depth above subgrade shown in the Drawings.

F. Backfilling: Do not completely backfill trenches until tests and observations have been made and backfilling is authorized by Engineer. Do not use compaction equipment directly over drain lines until sufficient backfill has been placed to insure that such equipment will not damage or disturb drainage lines.

G. Final Grade: Shape surface of gravel drainage material to grade and cross-section indicated, with a finish surface not more than 1/4 inch in length of 25 feet in any direction.

1. The Contractor shall utilize laser-controlled equipment for the grading of the drainage fill material to ensure accuracy in grading tolerances.

H. Gravel Conformance Survey: A certified survey shall be performed at 50 foot centers to verify grade and elevation of the gravel drainage blanket layer above the subgrade/immediately prior to turf placement.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Contractor shall engage a qualified independent testing agency to perform field quality-control testing.
B. Testing agency shall inspect and test the following:
   1. Subgrades and each fill or backfill layer.
   2. Compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

C. Proceed with subsequent work only after test results for previously completed work comply with requirements.

D. When testing agency reports that subgrades have not achieve degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

3.6 RECORD DRAWINGS:

   A. Provide as-constructed drawings illustrating locations and depths of all drainage pipe, conduit, etc.

3.7 CLEANING AND PROTECTING

   A. Cleaning: Upon completion of installation, clean all playing surfaces so they are free of foreign matter.

   B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and installer that ensure playing surface is without damage or deterioration at the time of Substantial Completion.

END OF SECTION 32 2202
SECTION 32 2902 - SODDING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS
   A. Drawings, General Provisions of Contract, Supplemental General Conditions and Division-1 Specifications, apply to work of this section.

1.2 SUMMARY
   A. This Section covers furnishing live sod from approved sources of the site, placing the sod on prepared areas, finishing watering, maintaining and repairing in accordance with this specification at the locations shown on the plans.
   B. The areas to be sodded will be fine graded by the Contractor.

1.3 SUBMITTALS
   A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Section.
   B. Plant & Material Certifications
      1. Certificates of Inspection as required by governmental authorities.
      2. Seed Vendors Certified Statement for each grass seed mixture required, stating botanical and common name, percentages by weight and percentages of purity, germination and weed seed for each grass seed species growing in sod.

1.4 GUARANTEE
   A. The Contractor is responsible for growing in the sod until an average root depth of 1 inch is obtained as verified at 3 locations on each playing field.
   B. Turf will be free of weeds, pests, and diseases.

PART 2 – PRODUCTS

2.1 SOIL TEST
   A. Contractor shall obtain soil test of topsoil that will be used as the growing medium for the sod, and guidelines in this specification may be adjusted as required.

2.2 SOD
   A. Sod shall be nursery grown Bluegrass sod, not less than 18 months old.
      a. Seed varieties: Sod shall be comprised of seed varieties that are wear tolerant and have an early spring green-up.
      b. Thickness of Cut: All sod shall be machine stripped at a uniform soil thickness of approximately ¾ inch. Measurement for thickness shall exclude top growth and thatch and shall be determined at the time of cutting in the field.
      c. Big Roll: Sod shall be “Big roll sod. Width shall be 30” minimum. Split 42 inch rolls are acceptable.
      d. Netting in the sod will not be allowed. Netting used for harvest must be removed prior to placement on the field.
      e. Mowing height: Before harvesting, sod shall be mowed uniformly at a height of 2”.

SODDING
32 2902 - 1
### 2.3 DELIVERY

A. All sod shall be tarped on trucks during delivery to prevent desiccation. If temperatures are high enough to damage turf under the tarps, delivery times shall be modified to ship during cool periods, and tarps shall be removed immediately upon arrival at site.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

A. The Surfaces to be sodded shall be cleared of all stones, roots or other objects and of all wire, brush, debris, or other objects that may interfere with subsequent planting or maintenance operation.

B. Eliminate surface irregularities by use of a weighted drag, making passes at 90 degrees to each other.

C. Portions not readily worked by machine shall be worked by hand. Areas adjacent to fences, warning tracks, curbs, walks, signs, existing trees, light poles and other site items shall be hand worked and blended into adjacent grades.

D. No fine grading shall be done when the soil is in a muddy or frozen condition.

#### 3.2 PRE-SOD FERTILIZATION

A. Fertilizer should be applied to all disturbed areas to be sodded or areas where any plant materials will be grown. Fertilizer shall be disturbed evenly over the area prior to sodding and should be incorporated into any topsoil mix.

B. Apply a starter fertilizer immediately before sodding at a rate of 7.5 lbs/1,000 s.f. of 13-25-12 turf grade fertilizer.

C. Additional soil amendments shall be distributed uniformly over the areas to be seeded or by a common fertilizer distributor, or other approved equipment at the following rates:
   a. 25-lbs/1000 s.f. of agricultural dolomitic limestone.
   b. 20-lbs/1,000 s.f. of Agricultural Sulfur

D. All fertilizer shall be incorporated into the topsoil to a depth of 2-inches by harrowing, diskimg, or cultipacking.

E. Immediately prior to sod placement (same day), contractor shall apply one application of liquid “Launch” or approved equal, at the manufacturers recommended rate.

#### 3.3 FINISH GRADING

A. Definition
   1. The words “finish grading," as used herein, mean the establishment of the required final grade elevations indicated on the Drawings.
   2. All surfaces shall be brought to the indicated grades and contours, and left in a “finish-graded” condition, free of all clods, stones larger than 1/4 –inch or weeds and other debris, ready for seeding or sodding.

B. Grading Tolerances
1. Playing field areas shall be graded to a tolerance of +/- 0.04' (0.50-inches) as measured with a 25' string line.

C. All areas are to be laser graded using cone shaped laser technology and machinery equipped with flotation type turf tires. This operation shall be completed and acceptable to the Architect prior to sodding. Contractor shall be responsible for repair of damaged, finished graded areas until sodding operations begin.

D. Upon completion of surface preparation, and fertilization operations, and immediately prior to sodding, the areas shall be given a final grading as needed to correct irregularities in the surface, due to the above operations or other causes, and to restore the prescribed grades.

E. All grades are to be held a distance down below infield and warning track material to match the thickness of sod soil. After sod is placed, there should be no “lip” in either direction as felt by the foot.

3.4 PLACING SOD

A. Lay first rows of sod along warning track edge and infield arc to provide clean uniform lines. Subsequent rows shall be placed tightly against previous roll with no visible seams. “Picture Frame” field to minimize the amount of “end of rolls” exposed to play.

B. Contractor to use tractors equipped with flotation type tires, or track type machinery to minimize disturbance of subgrade below newly placed sod, and/or on top of previously laid roll of sod.

C. Contractor to have adequate manpower at time of sodding to push/pull sod rolls tight with previously laid strips, remove netting if present, patch thin areas as needed, and cut fresh joints between ends of sod rolls. Contractor to also have adequate equipment to unload trucks and transport sod to field to minimize time sod is on truck or ground. Sod rolls must be laid within 16 hours of cutting.

D. Overlap all ends of sod rolls and cut fresh joints of both rolls of sod.

E. Take care not to stretch sod as subsequent shrinking will produce gaps in seams.

F. Any patching required shall be no smaller than 12 inches in length and width to match the sod roll.

G. Contractor is responsible for operating irrigation system and or placing hose and sprinklers as necessary to water freshly aid sod within 30 minutes of placement, depending on weather conditions.

H. Contractor is expected to roll the sod to remove any undulations and provide a smooth safe playing surface.

I. Any gaps in seams shall be filled by hand with a sandy loam soil mix. Seams will be checked for gaps at time of sodding through acceptance. Gaps larger than 1” are grounds for rejection, and may require total sod replacement, at the Architects discretion. Cost of this replacement will be the responsibility of the Contractor.

3.5 GROW-IN

A. General

1. The Contractor is responsible for all aspect of growing-in the fields.

2. The grow-in period shall be from time of sodding through owner acceptance.

3. Owner will accept playing fields when fields have an average root depth of 1”, as measured in three locations on the playing field.

B. Protection

1. The installer shall protect the area against traffic or other use by placing warning signs, and erecting any barricades that may be required before or immediately after sodding is completed.

C. Repairing

1. When the surface has developed gullies or is otherwise damaged during the period of establishing turf, the affected areas shall be repaired to re-establish the grade and the condition of the soil, and shall be re-sodded with the original sod. No sod patches shall be shorter than 12 inches or narrower than the width of the sod roll.
2. Any gaps in seams shall be filled by hand with a sandy loam soil mix. Seams will be checked for gaps at time of sodding through acceptance. Gaps larger than 1” are grounds for rejection, and may require total sod replacement, at the Architects discretion. Cost of this replacement will be the responsibility of the Contractor.

D. Rolling
1. Contractor to roll the sod in two different directions after initial sod placement. Care shall be taken not to damage irrigation heads or rut/tear new sod. One and one half to two ton rollers maximum.

E. Watering
1. The Contractor shall be proficient in operating the irrigation system and in making the judgment decisions of when to water and how much water to apply.
2. The grass shall receive sufficient water to promote active growth and prevent extended periods of wilt, however, excessive watering shall also be avoided since it encourages diseases and weeds.
3. The Contractor shall monitor the grass daily to adjust irrigation frequency and amount.
4. Initially, light and frequent irrigation will be needed to keep only the surface wet where the seeds are germinating, i.e. water for 3 to 5 minutes, at 30 to 60 minute intervals, during the day light hours.
5. Gradually reduce the frequency of irrigation, while at the same time increasing the amount of water applied at each watering, i.e. 4 times a day for 10 minutes each.
6. Keep the soil moist only as deep as the roots are growing.
7. Mowing will begin after the grass reaches 2.5 inches and irrigation frequency can be reduced to every other day if conditions allow.

F. Fertilization
1. Four days after sod installation, the Contractor shall apply by spray, Launch or approved equal, product at the recommended label rate for the application. Two to three weeks after sod installation, apply one half pound of nitrogen per 1,000 square feet.

G. Mowing
1. The first mowing shall occur when the grass reaches 2.5 inches.
2. The first 2 mowings of the seeding turf will require lightweight walk-behind mowers.
3. The mowing height shall be 2 inches.
4. Mow frequently enough so that no more that 1/3 of the grass height is removed.
5. During first two mowings, all clippings shall be caught and removed from site.
6. Anticipate mowing at least once per week during the growing season.
7. If at any time during grow-in, clippings exceed 1/2-inch, clippings shall be caught and disposed of off site.
8. If clippings clump or remain on surface of turf, contractor shall rake/sweep/drag to remove or work clippings through the turf.
9. Mow grass with a reel type or mulch rotary mower to provide a clean cut to the grass blades.
10. Mower blades shall be kept in sharp and in good working condition.

H. Maintenance Log
1. Record a daily log of all maintenance activities performed on the field through Substantial Completion.
2. These daily records shall be submitted to the Owner and Architect on a weekly basis through Substantial Completion.
3. Sample:

<table>
<thead>
<tr>
<th>Date</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/13/17</td>
<td>Cut entire field</td>
</tr>
<tr>
<td>1/14/17</td>
<td>Adjusted irrigation head height on 4 heads</td>
</tr>
<tr>
<td>1/15/17</td>
<td>Placed Typar cover on the infield, no other work performed. Soil temperature 50 degrees.</td>
</tr>
<tr>
<td>Date</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1/16/17</td>
<td>At 7 a.m., the soil temperature was 3 degrees warmer under the cover, as opposed to not covered. No other work performed.</td>
</tr>
<tr>
<td>1/17/17</td>
<td>Removed grass cover. No other work performed.</td>
</tr>
<tr>
<td>1/18/17</td>
<td>Due to great deal of rain and cool temperatures, I applied Snow Mold fungicide at the rate specified in the grow-in program. Watered product into soil for 15 minutes.</td>
</tr>
<tr>
<td>1/19/17</td>
<td>Rain, no work.</td>
</tr>
</tbody>
</table>

END OF SECTION
SECTION 32 2936 - SEEDING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS
A. Drawings, General Provisions of Contract, Supplemental General Conditions and Division-1 Specifications, apply to work of this section.

1.2 SUMMARY
A. This Section covers furnishing and sowing seed, compacting, applying herbicide, mulching, and establishing turf in accordance with this Specification.
B. Seeding applies to all area around playing fields.

1.3 SUBMITTALS
A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Section.
B. Plant & Material Certifications
   1. Certificates of Inspection as required by governmental authorities.
   2. Seed Vendors Certified Statement for each grass seed mixture required, stating botanical and common name, percentages by weight and percentages of purity, germination and weed seed for each grass seed species for current year.
C. Mulch
   3. Submit 1-gallon sample of mulch with description of application method.

1.4 GUARANTEE
A. Guarantee a thick, heavy stand of grass free of broadleaf weeds and undesirable grasses, free of eroded or bare spots over 3 in. square.
B. The Contractor is responsible for growing in the seed until all fields have a healthy stand of turf grass suitable to hold sporting events, and/or until the turf is accepted by the Owner.
C. The Contractor shall employ a qualified agronomist or groundskeeper capable of ensuring proper grow-in and maintenance through the guarantee period.

PART 2 – PRODUCTS

2.1 SOIL TEST
A. Contractor shall obtain soil test of topsoil that will be used as the growing medium for the seed, and guidelines in this specification may be adjusted as required.

2.2 MATERIALS
A. Provide fresh, clean, new-crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America. Provide Seed of grass species, proportions and minimum percentages of purity, germination, and maximum percentage of weed seed, as specified. Weed seed of 0.00% is desired.

2.3 SEEDING RATE
A. All seeding rates are expressed on a Pure Live Seed (PLS) basis. For Example, a perennial ryegrass with 95% purity and 95% germination will have a PLS of 90% (.95x.95 =90% PLS.) A 50-lb bag of seed with 90% PLS will contain 45 lbs PLS.
B. Seed Mix – Turf Type `Tall Fescue
   1. Seed Turf Type Tall Fescue at 10 lbs. PLS/1000 SQ. Ft. using a minimum of 3 improved varieties. Varieties should be chosen for high wear, early spring green-up and fine blade.
2. Contractor shall submit blend varieties with bid. Submit NTEP data for seed types and justification for use in mix. **Owner reserves the right to reject alternative blends submitted after bidding.**

2.4 DELIVERY

A. All seed shall be furnished in sealed standard containers. Seed that has become wet, moldy or otherwise damaged in transit or storage will not be acceptable.

2.5 MULCH

A. Mulch shall be wood fiber and emulsion based hydro-mulch. The hydro mulch shall be free of weed seeds.

PART 3 - EXECUTION

3.1 PREPARATION

A. The Surfaces to be seeded shall be cleared of all stones, roots or other objects and of all wire, brush, debris, or other objects that may interfere with subsequent planting or maintenance operation.
B. Loosen topsoil of lawn areas to a minimum depth of 2”.
C. Eliminate surface irregularities by use of a weighted drag, making passes at 90 degrees to each other.
D. Portions not readily worked by machine shall be worked by hand. Areas adjacent to curbs, walks, signs, existing trees, light poles and other site items shall be hand worked and blended into adjacent grades.
E. No fine grading shall be done when the soil is in a muddy or frozen condition.
F. The seedbed must be approved by the Landscape Architect prior to sowing seed.

3.2 APPLYING & INCORPORATING FERTILIZER

A. Fertilizer should be applied to all disturbed areas to be seeded, sodded or areas where any plant materials will be grown. Fertilizer shall be disturbed evenly over the area prior to seeding and should be incorporated into any topsoil mix to be used as backfill around trees, shrubs and ground cover.
B. Apply a starter fertilizer +/-5 days prior to seeding at a rate of 7.5 lbs/1,000 s.f. of 13-25-12 turf grade fertilizer.
C. Additional soil amendments, as determined by the soil test, and shall be distributed uniformly over the areas to be seeded with either of the following products and rates:
   a. 25-lbs/1000 s.f. of agricultural dolomitic limestone.
   or
   b. 20-lbs/1,000 s.f. of Agricultural Sulfur
C. All fertilizer and amendments shall be incorporated into the topsoil to a depth of 3-inches by harrowing, disking, or cultipacking.

3.3 FINISH GRADING

A. Definition
   1. The words “finish grading,” as used herein, mean the establishment of the required final grade elevations indicated on the Drawings.
   2. All surfaces shall be brought to the indicated grades and contours, and left in a “finish-graded” condition, free of all clods, stones larger than 1/4 –inch or weeds and other debris, ready for seeding or sodding.
B. Grading Tolerances
   1. Common areas shall be graded to a tolerance of +/- 0.08’ (1 inch) in 25’, leaving no puddles/low areas.
C. All areas are to be final graded by the Contractor. Grading machinery shall be equipped with flotation type tires. No machinery with farm type tires will be allowed to perform grading or seeding operations in turf areas. This operation shall be completed and acceptable to the Architect prior to seeding.
Contractor shall be responsible for repair of damaged, finished graded areas until seeding operations begin. (No equipment with tire loading greater than 10 psi will be allowed to work on the field)

D. Upon completion of surface preparation, and fertilization operations, and immediately prior to sowing seed, the areas shall be given a final grading as needed to correct irregularities in the surface, due to the above operations or other causes, and to restore the prescribed grades.

3.4 SEEDING SCHEDULE
A. Provide seeding schedule that coincides with field construction. General seeding windows are March 15 – June 1, and August 1 – September 30. Contractor to complete irrigation system prior to seeding to allow use of quick couplers around field to hand water common areas.
B. The sowing shall be stopped when satisfactory results are not likely to be obtained due to excessive moisture conditions, high winds or other unfavorable conditions. It shall be resumed only when conditions are favorable again or when alternative or corrective measures and approved procedures have been adopted.

3.5 STARTER FERTILIZER
A. Apply a starter fertilizer immediately before or after seeding at a rate of 7.5 lbs/1000 s.f of a 10-25-25 turf grade granular fertilizer.

3.6 METHOD OF SOWING
A. The seed shall be uniformly applied to the field area so that the seed is 0.25 inches below the soil surface.
B. The seed shall be sliced into the surface or broadcast and pressed into the surface using one of the following types of conventional turf seeding equipment.
   1. Brillion type seeder for turf with press wheels that make rows on more than 2.0 inches apart.
   2. A drill or slicer seeder with rows spaced 2” apart.
C. Seed shall be distributed in a minimum of 2 passes over the field.
D. The second pass shall be made at a 30 degree to 40 degree angle to the first pass to ensure proper coverage of the field.

3.7 COMPACTING
A. Immediately after sowing the seed, the entire area shall be compacted by means of a cultipacker, roller, or other approved equipment, in order to reduce air pockets and create good soil/seed contact.
B. When a cultipacker or other approved equipment that leaves a roughened surface is used, the compacting (wherever possible) shall be along the contour.
C. If the mulching operations can by accomplished by the same working day the area is seeded, compacting the seed and spreading the mulch should be done at the same time.

3.8 MULCHING
A. Hydro Mulch all areas with a uniform coating of wood fiber based hydro mulch. This site is extremely windy and will require maximum binder.
B. Seed will be drilled prior to hydro mulching. Hydro Seeding will NOT be allowed.

3.9 GROW-IN
A. General
   1. The Contractor is responsible for directing the Owner to grow-in the turf.
   2. The grow-in period shall be from time of seeding through final acceptance.
   3. Owner will accept seeded areas in total. Partial acceptance will not be allowed.
B. Protection
   1. The installer shall protect the area against construction traffic or other use by placing warning signs, and erecting any barricades that may be required before or immediately after sowing is completed.
C. Repairing
   1. When the surface has developed gullies or is otherwise damaged during the period of establishing turf, the affected areas shall be repaired to re-establish the grade and the condition of the soil, and shall be re-seeded with the original seed mix.
   2. Re-seeding shall be done in a manner that will cause a minimum of disturbance to the existing stand of grass.

D. Fertilization
   1. Allow for one application of 7.5 lbs/1000 s.f of 13-13-13 turf grade fertilizer during the grow-in period.

E. Watering
   1. The Contractor shall direct the Owner regarding when to water and how much water to apply. The Owner is responsible for providing hose and sprinklers or water trucks as necessary.
   2. The grass shall receive sufficient water to promote active growth and prevent extended periods of wilt, however, excessive watering shall also be avoided since it encourages diseases and weeds.
   3. The Contractor shall monitor the grass weekly to adjust irrigation frequency and amount.
   4. Initially, light and frequent irrigation will be needed to keep only the surface wet where the seeds are germinating, i.e. water for 3 to 5 minutes, at 30 to 60 minute intervals, during the day light hours.
   5. Gradually reduce the frequency of irrigation, while at the same time increasing the amount of water applied at each watering, i.e. 4 times a day for 10 minutes each.
   6. Keep the soil moist only as deep as the roots are growing.
   7. Mowing will begin after the grass reaches 2.5 inches and irrigation frequency can be reduced to every other day if conditions allow.
   8. Once the grass has matured and covered the ground, irrigation may be limited to 1-inch of water every week, applied only once or twice per week.

F. Pest Control
   1. Weeds
      a. Allow for one application of Trimec/Bromoxynil/Speedzone or equal in the spring of 2018 for broadleaf control of weeds in the seeded turf.
   2. Diseases
      a. Contractor will allow for one application of pythium control during the seeding stage.

G. Mowing
   1. The Owner will be responsible for mowing the grass. The contractor will direct the Owner in terms of height and frequency.
   2. The first mowing shall occur when the grass reaches 2.5 inches.
   3. The first 2 mowings of the seeding turf will require lightweight walk-behind mowers.
   4. The mowing height shall be 2 inches.
   5. Mow frequently enough so that no more that 1/3 of the grass height is removed.
   6. Anticipate mowing at least once per week during the growing season.
   7. Clippings shall not exceed 1/2-inch
   8. Mow grass with a reel type or mulch rotary mower to provide a clean cut to the grass blades.
   9. Mower blades shall be kept in sharp and in good working condition.

END OF SECTION
SECTION 32 3113 - CHAIN LINK FENCING AND GATES

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes:
   1. Chain link fences.
   2. Chain link gates.
   3. Related accessories.
B. Related Sections:
   1. Section 03300 – Cast-In-Place Concrete.

1.2 References
A. American Society of Testing and Materials (ASTM):
   3. ASTM F552-88B: Standard Definitions of Terms Relating to Chain Link Fencing.

1.3 SUBMITTALS
A. Shop drawings: 1) Layout of fences and gates with dimensions, details, and finishes of components, accessories.
B. Product Data: Manufacturer’s specifications and technical data including the following.
   1. Detailed specifications of construction and fabrication of fence components.

1.4 QUALITY ASSURANCE
A. Manufacturer’s Qualifications: Not less than 5 years experience in the actual production of specified products.
B. Installer’s Qualifications
   1. Firm experienced in installation of systems similar in complexity to those required for this project.
   2. A certified welder must conduct all welding.
C. Single-source responsibility: Obtain chain link fences and accessories as complete units from a single source or manufacturer.
D. Materials shall have a minimum 10-year warranty from the point of substantial completion. Labor shall have a 2 year warranty.

1.5 DELIVERY, STORAGE, AND HANDLING
A. Packing and Shipping: Deliver products in original unopened packaging with legible manufacturer’s identification.
B. Storage and Protection: Comply with manufacturer’s recommendations.
PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER’S
A. Merchants
B. Master-Halco
C. OR Equal

2.2 Fabric
A. General
   1. Selvage:
      a. Top: Knuckled.
      b. Bottom: Knuckled
   2. Mesh size: 2 inch.

      1. 9 Ga. unless noted otherwise on drawings.
      2. Finish: Galvanized Steel (ASTM A 392 Class 1, with not less than 1.2 oz. Zinc per square foot of uncoated wire surface.

2.3 FRAMING
A. General
   1. Strength requirements for posts and rails shall conform to ASTM F 669.
   2. Pipe shall be straight, true to section, material, and sizes specified.
   3. ASTM F1083, Type I, Schedule 40, round steel pipe. Also acceptable are SS-40 and WT-40 pipe.
   4. Bottom, Top and Diagonal Bracing Rails:
      a. Outside diameter: 1.660 inch.
      b. Weight: 2.27 pounds per lineal foot

B. Fences 6' or less in height:
   1. End, Corner and Pull post:
      a. Outside diameter: 2.875 inch.
      b. Weight: 5.79 pounds per lineal foot
   2. Intermediate post:
      a. Outside diameter: 2.375 inch.
      b. Weight: 3.65 pounds per lineal foot

C. Fences 8' or greater in height but less that 12' in height
   1. End, Corner and Pull post:
      a. Outside diameter: 4.00 inch.
      b. Weight: 9.11 pounds per lineal foot
   2. Intermediate post:
      a. Outside diameter: 2.875 inch.
      b. Weight: 5.79 pounds per lineal foot

2.4 ACCESSORIES
A. General
   1. ASTM F626, pressed steel.

B. Top rail Sleeves
   1. ASTM A824, Type II, Class 2
   2. Gage: 7
2.5 Gates
A. General
   1. Swing Gates up to 6’ high and 10’ wide.
   2. Comply with ASTM F 900
   3. Fabricate perimeter frames of gates to match fence framework.
   4. Mitre and weld gate frame.
   5. Fabricate frame to ensure that no openings greater than 1” will result in final assembly, including gap between grade and bottom of gate. (This provision will not allow passage of a baseball through a closed gate)
   6. Provide horizontal and vertical members to ensure proper gate operation and attachment of fabric, hardware, and accessories.
   7. Space frame members at a maximum of 8 feet apart unless indicated otherwise.
   8. Install fabric with tension bars and bands at vertical edges and at top and bottom edges.
   9. Install diagonal cross bracing consisting of 3/8-inch diameter adjustable length truss rods on gates to ensure frame rigidity without sag or twist.

B. Gate Posts
   1. Less that or equal to 6 feet in width
      a. outside Diameter: 2.875”
      b. Weight: 5.79 lbs. per foot
   2. Less than or equal to 10’, but more than 6’ in width.
      a. Outside Diameter: 4.0 ”
      b. Weight: 9.11 lbs per foot

C. Accessories
   1. Hinges: Structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180 degrees outward
   2. Latch: forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate.
   3. Double gates: Provide drop rod to hold inactive leaf. Provide gate stop pipe to engage center drop rod. Provide locking device and padlock eyes as an integral part of latch, requiring one padlock for locking both gate leaves. Provide “hold-back” pipes with holding mechanism to hold gates in open position.

2.6 WELDING PATCH MATERIALS
A. HY-Zinc Aerosol
B. Or equal

2.7 WIRE TIES
A. Twelve (12) gauge steel wire zinc-coated with a minimum coating weight of 1.2 ounces of zinc per square foot of surface area. Zinc coating shall be in accordance with ASTM F 626 paragraph 6.1.1.2.

PART 3 – EXECUTION

3.1 EXAMINATION
A. Verify areas to receive fencing are completed to final grades and elevations.
B. Ensure property lines and legal boundaries of work are clearly established.

3.2 CHAIN LINK FENCE FRAMING INSTALLATION
A. Install chain link fence in accordance with ASTM F 567 and manufacturer’s instructions.
Park Hill High School Athletic Complex Renovation  
Kansas City, MO

B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30° or more.

C. Space line posts uniformly [at 10’ (3048 mm) on center].

D. Concrete Footings for posts: Drill holes in firm, undisturbed or compacted soil. Holes shall have diameter 4 times greater than outside dimension of post, and depths approximately 6" (152 mm) deeper than post bottom. Excavate deeper as required for adequate support in soft and loose soils, and for posts with heavy lateral loads. Set post bottom 36" (914 mm) below surface when in firm, undisturbed soil. Place concrete around posts in a continuous pour. Trowel finish around post. Slope to direct water away from posts.

F. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

G. Bracing: Install horizontal pipe brace at mid-height for fences 6’ (1829 mm) and over, on each side of terminal posts. Firmly attach with fittings. Install diagonal truss rods at these points. Adjust truss rod, ensuring posts remain plumb.

I. Top rail: Install lengths, 21’ (6400 mm). Connect joints with sleeves for rigid connections for expansion/contraction. No top rails shall be less that 11’ length.

J. Center Rails (for fabric height 12’ (3658 mm) and over). Install mid rails between posts with fittings and accessories. Use offset fittings as necessary to provide continuous line of fabric along playing field side of posts.

K. Bottom Rails: Install bottom rails between all posts with fittings and accessories. Use offset fittings as necessary to provide continuous line of fabric along playing field side of posts.

3.3 CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on playing field side of posts at all field locations and attach so that fabric remains in tension after pulling force is released. Leave approximately 1” (25 mm) between finish grade and bottom selvage. Attach fabric with wire ties to line posts at 15” (381 mm) on center and to rails, braces, and tension wire at 24” (600 mm) on center.

B. Tension (stretcher) bars: Pull fabric taut; thread tension bar through fabric and attach to terminal posts with bands or clips spaced maximum of 15” (381 mm) on center.

3.4 ACCESSORIES

A. Tie wires: Twist BOTH ends of wire a minimum of two (2) revolutions. Ends of tie wire shall point away from the field of play.

B. Fasteners: Install nuts on side of fence opposite fabric side for added security.

3.5 CLEANING

A. Clean up debris and unused material, and remove from the site.

END OF SECTION
SECTION 32 8400 - IRRIGATION

PART 1: GENERAL

1.1 SCOPE:
Provide labor, materials, supplies, equipment, tools, and transportation, and perform all operations in connection with and reasonably incidental to the complete installation of the irrigation system, and guarantee/warranty as shown on the drawings, the installation details, and as specified herein. Items of work specifically included are:

A. Coordination of Utility Locates (“Call Before You Dig”).
B. Irrigation System installation
C. Sleeving for irrigation pipe and wire.
D. Connection of electrical power from new pressbox to irrigation controller.
E. Preparation of Record Drawings.
F. Winterization and Spring Start-up
G. Maintenance period.

1.2 WORK NOT INCLUDED:
Items of work specifically excluded or covered under other sections are:
A. Procurement of applicable licenses, permits, and fees including payment of development, plant investment, and other fees and permits associated with purchase and installation of tap.

1.3 SUBMITTALS:
A. Deliver four (4) copies of submittals to Owner’s Representative within 10 working days from date of Notice to Proceed. Furnish information in 3-ring binder with table of contents and index sheet. Index sections for different components and label with specification section number and name of component. Furnish submittals for components on material list. Indicate which items are being supplied on catalog cut sheets when multiple items are shown on one sheet. Incomplete submittals will be returned without review.
B. Materials List: Include sleeving, pipe, fittings, mainline components, sprinkler components, control system components, shop drawings and other components shown on drawings and installation details or described herein. Include pipe sealant, wire, wire connectors, ID tags, and other miscellaneous items. Quantities of materials need not be included.
C. Manufacturers' Data: Submit manufacturers' catalog cuts, specifications, and operating instructions for equipment shown on materials list.
D. Shop Drawings: Hunter Irrigation products have been used as the basis of design to match other District equipment. Substitutions must be accepted by the Landscape Architect/Owner prior to Shop Drawing submittal. Submit shop drawings of full system design with zone table with water calculations and installation details. Show products required for proper installation, their relative locations, and critical dimensions. Note modifications to Construction Documents.

1.4 RULES AND REGULATIONS:
A. Provide work and materials in accordance with latest edition of National Electric Code, Uniform Plumbing Code as published by the Western Plumbing Officials Association, and applicable laws, regulations and codes of governing authorities.
B. When contract documents call for materials or construction of better quality or larger size than required by above-mentioned rules and regulations, provide quality and size required by contract documents.
C. If quantities are furnished either in specifications or on drawings, quantities are furnished for information only. It is Contractor's responsibility to determine actual quantities of material, equipment, and supplies required by the project and to complete independent estimate of quantities and wastage.

D. Notify Engineer in writing prior to construction about discrepancies between contract documents and existing site conditions or manufacturer's specific recommendations for use of their product.

E. Contractor is responsible for damage to site amenities during construction. Replace damaged items with identical materials of equal value to match existing conditions. Make replacements at no additional cost to contract price. Penalty for specific damage: as valued by an independent auditor or as mutually agreed to by Owner and Contractor.

1.5 TESTING:
A. Schedule testing with Owner's Representative a minimum of three days in advance of testing.
B. Allow irrigation pipe jointed with solvent-welded PVC joints to cure at least 24 hours before testing.
C. Subsections of mainline pipe may be tested independently, subject to review of Owner's Representative.
D. Provide clean, clear water, labor, fittings, and equipment necessary to conduct tests or retests.
E. Hydrostatic Pressure Test:
   1. Perform hydrostatic pressure test on mainline pipe less than 3-inch size.
   2. Subject mainline pipe to hydrostatic pressure equal to 140 PSI for two hours. Test with mainline components installed.
   3. Backfill to prevent pipe from moving under pressure. Expose couplings and fittings.
   4. Purge air from mainline pipe before test. Attach pressure gauge to mainline pipe in test section.
   5. Observe pressure loss on pressure gauge. If pressure loss is greater than 5 PSI, identify reason for pressure loss. Replace defective pipe, fitting, joint, valve, or appurtenance. Repeat test until pressure loss is equal to or less than 5 PSI.
   6. Visually inspect irrigation pipe for leakage and replace defective pipe, fitting, joint, valve, or appurtenance. Repeat test until pipe passes test.
   7. Cement or caulking to seal leaks is prohibited.
F. Operational Test:
   1. Activate each remote control valve in sequence from controller. Provide either one additional personal with radio or use handheld remote to activate remote control valves from controller. Manually activating remote control valve using manual bleed mechanism at remote control valve is not an acceptable method of activation. Owner's Representative will visually observe operation, water application patterns, and leakage.
   2. Replace defective remote control valve, solenoid, wiring, or appurtenance to correct operational deficiencies.
   3. Replace, adjust, or move water emission devices to correct operational or coverage deficiencies.
   4. Replace defective pipe, fitting, joint, valve, sprinkler, or appurtenance to correct leakage problems. Cement or caulking to seal leaks is prohibited.
   5. Repeat test(s) until each lateral passes all tests. Replace components, and correct deficiencies at no additional cost to Owner as necessary to comply with the operation test.
G. Control System Grounding:
   1. Test for proper grounding of control system per manufacturer's recommendations. Test results must meet or exceed manufacturer's guidelines for acceptance.
   2. Replace defective wire, grounding rods, grounding plates, or appurtenances. Repeat test until manufacturer's guidelines are met.

1.6 CONSTRUCTION REVIEW:
The purpose of on-site reviews by Owner's Representative is to periodically observe work in progress, Contractor's interpretation of construction documents, and to address questions with regard to installation.

   A. Schedule reviews for irrigation system layout or testing with Owner's Representative as required by these specifications.
   B. Impromptu reviews may occur at any time during project.
   C. A review will occur at completion of irrigation system installation and Project Record Drawing submittal.

1.7 GUARANTEE/WARRANTY AND REPLACEMENT:
The purpose of guarantee/warranty is to ensure that Owner receives irrigation materials of prime quality, installed and maintained in thorough and careful manner.

   A. All irrigation equipment including controller, control valves, sprinklers, rotors, and accessories shall have a five (5) year manufacturer's warranty. All other irrigation equipment, workmanship and supplies shall be warranted for one (1) year from date of issuance of substantial completion.
   B. Fill and repair depressions. Restore landscape, utilities, structures and site features damaged by settlement of irrigation trenches or excavations. Repair damage to premises caused by defective items. Make repairs within seven days of notification from Owner's Representative.
   C. Replace damaged items with identical materials and methods per contract documents or applicable codes. Make replacements at no additional cost to contract price.
   D. Guarantee/warranty applies to originally installed materials and equipment, and replacements made during guarantee/warranty period.

PART 2: MATERIALS

2.1 QUALITY:
Use new materials without flaws or defects.

2.2 SUBSTITUTIONS:
   A. Use specified equipment, or pre-approved equal. Alternative equipment must be approved by Owner's Representative prior to bidding. Changes and associated design costs to accommodate alternative equipment are Contractor's responsibility.
   B. Pipe sizes referenced in the construction documents are minimum sizes, and may be increased at Contractor's option.

2.3 SLEEVEING:
   A. Provide sleeve beneath hardscape for irrigation pipe. Provide separate sleeve beneath hardscape for wiring bundle.
   B. Provide PVC Schedule 40 pipe with solvent welded joints for sleeving material beneath
hardscape.

C. Sleeve sizing: A minimum of twice the nominal diameter for solvent-welded pipe or 60% the nominal diameter of the wiring bundle, or as indicated on drawings.

2.4 PIPE AND FITTINGS:

A. Mainline Pipe and Fittings:
   1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with integral belled end.
   2. Use Class 200, SDR-21, rated at 200 PSI, conforming to dimensions and tolerances established by ASTM Standard D2241.
   3. Mainline pipe within sleeves: Use solvent weld pipe for mainline pipe with nominal diameter 3-inches and smaller installed within sleeves.

B. Lateral Pipe and Fittings:
   1. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with integral belled end.
   2. Use Class 200, SDR-21, rated at 200 PSI, conforming to dimensions and tolerances established by ASTM Standard D2241.
   3. Mainline pipe within sleeves: Use solvent weld pipe for mainline pipe with nominal diameter 3-inches and smaller installed within sleeves.

C. Specialized Pipe and Fittings:
   1. Use PVC Schedule 80 nipples and PVC Schedule 40 threaded fittings for threaded pipe connections.
   2. Joint sealant: Use non-hardening, nontoxic pipe thread sealant formulated for use on threaded connections and approved by pipe fitting or valve manufacturer.

2.5 MAINLINE COMPONENTS:

A. Winterization Assembly: according to local practice and in compliance with local code.
B. Isolation Gate Valve Assembly:
C. Quick Coupling Valve Assembly: as presented in drawings and installation details.
D. Frost Free Hydrant. System will be winterized, so water line does not need to be frost depth.
E. Master Valve Assembly: Master Valve shall match other Control Valves.

2.6 SPRINKLER IRRIGATION COMPONENTS:

A. Remote Control Valve (RCV) Assembly for Sprinkler Laterals: as presented in drawings and installation details.
B. Sprinkler Assembly: as presented in drawings and installation details.

2.7 CONTROL SYSTEM COMPONENTS:

A. Irrigation Controller Assembly:
   1. As presented in drawings and installation details.
      a. Lightning protection: Ground irrigation controller to building per Manufacturer’s recommendations and UEC code.
      b. Wire markers: Pre-numbered or labeled with indelible non-fading ink,
made of permanent, non-fading material.

B. Power Wire:
   1. Use AWG #12, solid or stranded copper, Type UF single-conductor cable or multi-conductor with ground cable, UL approved for direct underground burial from power source to Controller Assembly.
   2. Splices: Use 3M #82-A2 Series with Split Bolts or Butt Connectors for inline splices and 82-B1 or 90-B1 Series for wye splices.
   3. Electrical conduit: Use PVC Schedule 40 conduit conforming to dimensions and tolerances established by ASTM Standard D-1785. Use Schedule 40, Type 1, PVC solvent weld sweep fittings for PVC conduit conforming to ASTM Standards D2466 and D1784 for buried installations. Use rigid metallic conduit with sweep elbows for above grade installations.
   4. Warning tape: Inert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."

C. Low Voltage Control Wire:
   1. Use American Wire Gauge (AWG) No. 14-1 solid copper, 600 volt, Type UF or PE cable, UL approved for direct underground burial for individual control wires and spare control wires from the controller assembly to each remote control valve or stub-out location. Use American Wire Gauge (AWG) No. 14-1 solid copper, 600 volt, Type UF or PE cable, UL approved for direct underground burial for common ground wire and spare common wires from controller assembly to each remote control valve or stub-out location.
   2. Splices: Use 3M DBY or 3M DBR wire connector with waterproof sealant.
   3. Electrical conduit: Use PVC Schedule 40 conduit conforming to dimensions and tolerances established by ASTM Standard D-1785. Use Schedule 40, Type 1, PVC solvent weld sweep fittings for PVC conduit conforming to ASTM Standards D2466 and D1784 for buried installations. Use rigid metallic conduit with sweep elbows for above grade installations.
   4. Warning tape: Inert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."
   5. Use shielded and jacketed, twisted pair, multi conductor PE-39 (3 pair) or PE-89 (6 pair), 19AWG wire designed for direct burial, as recommended by control system manufacturer.
   6. Splices: Use 3M #SLIC with 3M "Insulation Displacement Connectors" (316IR or UR-2), Ranger Serviseal Connectors, or approved equal, as recommended by central control system manufacturer.
   7. Electrical conduit: Use PVC Schedule 40 conduit conforming to dimensions and tolerances established by ASTM Standard D-1785. Use Schedule 40, Type 1, PVC solvent weld sweep fittings for PVC conduit conforming to ASTM Standards D2466 and D1784 for buried installations. Use rigid metallic conduit with sweep elbows for above grade installations.
   8. Warning tape: Inert plastic film highly resistant to alkalis, acids, or other destructive chemical components likely to be encountered in soils. Three inches wide, colored red, and imprinted with "CAUTION: BURIED ELECTRIC LINE BELOW."

D. Tracer Wire:
1. Use AWG #12, solid copper bare wire, Type UF single-conductor cable, UL approved for direct underground burial.

E. Instrumentation: As presented in the drawings and installation details.

2.8 OTHER COMPONENTS:
A. Tools and Spare Parts: Furnish operating keys, servicing tools, spare parts and other items indicated in drawings and specifications.
B. Other Materials: Provide other materials or equipment shown on drawings or installation details that are part of irrigation system, even though items may not have been referenced in specifications.

PART 3: EXECUTION

3.1 INSPECTIONS AND REVIEWS:
A. Site Inspections:
   1. Verify construction site conditions and note irregularities affecting work of this section. Report irregularities in writing to Owner's Representative prior to beginning work.
   2. Commencement of work implies acceptance of existing site conditions.
B. Utility Locates ("Call Before You Dig"): 
   1. Arrange and coordinate Utility Locates with local authorities prior to construction.
   2. Repair underground utilities that are damaged during construction. Make repairs at no additional cost to contract price.

3.2 LAYOUT OF WORK:
A. Stake out irrigation system. Items staked include: winterization assembly, backflow preventer, sprinklers, pipe, sleeves, control valves, controller assembly, and isolation valves.
B. Irrigation System Layout Review: Irrigation system layout review will occur after staking has been completed. Notify Owner's Representative one week in advance of review. Modifications will be identified by Owner's Representative at this review.
C. Install irrigation components inside of project property lines.

3.3 EXCAVATION, TRENCHING, AND BACKFILLING:
A. Excavate and install pipes at minimum cover indicated in drawings or specifications. Excavate trenches at appropriate width for connections and fittings.
B. Minimum cover (distance from top of pipe or control wire to finish grade):
   1. Mainline pipe: (24-inches) to top of pipe.
   2. Electrical conduit: 26-inches to top of pipe.
   3. Control wire: 2-inches deeper than top of mainline pipe.
   4. Lateral pipe to sprinklers: 12-inches to top of pipe.
C. Maintain at least 15-feet clearance from centerline of trees.
D. Backfill only after lines have been reviewed and tested.
E. Excavated material is generally satisfactory for backfill. Use backfill free from rubbish, vegetable matter, frozen materials, and stones larger than 2-inches in maximum diameter. Remove material not suitable for backfill. Use backfill free of sharp objects next to pipe.
F. Backfill buried pipe and sleeves in either of the following manners:
   1. Backfill and puddle lower half of trench. Allow to dry 24 hours. Backfill remainder
Park Hill High School Athletic Complex Renovation  
Kansas City, MO  

of trench in 6-inch layers. Compact to density of surrounding soil.

2. Backfill trench by depositing backfill material equally on both sides of pipe in 6-inch layers and compacting to density of surrounding soil.  

G. Backfill buried pipe and sleeves by depositing backfill material equally on both sides of pipe in 6-inch layers and compacting each layer to 90 percent Standard Proctor Density, ASTM D698-78. Use of water for compaction, “puddling”, will not be permitted.  

H. Enclose pipe and wiring beneath roadways and hardscapes in separate sleeves. Minimum compaction of backfill for sleeves shall be 95 percent Standard Proctor Density, ASTM D698-78. Use of water for compaction around sleeves, “puddling”, will not be permitted.  

I. Dress backfilled areas to original grade. Incorporate excess backfill into existing site grades. Dispose of excess backfill off site.  

J. Contact Owner’s Representative for trench depth adjustments where utilities conflict with irrigation trenching and pipe work.  

3.4 SLEEVING AND BORING:  

A. Provide sleeving at depth that permits encased pipe or wiring to remain at specified burial depth.  

B. Extend sleeve ends twelve inches beyond edge of hardscape. Cap sleeve ends and mark with stakes. Provide rope or wire through sleeve and secure to stake at surface grade at each end for future sleeve location.  

C. Bore for sleeves under obstructions that cannot be removed. Employ equipment and methods designed for horizontal boring.  

3.5 ASSEMBLING PIPE AND FITTINGS:  

A. General:  

1. Keep pipe free from dirt and debris. Cut pipe ends square, debur and clean as recommended by manufacturer.  

2. Keep ends of assembled pipe capped. Remove caps only when necessary to continue assembly.  

3. Install pipe with markings on the top of the pipe.  

4. Trenches may be curved to change direction or avoid obstructions within limits of the curvature of pipe. Curvature results from bending of pipe lengths. Do not exceed pipe and fitting manufacturer’s allowable deflection at joints. Minimum radius of curvature and offset per 20-foot length of pipe-by-pipe size are shown in following table.  

<table>
<thead>
<tr>
<th>Size</th>
<th>Radius</th>
<th>Offset per 20' length</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5&quot;</td>
<td>25'</td>
<td>7'-8&quot;</td>
</tr>
<tr>
<td>2&quot;</td>
<td>25'</td>
<td>7'-8&quot;</td>
</tr>
<tr>
<td>2.5&quot;</td>
<td>100'</td>
<td>1'-11&quot;</td>
</tr>
</tbody>
</table>

B. Mainline Pipe and Fittings:  

1. Use only strap-type friction wrenches for threaded plastic pipe.  

2. PVC Solvent Weld Pipe:  

a. Use primer and solvent cement. Join pipe in manner recommended by manufacturer and in accordance with accepted industry practices.  

b. Cure for 30 minutes before handling and 24 hours before allowing water in pipe.  

c. Snake pipe from side to side within trench.  

3. Fittings:  

a. Use of cross type fittings is not permitted.  

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C. Lateral Pipe and Fittings:
   1. Use only strap-type friction wrenches for threaded plastic pipe.
   2. PVC Solvent Weld Pipe:
      a. Use primer and solvent cement. Join pipe in manner recommended by manufacturer and in accordance with accepted industry practices.
      b. Cure for 30 minutes before handling and 24 hours before pressurizing or installing with vibratory plow.
      c. Snake pipe from side to side within trench.
   3. Fittings: Cross (+) type fittings are not permitted.
   4. PVC Threaded Connections:
      a. Use only factory-formed threads. Field-cut threads are not permitted.
      b. Apply thread sealant in manner recommended by component, pipe and sealant manufacturers and in accordance with accepted industry practices.
      c. Use plastic components with male threads and metal components with female threads where connection is plastic-to-metal.

3.6 INSTALLATION OF MAINLINE COMPONENTS:
   A. Isolation Gate Valve Assembly: Provide where indicated on drawings. Install at least 12-inches from and align with adjacent walls or edges of paved areas. Enclose with valve box. Brand or attach surface tag with rivet, “GV” on valve box lid in 2-inch high letters.
   B. Quick Coupling Valve Assembly: Provide where indicated on drawings. Install in valve box. Brand or attach surface tag with rivet, “QC” on valve box lid in 2-inch high letters.
   C. Master Valve Assembly: Provide where indicated on drawings. Install in valve box. Brand or attach surface tag with rivet, “MV” on valve box lid in 2-inch high letters.

3.7 INSTALLATION OF SPRINKLER IRRIGATION COMPONENTS:
   A. Remote Control Valve (RCV) Assembly for Sprinkler Laterals:
      1. Flush mainline before installation of RCV assembly.
      2. Provide where indicated on drawings. Use wire connectors and waterproof sealant to connect control wires to remote control valve wires. Provide connectors and sealant per manufacturer's recommendations.
      3. Provide only one RCV to a valve box. Locate valve box at least 12-inches from and align with nearby walls or edges of paved areas. Group RCV assemblies together where practical. Align grouped valve boxes in uniform patterns. Allow at least 12-inches between valve boxes. Brand or attach surface tag with rivet, controller letter and station number on valve box lid in 2-inch high letters.
      4. Adjust RCV assembly to regulate downstream operating pressure.
      5. Attach ID tag with controller station number to control wiring.
   B. Sprinkler Assembly:
      1. Flush lateral pipe before installing sprinkler assembly.
      2. Provide per installation details at locations shown on drawings.
      3. Locate rotary sprinklers 6-inches from adjacent walls, fences, edges of paved areas, or edges of sod/dirt interfaces except where noted on the drawings.
      4. Locate spray sprinklers 6-inches from adjacent walls, fences, or edges of paved areas.
      5. Install sprinklers perpendicular to finish grade.
      6. Provide appropriate nozzle or adjust arc of coverage of each sprinkler for best performance and uniform coverage.
7. Adjust radius of throw of each sprinkler for best performance and uniform coverage.

3.8 INSTALLATION OF CONTROL SYSTEM COMPONENTS:

A. Irrigation Controller Assembly:
   1. Location of controller assembly as depicted on drawings is approximate; Owner’s Representative will determine exact site location. Install controller assembly in accordance with controller manufacturer recommendations.
   2. Lightning protection: Drive full length of grounding rod into soil. Connect #6 AWG copper grounding wire to rod using CADWELD connection. Install 6-inch round valve box over CADWELD connection. Install grounding wire connection to controller per manufacture guidelines.
   3. Coordinate installation of electrical service in accordance with local codes. Provide primary surge protection arrestors on incoming power lines in accordance with controller manufacturer recommendations.
   4. Provide one valve output surge protection arrestor on each control wire and one for common wire.
   5. Connect control wires to corresponding controller terminal. Attach wire markers to ends of control wires inside controller assembly housing. Label wires with identification number (see drawings) of remote control valve to which control wire is connected.

B. Power Wire:
   1. Install with minimum number of field splices. If power wire must be spliced, make splice with recommended connector, installed per manufacturer's recommendations. Locate splices in jumbo rectangular valve box. Coil 3-feet of wire in valve box.
   2. Install electrical disconnect switch to allow for shut off of controller on site.

C. Low Voltage Control Wire:
   1. Bundle control wires where two or more are in same trench. Bundle with pipe wrapping tape spaced at 10-foot intervals. Do not tape wires together where contained within sleeving or conduit.
   2. Provide 24-inch excess length of wire in 8-inch diameter loop at each 90-degree change of direction, at both ends of sleeves, and at 100-foot intervals along continuous runs of wiring. Do not tape or tie wiring loop. Coil 30-inch length of wire within each remote control valve box.
   3. Install common ground wire and one control wire for each remote control valve. Multiple valves on single control wire are not permitted.
   4. If control wire must be spliced, make splice with wire connectors and waterproof sealant, installed per manufacturer's instructions. Locate splice in valve box that contains irrigation valve assembly, or in separate standard rectangular valve box. Use same procedure for connection to valves as for in-line splices.
   5. Install wire parallel with and below mainline pipe unless noted otherwise on plans.
   6. Encase wiring within electrical conduit where installed above grade, and where not installed in common trench with PVC irrigation mainline pipe. Protect wire not installed with PVC mainline pipe with continuous run of warning tape placed in backfill six inches above wiring.

D. Tracer Wire:
   1. Place tracer wire in ALL mainline trenches for the express purpose of locating lines.
3.9 INSTALLATION OF OTHER COMPONENTS:
A. Tools and Spare Parts: Prior to Review at completion of construction, supply to Owner operating keys, servicing tools, spare parts, test equipment, and other items indicated in General Notes on the drawings.
B. Other Materials: Provide other materials or equipment shown on drawings or installation details that are part of irrigation system, even though items may not have been referenced in specifications.

3.10 PROJECT RECORD (AS-BUILT) DRAWINGS:
A. Document changes to design. Maintain on-site and separate from documents used for construction, one complete set of contract documents as Project Documents. Keep documents current. Do not permanently cover work until accurate “as-built” information is recorded.
B. Record pipe and wiring network alterations on a daily basis. Record work that is installed differently than shown on construction drawings. Record accurate reference dimensions, measured from at least two permanent reference points, of each irrigation system valve, each backflow prevention device, each stub-out for future pipe or wiring connections, and other irrigation components enclosed within valve box.
C. Record information on clean drawings in legible “hand drawn” or electronic format. Label each sheet “Record Drawing”.
D. Turn over “Record Drawings” to Owner’s Representative. Completion of Record Drawings is required prior to final construction review at completion of irrigation system installation.

3.12 WINTERIZATION AND SPRING START-UP:
A. Winterize irrigation system in fall following completion, or partial completion, of irrigation system construction. Contractor is responsible for spring start-up irrigation system in spring following completion, or partial completion, of irrigation system construction. Repair any damage caused in improper winterization at no additional cost to Owner. Coordinate winterization and start-up with landscape maintenance personnel.

3.13 MAINTENANCE:
A. Maintain irrigation system for 30 calendar days from formal written acceptance by Owner’s Representative. Make periodic examinations and adjustments to irrigation system components in order to achieve the most desirable application of water.
B. Following completion of Contractor’s maintenance period, Owner will be responsible for maintaining system in working order during remainder of guarantee/warranty period, for performing necessary minor maintenance, for trimming around sprinklers, for protecting against vandalism, and for preventing damage after landscape maintenance operation.

3.14 CLEANUP:
A. Remove from site machinery, tools, excess materials, and rubbish upon completion of work.

END OF SECTION