SECTION 02110

SITE CLEARING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Disposal of demolition materials

B. Removal of surface debris

C. Clear project portion of site of plant life and grass

D. Temporary construction Fencing

E. Protection of existing improvements and utilities

1.02 REGULATORY REQUIREMENTS

A. Conform to applicable City, County and State codes for disposal of debris.

B. Conform to the provisions in Section 16, “Clearing and Grubbing,” of the City of Brentwood and the State Standard Specifications and these specifications.

C. Coordinate clearing work with utility companies.

PART 2 – PRODUCTS -- Not Used

PART 3 - EXECUTION

3.01 PREPARATION

Verify that existing plant life designated to remain, is tagged or identified.

3.02 PROTECTION

A. Protect trees, plant growth, and features designated to remain. Provide 8’ height snow fencing with 2x4x8’s at 12” o.c. around the entire perimeter of the trunks of trees within 6’ of improvements.

B. Protect existing structures and utilities from damage or displacement.

C. Dust Control

1. Conform to applicable codes for dust control.

2. Use of water for dust control is not permitted if it's use creates erosion, flooding, or hazardous and objectionable conditions on and around the job site.

D. Erosion Control

1. The contractor shall adhere to the City of Mill Valley's SWPPP BMP's during all phases of construction.

E. Temporary Construction Fencing

1. Fencing shall be 6'0" minimum in height and made of chain link with metal posts and rails top and bottom.

2. Fencing shall be in place and prevent public access to the job site at all times, 24 hours, 7 days a week until the project has been accepted by the Owner.

3.03 CLEARING

A. Clear areas of weeds and debris as required to complete new construction.

B. Grind asphalt paving at existing cracks to create a planar surface.

C. The limits of clearing shall be of sufficient area and depth to complete the work as shown on the other plans. Clearing shall not exceed what is necessary to provide the clearances shown on the plans.

3.04 REMOVAL

A. Remove Basketball posts, hoops and backboards:

Existing basketball posts are to be removed and salvaged for relocation as a part of this project.

The posts shall be cut cleanly and flush with the existing asphalt surface. The remaining post is to have all exposed portions ground to remove any sharp and/or exposed edges. Provide high strength concrete as backfill to fill the resulting voids from the removal of the posts. Finish surface of the concrete shall be medium broom finish and flush with surrounding paving.

B. Store and protect the remaining posts, backboards and hoops for relocation on site as a part of this contract.

3.05 CLEANUP

A. Debris and Rubbish: Clean site daily of loose papers, debris, rubbish and trash. The construction site shall be maintained in good order. Remove and transport debris and rubbish to a facility licensed to accept this material in a manner that will prevent spillage on streets or adjacent areas. Clean up spillage from streets and adjacent areas. Store materials which cannot be removed daily in an area to minimize visual impact to the public and specified by the City Inspector.

B. Regulations: Comply with Federal, State and Local hauling, dust suppression and disposal regulations.

Part 4 PAYMENT

4.01 Base Bid

Payment for all labor, material, and equipment to perform demolition operations as indicated in the plans and specs shall be paid for per a single lump sum. No additional compensation shall be made.

END OF SECTION

SECTION 02780 PAVEMENT STRIPES AND MARKINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes specifications traffic stripes, and pavement markings, as well as striping and pavement markings for station platforms.

1.2 REFERENCE STANDARDS

A. State of California, Department of Transportation Standard Specifications (Caltrans):

1. Section 84 Traffic Stripes and Pavement Markings

B. State of California, Department of Transportation (Caltrans) Standard Plans.

1.3 DEFINITIONS

A. The following definition augments definitions in the Caltrans Specifications:

1. Basketball Striping: White stripe applied to the asphaltic concrete paving where indicated on the Contract Drawings.

1.4 SUBMITTALS

A. Submit manufacturer's product data for materials.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Paint for pavement marking and striping paint: Paint for traffic stripes as specified in Caltrans Standard Specifications, Section 84-3.

PART 3 - EXECUTION

3.1 PREPARATION

A. Layout of Work: Prior to the application of the striping and pavement markings, mark the location of the striping and pavement markings, and request inspection and obtain Engineer's approval of the layout before proceeding with the application work.

3.2 APPLICATION

A. Apply paint in accordance with Caltrans Standard Specifications, Section 84-3, Painted Traffic Stripes and Pavement Markings.

END OF SECTION

SECTION 02870 - SITE FURNISHINGS

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 site and street furnishings:

1. Weld galvanized steel sleeve to existing basketball post for reinstallation.

B. Related Sections include the following:

1. Division 2 Section Site Concrete Work

C. Products furnished, but not installed under this Section, include **pipe sleeves** to be cast in concrete footings.

1.3 SUBMITTALS

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

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain site and street furnishings through one source from a single manufacturer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Steel: Free from surface blemishes and complying with the following:
1. Steel Pipe: Standard-weight steel pipe complying with ASTM A 53, or electric-resistance-welded pipe complying with ASTM A 135.
2. Tubing: Cold-formed steel tubing complying with ASTM A 500.
3. Mechanical Tubing: Cold-rolled, electric-resistance-welded carbon or alloy steel tubing complying with ASTM A 513, or steel tubing fabricated from steel complying with ASTM A 569/A 569M and complying with dimensional tolerances in ASTM A 500; zinc coated internally and externally.
4. Sheet: Commercial steel sheet complying with ASTM A 569/A 569M.

B. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

C. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications.

D. Galvanizing: Where indicated for steel and iron components, provide the following protective zinc coating applied to components after fabrication:
   1. Hot-Dip Galvanizing: According to ASTM A 123/A 123M, ASTM A 153/A 153M, or ASTM A 924/A 924M.

E. Steel Finish: **Galvanized**

2.2 FABRICATION

A. Welded Connections: Weld connections continuously. Weld solid members with full-length, full-penetration welds and hollow members with full-circumference welds. At exposed connections, finish surfaces smooth and blended so no roughness or unevenness shows after finishing and welded surface matches contours of adjoining surfaces.

B. Exposed Surfaces: Polished, sanded, or otherwise finished; smooth all surfaces, free from burrs, barbs, splinters, and sharpness; all edges and ends rolled, rounded, or capped.

2.3 FINISHES, GENERAL

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance.

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

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written installation instructions, unless more stringent requirements are indicated. Complete field assembly of site and street furnishings, where required.

B. Unless otherwise indicated, install site and street furnishings after landscaping and paving have been completed.

C. Install site and street furnishings level, plumb, true, and **securely anchored** at locations indicated on Drawings.

D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.

E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site and street furnishings and 3/4 inch (20 mm) larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with **anchoring cement**, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

F. Pipe Sleeves: Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with **anchoring cement**, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

3.3 CLEANING

A. After completing site and street furnishing installation, inspect components. Remove spots, dirt, and debris. Repair damaged finishes to match original finish or replace component.

END OF SECTION 02870

Section 02921

ALL-WEATHER GRASS SPORTS SURFACING

PART 1 – GENERAL

1.01 GENERAL PROVISIONS

A. All all-weather grass system shall be free of hazardous Materials and heavy metals with lead component being less than 50ppm. Provide certification stating applicable regulation related to these Materials.

B. The Contractor is responsible for the purchase of and installation of all fixed items, and providing all non-fixed items.

C. Lines, logos, and graphics to be installed on the all-weather grass surface as per documents Are to be tufted in the factory to the maximum extent practical. Those not tufted in the factory shall be inlaid in the field.

1.03 DEFINITIONS

A. Most terms used within the documents are industry standard. Certain words or phrases shall be understood to have specific meanings as follows:
   1. Provide: Furnish and install completely connected up and in operable condition.
   2. Furnish: Purchase and deliver to a specific location within the building or site.
   3. Install: With respect to equipment furnished by others, install means to receive, unpack, move into position, mount and connect, including removal of packaging Materials.

1.04. RELATED WORK SPECIFIED IN OTHER SECTIONS:

A. The following related work is to be performed under designated sections.

   1. SECTION 03 03 30 00 - CAST-IN-PLACE CONCRETE
   2. SECTION 32 32 92 20 - ALL-WEATHER GRASS SPORTS SURFACING WARRANTY

1.05 CODES AND STANDARDS

A. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirement shall govern.

B. American Association of State Highway and Transportation Officials (AASHTO):
   1. T 89 Determining the Liquid Limit of Soils
   2. T 90 Determining the Plastic Limit and Plasticity Index of Soils

C. American Society for Testing and Materials (ASTM):
   1. D 355 Impact Attenuation

2.	D 395	Rubber Property – Compression Test
3.	D 418	Pile Yarn Floor Covering Construction (Pile Height, Total Weight and Backing Perforations)
4.	D 789	Yarn Melting Point
5.	D 1335	Tuft Bind of Pile Floor Coverings (Tuft Bind (without in-fill), Tuft Bind (with in-fill) & Fiber Grab)
6.	D 1577	Linear density of Textile Fibers (Yarn Denier)
7.	D 1682	Breaking Load and Elongation of Textile Fabrics
8.	D 2256	Breaking Load (Strength) and Elongation of Yarn by the Single-Strand Method
9.	D 2859	Pill Burn Test
10.	D 3776	Mass per Unit Area (Weight) of Woven Fabric
11.	D 3786	Hydraulic Bursting Strength of Knitted Goods and Non-Woven Fabrics: Diaphragm Bursting Strength Tester Method
12.	D 4491	Water Permeability of Geotextiles by Permittivity
13.	D 4533	Trapezoid Tearing Strength of Geotextiles
14.	D 4632	Breaking Load and Elongation of Geotextiles (Grab
15.	D 4833	Index Puncture Resistance of Geotextiles, and Related Products
16.	F 355	Shock Absorbing Properties of Playing Surface Systems Materials
17.	F 1551-97	Comprehensive Characterization of ALL-WEATHER Grass Playing Surfaces and Materials (for those not covered
18.	F 1632	Particle Size Analysis and Sand Shape Grading of Golf Course Putting Green and Sports Field Rootzone Mixes
19.	F 1936	Shock Absorbing Properties of North American Football Field Playing Systems as Measured in the Field
20.	F2765-09	Standard Specification for Total Lead Content in All-Weather Grass Fibers

D. Dynamic Cushioning: The dynamic cushioning of the combined performance pad, all-weather grass and in-fill system shall not exceed a maximum of 110G's at 70 degrees F. per ASTM 1936-98, F355, Procedure A at any location within 30 days of the installation.
   1. The system shall not exceed 150 G's over the warranty period.

E. Comply with applicable requirements of the following standards. Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.

1.06 QUALIFICATIONS

A. Installation Qualifications: The General Contractor or the Installation Contractor of the all-weather grass System (referred to herein as the Sub-Contractor) shall hold, in good standing with the State of California Department of the Construction Licensing.

B. The Contractor shall indicate how your company will staff this project and provide project Managers experience (on-site and day to day contact person for the project). Include

Contact Name, Address, Phone Number, Fax Number and Email Address.

C. Provide experience to show that your company is competent to complete the level of work outlined in this project.

Provide the following (with scope, construction timeline, construction cost, reference person, title and contact information for each project):

- 5 Synthetic Grass Multisport Fields with shock pad and sand infill

1.07 QUALITY CONTROL

A. Testing and Quality Control: Prior to shipping the all-weather grass to the project site, the Contractor shall submit to the Engineer a copy of the results certified by an independent testing laboratory for the following tests performed on the all-weather grass to be installed in the Project.

Pile Yarn Type100% Polyethylene Fiber	
Yarn Denier	ASTM D-1577
Yarn Breaking Strength	ASTM D-2256
Yarn Melting Point	ASTM D-789
Pile Height	ASTM D-418
Pile Weight	ASTM D-418
Total Weight	ASTM D-418
Fiber Grab	ASTM D-1335
Backing Perforations	ASTM D-418
Tuft Bind (Without in-fill) Tuft	ASTM D-1335
Bind (With in-fill)	ASTM D-1335

Grab Tear Strength	ASTM D-1682
Impact Attenuation	ASTM D-355
Pill Burn Test	ASTM D-2859

B. All-Weather Grass Pile Surface: The pile surface shall provide good traction in all types of weather with the use of conventional “sneaker type shoes” and composition, molded sole athletic shoes. The pile surface shall be suitable for both temporary and permanent line Markings using a rubber base paint where applicable.

C. Supplied Rolls: Rolls that do not comply with the proper length or conform to the seaming diagram as submitted prior to installation shall be rejected from the site.

D. Infill Materials: This Contractor shall be responsible for the supply and installation of all in-fill Materials and shall be required to return to the site after not less than 30 days to inspect and add in-fill Materials as needed.

E. Drainage: The all-weather grass shall remain free draining at all times before, during, and after the in-fill Materials Are installed.

1.08 PRE-QUALIFICATION SUBMITTALS

A. Only one each of the following pre-qualification submittals Are required at the time of pre-qualification:

B. Documented Experience: The Contractor, or Sub-contractor, shall submit with the pre-qualification, documented experience on at least five (5) that meets qualifications as set forth in this specification (1.06 Qualifications)

C. All-Weather Grass Preliminary Sample: The Contractor / Sub-contractor shall submit with the pre-qualification, three twelve-inch square sample of un-filled and un-fibrillated all-weather grass proposed for this contract for identification of the all-weather grass system components and specification data for sample.

D. A letter on the Contractor / Sub-contractor’s letterhead shall be submitted, with the pre-qualification, confirming their intent to conform to these Specifications in the event the preliminary sample does not meet these Specifications

E. Warranty: The Contractor / Sub-contractor shall submit with the pre-qualification, a sample Manufacturer’s warranty as specified in Section 329220, All-Weather Grass Sports Surfacing Warranty.

F. Third Party Policy: The Contractor / Sub-contractor shall submit with the pre-qualification, written intent of an eight (8) year Third-Party Insurance or Five-Year Maintenance Bond as specified in Section 329220, All-Weather Grass Sports Surfacing Warranty.

G. Non-compliance with the pre-qualification submittal requirements as specified herein will result in rejection of the bid.

1.09 BID-SUBMITTALS

A. Only one each of the following bid submittals are required to the bidding entities at the time of bid:

1. A letter on the Contractor / Sub-contractor's letterhead shall be submitted, with the bid, confirming their intent to conform to all information presented during the pre-qualification process.
2. Warranty: The Contractor / Sub-contractor shall submit with the bid, a sample Manufacturer's warranty as specified in Section 329211 All-Weather Grass Warranty and Guarantee.
3. Third Party Policy: The Contractor / Sub-contractor shall submit with the bid, written intent of Third-Party Insurance or Five-Year Maintenance Bond as specified in Section 329220, All-Weather Grass Sports Surfacing Warranty and Guarantee.
4. Non-compliance with the bid submittal requirements as specified herein will result in rejection of the bid.
5. Submit separate price of for the Optional Service Contract, as described in paragraph 3.07 of the section.

1.10 SUBMITTALS

A. The all-weather field surfacing specified herein is intended to be non proprietary. It is the Manufacturer's responsibility to supply complete shop drawings, details, and Material samples for the system proposed to be installed to the Engineer for review and approval.

B. Shop drawings of all-weather grass field surfacing indicating dimensions and layout of field construction including lining, and location and details of base installation to accommodate future goal posts shall be submitted. Submit drawings for, one month prior to installation:
1. Seaming plan; seams of pad are not to coincide with seams of all-weather grass nor interfere with subsurface drain system.

2. Installation details; edge detail, goal post detail, covers for access to subsurface structures, other inserts, etc.

3. Striping plans; layouts showing any field lines, Markings, boundaries on the appropriate field(s) and all specified colors. All markings shall be inlaid.

4. Submit to Owner for approval - quality assurance information as delineated in paragraphs
1.05A, 1.05B and 1.05C above.

5. Certified list of existing installations, including Owner representative and telephone number, attesting compliance with quality assurance information.

C. Samples
   1. All-Weather Grass Final Sample: The Contractor shall submit with the all-weather grass test data, three (3) twelve-inch square samples of un-filled all-weather grass (in-fill in separate bags with sieve analysis) proposed for this contract for approval of colors, in-fill, seaming or sewing Materials and layout of the system. The samples shall be reviewed as the product intended for use on the field.

   2. Submit three (3) samples of the all-weather grass and all used colors (field, stripes, logos, end zones, etc.), 30 days prior to installation.

D. Material safety data sheets on all products and product components, as necessary. This shall including solvents and other products required as part of clean up.

E. Certified Statement of the presences of toxic and or hazardous Materials. Any toxic and or hazardous Material exceeding 80 ppm shall be included in this list. The list shall reference the standard in name and threshold if applicable, and the test results. This requirement is above and beyond the requirements for MSD Sheets which only require reporting compounds that exceed 80 ppm.

F. Prior to order of Materials, submit the following for review and approval:

   1. Sample Warranty
   2. Sample warranty from field Manufacturer and or vendor
   3. Sample warranty from fiber Manufacturer
   4. Sample third party warranty
   5. Seam layout of the field
   6. Field Marking layout, including logos
   7. Details on construction, especially any details that May deviate from these plans and specifications.
   8. Laboratory testing for proposed product by independent laboratory. Testing must be for current Materials with current date from independent laboratory.

G. Manufacturer's Review: Submit written statement, signed by Contractor and all-weather field surfacing installer stating that the Drawings and Specifications have been completely reviewed by qualified representatives of the Materials Manufacturer, and that they Are in agreement that the Materials and system to be used all-weather field surfacing Are proper and adequate for the applications shown and in no way impact the system warranty.

H. Letter indicating that they have reviewed the Materials proposed for use in the dynamic stone and topping course are compatible with the intended use.

I. Product Data: Submit Manufacturer's specifications and installation instructions for all products in the all-weather field surfacing system, including certifications and other data as May be required to show compliance with the Contract Documents.

   1. Certified copies of independent (third-party) laboratory reports on ASTM tests as follows:
   2. Pile Height, Face Weight & Total Fabric Weight - ASTM D418 ii. Primary Backing Weights – ASTM D418

3. Tuft Bind – ASTM D1335
4. Grab Tear Strength – ASTM D1682
5. Dynamic Cushion Test (GMax) - ASTM F-355, Procedure A (system)
6. Comprehensive Characteristics of All-Weather Grass Playing Surfaces andMaterials ASTM 1551
7. Adhesives and solvents used in the installation of system.
8. Seaming tape.
9. Yarn for sewing seams and Making minor repairs.
10. Lab test results and certifications regarding existence of hazardous Materials with products used in the system.
11. Primary and secondary backing Material and coatings. h. Inlaid and painted color data.
12. Certification from yarn Manufacturer that system installed is manufactured using their yarn as specified.
13. Material MSDS Sheets
14. Statement and Test Results from Yarn Manufacturer indicating that the yarn, including each fiber color separately, has less than 100ppm lead content as tested using ASTM F2765-09.

J. Acceptance of Prior Work: Upon completion of the base and drainage work, Contractor shall submit to the Owner a letter confirming the site inspection has been performed, noting any discrepancies, problems and/or conflicts. A summary of certification of the acceptance of the base and drainage shall be submitted. Continuing with the installation of the all-weather grass (without submittal of a written acceptance by the all-weather grass Contractor) over the base shall be considered as an approval of the base by the all-weather grass Contractor.

K. Maintenance and Operating Data: The Contractor shall submit to the Owner a copy of Maintenance and operating data for the all-weather grass system. Provide descriptions of all equipment recommended for the Maintenance, repair, citing all-weather grass and activities not recommended relative to the warranty. Include Maintenance recommendations including coverings for special events, small repair procedures, minor seam repair, the discussion of the precautions to be practiced, general Maintenance and uses to avoid to protect the all-weather grass system.

a. Maintenance Data shall include a list of acceptable cleaning agents only for emergency use. Any claim by the Contractor that no cleaning agents whatsoever can be used shall not be acceptable to the Owner.

L. Statement of Supervision: Upon completion of the Work, submit a written statement signed by the Manufacturer stating that the field supervision of the Manufacturer's representative was sufficient to insure proper application of the Materials, that the Work was installed in accordance with the Contract Documents, and that the installation is acceptable to the Manufacturer.

M. Post-completion: The Contractor shall submit to the Owner the following documents on completion and final inspection of the work:

- Schedule of preventive Maintenance visits as specified herein.

- o Independent test results on the all-weather grass once a year as specified herein.

1.11 DELIVERY, STORAGE, HANDLING, AND INSPECTION

A. Packing and Shipping: Deliver products in original unopened packaging with legible Manufacturers' identification. All Materials shall be stored in a dry place out of the direct sunlight.

B. Prior to the installation of any Materials and immediately upon delivery of the all-weather grass system and components to the Project site, the Contractor shall inspect materials as follows:

1. For damaged or defective items
2. Measure all-weather grass pile height and roll lengths
3. Inspect the perforations and uniformity
4. Adhesives shall arrive in sealed dry containers.
5. Sand shall arrive in large sacks or bags without tears and loose material about.
6. Sand shall arrive dry and loose.

C. Bulk Materials: Deliver materials in clean, washed and covered trucks to eliminate contamination during transportation. On site stockpiling locations to be coordinated with the Owner. Stockpile only in Areas free of debris and away from drainage routes. Cover all Materials with plastic or geotextile if materials are to be stockpiled more than 48 hours.

1.12 COORDINATION

A. Base/drainage coordination: As a part of this contract, this Contractor shall be responsible to oversee the installation of the base and drainage and to comment on any problems or conflicts that May be discovered.

B. Prior to the installation of the cement treated base and after the sub-grade has been compacted, impermeable geotextile fabric shall be installed on top of the compacted sub-grade.

1.13 TESTING

A. The Owner reserves the right to submit any Material, either before or after installation, for testing it deems necessary to satisfy the conditions of this contract.

B. Any material tested and found not in compliance with the contract will be rejected and replaced with Material conforming to the specifications. This will be done at the sole expense of the Contractor.

C. Any testing performed by the Owner will be at the Owner's expense. The Contractor is responsible for the cost of all testing that fails. Contractor will bear the cost of all retesting

as required by the Owner.

1.14 FIELD SYSTEM HOLD HARMLESS

A. The Contractor shall hold the Owner, Engineer, Engineer/P.M. and Field Consultant harmless from infringement of any current or future patent issued for the all-weather grass system, fibers, backings, including shock pad (if required), installation methods and vertical draining characteristics. The successful bidder will be required to submit a letter for consent from their surety. The Surety shall indemnify the requirements.

1.15 PROTECTION OF UTILITIES AND STRUCTURES

A. The Contractor shall take special care to protect all field and stadium structures

and utilities.

PART 2 –MATERIALS

2.01 FIELD MAINTENANCE TRAINING

A. Training Instruction and DVD: Provide a 4 hour on-site training instructional program for the Owner. The training instruction will be summarized on a DVD included in the close-out documents.

2.02 ADDITIONAL FIELD MATERIALS

A. The Contractor shall supply and deliver an additional 100 lineal feet of standard width Material, plus 10 linear feet of each color used.
B. The Contractor shall supply and deliver an additional 2,000 lbs of rubber in-fill Material as specified for the field. The rubber infill will be placed in Rubbermaid 50 gallon containers with covers.
C. Seaming Tape and Adhesive: Provide 200’ linear feet of seaming tape and 2 additional 5 gallon pails of adhesive for making minor repairs.

2.03 ALL-WEATHER GRASS SYSTEM

A. The field surfacing system shall be a vertically draining permeable all-weather grass system consisting of an all-weather grass like pile that shall be tufted into a triple layer synthetic backing. The final coating shall be a polyurethane based Material.

B. The All-Weather Grass Systems:
Turf- AstroTurf, Golden Series, with sand infill, (800) 723-8873 www.astroturfusa.com (or equal)
Pad- Brock PowerBase- 23mm thickness, (or equal)

C. The list of All-Weather Grass Systems is provided for general approval of product line only. Bid-submittals as specified herein Are required without exception. The Contract Specifications shall supersede product literature from the approved All-Weather Grass Systems listed.

D. Submittals for all Manufactures and for equal product approval shall be submitted to the Engineer for pre-qualification prior to bidding. The pre-qualification submittal shall include all of the submittal requirements required within this specification section except the logo colors and seaming diagram which shall be submitted later as specified.

E. The entire system shall be resistant to weather, insects, rot, mildew, fungus growth and be non-allergenic and non-toxic. The entire system shall be constructed to maximize dimensional stability, to resist damage and normal wear and tear from its designated uses and to minimize the ultra-violet degradation.

F. All adhesives used in bonding the system together shall be resistant to moisture, bacterial and fungus attacks, and resistant to ultra-violet rays at any location upon installation.

2.04 ALL-WEATHER GRASS FIBERS

A. Pile fibers shall resemble freshly grown natural grass in appearance, texture and color (except for the colored all-weather grass for Markings). Streaks, discoloration or different dye lots shall not be accepted.

B. Fibers shall be a 100% Slit Film utilizing Tencate XP Yarn.

C. Pile surface shall be nominally uniform in length as specified herein.

D. The fibers are tufted through a double layer (two separate layers) referred to herein as the PrimaryBacking, Intermediate Layer, and Secondary coating Backing.

1. The Primary Backing and Intermediate Layer shall be a combination of woven and/or non- woven synthetic backing Material. Secondary shall be not less than 18 pitch mesh.
2. The Secondary Backing shall be moisture cure polyurethane. This backing shall be not less than 20 ounces. The polyurethane coating for the Secondary backing shall be uniform and monolithic when cured.

E. If sewn, all all-weather grass seams shall be constructed of reinforced backing Material or sewn with high strength polyester fiber cord. Sewn seams shall be a “double loop stitch” type seam. A “bagger” seam will not be accepted. Seams shall lay flat after in-fill.

F. All glued seams shall have a 12” wide seaming tape of nylon or mylar, fully coated with adhesive. All seams shall not have any adhesive applied to any exposed fibers. All graphics or Markings can be in-laid or cut-in. The seams shall not be adhered to the performance pad.

G. Fabric surface shall be constructed and installed in minimum widths of 15 feet with no longitudinal or transverse seams, except for inlaid lines with a finished roll assembly.

1. The seams shall be 15’-0” apart. No fitted pieces shall be allowed to true alignment.
2. Each panel shall be delivered for installation across the full width of the field.

Butt and/or head seams shall not be allowed within the field of play.

3. Panels shall be perpendicular to the playing direction. Sidelines May be installed lengthwise of the field.

2.05 ADHESIVE MATERIAL

A. Adhesive Material to fix the all-weather grass system to the seaming tape and to the backing supplied by MAPEI or approved equal.

1. The adhesive shall have the same warranty period as the all-weather grass system.
2. If a hot melt welding method is used, the glue shall have an application temperature of 325 degrees F. with a melting point of 180 degrees F. Material shall be National Adhesive #34-5372 or equal. Submission of all hot melts shall be 10 calendar days prior to installation.

2.06 INFILL

A. Composition: the infill shall be free of all metal and SBR (tire rubber) and produced of 100% silca sand. The Material shall have a size not to exceed 14 mesh nor smaller than 20 mesh.

1. The fine particles shall not exceed 10% by volume

2. The all-weather grass field system shall be brushed prior to installation and after installation of the infill with an approved sweeping apparatus containing full length magnets to ensure no foreign metal material is present in the completed field.

a. Volume/weight: The in-fill system shall have not less than 2.0 lbs of sand per sq ft installed and shall consist of a minimum of 33% of the fiber height as the infill after all infill materials are installed.

b. Sand is to be used as the in-fill system, there is no rubber content. Sand will be installed in layers of 0.25 lbs per layer and brushed before the following layers are installed. A total of 2.0 lbs per sq ft .

3. The fiber length shall not be less than 1.5”.

2.07 PERFORATIONS

A. For porous all-weather grass, all carpet shall be perforated, or non perforated porous backing, to provide vertical drainage as specified herein.

1. Size and spacing of perforations shall be as specified herein. Spacing of perforations shall be uniform in both directions.
2. Perforations shall be complete and full diameter for a minimum of 95% of the each roll.
3. Perforations shall be tested by passing a 3/8” drill bit through the holes with no more than 7 lbs. of pressure.

2.08 PERFORMANCE AND TEST REQUIREMENTS

A.	Pile (Fiber) Height	ASTM D418	1.5” minimum.
B.	Pile(Fiber)Face Weight	ASTM D418	74 oz./ Sq. yd. (minimum) 20 oz. of texturized polypropolene
C.	Fiber Construction	ASTM D418	See paragraph 2.04
D.	Fiber Denier	ASTM D418	8,000 Slit denier/per strand
E.	Fiber Thickness	ASTM D418	110 microns min. for Slit Film
F.	Melting Point	ASTM D789	235 degrees
G.	Specific Gravity	ASTM D792	.950 to .960
H.	Breaking Strength	ASTM D5034	Length 283 lbs./ft. Width 208 lbs. /ft.
I.	Coefficient of Friction	ASTM D5034	Dry 1.15 Wet 1.00
J.	Pill Burn Test	ASTM D2859	8 Passed/0 Failed
K.	Fiber Grab	ASTM D-1335	8 lbs tensile
L.	Tuft Bind (without in fill) Tuft Bind (with in-fill)		11 lbs tensile 22 lbs tensile
M	Fiber Gauge Width	ASTM D418	3/16" between tufted rows
N.	Fiber Manufacturers	Ten Cate, Nicolon B.V. Nijverdal, Netherlands	
O.	Secondary Backing	ASTM D418	Oven cured Polyurethane
P.	Secondary Backing	ASTM D418	20 ounces of finished weight per square yard
Q.	Perforations	Visual	3/8” dia. holes, spacing 3” x 4” on center,Maximum, or non perforated porous backing
R.	Water Permeability		> 16” per hour
S.	Perforations	Visual	3/8” dia. holes, spacing 3” x 4” on center, maximum, or non perforated porous backing

***NOTE:All testing shall be performed on recent products and test data shall not be dated earlier than May 2012.

2.08 MARKINGS

A. All field lining, Marking, field boundary system with team Area limits, logos, etc. shall be same Material (fiber, infill, and backing) as playing field system.

B. A complete field lining, Marking, and field boundary system with team Area limits, etc. shall be provided with the initial installation. Layouts shall be accurately surveyed and marked prior to installation.

C. All lines, numbers, and field Markings Are to be tufted or inlaid with the specific colored all- weather grass. All Markings shall be uniform in color, providing a sharp contrast with the all- weather grass color and shall have sharp and distinct edging. Markings shall be true and shall not vary more than 1/2" from specified width and location.

D. Manufacturer is to guarantee that the all-weather fiber is adaptable to painted lines.

PART 3 –EXECUTION

3.01 GENERAL

A. Prior work: The Contractor is responsible for the review and acceptance of the base and drainage prior to starting work and shall submit a written document as specified herein.

B. Weather Permitted Conditions: The Contractor shall not perform any work if the conditions for working are:

1. Ambient air temperatures are below 45 degrees F.
2. Material temperature falls below 45 degrees F.
3. Rain is forecast or falling
4. Conditions exist or Are pending that will be unsuitable to the installation of the system.

C. Drawings / Specifications: The Contractor shall perform all work in strict accordance to the Contract Drawings / Plans, Shop Drawings and Manufacturer's specifications and instructions.

D. Verification: The Contractor shall be responsible for the inspecting, verifying and completing all installed work of this section.

3.02 FIELD LAYOUT & SLOPE

A. Layout: The Contractor shall be responsible for furnishing, setting and marking all lines, seams and markings for the field. The Contractor shall at all times maintain all necessary benchmarks and control points to locate all events and Markings.

3.03 ALL-WEATHER GRASS INSTALLATION

A. Install the non-woven geotextile fabric under the all-weather grass and on top of the field base, if required in addition to the secondary backing as specified herein.

B. The all-weather grass shall be staged and unrolled as necessary for a daily installation. No Material will be allowed to be unrolled 24 hours prior to installation. All wrinkles shall be pulled out.

C. The shock pad is required, pad can be installed over the accepted base. Control of the finish grade and contour shall be the responsibility of the Contractor. The use of a pre-manufactured pad will be acceptable.

D. Seams:

1. All panel seams shall be securely glued to a backing Material of nylon or mylar.
2. All panel seams spacing are to be held to a minimum of 15 feet unless prior approval of seaming diagram indicates a lesser panel.
3. All inlaid Areas shall have full fastenings and no loose Areas. At no time can pulling on the section separate the Material.
4. All seams and inlaid Areas shall be brushed thoroughly before infill Materials Are installed.

E. All-Weather Grass Edges and Termination

1. All edges and ends of the all-weather grass shall be secured to the termination nailer. This termination shall be as detailed in the Drawings and as specified in 033013 Site Concrete.

3.04 LINES AND MARKINGS

A. All Markings and lines shall be in-laid using the all-weather grass of the accepted colors.

B. All lines and markings shall be accurately set and surveyed to within 1/2" tolerance.

C. All lines and markings shall be installed prior to any installation of in-fill Material.

3.05 INSTALLATION OF IN-FILL

A. No in-fill Materials shall be installed until the all-weather grass system is fully installed with all lines and markings.

B. The all-weather grass shall be thoroughly brushed prior to any in-fill materials to remove any wrinkles and defibrillate the slit film.

C. The in-fill material shall be installed at not less than 2.0 lbs per sq ft. of zeolythe total infill shall consist of not less than 75% of the fiber height after brushing.

D. The in-fill materials shall be installed in layers not to exceed 0.25 lbs per sq ft per layer.

3.06 GENERAL CLEANUP

A. The site shall be kept clean and free of debris throughout the installation. Empty barrels,

sacks, bags and remnant Materials shall be stored or disposed daily in a proper container or legal manner.

B. After completion of the entire Project, the site shall have a general cleanup removing all debris remaining on the site that is not a part of the final Project.

C. The equipment supply requirements for this Project shall be part of the total price and shall be the sole expense of the Contractor.

D. All natural grass Areas disturbed during this construction shall be restored to the satisfaction of the Owner at no additional cost to the Owner.

END OF SECTION

SECTION 02922

SYNTHETIC GRASS SPORTS SURFACING WARRANT AND GUARANTEE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SIGNATORIES TO THE WARRANTY

A. The Synthetic Grass System Warranty shall be signed by:

An officer of the applicable party or agency duly authorized to sign contracts. The term “Contractor” specified herein shall refer to the party or agency that is furnishing the warranty.

a. If the grass Manufacturer and/or Installation Contractor of the Synthetic Grass System (referred to herein as the Sub-contractor) is not the same entity as the Contractor, the warranty shall be co-signed by the Manufacturer and/or the Sub-contractor.
b. “Owner” is the Mill Valley School District.

1.3 GENERAL WARRANTY CONDITIONS

A. Warranty Period: The Contractor shall provide a non-prorated Synthetic Turf Manufacturer/Installer Warranty/Guarantee (also referred to herein as the Warranty) for the synthetic grass as specified herein, for a minimum period of eight (8) years to the Owner from the date of Certificate of Substantial Completion (unless a leasing program is entered into. If so, the warranty shall be for the period of the lease).

1. The Warranty shall cover, in general, the usability of the Synthetic Grass System (and pad if required); accessories, use, characteristics, and suitability, of the installation.

2. All items covered by the warranty are to be replaced or repaired with new Materials, including installation at the sole expense of the warranting Manufacturer/surface supplier over the life of the Warranty.

B. Field Use: The field Materials shall be guaranteed for the designated uses as follows:

1. Soccer
2. Lacrosse
3. Physical Education exercises and activities
4. Pedestrian traffic and other similar uses
5. Pneumatic rubber tired maintenance and service equipment, designed for use on athletic fields and golf courses.

C. Warranty documents and terms of Warranty shall be in accordance with this Specification Section.

1. The use of the Manufacturers' standard or modified form of Warranty shall in no circumstance supersede the conditions set forth in this Specification Section, which shall be considered part of the Warranty.

D. This Warranty shall constitute a contract Made in the State of California and shall be governed by the laws of that State.

1.4 BID SUBMITTALS

A. Provide at the time of bid the following documents:

1. Manufacturer's Sample Warranty: shall be a minimum eight (8) year non-prorated Synthetic Turf Warranty (unless a leasing program is entered into. If so, the warranty shall be for the period of the lease), as specified herein, for the specific type of synthetic grass that the Contractor intends to install on this Project.
2. Financial Warranty: Provide in writing from the Contractor's Insurance Agency, that the Insurance Agency intends to provide the Contractor either a Three-Year Maintenance Bond or Third-Party Insurance Policy, as specified herein, for this Project.

B. If the Bid-submittal documents, as specified herein, are being provided by Sub-contractor, then it is the Contractor's responsibility to qualify the bid in terms of all the Specifications.

C. Non-compliance with the bid submittal requirements as specified herein will result in rejection of the bid.

1.5 PRE-COMPLETION SUBMITTALS

A. Provide prior to Substantial Completion, the following documents:

1. Manufacturer's Warranty Certificate, noting compliance with all the conditions of this Specification.

2. Written proof of A.M. Best Rating, as specified herein, for Third-party Insurers affording coverage.

3. Certificate of Liability Insurance (also referred to herein as the Insurance Certificate) – applicable to Financial Warranty as specified herein.

4. Copy of Insurance Policy between the Third-party Insurer and the Synthetic Turf Manufacturer – applicable to Financial Warranty as specified herein.

1.6 CONTRACTOR'S LIABILITY

A. General: Failure to service the requirements of the Warranty will be charged to the Contractor.

B.

C. Repair and Replacement: Any defects caused by delaminating, peeling, normal abrasion or raveling that is not in original conformance with the testing specifications shall be repaired or replaced at no cost to the Owner during this Warranty period.

D. The Contractor will be responsible for all tests, as specified herein, that fail the requirements of the Synthetic Grass System Warranty/Guarantee.

E. Limited Liability: This warranty does not cover excessive wear of the surface caused by misuse. The Owner will be given instructions and care-taking procedures before final acceptance. The Owner is to follow the Maintenance guidelines as specified by the surfacing Manufacturer.

1.7 GENERAL FORM OF WARRANTY OF THE SYNTHETIC GRASS SYSTEM

A. Warranty form: Sample form of warranty herein set forth is a suggested for use for the work under this section. Manufacturers' standard form of warranty May be used or modified provided conditions specified herein Are incorporated.

B. Contractor hereby warrants to the Owner, subject to the limitations and conditions set forth below, that its synthetic grass system consisting of the synthetic grass described as _____, the shock-absorbing under-pad (if necessary) described as _____, and the adhesives used in the installation, Are free from defects in Material and workmanship and shall, for a minimum period of eight (8) years from the date of acceptance by the Owner, remain serviceable for the activities as listed above.

C. Contractor warrants to the Owner that its synthetic grass Materials shall not fade, fail, shrink, wrinkle or reflect excessive wear. Contractor shall, at their sole expense and cost, replace such Areas of the synthetic grass system not performing to these standards for the life of the warranty.

1. The term “not fade” in the context of this warranty shall mean that the synthetic grass Material remain a uniform shade of green or the other colors installed with no significant loss of color as defined by not greater than 20% loss or shade reduction.

2. The term “not fail” or “excessive wear” as used in the context of this warranty shall mean that the length and weight of the face yarn or pile Material in the synthetic grass surface shall not have been decreased by more than 6% per year according to ASTM D418, nor exceed 20% during the warranty period.

D. In the event that the synthetic grass Materials do not retain its fiber height or shock absorbency and is consequently no longer serviceable during the warranty period, the Contractor shall, at their sole expense, replace such portions of the system that Are no longer serviceable.

1. The term “serviceable” in the context of this warranty shall mean that the synthetic grass Material shall have a maximum ‘”G” force value according to Procedure A, B, or C of ASTM D355, not exceed 110 G’s at any location upon installation and shall not exceed 150 G’s thereafter throughout the life of the warranty period. This shall be determined by conducting dynamic cushioning tests at the six field locations as required per ASTM D355 procedures. “G” force factor values to be determined at 70 degrees F.

a) Any increase from 110 G’s to allowable 150 G’s maximum shall be at a relatively uniform rate not to exceed 10 G’s in any single year. Individual "G" testing below 95 “G’s” shall not be allowed in the total averaging of the G-Max testing.

b) Prior to any G-Max testing on the field, the testing machine shall be calibrated in the field with a test pad to verify accuracy of the testing
unit. Calibration and testing shall be witnessed by the Owner or Ar. The Contractor is required to perform the necessary testing during a scheduled time at least one time per year during the Warranty period. The results of the testing shall be submitted to the Owner within 30 days of each test. Failure to submit the results shall serve as notice to perform such testing by Owner to determine the extent of the needs under this Warranty.

E. Where applicable, the fabric shall adhere firmly and completely to the under-pad or seaming tape over the entire warranty period.

F. Contractor warrants to the Owner that the permeable synthetic grass system shall drain vertically a minimum of 10 inches precipitation per hour for a maximum of 24 hours continuously, without visible surface ponding.

G. Contractor shall replace with new Materials, at their sole expense, any damage to the synthetic grass system, which extends more than one meter beyond the location of foreign combustibles, which May ignite, and fire-damage the synthetic grass system. The Contractor shall not be held responsible for any incidental or consequential damages. These warranties and the Contractor’s obligations here-under are expressly conditioned upon;

1. The Owner marking all minor repairs to the synthetic grass system upon the discovery of the need for such repairs.

2. The Owner Maintaining and properly caring for the synthetic grass system in accordance with the Contractor's Maintenance Manual and instructions.

3. The Owner complying with the dynamic and static load specifications established by the Contractor.

H. The warranty is not to cover any defect, failure, damage or undue wear in or to the synthetic grass system caused by or connected with abuse, neglect, deliberate acts, acts of God, casualty, static or dynamic loads exceeding Contractor's recommendations.

1.08 FINANCIAL WARRANTY

A. General: In addition to the Manufacturer's Warranty specified herein, the Contractor shall submit one of the following options to the Owner in regard to the Financial Warranty, prior to final payment.

B. Third-party Insurance Policy: The Third-party Insurance Policy (referred to herein as the Insurance Policy) shall be pre-paid for the entire (8) eight-year period (unless a leasing program is entered into. If so, the warranty shall be for the period of the lease)., without exceptions and must have the following policy features:

1. Insurance Policy shall be issued by a reputable third-party insurer with an A.M. Best financial strength rating of "Excellent" or A-.

2. Insurance Certificate shall name the Owner shall as an additionally insured party.

Insurance Policy coverage shall specifically provide for reimbursement to the warranty holder and/or the Owner of the turf system installed, in the event of a bankruptcy of the Synthetic Turf Provider.

3. Insurance Certificate shall note that insurance coverage applies to the full eight (8) year period (unless a leasing program is entered into. If so, the warranty shall be for the period of the lease).from the date set by the Certificate of Substantial Completion. Insurance coverage shall have no uninsured periods or periods of self-insurance.

4. Insurance Certificate shall note that insurance coverage offers a minimum claim limit of $300,000 per field of 100,000 square feet or less – to be noted in the Insurance Certificate. Larger field Areas or multiple fields shall be separately insured under the same terms of this specification.

5. Insurance Certificate shall note that insurance coverage offers a minimum claim limit of $5,000,000 in the aggregate per annum.
   a. The Mill Valley School District shall be listed as "Additionally Insured" in the appropriate place on the policy.

6. Insurance Policy coverage shall not have exclusions for epidemic or

catastrophic failure.

7. Insurance Policy coverage shall not limit the hours of use.

8. Insurance Policy coverage shall not exclude heavily trafficked Areas or related uses such as team practices, band practices or multiple sports use.

9. Insurance Policy coverage shall apply to playing surface inclusive of the infill, seaming, labor, colored inlays, logos, lettering, numbers, and event Markings.

1.08 FINANCIAL WARRANTY INSPECTIONS AND TESTING

A. Scheduled Inspection and Testing: Contractor shall examine the synthetic grass system twice a year, and conduct tests once a year including analysis, on the synthetic grass surface as a part of a Maintenance plan

1. The analysis results shall be delivered to the Owner within sixty (60) days of the testing.

B. Other Inspections: Contractor shall examine the synthetic grass system in regards to any claim that the Owner Makes to be present at any time, to analyze the results of all tests conducted by the Owner or Owner's Authorized Representative(s), and to conduct such tests of his own on the synthetic grass surface.

1. The Owner reserves the right to submit on the synthetic grass surface to the above tests at any time during the length of the Warranty. Consideration will be given to the age and intensity of use of the surface.

C. Cost of Inspections: The Contractor shall pay for costs of scheduled inspections, testing, and analysis.

1. The Contractor shall not be responsible for any other costs or expenses, incurred by the Owner or others with respect to such inspections, testing, and analysis.

1.10 REMEDIAL WORK

A. Notice: The Owner will notify the Contractor in writing of any issues that require remedial work on the field Area.

1. The Contractor shall respond to the notification within forty-eight (48) hours of receipt and schedule any major defect or repair within seventy-two (72) hours or as weather permits.

2. In the event the Contractor does not respond to the Owner's written notice within ten (10) days of receipt of the notice or does not submit, schedule and execute corrective work within sixty (60) days, weather permitting, the Owner has the option of having the work performed at the expense of the Contractor.

3. The Contractor will be given seven (7) days notice in the form of a certified letter notifying the Contractor of the end of the sixty (60) day period.

B. Repairs: The Warranty requires that the Contractor shall be required to perform all required repairs in a permanent and suitable , manner as deemed necessary to Maintain a safe playing condition at all times.

1. Any replacement or repair area shall match (as close as possible) the appearance of the existing grass.

C. Schedule of Repairs: The Warranty requires that in case of any major repair or replacement, the Contractor is to schedule such work as to not interfere with the Owner's primary use or schedule.

1.11 CLAIMS

A. All claims by the Owner under this Warranty must be made in writing to the Contractor's address, Within 30 days after the Owner learns of the defect, giving rise to the claim.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE,

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cast-in-Place concrete.

B. Control, expansion and contraction joint devices associated with concrete work.

C. Reinforcing steel bars and accessories for cast-in-place concrete.

1.02 REFERENCES AND STANDARDS

Perform work in accordance with all applicable laws, codes and regulations required by the School District, State and Federal Government.

A. ASTM A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement

B. ASTM C33 Concrete Aggregates

C. ASTM C150 Portland Cement

D. ASTM D1190 Concrete Joint Sealer

E. ASTM D1751 Preformed Expansion Joint Filler

1.03 GENERAL REQUIREMENTS

A. All concrete work shall be true to line and grade as indicated on the drawings.

B. Anchors, inserts and other items imbedded in concrete shall be accurately secured so that they will not be displaced during placing of concrete.

1.04 SUBMITTALS

A. Contractor Mix Design: Submit a mix design for the concrete, including a complete list of materials including admixtures and the applicable reference specifications, and copies of test reports showing that the mix has been successfully used to produce concrete with the properties specified. Mix to meet School District of Brentwood standards.

B. Shop Drawings: Indicate bar sizes, spacings, locations and quantities of reinforcing steel, bending and cutting schedules, and supporting and spacing devices.

C. Product Data: Provide data on material for curing concrete, joint filler, joint sealant and fibrous concrete reinforcement.

D. Manufacturer's Certificate: Certify that aggregates, admixtures, reinforcement and cement meet or exceed the requirements specified.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301.

B. Acquire cement and aggregate from same source for all work.

C. Conform to ACI 305R when concreting during hot weather.

D. Conform to ACI 306R when concreting during cold weather.

1.06 COORDINATION

Coordinate the placement of joint devices and reinforcing with erection of concrete formwork and placement of form accessories.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

A. Cement: ASTM C150, Type II, Portland Type.

B. Aggregate: Conformng to ASTM C33. Fine aggregates shall consist of clean, natural washed sand, well shaped, hard, durable particles. Varying from fine to particles passing 3/8" screen of which at least 12% shall pass a 50 mesh screen. Course aggregate shall be uniformly graded between the maximum size, 3/4", and the minimum size, No. 4.

C. Water: Free from acid, alkali, organic matter or other impurities detrimental to the concrete.

D. Reinforced Steel: ASTM A-615, 60 ksi.

E. Forms for Concrete: Substantial, unyielding and sufficiently tight to prevent leakage of concrete and conform to the dimensions of the finished concrete. Earth forms for footings may be used with concrete deposited directly against the ground. Trenches shall be thoroughly cleaned and free of loose debris prior to pouring.

F. Concrete Strength:

1. Post concrete collar and footing: Class B in accordance with Caltrans SS, Section 90.

2. Vertical curb and curb and gutter, ramps and any miscellaneous concrete: Concrete shall be 3000 psi meeting Class B concrete requirements in accordance with Caltrans SS, Section 90.

PART 3 - EXECUTION

3.01 FORMWORK

A. Forms: Shall conform strictly to shape, lines and dimensions and details for concrete work. Construct forms true to lines and plumb, level and square. Construct forms to prevent spreading, shifting, settling, or leakage when concrete is deposited.

B. Footing Forms: If earth banks will stand without clumping or caving, and weather conditions permit, concealed footings may be cast in neat trenches. Moisten soil prior to placing concrete, but shall not be muddy or puddled.

C. Inspection of Forms: All forms will be inspected by the School District Engineer prior to pouring concrete.

3.02 PLACING REINFORCING

A. Accurately locate reinforcing steel in the forms and firmly hold in place before and during the placement of concrete by means of wire supports and/or other suitable devices of standard manufacture to prevent displacement.

B. Reinforcing steel shall be inspected by Project Inspector prior to concreting.

3.03 PLACING CONCRETE

Concrete Placement:

A. Mixing: Transit mixed concrete, ASTM C94. Maximum water content 6-3/4 gallons per sack of cement. Slump maximum 3", minimum of 1".

B. Deposit concrete in continuous and complete pours between joints to the full height of forms.

C. Thoroughly compact concrete by puddling with suitable tools during placement and thoroughly work around the reinforcement and into the corners of the forms. In addition to manual spading and tamping, internally vibrate concrete with high speed mechanical vibrators. Maintain a standby vibrator on the job until all concrete is placed.

3.04 CONCRETE FINISHING

Finish all concrete as indicated on drawings.

3.05 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure surfaces in accordance with ACI 308.

D. Do not work within 10’ of concrete until it has reached a minimum of 70% strength.

3.06 PATCHING

A. Allow School District Inspector to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify School District Inspector upon discovery.

C. Patch imperfections in accordance with ACI 301.

3.07 DEFECTIVE CONCRETE

If any concrete work is not found as indicated, is understrength concrete, out of line, not level or plumb, or showing objectionable cracks, honeycomb, rock pockets, voids, spalling or exposed reinforcing, it shall be removed and replaced as directed by the Engineer.

Any concrete that is damaged, cracked, scratched, gouged, chipped, etc. during construction shall be replaced or repaired to the owner representative’s satisfaction.

END OF SECTION