SECTION 02810
IRRIGATION SYSTEM

PART 1 – GENERAL

1.1 Work included in this Section:

a. Landscape Irrigation System, including all work materials, appliances, tools, equipment, facilities, transportation, and services necessary to install the complete irrigation system.
b. Record drawings. (Field and Final As-Builts)
c. Irrigation work shall be coordinated with all other trades.

1.2 Work Not Included in this Section:

a. Grading
b. Landscaping
c. Electrical

1.3 Related Work Specified Elsewhere:

Cutting and Patching, Section 01045.

1.4 Quality Assurance:

1.5 Permits: Obtain and pay for all permits and inspections required by outside agencies.

1.6 Ordinances and regulations: Local, municipal and California state laws and rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the Contractor. Anything contained in the specifications shall not be construed to conflict with any of these rules and regulations or requirements of the same. However, when the specifications and drawings call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by these rules and regulations, the provisions of the specifications and drawings shall take precedence.

1.7 Protection: Erect and maintain barricades, warning signs and lights and provide guards as necessary or required to protect all persons on the site.

1.8 Underwriters Laboratories: Electrical wiring, controls, motors and devices shall be U.L. listed and so labeled.

1.9 Installer qualifications (for solvent and rubber gasket joints): Each person shall be trained by the manufacturer's representative in techniques for making correct joints prior to performing work on the site.

1.10 Work of this Section which is allied with the work of other trades shall be coordinated as necessary.

a. Superintendent: A superintendent satisfactory to the Agency's Representative shall be present on the site at all times during the progress of the work.

b. The Superintendent shall not be changed, except with the consent of the Agency's Representative.

c. The Superintendent shall be authorized to represent the Contractor.

1.11 Discrepancies: When discrepancies exist between drawings and specifications, and no specific interpretation is issued prior to bidding, the decision regarding this interpretation will rest with the Agency's Representative. The Contractor will be compelled to act on this decision as directed. In the event the installation deviates from the directions given, it shall be corrected at the Contractor's expense.

1.12 Manufacturer's directions: Manufacturer's directions and detailed drawings shall be followed in all cases where the manufacturers used in this Contract furnish directions covering points not shown in the drawings and specifications.

a. Work called for on the drawings by notes or details shall be furnished and installed whether or not specifically mentioned in the specifications.

b. The Contractor shall not install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage or area dimensions exist that might have been considered in the engineering. Such obstructions or differences shall be brought to the attention of the Agency's Representative. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary at no cost to the Agency.

1.13 Point of Connection:

a. Make connection of irrigation system main line at new irrigation water meter in approximate location shown. See drawings for location.

1.14 Electrical Meters:

a. New electrical meters required by this contract shall be provided under the Electrical Section. Refer to the electrical drawings and specifications.

1.15 Drawings:

a. The drawings are diagrammatic only. It is the intent of the plans and specifications that the irrigation system shall efficiently and uniformly irrigate all areas according to horticultural and soil requirements, and that it shall be complete in every respect and shall be ready for operation to the satisfaction of the Agency.

b. Due to the scale of drawings, it is not possible to indicate all offsets, fittings, sleeves, etc. which may be required. Carefully investigate the structural and finished conditions affecting all of this work and plan this work accordingly, furnishing such fittings, etc. as may be required to meet such conditions. Drawings are generally diagrammatic and indicative of the work to be installed. The work shall be installed in such a manner as to avoid conflicts between irrigation systems, planting and architectural features.

c. Materials List and Manufacturer's Catalogs. Within thirty (30) calendar days after award of contract, submit six (6) copies of a complete materials list, including manufacturer's name and number covering all material required under this Division, together with six (6) copies of descriptive literature.

1.16 Record Drawings:

a. Record dimensioned locations and depths for each of the following:

1. Point of connection (POC) and all related equipment at the POC.
2. Irrigation pressure line (mainline) routing. (Provide dimensions for each 100 lineal feet [maximum] along each routing and for each change in direction.)

3. Flow meters.
4. Gate valves.
5. Sleeves / Conduits.
6. Remote control valves.
7. Quick coupling valves.
8. Control wire routing.

b. Other related items as may be directed by the Agency Representative.

c. Locate all dimensions from two permanent points (buildings, monuments, sidewalks, curbs or pavements).

d. Record all changes which are made from the Contract Drawings, including changes in the pressure and non-pressure lines.

e. Record all required information on a set of blackline prints of the drawings. Do not use these prints for any other purpose.

f. Maintain information daily. Keep drawings at the site at all times and available for review by the Agency Representative.

g. When record drawings have been approved by the Agency Representative, transfer all information to a set of reproducible prints using permanent India ink. Changes using ballpoint pens are not acceptable.

h. Make dimensions accurately at the same scale used on original drawings or larger. If photo reduction is required to facilitate controller chart housing, notes or dimensions must be a minimum 1/4 inch in size.

i. Reproducible prints (6 maximum) will be furnished by the Agency Representative at cost for printing and handling.

j. Use appropriate eradicating fluid for removing original lines and dimensions where changes are made. Completed reproducibles shall be equal to the original drawings.

k. Controller Charts. On the inside surface of the cover of each automatic controller, the Contractor shall prepare and mount a chart showing the valves and sprinkler heads serviced by that particular controller. All valves shall be numbered to match the operation schedule and the drawings. Only those areas controlled by that controller shall be shown. This chart shall be a plot plan, entire or partial, showing building, walks, roads and walls. A photostatic print of this plan, reduced as necessary, and legible in all details, shall be made to size that will fit into the controller cover. Do not prepare charts until record drawings have been approved by the Agency's Representative. Provide one controller chart for each automatic controller installed. Identify the area of coverage of each remote control valve, using a distinctly different pastel color, drawn over the entire area of coverage. Charts must be completed and approved prior to final review of irrigation system. This print shall be approved by the Campus representative and shall be hermetically sealed in 20 mil plastic (2-10 mil Pieces). This shall then be secured to the inside of the cover. Show controller designation on each chart.

1.17 Miscellaneous Items to be furnished by Contractor:

a. Provide the following tools as a part of this contract:
Six (6) wrenches for disassembling each type sprinkler head used;

Two (2) operating keys suitable to operate each type of valve used;
Six (6) quick coupler valve keys to fit type of couplers used (complete with hose bib);
Six (6) quick coupler lock type cover keys;
One (1) set of automatic controller cabinet keys for each controller used;

b. Provide Three (3) sets of maintenance and parts manuals for controller, remote control valves, shut-off valves, quick coupler valves, rotary heads, and all other mechanical devices with moving parts used in this contract.

c. Present in hardback three-ring binders.

1.18 Checklist:

a. Provide a signed and dated checklist and deliver to the Agency's Representative prior to final review of the work.

b. Use the following format:

Confirmation of service pressure: psi, by whom and date.

Plumbing permits: if none required, so noted.

Materials approvals: approved by and date.

Pressure line tests: by whom and date.

Record drawings: received by and date.

Controller charts: received by and date.

Materials furnished: received by and date.

Operation and maintenance manuals: received by and date.

System and equipment operation instructions: received by and date.

Manufacturer's warranties if required: received by and date.

Written guarantee: received by and date.

Lowering of heads in lawn areas: if incomplete, so state.

1.19 Guarantee:

a. A letter of guarantee from each manufacturer shall be submitted to the Agency guaranteeing his materials for a period of one year against material defects and workmanship. In cases where longer guarantees are required by these specifications, such guarantees shall be submitted.

PART 2 – MATERIALS

2.1 Specifying by Name:

Whenever any material is specified by name and number thereof, such specifications shall be deemed to be used for the purpose of facilitating a description of the materials and established quality, and shall be deemed and construed to be followed by the words "or approved equal". No

substitution will be permitted which has not been submitted for approval to the Agency within thirty (30) calendar days after the contract has been awarded. Six (6) copies of descriptive literature, including pressure loss curves, nozzle performance characteristics, etc., shall be furnished for any materials submitted as "equal" substitutes. No item will be considered as "equal" if it is constructed of different materials or alloy or is of a different principle of operation. Piping, tubing, conduit, valve, or any device through which the flow of water must pass shall not cause a greater resistance, turbulence, or pressure loss due to friction than that material as engineered and designed into this system.

2.2 Pressure loss curves shall be certified by an impartial commercial testing laboratory with all costs for tests and reports being paid for by the Contractor wishing to make the substitution.

2.3 Contractor shall submit letter (with material list) stating his reasons for any substitution and showing amount of credit offered if substitution should be acceptable.

2.4 General:

All materials shall be new and of size and type as called out on the drawings. All materials of like kind shall be of one manufacture.

2.5 Valve Boxes for Main Shut-Off Valves:

Size and type as called out on the drawings.

2.6 Backflow Preventer and Enclosure:

Wye strainers at backflow prevention units shall be 85% red brass, American National Standard Institute (ANSI) with 40 mesh monel screen.

2.7 Red Brass Pipe:

Shall be Federal Specification No. WW-P-351 medium weight, IPS, with threads to conform to ASA Specification B2. Fittings shall be medium pattern, banded, threaded with standard taper pipe threads.

2.8 Fittings - Steel:

150 lb. galvanized malleable iron, banded.

2.9 Unions - Steel:

Galvanized steel with brass to iron seat, minimum 300 lb. WOG, ground joint.

2.10 Risers - Ferrous Metal:

Shall be cast iron flanged steel pipe (to strainer assembly). Material for irrigation head risers shall be as indicated in the Irrigation drawings/Legend.

2.11 Pipe Wrap:

Galvanized steel pipe to strainer assemblies shall be field wrapped as detailed or to 6 inches above finished grade. Use ten-mil PVC tape, two layers (half-lapped) to equal forty-mil thick total wrapping. Clean surfaces and prime with solution required by manufacturer of tape. Field wrap all joints with same materials leaving identification marks visible, re-apply wrap as recommended by tape manufacturer. All wrapping to be tested in the presence of the Agency

Representative using approved detector.

2.12 PVC Pipe (General):

All pipe to be permanently and continuously marked with manufacturer's name, pipe size (IPS) and schedule (D-1785-68 for schedule pipe), manufacturers lot number and NSF approval. Pipe with dents, ripples, wrinkles, die or heat marks is not acceptable. Pipe shall be delivered to the site in 20 foot lengths.

2.13 Tracer Wires:

A Number 12 Green Type TW plastic-coated copper tracer wire shall be installed with non-metallic main lines.

2.14 Threaded PVC Nipples:

Schedule 80, Type 1, 3 inch minimum length, except where detailed otherwise on drawings. PVC domestic main to drinking fountains shall be PVC Schedule 80 solvent welded plastic pipe gray in color, meeting ASTM D-1785.

2.15 PVC Mainline:

Shall be 1120/1220 normal impact, 2" through 12" use Schedule 40 with integrally thickened bell ends, solvent weld type meeting ASTM D-1785, 2 through 22", use Class 315, solvent weld type meeting ASTM D-1785, 3" and larger use Class 200 O-ring gasketted pipe. All pressure supply lines under vehicular paving shall be installed in a PVC Schedule 40 sleeve.

2.16 PVC Laterals (Non-Pressure Piping):

Normal impact, Schedule 40, solvent weld type meeting ASTM D-1785.

2.17 Fittings - PVC:

For make-up shall be of same chemical compound as pipe on which it is installed. Use Schedule 40 medium-wall fittings for any "all socket" connections. Use Schedule 40 heavy-wall fittings for all fittings with one or more threaded outlets. Fittings for ring-type connections shall be compatible with the pipe on which they are used. Sealing rings shall be procured from the Manufacturer of the pipe and meet configuration of grooves and diameters provided. All fittings shall be ductile iron except tee fittings where tees are bell x bell x slip or thread, which may be PVC Schedule 40 heavy wall.

2.18 P.V.C. Pipe Compound:

Plastic pipe and threaded fittings: Assemble using Teflon tape applied to male threads only.

2.19 Primer:

For PVC solvent weld connections shall be as recommended by the manufacturer of the PVC pipe. Primer shall be chemically compatible with the pipe, fittings and solvent. No primer need be used if "Christy's Red Hot Blue Glue" is used as solvent material.

2.20 Solvent:

For PVC solvent weld connections shall be as recommended by the manufacturer of the PVC pipe. Solvent shall be chemically compatible with the pipe, fittings and primer.

2.21 Irrigation Risers:

The riser shall be PVC Schedule 80 to fit sprinkler opening in swing joint assembly and proper length as detailed on the drawings.

2.22 Valves:

a. Ball Valve:
2 2 inches and smaller bronze ball valve (unless otherwise noted on drawings); ASTM B-584 Alloy-844, 150 PSI saturated steam-600 WOG rating. 2 piece body, chrome plated ball, blowout-proof stem UL listed.

b. Check Valves:
Swing check valve, 2 inches and smaller on non-pressure lines: bronze or plastic construction, 100 pound S.W.P. female i.p.s.

Swing check valves, 2-1/2 inches and larger on pressure lines: cast iron, 150 pound class with no-slam feature.

c. Couplers:
Same manufacturer as quick coupling valve; cast bronze, machined shank, coupler to include operating handle. Top of coupler equipped with 3/4" hose swivel.

d. Gate Valves:
2 2 inches and smaller (unless otherwise noted on drawings): ASTM B62 brass body, 150 pound saturated steam rated; with screwed joints; non-rising stem; screwed bonnet solid disc. Provide with brass or bronze handwheel.

3 inches and larger (unless otherwise noted on Drawings): ASTM A-126 class B, iron body 150 pound W.O.G. with flanged joints, non-rising stem; bolted bonnet and double disc, equipped with operating nut, or as otherwise approved.

e. Quick Coupler Valves:
150 lb. cast bronze body, self-closing metal cover with yellow rubber protective caps, locking type. Threaded track, size as indicated in the Irrigation Legend.

f. Remote Control Valves:
All bronze globe type, contamination proof, slow closing, 150 lb.; electrically operated, 24 volt, epoxy encapsulated waterproof, solenoid to be an integral part of the unit; throttling device with cross arm on top; manual operated to cause valve to open and close with out use of electricity. Manual operator shall be provided by the factory and not fabricated by the Contractor. Valves shall be of same manufacture as automatic controller unless noted otherwise. Valves shall have one year manufactures warranty.

g. Master Valve:
Shall be normally open master valve, with a voltage range from 17 to 40 VAC self cleaning slow closing iron and bronze construction with a 5 year warrantee.

h. Irrigation Heads:

Make, size, type and performances as indicated in the drawings.

i. Automatic Controller:

120 volt, single phase, 60 cycle electric clock control unit in weatherproof, vandal-resistant metal cabinet, hinged locking door. Shall incorporate the following features: 8 day variable cycle, 0 to 99 minutes timing integrally variable; automatic, semi-automatic, and manual operation; manual immediate-station-advance; station-in-operation indicator; 24-hour start clock; on-off and repeat device. No delay between stations. To operate 24 volt valves. Contains pump-starting-stopping circuit. Master switch cuts all power circuits except starting clock. Controller shall be as indicated in the drawings.

j. Automatic Controller Enclosure:

Shall be make, size, and type as indicated in the drawings. Provide one "security" padlock and two keys for each enclosure.

k. Valve Boxes:

Valve boxes unless otherwise noted shall be fabricated from a durable plastic material resistant to weather, sunlight and chemical action of soils. They shall be green in color. The cover shall hinged and shall be secured with a stainless steel bolt mechanism. The cover shall be capable of sustaining a load of 1500 PSI. Valve box extensions shall be by the same manufacturer as the valve box. All valve boxes shall be as manufactured by Brooks, Carson or an approved equal.

1. Quick coupling valve boxes shall be round. The cover shall be heat branded with the letters "QCV," 2" high.
2. Gate valve boxes shall be round. The cover shall be heat branded with the letters "GV," 2" high.
3. Remote control valves shall be 12" X 18". The cover shall be heat branded with the letters "RCV" and the valve number in characters 2" high.
4. Splice boxes shall be 12" X 18". The cover shall be heat branded with the letters "SB," 2" high.
5. Valve boxes for moisture sensing stations shall be 12" X 18". The cover shall be heat branded with the letters "MSS," two inches high.

l. Traffic area boxes: concrete cast iron lid designed for vehicular traffic use.

m. Electrical Requirements to Automatic Controllers - (120 v):

The electrical subcontractor shall provide Service to automatic controllers and final controller connection. The general contractor, the electrical contractor and the irrigation contractor shall coordinate the final electrical connection to all irrigation controllers.

Electrical equipment installed outside building shall be NEMA 4 type.

All connections between electrical services and equipment shall be in rigid galvanized electrical conduit, with conduit and wiring size as required.

To be complete in every respect to City's Electrical Code, ready for use and in accordance with manufacturer's requirements. Provide separate power shut-off switch at panel for each controller. All wiring in galvanized conduit and fittings from source provided under the electrical section. No running threads accepted; use nipples. Conduit system shall be 660 volt insulation, NEC standard annealed copper wire and shall be minimum AWG #12 TW or RW. Protect each controller by a code approved ground connection. Supply to be 120 volts, 60 cycle, single phase, one amp. Use only galvanized steel fasteners in securing controllers in position. Install new controllers as detailed on the drawings.

n. Electrical Requirements from Automatic Controllers (24 volts):

1. Control and Common Wire

To remote control valves wires shall be U.F. type, U.L. approved, AWG number 14 solid strand copper wire with minimum 4/64" PVC coating, 600 volt, 75 C. "Common" wire to be white coated. Each controller to have a different color pilot wire.

2. Flow Sensor Cable:

A PVC jacketed two-conductor cable. The conductors shall be 16 AWG 7 stand annealed copper, conforming to ASTM B-3 and B-8 with heat and moisture resistant PVC, covered with a .004 wall of stabilizing nylon conforming to UL 83 heated at 90 degrees Celsius. The conductors shall be twisted and encased in a single outer jacket of .050" nominal wall of sunlight and moisture resistant PVC conforming to UL, ICEA and NEMA standards. The two conductors shall be color coded with one conductor yellow and the other gray as manufactured by Arizona Electrical Fabricators model #9516-2SP or approved equal.

The flow sensor cable shall be installed in a 1" PVC schedule 40 conduit to protect it from rodents and physical abuse as indicated in the drawings.

3. Wire Connectors for Direct Burial Conductors (24 volt):

Splices, where permitted, shall be waterproofed using Rain Bird or Pen-Tite Connectors.

4. Di-Electric Isolation:

Provide between all connections joining ferrous and non-ferrous metals, or old (existing) ferrous and new ferrous metals. Submit for approval type intended for use.

5. Concrete:

2,500 lb. strength at 28 days. Fine aggregate may be granular sand. All rock and gravel for use in concrete shall be mechanically washed and free from injurious amounts of deleterious substances.

PART 3 – INSTALLATION

a. General:

All work shall be performed by competent, experienced workmen and in a manner to coincide with methods as set forth by the manufacturers of the equipment to be used and as acceptable to the Agency Representative. No consideration will be given to any design changes unless called for by the Agency Representative.

Contractor shall be responsible for damages caused during his operations to any existing underground utility lines including existing irrigation control wires, storm sewers, sanitary sewer systems, gas lines, potable water lines, irrigation lines, telephone cables, gasoline or oil lines, electrical cables, or any other systems (buried or overhead). If such damage should occur, Contractor should immediately notify the Design Consultant, the Agency, and the department affected by such damages and shall pay all ensuing costs.

Where it is necessary to excavate adjacent to existing trees, use all possible care to avoid injury to trees and tree roots. Excavation in areas where 2 inches and larger roots occur shall be done by hand. Roots 2 inches and larger in diameter, except directly in the path of pipe or

conduit, shall be tunneled under and shall be heavily wrapped in burlap, to prevent scarring or excessive drying. Where a ditching machine is run close to trees having roots smaller than 2 inches in diameter, the wall of the trench adjacent to the tree shall be hand trimmed, making clean cuts through. Roots 1 inch and larger in diameter shall be painted with two coats of Tree Seal, or equal. Trenches adjacent to trees would be closed within 24 hours. Where this is not possible, the side of the trench adjacent to the tree shall be kept shaded with burlap or canvas.

Comply with all governing construction and plumbing ordinances for all work under this contract.

All work shall be assembled to conform to details and notes on the drawings, whether or not mentioned in the specifications.

b. Site Reviews:

Before any work commences, a conference shall be held with the Agency's Representative and Contractor regarding general requirements of this work.

Prior to trenching, Contractor shall be responsible for verifying existing pressure at point of connection. If pressure varies from what is indicated on drawings, the Contractor shall immediately notify Agency Representative.

Contractor's responsibility:

Examine surfaces for conditions that will adversely affect execution, permanence and quality of work.

Verify that grading has been completed and the work of this section can properly proceed.

Exercise extreme care in excavating and working near existing utilities. Contractor is responsible for damages to utilities which are caused by his operations or neglect. Check existing utility drawings for locations.

Notify the Agency's Representative in writing, describing unacceptable conditions.

Do not proceed with work until unacceptable site conditions are corrected or existing utilities are located.

c. Verification of Dimensions:

Verify all horizontal and vertical site dimensions prior to staking of heads. Do not exceed spacing shown on drawings for any given area. If such modified spacing demand additional or less materials than shown on the drawings, notify the Agency Representative before commencing work.

d. Manufacturer's Requirements:

Manufacturer's requirements for installation of products shall apply:

1. When no other direction is given;

2. When it is a more stringent requirement than these Special Provisions.

e. Work Space:

The Contractor shall erect fences or guards as are required for the protection of the public and protection of construction materials, and maintain same in good repair until the completion of the work under the contract.

f. Drawings of Record:

Obtain blueline ozalid prints from the Agency Representative and maintain daily records showing every change from the contract drawings of all locations of main lines, buried valves, conductors, quick coupler valves, and plugged or capped outlets. Locate each item from two points of architectural permanence, i.e., curbs, walls, light standards, etc. Do not dimension from irrigation heads or other parts of the irrigation system. Keep record drawings on site for daily observation by the Agency Representative. All dimensions to be taken prior to backfill. On date of final observation, deliver corrected drawings to the Agency Representative. Final drawings shall be prepared by the Contractor on sepia prints obtained from the Agency Representative, showing all field notes in India ink finalized by a competent draftsperson. Delivery of prints does not relieve the Contractor of responsibility for providing any information that may be omitted from the prints.

g. Trenching:

Do all excavation for installation of all work included in contract. Mechanical trenching machines shall be type to cut trenches with straight, parallel sides. Trenches to be only wide enough as may be required to lay the pipe and control wires. "Pulling" of main line pipe and/or control wires will not be permitted. Contractor shall use all possible care to protect existing trees and plants during trenching. Roots 2" or larger shall be tunneled under and wrapped with wet burlap to prevent scarring with two coats of approved sealer manufactured for this purpose. Cover all trenches in root areas (only while open) with wet burlap, and backfill within 24 hours after opening the trench. Obtain Agency Representative's approval before cutting any root over one inch diameter. All trenching in such areas shall be done by hand.

h. Backfill:

After the work has been installed to depths as detailed on the drawings, flushed, tested, and proven tight in the presence of the Agency Representative, backfill with fine granular materials as approved by the Agency Representative. Allow no rocks or other objects larger than one inch diameter to fall in the first 6" of cover. Backfill carefully and tamp properly to avoid any voids. Flooding of trenches shall be done only with the approval of the Agency Representative; however, all sandy soils shall be flooded during the backfill-compaction operation.

After compacting backfill over all pipe lines to equal density of adjoining undisturbed soils, Contractor shall remove all remaining debris caused by his operation from the site and dispose of same in legal manner. All trenches shall be left flush to the adjoining undisturbed grades. Any work covered prior to field observations by the Agency Representative shall be uncovered at the expense of the Contractor to allow for such observations.

i. Laying of Lines:

Lines shall be staked and installed in the locations shown on the drawings. Discrepancies between drawings and site shall be brought to the attention of the Agency Representative prior to trenching. Do not exceed maximum spacing shown on drawings, nor exceed the GPM on the pipe sizes shown. Assemble all pipes free from dirt and scale; ream and deburr. Piping and electrical sleeves under concrete shall be set in place prior to paving work. If pipe must be laid after paving is in place, it shall be done by jacking, boring, or hydraulic driving.

If cutting or breaking of any paving is necessary, it shall be done and replaced with like material at the expense of the Contractor. Obtain approval of Agency Representative prior to any cutting or breaking. Hydraulic driving will not be permitted under asphalt paving. All sleeves set in place under paving shall extend 18" minimum beyond such paving and be capped handtight. No fittings, including couplings, will be permitted under surfaces to be paved except where the length of the line under the paving exceeds 20 feet or where lines are encased in sleeves.

Unless installed in a PVC sleeve, all pipes under pavement surface to be installed a minimum of 24 inches below A.C. paving base.

Replace and restore all surfaces to original condition, including grade and landscaping.

Restoration work shall match the original work in every respect, including type, strength, texture and finish.

In new paved areas, coordinate installation of piping and wires under paved areas with General Contractor.

If the only piping installed is over 20 feet long, pressure testing is required for that section at the time of installation. Upon completion of piping installation, the entire system must be tested.

If wire under paved areas cannot be continuous, all splices shall be enclosed in an approved box.

j. Assembly of Metal Pipe:

Do not bend or spring pipe; make all offsets or changes in direction with fittings. Cut threads with sharp, clean dies to conform to ASA specifications B2. Make up joints by applying oil base compound to male threads only. Remove excessive compound after makeup.

k. Assembly of PVC Pipe:

Handle with care when loading, unloading, transporting and storing to avoid damage. Store pipe and fittings under cover before using. Transport in vehicle with bed of sufficient length to carry pipe flat and fully supported. Store pipe in same manner. Notify Agency Representative when each pipe and fittings shipment reaches the site, for observation. Rejected materials shall be immediately removed from the site and replaced with new shipment of different batch number.

l. Joining by Ring Seals:

Provide for expansion and contraction at each end. Use rubber ring and lubricate with non-toxic lubricant. Centerload, leaving all connections exposed. Do not lay pipe in trench containing water or at less than 32 degrees F.

m. Joint Restraints:

Ductile iron joint restraints shall be installed on all fittings and gate valves for all IPS-Size, ring joint PVC pipe. The joint restraint shall be capable of securing the PVC pipe directly to the lugs on the Leemco and HARCO deep bell ductile iron fittings without the use of bolts, links, and adapters. The joint restraint shall be capable of securing PVC pipe to PVC pipe and PVC pipe to ring joint gate valves without the use of threaded linkages.

All ductile iron fittings shall be secured to full-length pipes and on all bends and tee branches, the next joint of the pipe shall be secured. At least two full lengths of pipe must secured when attached to bends and tee branched 8" and larger, and at least three full lengths when attached to a fitting shall also be secured.

The joint restraint must be similar in all respects to the joint restraints as manufactured by Leemco, Corona, California or equal.

n. Joining by Solvent Weld:

Use non-synthetic brush to spread primer and solvent using no larger than pint-sized cans. Clean and refill cans each day. Cut pipe square, ream, chamfer outside end at 10 degrees. Clean and dry pipe and fitting socket. PVC solvent weld connections shall be made as recommended by the manufacturer of the PVC pipe. Bottom the pipe in socket and turn 90 degrees. Hold joint together 30 seconds. Wipe off excess solvent. Allow to set 30 minutes before moving. Snake pipe side to side in trench bottom, keeping 4" horizontal clearance between two pipes in same trench. Do not lay pipe in trench containing water or at less than 32 degrees F. Center load immediately leaving joints exposed.

o. Locating Assemblies and Valves:

Install backflow assemblies in shrub areas at minimum height permitted by local code. Paint assemblies with 2 coats of flat black enamel.

Quick coupling valves: Unless otherwise indicated, locate valves within 12 inches of hardscape.

Remote control valves: Locate as indicated on Drawings within 12 inches of hardscape, with access sleeve, unless otherwise noted.

Fill area under valve box with minimum 3 cubic feet of pea gravel before box is installed.

p. Flushing of Lines:

Mains shall be flushed before attaching remote control valves, quick coupler valves and with pipe centerloaded. All water being discharged shall be temporarily piped up and out of the trenches. Trenches to be kept dry for pressure tests to follow. Install all valves after approval of flushing procedure by the Agency Representative.

Laterals shall be flushed before irrigation heads are in place. Cap all risers, apply pressure, and remove caps in sequence starting at the control valve. Replace caps before removing caps to follow. Continue to end of each lateral. Flush until all foreign matter and mud is cleared of the system. Contractor to provide all materials required for flushing operations.

q. Pressure Tests:

Do not backfill over any line more than is necessary for testing until it has been inspected, tested, and approved.

Perform all hydrostatic tests in presence of the Agency Representative after flushing lines. Maintain 125 psi on main lines for four (4) hours with all air expelled from line without quick coupler and control valves in place. All leaks shall be corrected in mechanical manner without use of epoxy fillers or other filler compounds. Provide all equipment for tests including force pump and pressure gauges. No pressure test shall be required for lateral lines unless otherwise noted.

If pressure tests are noted, lateral lines shall be pressure tested at 100 psi for two (2) hours where they are providing water to street trees only and will be primarily buried under concrete or asphalt paving. Swing joints do not need to be tested.

r. Laying of Control Wires (24 volt):

Lay wires in common trench with main lines unless otherwise approved. Splicing allowed only every 500 feet. Provide 2 feet expansion loop at splice. Use concrete electrical junction box with bolt down lid at each splice point. White coated common wire in junction boxes to be tagged with 1/4" wide embossed plastic labeling tape showing controller designation. Use plastic electrical tape and bind all control wires in bundles at 10 foot intervals. All approved splices, including splices at remote control valves, shall be waterproof and enclosed in an acceptable box. Install PVC sleeve where wire is not installed with main lines.

s. Laying of Tracer Wires:

Tracer wire shall be placed on bottom of trench under vertical projection of pipe, paved carefully to avoid stress from backfilling, and shall be continuous throughout length of pipe with spliced joints soldered and covered with insulation type tape.

Tracer wire shall follow main line pipe and branch lines and terminate in yard box with gate valve that controls these main irrigation lines. Provide enough length of wire to reach surface grade, bend back end of wire to make a loop and attach a Dyno-tape plastic label with designation of ATracer Wire@.

Location of tracer and its termination shall be recorded on Project Record Documents.

t. Adjusting System

Adjust entire system prior to coverage test and again at conclusion of maintenance period.

1. Set all shut-off valves in the system to full open position.

2. Adjust all stationary heads to equal and uniform coverage using adjusting screws in each irrigation head and by control of the throttle device in each remote control valve.

3. Adjust all rotary head systems using Pitot tube with pressure gauge attached. Set most critical head in each system to meet nozzle pressure as called out on the legend by regulating the remote control valve while pitot tube-gauge assembly is inserted in nozzle. Adjust all radii to fit requirements on drawing if heads are equipped with such a device.

4. Adjust arcs of all adjustable arc type heads so as to prevent overspray on areas to be kept dry. This can also mean the replacement of nozzles or arcs in stationary heads to nozzles of difference cut, i.e., 180° nozzles to change to 120° nozzles, etc.

5. At proper time of plant growth, or when directed by the Agency Representative, Contractor shall set automatic controller to operate as noted on the drawings and shall at that time readjust all remote control valves in the system to operate heads at optimum performance based on night time pressures and simultaneous demands through the supply lines. This may call for repeat of the pitot tube-pressure gauge tests described above if the Agency Representative calls for such procedure, at no additional cost to the Agency.

u. Site Cleaning:

Clean all debris from site, remove all storage rooms and all other constructions and make site ready for planting work to follow. Work or debris not cleared for landscape work may be backcharged to this subcontractor by the landscape subcontractor.

v. Observations:

Observations will be performed by the Agency Representative and the general contractor at the following times and at random visits when the observer may be on the site.

1. Prework conference. To be conducted prior to any irrigation work under this contract.
2. Observation of flushing.
3. Observation of pressure test.
4. Observation of coverage performance.
5. Final observations of the completed installation.
6. Contractor shall not cover any work prior to observation by the Agency Representative.
7. All observances called for by the Contractor shall be requested in writing, at least 48 hours prior to the anticipated observation.

Contractor shall provide "walkie-talkie" equipment and/or personnel to maintain communication from review are to automatic controllers.

All work shall meet the approval of the Agency Representative or be rectified by the Contractor to a condition that does meet this acceptance at no additional cost to the Agency. If the Contractor calls for observations and is not ready for the observations, it shall be backcharged, hourly, including travel time for all members of the team of observers involved.

w. Lowering of Heads, Valve Boxes, Quick Coupler Valves, etc.:

All equipment that may be damaged by mowing shall be set flush to finished grade as called out on the drawings, prior to final acceptance of the work.

x. Guarantee:

The Contractor shall guarantee the entire irrigation system against defects in materials and workmanship for a period of one (1) year from the date of acceptance of the work. The Contractor shall furnish a Faithful Performance Bond in the amount of 10% of the amount bid for the installation of the irrigation system to be in force for the one (1) year guarantee period.

A copy of the guarantee form shall be provided at the time of contract award and shall also be included in the Operations and Maintenance Manual.

The guarantee form shall be retyped onto the Contractor's letterhead and contain the following information.

GUARANTEE FOR IRRIGATION SYSTEM

We hereby guarantee that the irrigation system we have furnished and installed is free from defects in materials and workmanship, and the work has been completed in accordance with the Drawings and Specifications. We agree to repair or replace all defects in material or workmanship which may develop during the period of one year from date of acceptance and also to repair or replace all damages resulting from the repair of such defects at no additional cost to the Agency. We shall make such repairs or replacements within a reasonable time, as determined by the Agency, after receipt of written notice. In the event of our failure to make such repairs or replacements within a reasonable time after receipt of written notice from the Agency, we

authorize the Agency to proceed to have said repairs or replacements made at our expense, and we will pay the costs and charges therefore upon demand.

PROJECT:
LOCATION:
CONTRACTOR/COMPANY:
LICENSE NO.:
ADDRESS:
PHONE:
DATE OF FINAL ACCEPTANCE:

SIGNED:

DATE:

IV. Prefabricated Pump Station:

See Appendix A

END OF SECTION - 02810

SECTION 02830
CHAIN LINK FENCING

PART 1 – GENERAL

1.1 The provisions of the Standard Specifications for Public Works Construction (SSPWC), 2000 Edition, Sections 206-6 and 304-3 apply except as modified herein.

a. Work Included:

Furnish and install chain link fencing as shown on the drawings.

Furnish and install windscreen fabric on chainlink fencing as shown on the drawings.

PART 2 – MATERIALS

a. Chainlink Fabric:

Chain link fabric shall be galvanized, 2-inch mesh, 6-gauge, knuckled selvage top and bottom, widths in full height of fence up to 8 feet in height. All fabric 8'-1" and higher to be 2-inch mesh, 9-gauge. (On backstop fencing only). All other fencing 9 ga. galvanized unless otherwise noted on plans.

b. Posts:

Posts, rails, bracings and footings shall be sized as noted on drawings.

c. Post Caps:

Post caps shall be malleable iron. Post caps for line posts shall be designed for through passage of top rail. Post caps for all other posts shall have curved tops.

d. Fittings:

All fittings shall be heavy duty.

e. Vinyl Coating:

Where vinyl coating is specified over chainlink fabric, the gauge of the chainlink fabric shall be 9 gauge without the additional vinyl coating.

f. Tension Bands:

Tension bands and bands for securing rail ends shall be mild steel flats, not less than 1/8 inch by 1 inch.

g. Tension Bars:

Tension Bars shall be mild steel flats not less than 1/4 inch by 3/4 inch.

h. Gate Hinges:

Gate hinges shall be heavy duty 360 degree hinges welded to vertical posts after all adjustments have been made.

i. Gate Frames:

Gate frames corner joints shall be cut at a 45 degree angle and welded.

j. Tie Wire:

Tie wire shall be soft annealed galvanized steel wire No. 9 gauge wire for fastening fabric to posts. No. 11 gauge wire shall be used for fastening fabric to top rails, brace rails and bottom tension wire. No. 10 gauge galvanized wire clips may be used on tension wire.

k. Tension Wire:

Tension wire for installation at bottom of fabric shall be no. 6 gauge steel wire.

l. Windscreen Fabric:

Windscreen fabric shall be closed -mesh style polypropylene screen with 4 ply hems and all accessories to install on chainlink fence. Fabric shall be constructed of 100% Leno construction, U.V. stabilized polypropylene, heat set, with a density of 93% 5.8 oz. per square yard. tensile strength 300 x 100 green in color. Hems shall be reinforced 2-ply double stitched with U.V. stabilized polypropylene thread with 2.75 inch black tape edge provides 4-ply hem. Horizontal and vertical tape to have #2 brass grommets 12" on center. Panels exceeding 7" in height shall have a horizontal flap centered in the fabric with #2 brass grommets on 24" centers. All grommets should be affixed to chainlink fence with 11 ga. hog rings or greater. Installation shall be for high wind load area with hog rings on the bottom grommets and 50 pound break strength, black U.V. stabilized tie wraps to be used on top, center line and side grommets of panels. Windscreen and accessories by by California Industrial Fabrics (619)661-7166 or equal.

m. Fence Cap:

All 42" high fence & minor league home run fence shall be furnished with a PVC fence cap. Weather treated, UV protected 4.5" dia. Color to be determined. Contractor to submit 12" sample for approval prior to purchasing and installation. Install per manufacturers specification. Available manufacturer: Tomark Sports, 800-959-1844. or approved equal.

PART 3 – EXECUTION

a. All fabric shall be installed on the "playing" side of fencing.

b. Fasten fabric to line posts with 9 gauge wire ties spaced no more than 16 inches apart.

c. Posts, rails, and fittings shall be painted to match vinyl covered fabric wherever vinyl coated fencing is specified. Paint with 2 coats of flat enamel paint and primer in accordance with Section 09900 Painting.

<u>All chainlink fencing installed in turf areas shall have a continuous 9" wide x 6" deep concrete mowstrip centered on the fence posts.</u>

END OF SECTION - 02830

SECTION 02833
SAFETY NETTING

PART 1 – GENERAL

1.1 The provisions of the Standard Specifications for Public Works Construction (SSPWC) apply except as modified herein.

a. Work Included:

Furnish and install steel poles, cables, wire and netting and all necessary attachments and connections, as shown on the drawings and specified herein these specifications.

1.2 Scope of Work

a. Furnish all labor, materials, tools and equipment necessary to install, in place all netting poles as indicated on the plans and as specified herein. The installation of all new materials shall be performed in strict accordance with the manufacturer's written installation instructions and in accordance with all approved shop drawings.

1.3 Shop Drawings

a. Shop drawings shall be prepared for all necessary components of the netting system containing all pertinent information regarding the installation. These drawings shall be submitted to the Owner for approval prior to the manufacturing, fabrication and shipment of materials.

b. Submit drawings for:

1. Installation details for attachments and connections of all netting components.
2. Submit samples of rope and wires
3. Submit an 12" x 12" sample of each netting used for project for approval.
4. Submit a 3" x 3" sample of the pole paint and paint process
5. A letter and specification sheet certifying that the products of this section meet or exceed all specified requirements.

1.4 Quality Assurance

a. Performance shall be in accordance with the highest standard prevailing in the barrier netting industry. The netting system installation must be performed by a professional netting installation contractor with a minimum of five years, current to this date, proven experience constructing sport netting systems of the size, scope and nature of the work in this specification.

b. The Netting installation Contractor shall provide Certificates of Insurance with minimum limits of $1,000,000 per occurrence and $5,000,000 total aggregate, including any excess or umbrella coverage, for general liability, completed products and automobile. The insurance company must have minimum A+ rating. The steel pole fabricator shall provide Certificates of Insurance for Product Liability with minimum limits of $10,000,000.

1.5 Schedule

a. Contractor shall complete all work on the netting poles in accordance to the published project schedule.

1.6 Measurement

a. Contractor to verify all netting dimension, including lengths and heights.

PART 2 – MATERIALS

A. Netting Systems

1. 70' Steel Pole Netting System; pole spacing NTE engineering requirements, Homerun Safety Netting, including between fields and over gates

a. at Replica Walls Stadiums netting to begin 20'-25' above ground level depending on the stadium outfield wall height and shall overlap top elevation of wall by minimum of two feet

b. at Minor League Stadiums netting to begin 8'-10' above ground level depending on the outfield wall height and shall overlap top elevation of wall by minimum of two feet

2. Netting Barriers for foul lines adjacent to Plaza Area.

a. 20' above ground level Steel Pole Netting System; pole spacing NTE engineering documents.

3. Backstop Hood/Canopy Netting

a. Six each backstop Netting "Hoods / Canopies" over backstop field area to extend from backstop over home plate. 2 each per field x 27' above ground level Steel Poles for 1st and 3rd base corner poles; 2 each per field x 25' above ground level Steel Poles for backstop corners.

4. Batting Cage Netting System

a. Provide and install Steel Mono-Pole, all netting support cables from center steel mono-pole to perimeter, canopy netting over entire enclosure, heavy vertical netting around inside perimeter and in front of machine enclosure, and 4 each safety divider nets on outside stalls; Inclusion and installation of monopole, all related hardware, collar, wire, and winch system, excluding chain link fencing. Refer to drawings for specific details.

5. Soccer Pavilion Netting System

a. Provision and Installation of overhead hardware, wire, netting, and attachments; Custom openings in overhead netting for access to lights; Provision and Installation of vertical netting from top canopy perimeter to dasher panels around entire perimeter creating a "ball tight" enclosure.

B. Netting and Rope

1. Vertical Barrier Netting:

a. #36 x 1-3/4" (3-1/2" Stretch Mesh) Baseball Barrier Netting 100% DuPont Type 66-728 Knotted Nylon; 381 lb per strand break strength; Dyed Black, Stabilized, and bonded for UV and weather resistance; Netting hung on diamond and manufactured in one "sheet" allowing no escapement with rope borders hand sewn to netting around entire

perimeter, vertical riblines @ all poles, and horizontal wind line(s) NTE 25' O.C.; Custom manufactured to as built dimensions and tailored for tight fit on framing wires.

2 Batting Cage Netting:

a. Canopy and stall Tops:
#36 x 1-3/4" (3-1/2" Stretch Mesh) Baseball Barrier Netting 100% DuPont Type 66-728 Knotted Nylon; 381 lb per strand break strength; Dyed Black, Stabilized, and bonded for UV and weather resistance; Rope borders hand sewn to netting around entire perimeter; Custom manufactured to as built dimensions and tailored for tight fit on framing wires.

b. Vertical Side Netting, Stall Dividers, & Pitching Machine Enclosure Screen:
#72 x 1-3/4" (3-1/2" Stretch Mesh) Baseball Barrier Netting 100% DuPont Type 66-728 Knotted Nylon; 740 lb per strand break strength; Dyed Black, Stabilized, and bonded for UV and weather resistance; Rope borders hand sewn to netting around entire perimeter; Custom manufactured to as built dimensions and tailored for tight fit on framing wires.

3. Backstop Hoods/Canopy and Soccer Pavilion:

a. #15 x 1-3/4" (3-1/2" Stretch Mesh) Barrier Netting 100% DuPont Type 66-728 Knotted Nylon; 141 lb per strand break strength; Dyed Black, Stabilized, and bonded for UV and weather resistance; Rope borders hand sewn to netting around entire perimeter and all support wires; Custom manufactured and tailored for tight fit on framing wires.

4. Rope/Twine

a. Rope:
Black 5/16" Twisted Nylon Rope for netting borders / perimeters, horizontal wind lines, & vertical rib lines at each pole; 3,600 lb break strength; All rope locations on the net panels shall correspond to the as built net panel suspension and support cables constructed to pole structures; Tying on all netting on batting cage canopy and vertical perimeter netting.

b. Twine:
#42 Twisted Nylon Twine 100% DuPont Type 66-728 Nylon; Dyed Black, stabilized, and bonded for UV and weather resistance; minimum 470 lb break strength; The attachment twine shall continually encompass the netting component and be tied to the rope component via a clove and one half hitch knot +/- 6 inches on center, never to exceed 8 inches on center.

C. Attachment and Wire

1. Netting Attachment – Vertical Barriers, Backstops and Soccer Pavilion:

a. Finished net panels shall be suspended to all support cables by the rope component via a 5/16" Electro-Galvanized Steel Carabineer with minimum 1,140 lb break strength on 70' AGL Netting Systems and 1/4"

Electro-Galvanized Steel Carabineer with minimum 560 lb break strength on all other Netting Systems; The interior of the snap shall encompass the netting / rope and cable components when suspension is completed; The interval between snap to cable attachment points shall not exceed 30" O.C. along all perimeter, horizontal, and vertical rib line ropes.

2. Batting Cage Netting Attachment

   a. Canopy and vertical perimeter netting shall be attached with 5/16" Twisted Nylon Rope with minimum 3,600 lb break strength; the rope shall continually encompass the netting / rope component and be tied to the top rail of chain link fencing on canopy netting and bottom stand-off rails on vertical netting via a clove and one half hitch knot +/- 5 feet on center; Center at collar shall be attached 5/16" Electro-Galvanized Carabineers. Stall tops, pitching machine enclosure and end safety divide netting shall be attached with #72 Braided Nylon Twine; twine shall continually encompass the netting / rope component and be tied to rails of chain link fencing via a clove and one half hitch knot +/-16 inches on center.

3. Framing/Support wire and down guys – Vertical Netting Systems

   a. 5/16" EHS (Extra High Strength) Guy Strand 1x7 wire with minimum 11,200 lb break strength on 70' AGL System; 1/4" EHS (Extra High Strength) Guy Strand 1x7 wire on with minimum 6,650 lb break strength on all other systems; Pre-Formed Grips, Utility Standard, used to form all eyes on framing wires; Strand-Vise / Automatic Guy Dead End for termination of Down Guys to Anchors.

4. Batting Cage and Soccer Pavilion Wire

   a. Shall be 3/16" High Strength Aircraft Cable; Eyes formed with ferrules.

D. Pole line hardware

1. All pole line hardware to be galvanized, meet ANSI Standards and be RUS Listed; Manufactured by Chance / Hubble or approved equal; Sized Typ. 5/8" Bolts and Fittings; All fittings not to exceed 25' O.C. each pole; 10" Helix x 72" Earth anchors installed end of each run and turns exceeding 20 degrees for down guys; May guy into base of adjacent pole if there is no access or space for earth anchor with engineer approval.

2. End / Termination and Corner Poles:

   a. 5/8" DAFTB (Double Arming Full Thread Bolt) NTE 25' O.C. with 5/8" thimble eye nut; Top & Bottom with Angle Thimble Eye behind standard thimble eye fitting for attachment of vertical wires; Angle Thimble Eyes on outside of pole tops & center (on 70' system) for running down guys to earth anchor; 5/8" square curved and spring locking washers typical each side of fitting / bolt.

3. Mid Span Poles:

   a. 5/8" DAFTB (Double Arming Full Thread Bolt) NTE 25' O.C. with 3-Bolt Suspension clamps top, center (on 70' system), and bottom; vertical support roller behind 3-bolt clamp on top and bottom for attachment of vertical wires; 5/8" 1-Bolt Clamp at center fitting, NTE 25' O.C., behind 3-

bolt clamp (on 70' system) for securing vertical wire; 5/8" square curved and spring locking washers typical each side of fitting / bolt.

b. All cable attachment points using thimble eye type hardware to minimize pinching and / or kinking of cable; All bolts are through bolt and rated; Pre-Formed Grips used to form all eyes

.E. Steel Pole

1. Structurally engineered steel poles and foundations to exceed wind load, exposure class, and soil conditions for project site location. All structural welding and steel fabrication to be performed by an approved certified fabricator of the City of Los Angeles or a reciprocating authority. All poles finished with black STRYK© 5388 FACS Flexible Anti-Corrosion System applied in three coats as provided by Coastal Netting Systems or equal.

2. 70' AGL Home Run Safety Netting Systems:

   a. 70' above ground level Steel Pole: 16" O.D. x 25' H base section with 12.75" O.D x 45' Top Section – 2 Section Pole; Non Extendable; Pole spacing shall be so that it fits with the shape of the outfield walls with spacing NTE engineering requirements.

3. 20' AGL Foul Line / Plaza Safety Netting Systems:

   a. 20' AGL x 10.75" O.D. Steel Pole – 1 Section Pole; Non Extendable; Pole spacing NTE engineering requirements.

4. Backstop Poles for field hoods / canopies:

   a. 27' AGL x 12.75" O.D. Steel Pole for 1st and 3rd base corners – 1 Section Pole; Non Extendable.

   b. 25' AGL x 12.75" O.D. Steel Pole for backstop corners– 1 Section Pole; Non Extendable.

5. Batting Cage Mono-Pole:

   a. 45' AGL Steel Pole - 16" O.D. x 5' H base section with 10.75" O.D x 40' Top Section – 2 Section Pole; Non Extendable.

PART 3 – EXECUTION

A. Install all poles, vertical and plumb. Netting and cable shall be as indicated on drawings.

END OF SECTION 02833

SECTION 02870
SITE FURNISHINGS

PART 1 – GENERAL

1.1 Scope of Work:

Furnishing and installing benches with backs.
Furnishing and installing drinking fountains.
Furnishing and installing bike racks.
Furnishing and installing litter receptacles.
Furnishing and installing picnic tables.
Furnishing and installing flagpoles.
Furnishing and installing team benches.
Furnishing and installing aluminum bleachers.
Furnishing and installing spectator stadium seating.
Furnishing and installing foul ball poles.
Furnishing and installing Indoor Soccer Arena System.
Furnishing and installing Indoor Soccer Surfacing.
Furnishing and installing Indoor Soccer Scorers Box.
Furnishing and installing Indoor Soccer Players Bench.
Furnishing and installing Soccer Scoreboard.
Furnishing and installing Pitching Machines.
Furnishing and installing Batting Cage Netting.
Furnishing and installing Baseball Field Equipment.
Furnishing and installing Round Plaza Picnic Tables.

1.2 Work not included:

a. Play equipment.

b. Play Ground Rubberized Surfacing

PART 2 – PRODUCTS

a. Bench with Back:

As indicated on plans. Install per manuf. Specs. Final locations to be approved.

b. Drinking Fountain:

As indicated on plans. Install per manuf. Specs. Final locations to be approved.
Install pressure regulator on all water lines to drinking fountains where pressure exceeds 60 psi, set regulator at 50 psi. Refer to drawings.

c. Bike Racks:

Universal Bike Rack, Black in color. Patterson Williams Model # 1602-09 or approved equal. Available through Dave Bang Associates Inc. Refer to drawings.

d. Litter Receptacles:

Shall be Du Mor Receptacle 107-32, color: Powder Coat Black, with black 32-gallon rigid liner included. Install per manuf. Specs. Final locations to be approved. Contractor to provide 32 trash cans and place on site at direction of owner's representative.

e. Picnic Tables:

As indicated on plans. Install per manuf. Specs. Final locations to be approved.

f. Flagpoles:

As indicated on plans. Install per manuf. Specs.

g. Team Benches:

Six Foot Long Recycled Plastic Bench Du Mor Model 11-80 S-1 with powder coated black frame and Cedar colored recycled plastic or approved equal.(36 total). Adjust length and frames as necessary to accommodate dugout team bench and dugout roof supports. Add additional shelf as indicated on the drawings. Available through the Wakefield Company. (949) 552-1130.

h. Aluminum Bleachers for Indoor Soccer facility and Multi-Purpose Arena:

Five (5) row by 26' wide aluminum bleacher systems, with ADA seating & powder coating seat option, manufactured by Dant-Clayton Corporation. Phone Number (502) 214-8709 or approved equal. Colors: T.B.D.

i. Spectator Stadium Seating:

Ductile iron standards and hinges QT4—9class 57 ductile iron alloy Model number 4552-12LR low riser installation. Seat width shall be 19"- 22" – depending on approved manuf. Color will be as determined by the Agency Representative. Total number of seats for each stadium will be a minimum of 172 seats with arms and 10 armless companion seats. Contractor shall provide and install three (3) full rows of seats in the two - (2) side sections and four (4) full rows in the center section of each stadium. Contractor shall provide and install armless companion seats for wheelchair patron guests as indicated in the drawings. Model number 4552 armless as supplied by Track Seating, or approved equal.

j. Foul Ball Poles:

Foul ball poles shall be Patterson Williams Model 1274-30 or equal, Available through Dave Bang Associates, Inc. Location shall be survey controlled and approved by the Agency Representative before installation of footing. Refer to drawings for locations.

k. Indoor Soccer Arena System:

The indoor soccer arena dasher board system shall be model system is manufactured by Sport Systems Unlimited available through Sport Systems Unlimited (877)778-5911 or approved equal. Two (2) retractable soccer goal systems are to be included. Refer to drawings. Area were spectator seating shall be clear acyrillic panels for ADA spectator viewing.

l. Indoor Soccer Surfacing:

The indoor soccer surfacing material shall be an artificial turf product, manufactured by Sportexe or approved equal. Turf shall have permanent inlaid soccer markings. Refer to drawings.

m. Indoor Soccer Scorers Box:

Scorer's Box, manufactured by Sport Systems Unlimited. Available through Sport Systems Unlimited (877)778-5911or approved equal. Refer to drawings.

n. Indoor Soccer Players Bench:
15' long Player's Bench manufactured by Dant-Clayton. Available: Dant-Clayton Corporation. Phone Number (502) 214-8709 or approved equal. Colors: T.B.D. Provide (1) bench per team, per soccer arena.

o. Indoor Soccer Scoreboard:
Soccer Scoreboard, Model# HK-1600-4, manufactured by Fair-play Scoreboards or approved equal. Refer to drawings. Provide (2) two per soccer arena.

p. Pitching Machine:
The pitching machine shall be a Master Pitching Machine available through Master Pitching Machine Inc. Refer to drawings. NO SUBSTITUTIONS WILL BE ACCEPTED.

q. Batting Cage Netting:

K3C1- ½ by Net Services (888)365-6387 or approved equal. Refer to drawings.

r. Baseball Field Equipment:

Pitching Rubber - Four-Way Pitching Rubber 6" x 24" with aluminum interior tube 27 pounds Hollywood Model # BBPB or approved equal. Refer to drawings.

Removable Pitching Rubber – Enduro Pro Removable Rubber Official 6"x24". Model # TB-K10378 or approved equal. Refer to drawings.

Homeplate - Bolco Model # 310-SHP or approved equal. Stanchion mounted professional homeplate with standard ground anchor and anchor plug included.
Refer to drawings.

Bases – Bolco Model # 175-MLB with three bases/anchors and plugs or equal (800) 959-1844.

Double First Base – Bolco. Model #110-DBL or equal (800) 959-1844.

Bat Rack - Shall be Model 11814 manufactured by Tomark Sports Supply or approved equal. Refer to drawings.

s. Round Plaza Picnic Table:

Total of 20 tables & umbrellas. Install per manuf. Specs. Final locations to be approved.

PART 3 – INSTALLATION

1.1 General:

a. Installation shall be in the locations shown on the drawings after approval of precise location by the Agency Representative. Install according to manufacturer's written instructions or according to approved shop drawings. Install all metal supports and post in footings prior to installing any concrete slabs.

b. Any item not imbedded shall be surface mounted to a concrete slab using minimum 3/8" x 3" long lag screws in expansion shields.

c. Wood Products: All non-pressure treated wood products listed under the section are to be sealed with a clear penetrating sealant to help prevent moisture damage to the wood product. Phenoseal liquid waterproofing or similar approved shall be used. Apply per manufacturer's specifications.

d. Concrete Footings: All site furnishings which are embedded in the ground shall have a 12" x 18" minimum concrete footing. Refer to the construction drawings / details for footing size, depth, steel rebar schedule and specific concrete requirements. If the manufacturer has a specified method of installation, it shall take precedence over the minimum footing size indicated in this specification section.

e. Sport Systems Unlimited Indoor Soccer dasherboard System: The dasherboard system shall be installed by manufacturer certified installers with at least four (4) similar installations experience.

f. Artificial Turf Product for the Indoor Soccer Arena: The indoor soccer dasherboard system and striping shall be installed and/or supervised by an authorized factory-trained dealer or manufacturer representative. The successful bidder must submit a list of completed projects of similar magnitude and complexity over a two (2) year period for Agency Representative=s review and approval as a qualified subcontractor.

g. Baseball Field Bleacher System: Install the bleacher seating as recommended by the manufacturer for low riser installation.

END OF SECTION - 02870

SECTION 02875
SHADE FABRIC STRUCTURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

1.2 SUMMARY

A. The shade structure contractor shall be responsible for the design, engineering, fabrication, supply and installation of the work specified herein. The intent of this specification is to have only one contractor be responsible for the above functions.

1.3 SUBMITTALS

1.3.1 Award of Contract Submittals:

A. Provide wet sealed structural engineering drawings and calculations.

B. Provide fabric samples and powder coat colors for final order selection.

1.4 QUALITY ASSURANCE

A. Manufacturer shall have at least 12 years experience in the design, engineering, manufacture, and installation of structures, engineered to California Building Code requirements with similar scope and a successful construction record of in-service performance.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for shade structures shown on the Drawings in relation to the property survey and existing structures, and verify locations by field measurements prior to construction.

1.6 WARRANTY

1. The successful bidder shall provide a 12 month warranty on all labor and materials.

2. A supplemental warranty from the manufacturer shall be provided for a period of 10 years (pro rated) on fabric and 10 years on the structural integrity of the steel from date of substantial completion.

3. The warranty shall not deprive the Owner of other rights the Owner may have under the provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 – PRODUCTS

2.1 GENERAL

A. Pre-Engineered Package: The proposed structure(s) manufactured by USA SHADE & FABRIC STRUCTURES, Inc., or approved equal shall be modular and pre-fabricated, and include the structural steel frame, fabric roof, steel cables, all fasteners, and installation of structure(s) including foundations.

B. Contact USA SHADE & FABRIC STRUCTURES, Inc., 350 Kalmus Drive, Costa Mesa CA 92626, Phone:(714) 427-6981, Fax: (714) 427-6982; Attn: Patti Abrecht

C. The shade structure shall conform to the current adopted version of the California Building Code 2007 including local agency amendments and additions to the code.

D. All shade structures are engineered and designed to meet a 80 mph wind load, Exposure C and seismic (earthquake) load based on Zone 4

E. Steel:

1. All steel members of the shade structure shall be designed in strict accordance with the requirements of the "American Institute of Steel Construction" (AISC) Specifications and the "American Iron and Steel Institute" (AISI) Specifications for Cold Formed Members.

2. All connections shall have a maximum internal sleeving tolerance of .0625 inches using high tensile strength steel sections with a minimum sleeve length of 6 inches.

3. All non-hollow structural steel members shall comply to ASTM A-36. All hollow structural steel members shall be cold formed, high strength steel and comply with ASTM A-500, Grade C. All steel plates shall comply to ASTM A-572, Grade 50. All galvanized steel tubing shall be triple coated for rust protection using an in-line electro-plating coat process. All galvanized steel tubing shall be internally coated with zinc and organic coatings to prevent corrosion.

F. Bolts:

1. All structural field connections of the shade structure shall be designed and made with high strength bolted connections using ASTM A-354, Grade B or SAE J249, Grade 8.

2. All stainless steel bolts shall comply with ASTM F-593, Alloy Group 1 or 2. All bolt fittings shall include rubber washer for water tight seal at joints. All nuts shall comply with ASTM F-594, Alloy Group 1 or 2.

G. Welding:

1. All shop welded connections of the shade structure shall be designed and performed in strict accordance with the requirements of the "American Welding Society" (AWS) Specifications. Structural welds shall be made in compliance with the requirements of the "Prequalified" welded joints where applicable and by certified welders. No onsite or field welding shall be permitted.

2. All full penetration welds shall be continuously inspected by an independent inspection agency and shall be tested to the requirement of 2007 CBC.

H. Powder coating:

1. Galvanized steel tubing preparation prior to powder coating shall be executed in accordance to solvent cleaning SSPC-SP1. Solvent such as water, mineral spirits, xylol, toluol, which are to be used to remove foreign matter from the surface. A mechanical method prior to solvent cleaning prior to surface preparation shall be executed according to Power Tool Cleaning SSPC-SP3 and utilizing wire brushes abrasive wheels and needle gun, etc.

2. Carbon structural steel tubing preparation prior to powder coating shall be executed in accordance to commercial blast cleaning SSPC-SP6 or NACE #3. A commercial blast cleaned surface, when viewed with out magnification, shall be free of all visible oil, grease, dirt, mill scale, rust, coating, oxides, corrosion, products and other foreign material.

3. Powder coating shall be sufficiently applied, with a minimum 3 mils thickness, and cured at the recommended temperature to provide proper adhesion and stability to meet salt spray and adhesion tests as defined by the American Society of Testing Materials.

4. Powder used in the powder coat process shall have the following characteristics:
   a. Specific Gravity: 1.68 +/- 0.05.
   b. Theoretical coverage: 114 +/- 4ft^2/lb/mil
   c. Mass loss during cure: <1%
   d. Maximum storage temperature: 75°F

I. Tension Cable: Steel cable is determined based on calculated engineering load.

1. For light and medium loads; ¼" (nominal) galvanized 7x19 strand cable to be used.

2. For heavy loads; 3/8" (nominal) galvanized 7 x 19 cable to be used.

K. Fabric Roof Systems:

1. UV Shade Fabric:
   a. UV Shade fabric is made of a UV stabilized high-density polyethylene. Mesh shall be rachel knitted with monofilament and tape yarn filler to ensure that material will not unravel if cut. Panels to be 10ft wide.
   b. Fabric shall meet the following fire resistance tests:
      1) ASTM E84
      2) NFPA 701-97 (Weathered or unweathered)
      3) CA Fire Marshall Rating (Reg. # FA-52001)

2. Stitching & Thread:
   a. All sewing threads are to be double stitched.
   b. Thread shall be GORE Tenara Sewing Thread manufactured form 100% expanded PTFE; mildew resistant exterior approved thread. Thread shall meet or exceed the following:
      1) Flexible temperature range
      2) Very low shrinkage factor
      3) Extremely high strength, durable in outdoor climates
      4) Resists flex and abrasion of fabric
      5) Unaffected by cleaning agents; acid rain, mildew, salt water and rot resistant, unaffected by most industrial pollutants.

6) Treated for prolonged exposure to the sun.

3. Shade and UV Factors:
   a. Shade protection and UV screen protection factors shall be as follows:

Color	UV Block %	Shade %
Pacific Blue	84%	82%
Rain Forest Green	83%	81%
Red	84%	85.5%
Brown	88%	88.5%
Silver	85%	81%
Desert Sand	86%	84.5%
Terracotta	85%	81%
Yellow	86%	84%

PART 3 – EXECUTION

3.1 INSTALLATION

A. Installations of shade structures shall be performed by a State of CA licensed and bonded contractor with certified Rope Access Technicians on staff with experience in tension fabric structures .

B. The contractor installing the structure shall comply with manufactures instructions for assembly, installation, and erection per approved drawings.

C. Concrete:

1. Concrete work shall be executed in accordance with the latest edition of American Concrete Building Code ACI 318.

2. Concrete specifications shall comply in accordance with the section 03300, and detailed as per plans, shall be as follows:
   a. 28 Days Strength F'c = 3000 psi
   b. Aggregate: HR
   c. Slump: 3 – 5
   d. Portland Cement shall conform to C-150
   e. Aggregate shall conform to ASTM C-33

3. All reinforcement shall conform to ASTM A-615 grade 60.

4. Reinforcing steel shall be detailed, fabricated, and placed in accordance with the latest ACI Detailing Manual and Manual of Standard Practice.

5. Whenever daily ambient temperatures are below 80 degrees Fahrenheit, the contractor may have mix accelerators and hot water added at the batch plant (See Table 1).

6. The contractor shall not pour any concrete when daily ambient temperature is below 55 degrees Fahrenheit.

TABLE 1

Temperature Range	% Accelerator	Type Accelerator
75-80 degrees	1%	High Early (non calcium)

70-75 degrees	2%	High Early (non calcium)
Below 70 degrees	3%	High Early (non calcium)

C. Foundations:

1. All Anchor Bolts set in new concrete shall be ASTM A-325.
2. All Anchor Bolts shall be Hot Dipped Galvanized.
3. Footings shall be placed in accordance with and conform to manufactures engineered specifications and drawings.

END OF SECTION 02875

SECTION 02880
PLAYGROUND EQUIPMENT

PART 1 GENERAL

1.1 SCOPE

A. Provide and install all playground equipment as identified in these specifications or identified on the drawings.

B. Contractor is to furnish and install new play equipment as shown on plans.

1.2 RELATED SECTIONS

A. Section 03300 – Cast-In-Place Concrete

B. Section 02880 – Playground Safety Surfacing

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 135 (1989a; R 1993) Electric-Resistance-Welded Steel Pipe

ASTM A 153 (1982; R 1987) Zinc Coatings (Hot-Dip) on Iron and Steel Hardware

ASTM A 385 (1980; R 1991) High-Quality Zinc Coatings (Hot-Dip)

ASTM A 500 (1990a; R 1993) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

ASTM A 513 (1991a; R 1992) Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing

ASTM B 117 (1990) Salt Spray Resistance Test

ASTM B 221 (1992a; R 1993) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes

ASTM D 822 (1989) Conducting Tests on Paint and Related Coatings and Materials Using Filtered Open-Flame Carbon Arc Light and Water Exposure Apparatus
ASTM D 1248 (1984; R 1989) Polyethylene Plastics Molding and Extrusion Materials

ASTM D 1734 (1993) Flexibility Mandrel Test

ASTM D 2454 (1991) Overbake Hardness Test

ASTM D 2794 (1992; R 1993) Resistance of Organic Coatings to the Efforts of Rapid Deformation (Impact)

ASTM D 3359 (1992a; R 1993) Measuring Adhesion by Tape Test

ASTM D 3363 (1992a) Pencil Hardness Test

ASTM F 1292 (1993) Impact Attenuation of Surface Systems Under and Around Playground Equipment

ASTM F 1487 (1993) Playground Equipment for Public Use

FEDERAL STANDARDS

FED-STD-795 (4/1/88) Uniform Federal Accessibility Standards (UFAS)

FEDERAL SPECIFICATIONS

FS L-P-390 (1987) Plastic Molding Material FEP Fluorocarbon, Molding and Extrusion (Low, Medium and High) Density

FS QQA-200/8F (11/8/83) Aluminum Alloy 6061, Bar, Rod, Shapes, Tubes, and Wire Extruded

CODE OF FEDERAL REGULATIONS

CFR 28 Part 36 (1991) Nondiscrimination on the Basis of Disability by Public Accommodations and in Commercial Facilities, Final Rule

36 CFR Part 1191 (2000) Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Play Areas, Final Rule

UNITED STATES CONSUMER PRODUCT SAFETY COMMISSION (CPSC)

CPSC (1997) Handbook for Public Playground Safety, Publication No. 325, U.S. Consumer Product Safety Commission, Washington, D.C. 20207, 301-504-0494

CALIFORNIA CODE OF REGULATIONS

Title 22. Social Security; Division 4. Environmental Health; Chapter 22. Safety Regulations for Playgrounds (2000)

Public Resources Code, Part B, Public Playground Equipment, Sections 5410 and 5411

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

9001 Quality Standards certifying manufacturers processes

14001 Standards for Environmental Protection and Natural Resource Preservation

1.4 PERFORMANCE REQUIREMENTS

A. Safety

1 Playground equipment and installation shall meet the safety requirements of CPSC and ASTM F 1487.

B. Accessibility

1 Playground equipment intended for access by children with disabilities shall meet the requirements of 36 CFR Part 1191 (2000) Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities, Play Areas, Final Rule; California Code of Regulations, Title 22. Social Security; Division 4. Environmental Health; Chapter

22. Safety Regulations for Playgrounds (2000), which are based on the 1997 CPSC guidelines and ASTM F 1487-98; and California Public Resources Code, Part B, Public Playground Equipment Sec. 5410 and 5411. Wherever a conflict arises between specific provisions of the above regulations, the option that provides greater accessibility shall apply.

C. Definitions:

1 Elevated Play Component: An elevated play component is a play component that is approached above or below grade and is part of a composite play structure. Play components that are attached to a composite play structure and that can be approached from a platform or deck area shall be considered elevated play components.

2 Ground-Level Play Component: Ground level play components are items that can be approached and exited at ground level.

3 Type of Play Component: Different types of play components shall be based on the general experience provided by the play component including (but not limited to) experiences such as rocking, swinging, climbing, spinning, and sliding.

4 Elevated Accessible Route: An elevated accessible route is defined as the path used for connecting elevated play components.

D. Requirements for Number and Variety of Play Components:

1 Ground-Level Play Components: At least one of each type of ground-level play component that is present in the play area shall be on an accessible route. The number and variety of ground-level play components required to be on an accessible route shall be determined by the number of elevated play components provided in accordance with Table 15.6.2.2 of 36 CFR Part 1191 (2000).

2 Elevated Play Components: At least 50 percent of the elevated play components shall be on an accessible route.

E. Requirements for Elevated Accessible Routes:

1 The elevated accessible route shall connect the entry and exit points of at least 50 percent of the elevated play components provided in the play area.

2 Elevated accessible routes shall have a minimum 36" clear width (narrowing to a minimum of 32" for a 24" length), a 12" rise maximum per ramp run, and handrails with a top gripping surface (0.95" to 1.55" diameter or width) between 20" and 28" above the ramp surface.

3 Ramps and transfer systems may be used for providing access to elevated play components. Ramps shall be provided on composite structures with 20 or more elevated play components and they shall connect to at least 25% of the elevated play components.

4 Landings at the top and bottom of each run are required and shall be as wide as the ramp they connect to and at least 60" long.

5 Handrails shall comply with ADAAG 4.8.5 except that they shall have no extensions.

F. Requirements for Transfer Systems:

1 Transfer platforms shall be between 11" and 18" high, minimum 24" wide, and minimum 14" deep.

2 Clear ground space at least 48" by 30" shall be provided, with the 48" long side parallel to the 24" side of the transfer platform.

3 Transfer steps shall be a minimum 24" wide by 14" deep. Steps shall be maximum 8" high. Steps on site-built and custom units shall be 6" for preschool-age play components.

a. Transfer supports shall be provided on transfer platforms and transfer steps at each level where transferring is the intended method of access.

G. Clear Floor or Ground Space:

1 Clear ground space at least 48" by 30" shall be provided at ground-level play components and elevated play components accessible by ramp.
2 Clear ground spaces may overlap accessible routes and maneuvering spaces.

3 Clear ground spaces shall have slopes not steeper than 1:48 in all directions.

H. Maneuvering Space:

1 Maneuvering spaces shall comply with ADAAG section 4.8.

2 Maneuvering spaces at least 60" diameter or 60" T-shaped shall be provided at ground-level play components and elevated play components accessible by ramp.

3 Maneuvering spaces shall be provided adjacent to swings.

4 At least one maneuvering space shall be provided on the same level as elevated play components accessible by ramp.

5 Maneuvering spaces shall have slopes not steeper than 1:48 in all directions.

I. Entry Points and Seats:

1 Entry points and seats shall be between 11" and 24" high, with a recommended height of 18".

J. Play Tables:

1 The wheelchair knee clearance for play tables shall be minimum 24" high, minimum 30" wide, and minimum 17" deep.

2 Play tables designed for preschool-age children may provide a parallel approach instead of knee clearance if the rim is maximum 31".

K. Reach Ranges for Manipulative Features

1. Manipulative features on ground-level play components or elevated play components accessible by ramp shall be located as follows:
Preschool-age equipment- 20" to 36" above adjacent accessible surface
School-age equipment- 18" to 40" above adjacent accessible surface.

2. Manipulative features on elevated play components accessible only by transfer systems shall be located as follows:
Preschool-age equipment as above, less 15"
School-age equipment as above, less 18"

L. Test Report:

1. Submit two bound copies of product manufacturer's test report indicating compliance with the latest U.S. Consumer Product Safety Commission's Technical Guidelines for Public Playground Safety with regard to thickness of product beneath various equipment height ranges. Test reports shall be by a certified laboratory, to ASTM- F-1292-91 specifications using the f355-Procedure C Test Method.

1.5 SUBMITTALS

A. Submit two bound copies of play equipment product data, catalog cuts, photo brochures, specifications, and installation procedures, (including diagrams, instructions, scale models) or other printed information in sufficient detail and scope to verify compliance with requirements of the contract documents.

B. Submit drawings showing scaled shop details of playground equipment, including equipment layout, platform heights, protective barriers, play events and use zones, in relationship to the playground design. If playground equipment other than what is shown on the drawings is proposed, shop drawings shall be provided to illustrate how the playground design and layout is modified to accommodate equipment installation and use zones.

C. Submit a listing of at least five installations where the brand of play equipment with similar units to those proposed has been installed and has been in successful service for at least five years. This list shall include owner or purchaser; address of installation; service or maintenance organization; date of installation; and contact person and phone number.

D. Submit two copies of the statement by the material supplier or equipment manufacturer asserting that the supplied material or equipment meets and is installed according to the specified requirements.

E. A Certificate of Insurance, shall be provided by the manufacturer, covering both product and general liability, of not less than $1,000,000. The issuing underwriter shall be AA rated.

F. Submit two copies of color charts displaying manufacturer's color selections and finishes, and identifying those colors and finishes proposed for use.

G. Submit two bound copies of procedures and instructions pertaining to frequency of preventive maintenance, inspection, adjustment, lubrication, and cleaning necessary to minimize corrective maintenance and repair for play equipment. A list of all parts and components for the system, by manufacturer's name, part number, and nomenclature, shall be attached.

H. Submit a copy of product manufacturer's test report indicating compliance with the latest U.S. Consumer Product Safety Commission's Technical Guidelines for Public Playground Safety with regard to thickness of product beneath various equipment height ranges. Test reports shall be by a certified laboratory, to ASTM- F-1292-91 specifications using the f355-Procedure C Test Method.

I. Contractor shall provide warranty against all defects in materials and workmanship for play equipment. Warranty shall include but not be limited to such defects as bubbling, peeling, loss of integrity, poor ultraviolet stability, lack of permeability, or general deterioration due to weather.

J. The installer of the play equipment must submit proof of liability insurance of at least $1,000,000 from a reputable insurance company covering defects in materials, workmanship, and installation. This liability shall cover any bodily harm resulting from a failure of play equipment due to installation defects.

K. The installer of the play equipment must submit proof that said installer is a certified installer of the play equipment manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Equipment shall be delivered and stored in accordance with the manufacturer's recommendations.

B. Contractor is responsible for loading, delivering and storing equipment as needed to ensure products are in perfect condition upon commencement of assembly.

C. The contractor is responsible to inspect each order and verify that all necessary hardware is available to complete the installation. If all pieces are not available, the contractor is responsible to inform the County's Construction Manager.

1.7 WARRANTY

A. Contractor shall furnish maximum warranty from play equipment manufacturer (equal or greater than warranty provided by equipment manufacturer listed under Products below) to guard against defects in materials and fabrication.

1.8 CERTIFICATION

A. Contractor shall furnish original-signed written certification that the play equipment has been installed in accordance with Manufacturer's requirements and complies with ASTM F-1487 and CPSC standards.

PART 2 PRODUCTS

2.1 Manufacturers: The play area equipment layout, as shown on the drawings, is based on the use of the manufacturers listed. This list is not meant to exclude other suppliers able to furnish equal products (see 3.3 Play Area Layout below).

A. Contractor shall receive approval of color selection (see 1.5 Submittals, Section F, and 2.2 below) for all equipment prior to placing the order for the equipment.

2.2 Playground Equipment

A. As listed in Materials List, sheet LM-1 and LM-2 in contract drawings.

PART 3 EXECUTION

3.1 PREPARATION

A. Prior to start of excavation, contractor shall lay out the entire outdoor play area and stake location of all elements, including playground equipment, use zones, pathways, planters, and hard surfaces, based on actual playground equipment supplied to be installed. Use zones shall not overlap hard surfaces and shall meet criteria of ASTM F 1292. County's Construction Manager reserves the right to adjust the equipment locations and other elements to meet field conditions and use zone safety requirements.

3.2 INSTALLATION

A. General: Playground equipment shall be installed according to the manufacturer's installation specifications and as shown on the drawings to meet the requirements of CPSC and ASTM F 1487.

B. All play equipment to be in-ground installation.

C. Playground Equipment Manufacturer's Services:
A manufacturer's representative who is experienced in the installation, adjustment, and operation of the playground equipment shall be on-site during installation. Manufacturer's certified installer shall be acceptable to meet this requirement. The representative shall supervise the installation and adjustment of the playground equipment to ensure that the equipment meets the requirements of CPSC and ASTM F 1487.

C. Measurement of Heights:
Play equipment installation height shall be measured from the finish elevation of the playground safety surface.

1. Maximum Accessible Height: For the purpose of meeting the impact attenuation requirements of the playground safety surface in accordance with ASTM F 1292 and Section 02880 PLAYGROUND SAFETY SURFACES, the maximum accessible height of playground equipment shall be as specified by the manufacturer.

3.3 PLAY AREA LAYOUT

The play area equipment layout, as shown on the drawings, is based on the use of above specified equipment. The use of other equipment suppliers with different configurations will require the Contractor to provide a revised play equipment layout and obtain approval of both the equipment and the play area layout. Contractor shall be responsible for all costs to revise the layout including review of the layout and documentation of the revised layout by County's consultant. The revised play equipment layout shall include appropriate safety use zone clearances for the equipment selected. The equipment shall be similar in material, size, and appearance, and shall provide a range of different activities and be appropriate for different physical and social levels within each play area, as intended by the selected equipment listed in the Schedule.

3.4 PLAY AREA SECURITY

The contractor shall provide means to keep the public from using any play equipment until safety surfaces have been properly installed, the area cleaned and cleared, and all installation reviewed by the County's Construction Manager. The area shall be secured until authorized by County's Construction Manager to be opened.

3.5 LEVEL OF SAFETY SURFACING

All play equipment shall be clearly marked to indicate the finished level of safety surfacing material to meet impact attenuating requirements. All metal posts shall be as marked by the manufacturer.

END OF SECTION - 02880