

## Roxbury Park Field Renovation and Irrigation Mainline Replacement Project

The project scope consists of in essence two projects – one being the renovation of the ballfield outfield/soccer field and the second being the replacement of the Irrigation Mainline valves and wires.

### **The ballfield renovation project includes:**

- Ripping and removal of the existing sod and soil in the designated areas as shown on the plan.
- Removal of all irrigation laterals and heads.
- Removal and replacement of a portion of the mainline and replacing with new mainline,wires and valves.
- Installation of the lateral lines and heads.
- Preparing soil with amendments and fertilizers.
- Fine grading the site.
- Installing a new QuikDrain system.
- Sodding and Hydroseeding turf areas.
- Establishing and Maintaining the turf areas.
- Providing Irrigation testing and adjustments during the turf establishment and maintenance period.

### **The irrigation renovation project includes:**

- Removal and replacement of the remaining sections of mainline valves and wires as noted on the plans – this must be done in sections or phases as agreed to by the contractor and the City as all portions of the site shall be properly irrigated during this process. Contractor shall also provide temporary construction fencing in all phased working areas.
- Installation of mainline, valves, wires, thrust blocks, quick couplers shall be done per the plans and specifications with minimal disturbance to plant materials as possible. All mainline routing and pipe and wire sleeving will be as per the plans and as recommended by the contractor and agreed to by the City.
- Providing Irrigation testing, adjusting and monitoring of all new systems.
- Providing all turn over items as indicated in the specifications.

**SECTION 02441 - IRRIGATION**

**PART I - GENERAL**

**1.01 SCOPE:**

The work required is indicated on the drawings and includes, but is not limited to, lawn irrigation systems, tie-in to existing automatic controller, remote control valves, wiring, main line, thrust blocks, quick coupler valves and sports turf irrigation installation and irrigation operations and maintenance.

**Note: It will be important to maintain all planting areas (shrub and turf areas – with exception of the new sportfield and surrounding turf project) during the replacement process on a continuing basis. Therefore the Irrigation mainline replacement will need to be done in a series of sections or phases as agreed to by the City of Beverly Hill Recreation and Parks Department. It will be the contractors’ responsibility while working on any particular section of mainline replacement that he provide an alternate watering source from adjoining/adjacent operational mainline systems of the park.**

**1.02 SUBMITTALS:**

**A. Materials List:**

1. Complete material list shall be submitted prior to performing any work. Catalog data and full descriptive literature must be submitted whenever the use of the items different than those specified is requested. Certificate must be submitted by plastic pipe and fitting manufacturer indicating that material complies with specifications, unless material has been previously approved.
2. Material list shall be submitted using the following format (double spaced between each item):

<u>Item</u>	<u>Description</u>	<u>Manufacturer</u>	<u>Model</u>
1.	Pressure Pipe	Lasco	Sch. 40
2.	Lawn Head	Rainbird	1804-SAM-PRS
Etc.	Etc.	Etc.	Etc.

**B. Record Drawings:**

1. Record accurately on one set of contract drawings all changes in the work constituting departures from the original contract drawings.
2. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the City. Prior to final inspection of work, submit record drawings to City for approval.
3. Dimensions from two permanent points of reference (buildings, monuments, sidewalks, curbs, pavement, etc.). Data to be shown on record drawing shall be recorded day to day as the project is being installed. All lettering on drawings shall be minimum 1/8 inch in size.
4. Show locations and depths of the following items:
  - a. Routing of sprinkler pressure lines (dimension maximum 100 feet along routing)
  - b. Gate valves.

- c. Sprinkler control valves.
  - d. Quick coupling valves.
  - e. Routing of control wires.
  - f. Related equipment (as may be directed).
5. Maintain record drawings on-site at all times. Upon completion of work, transfer all as-built information and dimensions to reproducible sepia prints.

1.03 INSPECTIONS:

A. Inspections Will Be Required For:

- 1. Pressure test of irrigation main line. (Each section as completed)
- 2. Coverage test.
- 3. Final inspection/start of maintenance. Final inspection shall be performed by the City in the presence of owner or his representative.
- 4. Final acceptance.

B. Inspection Requests:

Contractor shall notify the Parks Project Inspector in advance for requesting all inspections as follows:

Pressure supply line installation and testing - 36 hours (1 2 working days)  
 System layout - 36 hours (1 2 working days)  
 Coverage Tests - 36 hours (1 2 working days)  
 Final Inspection - 48 hours (2 working days)

When inspections have been conducted by other than the Park Projects Inspector, the Contractor shall show evidence of when and by whom these inspections were made.

No inspection will commence without "record" prints. In the event the Contractor calls for an inspection without up to date "record" prints, without completing previously noted corrections, or without preparing the system for inspection, the inspection will be canceled and the Contractor back charged for the direct costs of all City personnel time and consultant time lost.

C. Closing In Uninspected Work:

Do not allow or cause any of the work of this section to be covered up or enclosed until it has been inspected, tested, and approved by the City.

D. Coverage Test:

When the sprinkler system is completed, Contractor shall perform a coverage test in the presence of the City and the Landscape Architect to determine if the water coverage for planting areas is complete and adequate. This test shall be accomplished before any planting.

E. Hydrostatic Tests:

1. All pressure lines shall be tested under a hydrostatic pressure of 150 psi for a period of not less than two hours.
2. All hydrostatic tests shall be made in the presence of the City. No pressure line shall be backfilled until it has been inspected, tested, and approved in writing.
3. Contractor shall furnish necessary force pump and all other test equipment.

1.04 TURNOVER ITEMS:

A. Controller Charts:

1. Record drawings must be approved by City before charts are prepared.
2. Provide one controller chart for each automatic controller. Chart shall show the area covered by controller.
3. The chart is to be a reduced copy of the actual "record" drawing. In the event the controller sequence is not legible when the drawing is reduced, it shall be enlarged to a readable size.
4. Chart shall be a blackline print with a different color used to show the area of coverage for each station.
5. When completed and approved, the chart shall be hermetically sealed between two pieces of plastic, each piece being a minimum 20 mils in thickness.

1.05 GUARANTEE:

- A. General: The entire sprinkler system, including all work done under this contract, shall be guaranteed against all defects and fault of material and workmanship for a period of one (1) year following the filing of the Notice of Completion. All materials used shall carry a manufacturer's guarantee of one (1) year.

Should any problem with the irrigation system be discovered within the guarantee period, it shall be corrected by the Contractor at no additional expense to the City within ten (10) calendar days of receipt of written notice from the City. When the nature of the repairs as determined by the City constitute an emergency (e.g. broken pressure line) the City may proceed to make repairs at the Contractor's expense. Any and all damages to existing improvement resulting either from faulty materials or workmanship, or from the necessary repairs to correct same, shall be repaired to the satisfaction of the City by the Contractor, all at no additional cost to the City.

- B. Form of Guarantee: Guarantee shall be submitted on Contractors own letterhead as follows:

FORM OF:  
GUARANTEE FOR SPRINKLER IRRIGATION SYSTEM

We hereby guarantee that the sprinkler 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, ordinary wear and tear and unusual abuse, or neglect excepted. We agree to repair or replace any defects in materials or workmanship which may develop during the period of one year from date of filing of the Notice of Completion and also to repair or replace any damage resulting from the repairing or replacing of such defects at no additional cost to the City. We shall make such repairs or replacements within 10 calendar days following written notification by the City. In the event of our failure to make such repairs or replacements within the time specified after receipt of written notice from the City, we authorize the City 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: \_\_\_\_\_

SIGNED: \_\_\_\_\_  
ADDRESS: \_\_\_\_\_

PHONE: \_\_\_\_\_

- C. After the system has been completed, the Contractor shall instruct the Parks Department Representative in the operation and maintenance of the system and shall furnish a complete set of operating instructions.
- D. Any settling of trenches which may occur during the one-year period following acceptance shall be repaired to City's satisfaction by the Contractor without any additional expense to the City. Repairs shall include the complete restoration of all damage to planting, paving or other improvements of any kind as a result of the work.

PART II - MATERIALS

2.01 GENERAL:

Materials or equipment installed or furnished that do not meet the City standards will be rejected and shall be removed from the site at no expense to the City.

2.02 PIPE:

- A. Pressure supply line from point of connection through backflow prevention unit shall be Type >K= brass or copper pipe.
- B. Pressure supply lines 2-1/2 inches in diameter and up to 6 inches in diameter downstream of backflow prevention unit shall be Schedule 40 belled and gasketed PVC.
- C. Pressure supply lines 2 inches in diameter and smaller downstream of the backflow prevention unit shall be Schedule 40 solvent weld PVC.
- D. Non-pressure lines shall be Class 200 PVC.

2.03 COPPER PIPE AND FITTINGS:

- A. Copper pipe shall be Type 'K', hard tempered ASTM B 88 and fittings shall be wrought solder joint type in accordance with ANSI B16.22.
- B. Joints shall be soldered with silver solder, conforming to ASTM B206.

2.04 BRASS PIPE AND FITTINGS:

- A. Brass pipe shall be 85 percent red brass, ANSI, Schedule 40 screwed pipe.
- B. Fittings shall be medium brass, screwed 125-pound class.

2.05 GALVANIZED STEEL PIPE AND FITTINGS:

- A. All galvanized steel pipe shall be Schedule 40, threaded, coupled, and hot-dipped galvanized, and shall comply with the requirements of ASTM A 120-66 or ASTM A 53-67.
- B. All fittings for galvanized steel pipe shall be 150-pound rated galvanized malleable iron, banded pattern.
- C. Pipe sizes indicated on the drawings are nominal inside diameter, unless otherwise noted.

2.06 PLASTIC PIPE AND FITTINGS:

- A. All plastic pipe shall bear the following markings: manufacturer's name, nominal pipe size, schedule or class, type of material, pressure rating in psi, NSF seal of approval, and the date of extrusion.
- B. All plastic pipe shall be extruded of an improved PVC virgin pipe compound.
- C. Rubber gasket PVC pipe, couplings, and fittings shall conform to ASTM D 1784 Type I, Grade I, 2,000-psi design stress. Couplings, rubber gaskets, and fittings shall be as approved by the pipe manufacturer.
- D. Ring-type rubber gasket couplings shall permit a 5 degree deflection of the pipe at each coupling (2-1/2 degree each side) without exfiltration or infiltration,, cracking or breaking.
- E. All fittings shall be standard weight Schedule 40 and shall be injection molded of an improved PVC fitting compound. Threaded plastic fittings shall be injection molded. All tees and ells shall be side gated.
- F. All threaded nipples shall be standard weight Schedule 80 with molded threads.
- G. All solvent cementing of plastic pipe and fittings shall be a two-step process, using primer and solvent cement applied per the manufacturer's recommendations. Cement shall be of a fluid consistency, not gel-like or ropy.

2.07 VALVES:

A. Gate Valves:

1. Gate valves 2 inches or smaller shall have screwed joints and brass bodies.
2. All gate valves larger than 3 inches in diameter shall have 2-inch-square operating units and have an arrow cast in the metal indicating the direction of opening. Valves shall have iron body and be bronze mounted.
3. All gate valves larger than 2 inches and up to 3 inches in diameter shall conform to (1) or (2) above.
4. All gate valves shall have a minimum working pressure of not less than 150 psi and shall conform to AWWA standards.

B. Quick Coupling Valves:

Body of valves shall be brass with a wall thickness guaranteed to withstand normal working pressure of 150 psi without leakage. Valves shall have 3/4-inch female threads opening at base, with two-piece body. Construct valves to be operated only with a coupler, designed for that purpose. Coupler is inserted into valve and a positive, watertight connection shall be made between coupler and valve. Hinge cover shall be brass with a yellow rubber-like vinyl cover bonded to it.

C. Manual Control Valves:

Antisiphon-type valves shall be all bronze with swivel-type replaceable seating members and an approved vacuum breaker as an integral part of assembly.

D. Remote Control Valves:

Valves shall be spring-loaded, self-cleaning, packless diaphragm activated, of a normally closed type.

2.08 VALVE BOXES:

- A. Valve boxes shall be fabricated from a durable, weather-resistant plastic material resistant to sunlight and chemical action of soils.
- B. The valve box cover shall be secured with a hidden latch mechanism or bolts.
- C. The cover and box shall be capable of sustaining a load of 1,500 pounds.
- D. Valve box extensions shall be by the same manufacturer as the valve box.
- E. Gate valve boxes shall be round plastic boxes with bolt-down covers marked "GATE VALVE," heat branded in 2" high characters; AMETEK or approved equal.
- F. Remote control valve boxes shall be rectangular plastic boxes with bolt-down covers marked "CONTROL VALVE"; and with the valve identification number heat branded in 2" high characters; AMETEK or approved equal.

- G. Colors of boxes shall be as called for on the plans.

2.09 ELECTRICAL:

- A. All electrical equipment shall be NEMA Type 3, waterproofed for exterior installation.
- B. All electrical work shall conform to local codes and ordinances.

2.10 WIRING:

- A. Remote control wire shall be direct-burial AWG-UF type, sized according to manufacturer's specifications, and in no case smaller than 14 gage.
- B. Connections shall be either epoxy-sealed packet-type or Penn-Tite connectors.
- C. Common wires shall be white in color. (Where two or more controllers are used, the common wires shall be white with a different color stripe for each controller.) Control wires shall be black (where two or more controllers are used, the control wires shall be a different color for each controller.) These colors shall be noted on as-built plans located on controller door.

2.11 SPRINKLERS:

Sprinklers shall be as called for on the plans.

2.12 THRUST BLOCKS:

Thrust Blocks shall be required at the main line for all changes in direction greater than 20 degrees. The minimum size of all thrust blocks for this project will be 24" x 24". Thrust Blocks shall be installed at all changes in direction greater than 20 degrees and at all tees and at the end of all lines.

PART III - EXECUTION

3.01 GENERAL:

- A. Water Supply:

Connections to or the installation of the water supply shall be at the locations shown on the drawings. Minor changes caused by actual site conditions shall be made at no additional cost to the City.

- B. Electrical Service:

Contractor shall make 120V connection to the irrigation controllers.

- C. Layout:

Layout irrigation systems and make minor adjustments required due to differences between site and drawings. Where piping is shown on drawings under paved areas, but running parallel and adjacent to planted areas, install the piping in the planted areas.

- D. Diagrammatic Intent:

The drawings are essentially diagrammatic. The size and location of equipment and fixtures are drawn to scale where possible. Provide offsets in piping and changes in equipment locations as necessary to conform with structures and to avoid obstructions or conflicts with other work.

E. Grades:

Before starting work, carefully check all grades to determine that work may safely proceed, keeping within the specified material depths with respect to finish grade.

F. Inspections:

1. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.
2. Verify that irrigation system may be installed in strict accordance with all pertinent codes and regulations, the original design, the referenced standards, and the manufacturer's recommendations.

G. Discrepancies:

1. In the event of discrepancy, notify the City and the Landscape Architect.
2. Do not proceed with installation in areas of discrepancy until all discrepancies have been resolved.

H. Field Measurements:

Make all necessary measurements in the field to ensure precise fit of items in accordance with the original design. Contractor shall coordinate the installation of all irrigation materials with all other work.

3.02 TRENCHING:

- A. Dig trenches and support pipe continuously on bottom of ditch. Lay pipe to an even grade. Trenching excavation shall follow layout indicated on drawings to the depths below finished grade and as noted. Where lines occur under paved area, these dimensions shall be considered below subgrade.
- B. Provide minimum cover of 24 inches, maximum 30 inches on pressure supply lines 3 inches and larger.
- C. Provide minimum cover of 18 inches, maximum 24 inches on pressure supply lines 2 2 inches and smaller.
- D. Provide minimum cover of 18 inches, maximum 24 inches for control wires.
- E. Provide minimum cover of 18 inches, maximum 20 inches for non-pressure lines.
- F. Provide minimum cover of 24 inches, maximum 30 inches for all pipe sleeved under paving.
- G. Where it is necessary to excavate adjacent to existing trees, the Contractor shall avoid injury to trees and tree roots. Excavation in areas where 2-inch and larger roots occur shall be done by hand. All

roots 2 inches and larger in diameter shall be tunneled under and shall be heavily wrapped with wet burlap to prevent scarring or drying. Where trenching 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 a clean cut through the roots. Roots 1 inch and larger in diameter shall be painted with two coats of Tree Seal or approved equal. Trenches adjacent to trees shall be closed within 24 hours.

3.03 BACKFILLING:

- A. Initial backfill on all lines shall be of fine granular material with no foreign matter larger than 2 inch in size.
- B. Backfill shall be tamped in 4-inch layers under the pipe and uniformly on both sides for the full width of the trench and the full length of the pipe. Materials shall be sufficiently damp to permit thorough compaction, free of voids. Backfill shall be compacted to dry density equal to adjacent undisturbed soil and shall conform to adjacent grades.
- C. Flooding in lieu of tamping is not allowed without specific prior approval.
- D. Under no circumstances shall truck wheels be used to compact soil.
- E. Provide sand backfill a minimum of 6 inches over and under all piping under paved areas.

3.04 PIPING:

- A. Piping under existing pavement may be installed by jacking, boring, or hydraulic driving. No hydraulic driving is permitted under asphaltic concrete pavement.
- B. Cutting or breaking of existing pavement is not permitted.
- C. Carefully inspect all pipe and fittings before installation, removing dirt, scale, and burrs and reaming; install pipe with all markings up for visual inspection and verification.
- D. Exercise care in handling, loading, unloading, and storing plastic pipe and fittings; store plastic pipe and fittings under cover until ready to install; transport plastic pipe on a vehicle with a bed long enough to allow the pipe to lay flat, avoid undue bending and any concentrated external load.
- E. Remove all dented and damaged pipe sections.
- F. Contractor shall install concrete thrust blocking at all changes of direction and terminal points of pressure pipe.
- G. All lines shall have a minimum clearance of 6 inches from each other and 12 inches from lines of other trades.
- H. Parallel lines shall not be installed directly over one another.
- I. In solvent welding, use only the specified primer and solvent cement and make all joints in strict accordance with the manufacturer's recommended methods; allow solvent welds at least 15 minutes setup time before moving or handling and 24 hours curing time before filling.
- J. 360 degree applicators shall be used to apply primer and solvent on sizes 2 2 inches and larger.
- K. Centerload all plastic pipe prior to pressure testing.

- L. All threaded plastic-to-plastic connections shall be assembled using Teflon tape.
- M. For plastic-to-metal connections, work the metal connections first. Use a nonhardening pipe dope on all threaded plastic-to-metal connections, except where noted otherwise.

3.05 THRUST BLOCKS:

- A. Install all concrete thrust blocks per industry standards and practices. Thrust block material shall be concrete with a minimum psi of 2500. Do not surround entire mainline or fittings with concrete. Install all thrust blocks against firm undisturbed soil compacted to a minimum of 90% compaction.

3.06 ASSEMBLIES:

- A. Install all assemblies specified herein according to the respective detail drawings or specifications, using best standard practice.
- B. Install backflow assemblies at locations approved in the field and at height required by local codes.
- C. Valves shall be installed in shrub areas whenever possible per City standards.
- D. Each valve box shall be installed on a foundation of pea gravel backfill, 3 cubic feet minimum. Valve boxes shall be installed with their tops 3/4 inch above the surface of surrounding finish grade in lawn areas.
- E. Where there are several valves within close proximity to one another (plus or minus 10') the contractor may, with the owner's approval, install one isolation ball valve from the main line to serve not more than five (5) valves., thereby reducing the number of ball valves required for installation. The valves shall be "ganged" and the ball valve shall be located in a separate gate valve box.

3.07 WIRING:

- A. Wiring shall occupy the same trench and shall be installed along the same route as the pressure supply lines and shall be located below the supply lines wherever possible.
- B. Where more than one wire is placed in a trench, the wiring shall be taped together at intervals of 12 feet.
- C. All connections shall be of an approved type and shall occur in a valve box. Provide an 18-inch service loop at each connection.
- D. An expansion loop of 12 inches shall be provided at each wire connection and/or directional turn, and one of 24 inches shall be provided at each remote control valve.
- E. A continuous run of wire shall be used between a controller and each remote control valve. Under no circumstances shall splices be used without prior approval.

3.08 FLUSHING THE SYSTEM:

- A. Prior to installation of sprinkler heads, the valves shall be opened and a full head of water used to flush out the lines and risers.

B. Sprinkler heads shall be installed after flushing the system has been completed.

3.09 SPRINKLER HEADS:

A. Sprinkler heads shall be installed as designated on the drawings and per City standards.

B. Spacing of heads shall not exceed maximum indicated on the drawings.

3.10 ADJUSTING THE SYSTEM:

A. Contractor shall adjust valves, align heads, and check coverage of each system prior to coverage test.

B. If it is determined by the City that additional adjustments or nozzle changes will be required to provide proper coverage, all necessary changes or adjustments shall be made prior to any planting.

C. The entire system shall be operating properly before any planting operations commence.

3.11 COMPLETION CLEANING:

Upon completion of the work, Contractor shall smooth all ground surfaces; remove excess materials, rubbish, debris, etc.; sweep adjacent streets, curbs, gutters, walkways, and trails; and remove construction equipment from the premises.

**END OF SECTION**

F:\Specs\Irrigation.wpd

## SECTION 02920 – SPORTS FIELD FINE GRADING AND SOIL PREPARATION

### 02920-1 GENERAL

#### 02920-1.01 WORK INCLUDED

- A. Ripping/Soil and Spoils Removal
- B. Irrigation head and lateral removal
- C Fertilizer.
- D. Soil amendments.
- E. Amending Process
- F. Amending Equipment
- G. Fine grading
- H. QuikDRAIN system Installation
- I. Sodding and Hydroseeding
- J. Turf Establishment Period
- K. Turf Maintenance Period
- L. Irrigation maintenance

#### 02920-1.02 RELATED SECTIONS AND DOCUMENTS

#### 02920-1.03 SUBMITTALS

##### A. Quality Control Submittals:

1. Certificates: State, federal and other inspection certificates shall accompany invoice for all materials showing source or origin, Submit to Owner's Representative prior to acceptance of materials.

Soil and Leaf Analysis Report: Contractor shall be responsible for submitting soil and leaf samples per the following specifications seven (7) separate times (The first two samples will be soil samples only, samples three thru seven will be both soil and leaf samples). The first soil sample will be taken immediately after soils have been placed and graded to sub grade (soil samples only). This soil testing will determine if the quantities of amendments will need to change due to the difference in the soils as first tested and after they had been placed. The second immediately after the field has been roto tilled, rolled and fine graded (soil samples only). The third, fourth, fifth and sixth times should occur four weeks after planting, eight weeks after planting, 12 weeks after planting and 16 weeks after planting (soil and leaf samples for each of these). The seventh should occur two (2) weeks before the end of the 90 day maintenance period (soil and leaf samples). (120 day grow in plus the 90 day maintenance period) After each soil and leaf sampling, contractor shall immediately provide and spread the fertilizers that the Turf Consultant specifies based on these analyses.

For the first and second sampling, contractor shall take thirty small samples from all over the soccer field. Mix the samples together and separate into three Quart size sample bags. Mark each bag with contractors name and site name and location from which the sample was pulled (Soccer Field). Mark one bag PRZ Complete, the second PRZ Sieve and the third PRZ Plasticity. The samples should be pulled from 0 to 7.5" deep (do not go deeper than the soil was mixed). For samples three (3) thru seven (7) the contractor will need to use a pair of scissors to cut clippings from approximately the same areas that the ten (10) plugs are pulled from. Mark these bags with contractor's name and site name location, PRZ Leaf Analysis,. All samples shall be forwarded overnight (can take 7 days if not overnighted and work could be halted while we wait) by the contractor to SERVI-TECH LABORATORIES 1816 E. Wyatt Earp, Dodge City KS 67801, for

testing to verify that all fertilizers and soil amendments specified have been incorporated. Contractor shall pay for all testing fees from the lab( approximately \$175 per set of 3).

For the third through the seventh sampling repeat the above process except contractor will only need to pull approximately 10 plugs and put them into one bag from each field. Mark each bag with the group location, PRZ Complete Test, contractor's name and site name. Also at each of these samplings contractor will to need include the leaf analysis from the same areas as the soil samples are pulled from.

4. Submittals shall include the listing of the make, model, and sub-Contractor of the Soil Renovation Machine (roto-tiller), that will be used for this process.

#### 2920-1.04 QUALITY ASSURANCE

1. The work of this section shall be performed by an experienced landscape Installer having not less than 5 years successful experience in sports field projects of similar size and project scope. Include work of Sections 02930. For each of these 5 projects, contractor shall list:
2. Project Name, size of the project in acres & construction cost.
3. The general scope of the project.
4. List updated contact names and phone numbers.
5. List the change orders in % of construction cost of the project that contractor was responsible for. Failure to list these figures is grounds for rejection of contractor's bid.
6. List each of the sub-contractors that will be utilized, what each will be doing and what % of the total dollars of the contractor's project they will be responsible for. Failure to list these figures is grounds for rejection of contractor's bid. List the change orders in % of construction cost of the project that contractor was responsible for. Failure to list these figures is grounds for rejection of contractor's bid.

#### 02920-1.05 DELIVERY , STORAGE AND HANDLING

- A. General: Comply with Section 01600,
- B. Fertilizer: Deliver inorganic or chemical fertilizer to site in original unopened containers bearing manufacturer's guaranteed chemical analysis, name, trade name, trademark and conformance to state law, bearing name and warranty of producer.
- C. Notify Owner's Representative of delivery schedule in advance so material can be inspected upon arrival at project site. Immediately remove unacceptable material from project site.

#### 02920-1.06 PROJECT/SITE CONDITION

- A.General: Do not perform work when climate and existing site conditions will not provide satisfactory results.
- B. Vehicular accessibility on site shall be as directed by owner's representative. Repair damage to prepared ground and surfaces caused by vehicular movement during work under this section to original condition at no additional cost to owner.
- C. Perform soil preparation just prior to planting operations and in accordance with final planting schedule. Coordinate with irrigation system installation to avoid damage to work of one by the other.
- D. Utilities: Determine location of underground utilities (irrigation lines included) and perform work in a manner which will avoid damage, Hand excavate, as required.

## 02920-2 DRAINAGE PROCESSES

### 02920-2.01 THE QwikDRAIN™ SYSTEM

This is a two (2) tiered vertical by-pass drainage system comprised of a matrix of closely spaced, interconnected narrow slot, sand filled, drainage trenches crossing 2” perforated drain pipes that are spaced at specified centers. Two types of drainage trenches are used in the matrix: **Sub-drains** and **Top-drains**. All of the drainage sand slots and pipe are installed by machine, eliminating mistakes easily made when trenches and pipe installation must be done by manpower. This system is installed and grown in quickly without any visual sign of the trenches. This system will allow a field to drain at 4-5” per hour beginning the next day after installation without disturbing the established root system and allows play within weeks. All renovation equipment and procedures have been pre-approved and must be followed exactly. Any desire to substitute other processes must be pre-bid approved by The Sports Turf consultant.

### 02920-3 PRODUCTS

02920-3.01 All of the quantities of the products and soil amendments listed below have been specified just for this project based on preliminary soil testing and growing conditions at this site. Contractor should use these quantities for the purpose of bidding the project. The soil testing specified in this document will then be used to customize the quantities of each of these items for the soccer field.

All products, amendments, procedures and equipment listed below have been specified just for this project based on the specific soil conditions and growing conditions and have been submitted for testing to insure that they meet the specifications listed below and that they are compatible with the conditions of this site.

Any other products that are to be submitted as substitutes must be tested and approved by the same laboratories and the results will be used by the soil consultant to determine if they meet the specifications based on technical results. Contractor must allow at least two weeks from the day he overnights the samples to the laboratory for the results and approval for substitution.

02920-3.02 Organic Composted Soil Amendment: Compost must have the following characteristics:

1. PH of less than 8.5
2. Screened to 1/2” minus
3. Soluble salts EC less than 3
4. Carbon to nitrogen ratio 25/1 or less
5. Organic content above 25%
6. Shall be free of glass, metal and visible plastics
7. Odor shall be soil-like (musty or moldy) not sour, ammonia -like or putrid
8. Can have no nitrogenized wood product in it-especially redwood or fir
9. Quantities: All sports field and surrounding turf areas: 6 cubic yards/1,000 sq. ft.
10. Approved Suppliers or pre-bid approved equal:
  - Green Alliance Compost- Kevin-714-404-8985

02920-3.03 Washed Concrete Sand

1. Shall be 99.8% passing a #4 screen
2. Shall be no more than 3% passing a # 200 screen
3. Organic content below .3%
4. Quantities: 1.5” compacted (all of the area to receive sod only), and laser graded.
5. Approved Product washed concrete sand
6. Approved Suppliers or pre-bid approved equal: West Coast Sand & Gravel- Contact: Dante Hernandez-760-399-1891 or at [dhernandez@wscg.com](mailto:dhernandez@wscg.com)

02920-3.04 FERTILIZER

A. Commercial Fertilizer:

1. Sports Fields

a. Pre- Plant Fertilizer:

- aa. Acid/Calcium based control release liquid phosphorus- pH less than 1, Nutrient analysis- 5.5-10-0-2.4Ca Approved product -THI PHOS 10(no known equal)

Quantities: All sports field and surrounding turf areas:

Two (2) gallons/ 1000 sq. ft.

- bb. Concentrated Organic Growth Medium-All available- pH less than 8.5, 25%+ organic content, Salts EC less than 3, calcium Ca 10%+,Magnesium Mg 2%+, Iron Fe 2.5%+ Approved product -THI Concentrated Organic Growth Medium #604-(no known equal)

Quantities: All sports field and surrounding turf areas:

3.41 tons/acre

- cc. Concentrated Liquid Nitrogen with Catalyst23-0-0-7Ca Approved product -THI Nitro

Quantities: All sports field and surrounding turf areas

.5 gallons per 1,000 sq. ft. to provide 2lbs of N/1,000 sq. ft.

- dd. Concentrated Granule Potassium 0-0-50 or equal

Quantities: All sports field and surrounding turf areas:

13.34/ 1000 sq. ft.

to provide 6.67/1000 sq. ft. of P

- ee. Concentrated Granulated Gypsum-23% Ca

Quantities: All sports field and surrounding turf areas:

26.67 lbs/1,000 sq. ft.

to provide 6.13 lbs/1,000 sq. ft of Ca

- ff. All organic root growth hormone/seed germinator/bio-stimulant, normal turf spray application rate 1 gallon /acre-

Approved product -THI Composter or equal

Quantities for incorporation: All sports field and surrounding turf areas:

.5 (five tenths) gallons/1000 sq. ft (not per acre)

- gg. Concentrated 2 Part Microbes

Quantities: All sports field and surrounding turf areas:

3.48 gallons **per acre (not per 1000 sq. ft.)**

Approved product: THI Microbes Plus or equal

- hh. Concentrated 2 part Microbes Catalyst

Quantities: All sports field and surrounding turf areas:

One (1) gallon **per 1000 sq. ft (not per acre)**

Approved product -THI Microbes Plus Starter or equal

- b. Post- Plant Fertilizer
  - aa. Liquid 32% Nitrogen product for feeding through fertigation system to provide 6 lbs per 1000 sq. ft. Of N over 120 day grow in period- Approved Product- UAN 32-0-0  
Quantities: All sports fields and surrounding turf areas:  
1.7 gallons /1000 sq. ft.
  - bb. All organic root growth hormone/seed germinator–  
Approved product -THI Composter or equal  
Quantities: All sports field and surrounding turf areas:  
.3 (three tenths) gallons/1000 sq. ft.  
to be applied with sprayer
  - cc. Granule Control release Nitrogen product only to be used as a backup product if the fertigation system is not working for any reason during the 120 day grow in and the 90 day maintenance period.  
Approved Product- U-Flex 46-0-0  
Quantities: All sports fields and surrounding turf areas:  
2.17 lbs /1000 sq. ft. every 21 days only in absence of fertigation system
- 2. Approved fertilizer supplier-CPS or pre-bid approved equal- Chris Bunnell-760-594-1385 or e-mail: [chris.bunnell@cpsagu.com](mailto:chris.bunnell@cpsagu.com)
- 3. Approval of products as substitutions for specified material shall be based on technical results. Materials shall be sent to a testing lab (pre-bid) as prescribed by PRZ Consulting-719-265-6003. Call or e-mail for submittal form. – [larry@prz.com](mailto:larry@prz.com)

02920-3.05 SOD

- 1. Sod bed shall be free of debris and any foreign material that could affect rooting including stones, pvc pipe and hydraulic line breakage residue
- 2. People preparing sod bed must carry a 5 gallon bucket and a rake with them for removing additional debris discovered during the installation process.
- 3. Any low spots created by removal of debris shall be filled in before seeding and tamped in dry
- 4. Turf Sod shall have good Spring and Fall Growth, good turf density, shade tolerance and low light intensity tolerance.
- 5. Sod Variety shall be Ball Park, a mix of Tifway 328 Hybrid Bermuda Grass, Kentucky Blue grass and perennial rye grass.
- 6. Sod shall be sprayed with Primo Max or equal growth regulator 2-3 days prior to cutting and delivering the sod. Rate and spray date shall be determined by the sod farm and discussed with turf consultant, landscape architect and Cities representative before application.
- 7. Supplier shall be AG Sod Farms-Palmdale-800-669-4763( No known equal)

02920-3.06 OVERSEEDING OF NEW SOD

- 1. Four Weeks after the field has been sodded, the following seed mix shall be slit seeded into the newly sodded field at the rate of 1.5 lbs/1000 s.f.
- 2. The sod shall be sprayed with a double application of Primo Max type product to allow the new seed to germinate and grow in quicker.
- 3. Seed varieties shall be a blend of 5 bluegrasses selected for this area- 20% Touche, 25% SR2284 15% Emblem, 20% Spitfire and 20% Bandera Hybrid Blue grass.
- 4. Supplier shall be - CPS or pre-bid approved equal- Chris Bunnell 760-594-1385 or [chris.bunnell@cpsagu.com](mailto:chris.bunnell@cpsagu.com)

02920-3.07 FERTIGATION

A. Pump

1. Pump capacity shall be 3.0 gph @ 150psi head
  2. Adjustable: 0-100% by stroke knob
  3. Built in pressure relief
  4. Fertigation pump - wall mounted unit (Install in new Strongbox Stainless Steel Pedestal Enclosure (LD-16S) Install on new concrete pad with sleeves for Fertigation system full operation – Install next to existing meter/backflow/pump unit – Pico Blvd.
  5. Dimensions: 16" X 18"X 10"
  6. Proportional Controls by (flow Rate)
  7. Insertion type: Data Industrial flow sensor or optical isolation
  8. Variable Speed Control:SCR DC Drive
  9. All Installation / Operation Hardware
  10. Anti-Siphon included for each head
  11. System comes complete with all fittings, lines, and hardware less tanks
  12. UL Listed System
  13. System shall include a submersible, chemical proof, circulating pump with timer
- a. Approved System: Turf Feeding System-Model Landscape L500 C Series  
Michael-800-728-4504, Steve- Eco Fertigation-949-412-6775

B. Tank

1. Shall be minimum 50 gallon+ tank
2. Spherical tank (double wall- installed below grade 12")
3. Shall be underground with locking plastic valve box lid over/above fill cap.

C. Installation

1. Underground installation-Tank top shall be covered with standard locking valve cover to prevent vandalism - Heat branded (Fertilizer)
2. Both tank and pump shall be installed close to the backflow preventer and irrigation pump.

D. Fertigation and Grow In and Maintenance period

1. System must be up and running before leaching can proceed
2. System must be up and running before any sodding or seeding
3. System must have Sodium Blocker in the tank during entire leaching period
4. If for any reason the fertigation system is down for any time during the 120 day grow in or the 90 day maintenance period, contractor must apply the sodium blocker through a boom sprayer at the rate of 1 gallon per acre per month applied monthly
5. If for any reason the fertigation system is down any time during the grow in or maintenance period, contractor must apply a granular application of U-flex 46-0-0 Nitrogen at the rate of 2.17 lbs per 1,000 sq. foot every 21 days throughout the grow in and maintenance period until fertigation system is running properly.
6. If for any reason the fertigation system is down during the grow in or maintenance period, **contractor must continue to mow 3 times per week** as specified
7. Contractor must note any function above on the log kept on site. The end of the 120 grow in period and acceptance to begin the 90 day maintenance period cannot begin until the fertigation system is up and running correctly and the log showing all of the contractor provided grow in functions is provided and up to date.

#### 02920-3.08 GRADING AND LASER GRADING

- A. All sports fields and areas to receive sod shall be rough graded with a motor grader to within 1/10<sup>th</sup> ft.
- B. All sports fields shall then have the subgrade and final grade laser graded with the laser controlled grader and then laser graded with a laser controlled box scraper set at its highest accuracy to achieve + or - .25" (inches).
- C. The sub grade must be certified by survey and any discrepancies corrected before any other landscaping processes (perimeter drains ..etc) can begin.

#### 02920-3.09 ROTOTILLING SPORTSFIELDS

- A. All sports fields and areas to receive sod will be roto-tilled at 8" in depth and will require the large and powerful roto-tiller specified later in this document. It shall be a minimum of 350 horsepower with a minimum of a 4' high by 8' wide tilling drum capable of 3-4 revolutions per second at the hub.
- B. Two passes in slightly different directions will be required.
- C. The specified tiller will create a 15-18% fluff which will need to be wheel rolled (tracked) after each of 2 tilling passes. This is a critical step in this process and can be done with a soft tired or wobble wheel packer used in road building or a tractor with wide turf tires.

#### 02920-3.10 FIELD VERTICAL SLIT DRAIN SYSTEM

##### A. GENERAL

1. The **QwikDRAIN™** System is a two (2) tiered vertical bypass drainage system comprised of a matrix of closely spaced, interconnected narrow slot, sand filled, drainage trenches crossing 2" perforated drain pipes that are space at specified centers. Two types of drainage trenches are used in the matrix: **Sub-drains** and **Top-drains**.
2. **Top-drains** are trenches 1.65 inches wide by eight (8) inches deep on 20" centers, filled entirely with a medium-coarse *washed sand to the surface*.
3. **Sub-drains** are trenches 3 inches wide by 12 inches deep with 2" narrow slotted pipe at the bottom of the trench and filled with medium-coarse washed sand filled to the surface.
4. The **QwikDRAIN™** system consists of a matrix of **Top-Drains** spaced at 20" centers crossed at approximately 60-90 degree angles to the **Sub-Drains** at 15' centers (centers may vary depending on drainage requirements) terminating at and piped directly into the main collector (perimeter) drain. Spacing of the sub-drains can be modified to accommodate any drainage requirement.
5. All equipment utilized to install the system must be equipped with turf-type flotation tires to minimize rutting and compaction of existing surfaces. **All trenching and sand seam injection equipment must be capable of trenching and removing the spoils simultaneously to ensure minimal contamination of the drainage system.**
6. Sports Turf Drainage system shall be installed by a *certified contractor, pre-qualified prior to bid date.*
7. Pre-approved Certified Contractor- GreenOne Industries at (888) 567-6872.

B. PRODUCTS

1. Drain Pipe shall be 2” (50mm) dia. Turf Flow, Single Wall, Narrow Slot TF NS1 02 0500 as manufactured by Hancor [www.hancor.com](http://www.hancor.com)
2. Medium-coarse washed sand backfill for both Sub-drains and Top-drains conforming to the **USGA specifications** below:

	Gravel	Very Coarse	Coarse	Medium	Fine	Very Fine
U.S. Sieve No.	10	18	35	60	100	<100
Diameter (mm)	>2.00	1.00-2.00	.50-1.00	.25-.50	.15-.25	<.15
USGA Recommended (%) retained on Sieve	3 Max.	7-10 Max*	>60		<20	<5**

\*The total of the very coarse sand and gravel fractions may not exceed 10%

\*\*The total of the very fine sand, silt and clay fractions may not exceed 10%

3. Locally available sources of sand should be utilized so future topdressing sands match the **QwikDRAIN™** system sands. This avoids problems normally associated with dissimilar materials and will only enhance the systems drainage capacity and performance. Approved local sand- West Coast Sand & Gravel- Contact: Dante Hernandez - 760-220-8317, or equal

Installation- *BY GreenOne Industries Inc –888-567-6872*

A. Preparation:

1. Provide protection to all prepared grades and/or turf areas.
2. Amend turf areas per specifications
3. Ensure perimeter drains are installed and drain properly
4. Verify all grades prior to commencement
5. Verify irrigation system functions properly and irrigation lines are deeper than 16" to top of pipe
6. Existing turf areas to receive sod – remove one and one half inches (1 1/2”) of turf and soil material from all site areas to receive sod. Dispose off site in a legal manner.
7. Sub-Drain Installation: Install 2” Piping at 15’ on center over entire turf area to be drained. Trench at 12” depth. Utilize trenching equipment (with soil conveyor system) capable of trenching at 3” width, while simultaneously removing spoils and installing 2” dia. pipe in one operation to ensure no spoils are remaining on the surface that may contaminate trenches. Piping shall be sloped a minimum 0.1% for positive drainage. On flat fields, contractor shall *utilize laser-guided trencher* to ensure positive drainage.
8. Fill trenches to surface with specified sand while compacting at the same time to ensure no settling or sidewall cave-in.
9. Connect 2” pipe into perimeter drainpipe.

B. TOP-DRAIN INSTALLATION: Install over entire turf area to be drained utilizing the **KORO TopDRAIN** machine.

1. Install Top-Drains at 20” on center at 60-90 degrees to Sub-Drains.
2. Utilize trenching equipment (with soil conveyor system) capable of trenching 3 trenches at 20” centers simultaneously at 1.65” wide x 8” depth while removing the

trench spoils, mechanically force injecting the sand and compacting all in one simultaneous operation to ensure a clean process and eliminate side wall cave-in and bridging of the sand. Perform this process ensuring that trenches are slightly overfilled.

3. Topdress ½” of same sand over the entire surface to provide a sand cap upon completion. Utilizing a ridged drag mat, drag the excess sand over the surface to ensure a smooth surface or laser grade sand to final grade (if sand cap greater than 1”), all the while ensuring not to make contact with underlying soils that may contaminate the surface.
4. Irrigation Contractor to replace all irrigation heads, flush and test the system.
5. ***The sod to be installed over the top of the drain system, must be sand based or washed sod (soil attached to the sod must contain a minimum 83% sand content. Available from AG Sod Farm (800) 669-4763 (No known equal)***

02920-3.11 TURF ESTABLISHMENT PERIOD-120 DAYS - **MINIMUM**

A. Prior to starting of the maintenance period on this site:

1. Final inspection shall be by Community Works Design Group & City’s Agent.
2. All turf shall be completely established and filled in and all other contract requirements shall be fulfilled.
3. Any bare spots, light colored areas or low spots shall be fixed and re-sodded with like varieties.
4. Submit written request to the Owners Representative for acceptability of initiating first mowing.
5. First mowing shall take place when sod has reached a height of 1.25-1.5” inches and cut to 1” with a reel mower.
6. Each additional mowing shall be cut from 1.25”-1.5” and cut to 1” with a reel mower.
7. Mowings shall be done by approved mowing equipment.
8. If for any reason there are clippings visible on the surface, they shall be removed by the contractor. All other times, the clippings are to be left behind.
9. Each additional mowing during the (120 day establishment period shall be done at 1” cut from 1.5”, **no less than 3 times per week**. More frequent mowing may be done by contractor for even faster grow in (root establishment) if there is no price increase to the City. A log kept at the Park office shall be filled in each time a maintenance function has been performed and must be signed each time by an employee of the City of Beverly Hills who has checked the work and the contractor’s employee performing the function. If no one from the City is present at the time contractor fills in the log, a cell phone call to the designated City employee will alert them to stop by the site to verify and then sign.

#### 02920-3.12 HERBICIDE

Contractor shall maintain all the turf areas for weed control during the grow-in, establishment and maintenance periods. All herbicides shall be approved before applying to insure that they don't retard germination or establishment of the turf. In some cases this could mean hand removal of weeds at critical times during the germination or establishment periods.

#### 02920-4 PROJECT EXECUTION

##### 02920-4.01 EXAMINATION

- A. General: Verify that existing site conditions are as specified and indicated before beginning work under this section.
  - 1. Damaged Earth: Inspect to verify that earth rendered unfit to receive planting due to concrete water, mortar, limewater or any other contaminant dumped on it has been removed and replaced with clean earth from a source approved by the Owner's Representative.
- B. Unsatisfactory Conditions: Report in writing to PRZ and Community Works Design Group with copy to the City's Representative.
- C. Acceptance: Beginning of installation means acceptance of existing conditions by installer.

##### 02920-4.02 PREPARATION

- A. Protection:
  - 1. Locate sewer, water, irrigation, gas, electric, phone and other pipelines or conduits and equipment prior to commencing work.
  - 2. Be responsible for proper repair to landscape, utilities, walls, pavements and other site improvements damaged by operations under this section.
  - 3. Pay for all repairs made by contractor(s) designated by Owner.
- B. Remove all turf/weeds and soil to a depth of two (2") in all Sports Turf areas and adjoining turf areas (total landscape and irrigated area). Dispose off site in a legal manner. Then cross rip in two directions with approved heavy machinery rippers (Caterpillar 14G or 140 G or 140H) all areas to receive new sod twelve (12"), minimum deep (only in the sports turf area). Remove debris and rocks larger than 3/4" throughout all areas (total landscape area). Dispose of all material off site in a legal manner. Also remove all existing irrigation heads and laterals complete within area to receive sod (only in the sports turf area). Dispose off site in a legal manner. Also remove outfield fence sleeves complete and dispose off site in a legal manner.
- C. Runoff: Take measures and furnish equipment and labor necessary to control the flow, drainage, and accumulation of water to run off the grounds as is intended by the grades,
- D. Erosion Control: Take measures and furnish equipment and labor necessary to control and prevent soil erosion, blowing soil and accumulation of wind-deposited material on the site throughout duration of work.

02920-4.03 INSTALLATION

A. Irrigation

Irrigation system installation must be inspected and approved by a representative of the City and the Landscape Architect prior to the backfill of the trenched area and proceeding to the next phase.

B. **Schedule of required Sport Field installation equipment:**

1. Crawling soil mixing machine capable of roto-tilling a minimum of 18" deep at 3-4 revolutions per second.  
CMI Machines, Caterpillar Road renovators, with minimum of 350 hp & self-propelled – Contact: Porter Yet-503-282-3251
2. Dry spreader for spreading bagged fertilizer material( can be sling type or drop type- 1000 lbs or larger)
3. Boom sprayer for spraying liquid fertilizers-14-20ft. Boom and 150 gallons plus capacity.
4. Utilize a Four Yard Top dresser for spreading Growth medium. Under windy conditions this product can be placed in a hydroseeding machine and sprayed over the site. Contact PRZ Consulting for instructions.
5. Dual plane controlled road grader for final grading and laser controlled (not laser guided or laser surveyed) box scraper for last final grading and grading around heads after they have been brought to the surface.
6. Ten to sixteen foot reel mower sharpened for mowing all turf areas 3 times per week during the 120 day establishment period.
7. KORO QwikDRAIN™ machine for installing sand seams @ 20" O.C. while simultaneously removing soils, injecting new sand and compacting seams. Also used for removing native soils from 3" channels on 15' centers and simultaneously laying the 2' slotted pipe at the bottom followed by backfilling and compacting of the sand in the channels.
8. All Equipment used for any of the tasks involved in the completion of this project must have wide turf tires, no lugged tires (AG) allowed.
9. Six foot 3 point roto-tiller for turning under the amendments field by field to prevent them from blowing away before the approved rototiller above can be brought in. Cannot be used to replace the above approved roto-tiller for roto tilling everything 8" deep before final laser grading!
10. Large Wide roller for rolling down the fluff caused by the large roto-tiller between each of two passes of the large roto-tiller. Can be a soft tired packer as used by the counties to pack roads or caterpillar Vibratory roller with the vibratory on after the first roto-tiller pass but "Off" after the second roto-tiller pass

C. Soil Amendment – Sports Field and areas to receive sod.

1. Limit preparation to areas which will be planted promptly after preparation. The following order shall be followed. As each field has all of the amendments applied to the top, the small roto tiller specified above shall be used to till under the amendments to keep the amendments from blowing away until the large roto-tiller can be brought in to till all the fields in one visit.
2. Order of Amending:
  - A. Sports field and all areas to receive sod: (Items b. thru n. apply for all other turf/Hydroseed areas)
    - a) Spread approved sand 1.5 inches deep (compacted).
    - b) Spread approved compost at the rate of 6.0 cubic yards per 1,000 sq.ft.
    - c) Spread Growth Medium over the area at the rate of 3.41 tons per acre with the top dresser for even distribution (no front end loaders or manual spreading)
    - d) Mix THI Phos at the rate of 2 gallons / 1,000 sq. Ft and THI Composter at the rate of

- .5 (five tenths) gallon/1,000 sq. ft. and THI Nitro at the rate of .5 gallons per 1,000 sq. ft. together in the same tank with enough water to spray evenly over the areas
- e) Mix Concentrated Microbes Plus at the rate of 3.48 gallons each **per acre (not/1,000 sq. ft.) and the** Microbes Catalyst at the rate of 2 gallons per 1,000 sq. ft. (not per acre) together in the same tank with enough water to cover all Areas. Do not mix with the PHOS, Nitro or Composter in the same tank with either of the microbes products
  - f) Spread Concentrated 0-0-50 granular fertilizer evenly over the area at the rate of 13.33 lbs per 1,000 sq. Ft.
  - g) Spread Concentrated granular Gypsum fertilizer evenly over the area at the rate of 26.67 lbs per 1,000 sq. Ft.
  - h) Roto-till all areas with the specified larger tiller only, at 8” deep on the first pass and 7.5” deep on the second pass so as not to pick up additional original soil. **This process to be inspected on the first day by CWDG. (Provide 72 hour notice)**
  - i) Wheel roll the entire area with tired vehicles to press out air pockets (this can be with a soft tired packer -wobble wheel packer or wide turf tired tractor or vibratory roller with vibratory on after the first roto-tiller pass and off after the second roto-tiller pass)
  - j) Roto-till all areas a second time with the specified larger tiller only, at 7.5” deep being careful on the second pass not to pick up additional original soil. **This process to be inspected on the first day by CWDG. (Provide 72 hour notice)**
  - k) Wheel roll the entire area a second time with tired vehicles to press out air pockets (this can be with a soft tired packer -wobble wheel packer or vibratory roller with vibratory off after the second roto-tiller pass)
  - l) Laser grade to final grade with laser controlled box scraper set at its highest setting. **From this point on no trucks allowed on the roto-tilled areas, only turf tired carts and vehicles**
  - m) Raise irrigation heads to the surface and thoroughly test irrigation system and fertigation system before proceeding.
  - n) Laser grade with box scraper around the heads.
  - o) Install Qwik Drain Perimeter drain lines according to specification.
  - p) Install Qwik Drain 2” laterals at 15’ centers and Topdrain sand seams at 20” on centers.
  - q) Topdress with approved sand – (½”) over entire landscape area.
  - r) Float smooth with laser box scraper
  - s) Area to be inspected/verified as to grade & soil preparation prior to seeding
  - t) Pull soil samples as specified above in Sportsturf area, pulling approximately 30 plugs, fill three bags and mark as specified with PRZ Sieve, PRZ Plasticity and PRZ Complete + Sodium Paste tests and overnight to Servitech Labs.
  - u) Sod all sports field and adjacent turf areas as indicated on the plans. Spray newly sodded area with composter liquid product at the rate of .3(3/10’s) gallons per 1,000 sq. ft. mixed with enough water to cover all sodded areas.
  - v) Roll sod with a wide roller, no vibratory per sod companies recommendations.
  - w) Begin immediate irrigation with fertigation water (with approved fertilizer at the approved rate-1 lbs of N every 21 days through grow-in, to keep soil moist but not wet for germination encouragement. This could be from 3-5 smaller cycles per day during the heat of the day plus evening cycles all based on outside temperatures

**ADJACENT NON SPORTS TURF AREAS AROUND FIELD**

**Follow exactly all of the steps above for the sports fields from b) to n). This area to receive Hydroseed mix equal to the sod specification at 10/lbs. per 1000s.f.**

**Also repair all areas of compacted turf pathways damaged during renovation process:**  
Deep tine aerate or Aerway shatter tine compacted areas in two directions just before seeding

**HYDROMULCH MATERIALS:**

Water: All water used shall be potable domestic water as drawn from the City pressure main. General precautions should be observed when drawing water from sources other than pressure main. The use of filters may be required when directed. Such water must be free of impurities.

Seed: Seed as specified.

Mulch: Fiber shall be produced from cellulose such as wood pulp or similar organic material and shall be of such character that it will disperse into a uniform slurry when mixed with water. The fiber shall be of such character that when used in the applied mixture, an absorptive or porous mat, but not a membrane, will result on the surface of the ground. Materials which inhibit germination or growth shall not be present in the mixture.

Binding Agent: Dry powder organic concentrate, Ecology Control M-Binder or equal. Available from Hydro-Gro (800) 327-5296.

**HYDROSEEDING:**

Hydroseeding shall not commence until permanent power to controller has been installed and controller is working automatically and all planting areas have been finish graded and accepted by the Landscape Architect.

Mixing of hydroseed slurry: Mixing shall be performed in a tank, with a built-in continuous agitation and recirculation system of sufficient operating capacity to produce a homogenous slurry of fiber, seed, fertilizer and water in the designated unit proportions.

Fiber	1,800 lbs. per acre for groundcover areas 2,000 lbs. per acre for turf areas
Lawn Seed	As specified
Water	3,000 gal. per acre
Soil conditioner/Fertilizer	1,000 lbs. per acre

With agitation system operating at part speed, water shall be added to the tank, good recirculation shall be established. Materials shall be added in such a manner that they are uniformly blended into the mixture in the following sequence:

*When tank is 1/3 filled with water:*

- Add 3 - 50 pound bales of fiber
- Add seed - 1/2 acre requirement
- Add NPK fertilizer - 1/2 acre requirement

Agitate mixture at full speed when the tank is half-filled with water.

Add remainder fiber requirement, 7 bales before tank is 3/4 full. Slurry distribution should begin immediately.

Area to be hydroseeded shall be moistened to a depth of six inches just prior to application.

Application: Hydroseed slurry shall be applied under high pressure evenly and result in a uniform coat on all areas to be treated. Care shall be exercised to assure that plants in place are not subjected to the direct force of an application.

Slurry shall be immediately removed from walks, pavement, structures, and ground cover areas, that are inadvertently sprayed.

All bare spots shall be reseeded by the Contractor within 15 days. The Contractor will be responsible for all reseeded areas for as long after seeding as necessary until acceptable germination and establishment is realized and approved by the City.

The slurry shall not be sprayed on undesignated areas. Any slurry spilled or sprayed into areas other than those designated to receive spray shall be cleaned up at the Contractor's expense to the satisfaction of the City.

02920-4.04 NOTIFICATION AND INSPECTION

- A. Inspection: Provide notice to Owner's Representative requesting inspection at least 7 days prior to anticipated date of completion of each phase.
- B. Deficiencies: Owner's Representative will specify deficiencies to Contractor who shall make satisfactory adjustments and shall again notify Owner's Representative for final inspection,

02920-4.05 CLEANING

- A. General: Remove debris and excess materials from site. Clean out drainage inlet structures. Clean paved and finished surfaces soiled as a result of work under this section, in accordance with direction given by Owner's Representative.

02920-4.06 PROTECTION

- A. General: Provide and install barriers (temporary construction fencing per specifications) as required and as directed by Owner's Representative to protect completed areas against damage from pedestrian and vehicular traffic until acceptance by Owner. Contractor is not responsible for malicious destruction caused by others.

02920-4.07 WARRANTY

- A. Contractor to warrant for a period of two years that puddling, sinking or caving directly due to earthwork operations does not occur.

02920-4.08 MEASUREMENT AND PAYMENT

Payment for Sport Field Fine Grading and Soil Preparation work will be made as part of the contract square foot price and no additional compensation will be allowed, and shall include, but not be limited to: coordination with the suppliers for purchase, delivery, receipt and inspection of, storage and installation of all drainage system and soil preparation components as specified, and all other materials and work appurtenant to the plans and this specification, complete in place.

**02930 SPORTS FIELD AND ALL SURROUNDING TURF AREA MAINTENANCE**

02930-1 GENERAL

02930-1.01 SUMMARY

- A. Furnish all labor, materials, facilities, transportation and services to complete all landscape maintenance and related work as shown on the Drawings and specified herein.
- B. Scope of work:  
The general extent of landscape maintenance can include, but may not be limited to the following:
  - 1. Turf and Planting areas
  - 2. Irrigation systems
  - 3. General site clean-up

02930-1.02 REFERENCES AND REGULATORY REQUIREMENTS

- A. State of California Department of Transportation Standard Specifications, Current edition.

02930-1.03 QUALITY ASSURANCE

- A. Control of work: Comply with Section 5 of the Standard Specifications.
- B. Control of materials: Comply with Section 6 of the Standard Specifications.
- C. The Maintenance Contractor shall be experienced in horticulture and landscape maintenance, practices and techniques, and shall provide sufficient number of workers with adequate equipment to perform the work during the Landscape Maintenance Period.

2930-1.04 MAINTENANCE PERIOD

Sports Field and Extended Turf Area Maintenance Period shall be **90** calendar days (MINIMUM).

- A. Continuously maintain the entire project area during the progress of the work, during the specified Landscape Maintenance Period or until Final Acceptance of the project by the City's Representative.
- B. Landscape Maintenance Period shall not start until all elements of construction, planting and irrigation for the entire project are in accordance with Contract Documents. A prime requirement is that all turf and landscape areas shall be planted and that all turf areas shall show an even, healthy stand of "sod-like" turf which shall have been mowed three times per week through the grow-in. If such criterion is met to the satisfaction of the Owner's Representative or the City, a written notification shall be issued to establish the effective beginning date of Landscape Maintenance Period. Additionally, all elements contained on the Pre-maintenance Punch-list shall have been completed to the satisfaction of the Owner's Representative and/or City. The Landscape Maintenance period shall, per the discretion of the Owner's Representative and/or City, be allowed to start and finish at different times in different areas as applicable.
- C. Any day of improper maintenance, as determined by the Owner's Representative or City, shall not be credited as an acceptable Landscape Maintenance Period day. The Landscape Maintenance Period shall be extended on a day-for-day basis should this occur until proper maintenance, as determined by the Owner's Representative, is being performed.

- D. Contractor shall secure the project site against trespass, vandalism or theft during the Landscape Maintenance Period subject to the discretion of the Owner's Representative.

02930-1.05 GUARANTEE

- A. All work executed under this section shall be guaranteed against any and all poor, inadequate or inferior materials and/or workmanship, as determined by the Owner's Representative, for the entire Landscape Maintenance Period and for a period of one year after Final Acceptance of project.
- B. The contractor shall install all replacement material in conformance with the Contract Documents.

02930-1.06 FINAL ACCEPTANCE

- A. Upon completion of all project work, including Landscape Maintenance Period, the City's Representative will, upon written request from the contractor (2 working day minimum notice), make an observation to determine conformance with the Contract Documents.
- B. If, at the final project observation, work is found at variance with the Contract Documents, or is otherwise unacceptable, the Owner's Representative shall issue a punch-list of items requiring attention to the contractor. The contractor shall repair, replace or otherwise correct all non-compliant work, continue Landscape Maintenance Period, and make another written request to the Owner's Representative to verify punch-list completion. If punch-list is found to be incomplete, or if site is still found to be unacceptable, the contractor shall be back-charged as necessary for all additional observations required to issue Final Acceptance. All replacement materials and installations shall be in accordance with the Contract Documents. Remove rejected work and materials immediately from project. Prior to Final Acceptance, contractor shall provide the Owner's Representative with all Record Drawings and written Guaranty Statements in accordance with the Contract Documents.

02930-2 PRODUCTS

02930-2.01 MATERIALS

- A. All materials used shall either conform to Specifications in other sections or shall otherwise be acceptable to the Owner's Representative. The Owner's Representative shall be given a monthly record of all pre-approved herbicides, insecticides and disease control chemicals used.
- B. Maintenance fertilizer: shall be UAN 32 liquid fertilizer applied through the fertigation system.

02930-3 EXECUTION

02930-3.01 MAINTENANCE

- A. General: Proper maintenance, including watering, weeding, mowing, edging, fertilization, repairing and protection shall be required until entire project is finally accepted, but in any event for a period of not less than the specified Landscape Maintenance Period.
- B. Watering: Water appropriately (based on plant type) to insure vigorous and healthy growth until work is accepted. Water or irrigate in a manner to prevent runoff or erosion. When hand watering, use a "water wand" to break the water force.

- C. Weeding: Entire project site shall be kept free of weeds at all times. Control new weed growth with pre-approved pre-emergent herbicides. If weeds develop, use legally approved herbicides.
  - 1. No herbicide shall be used without the Owner's Representative prior consent. Use only herbicides in accordance with manufacturer's recommendations. If selective herbicides are used, extreme caution shall be observed so as not to damage any other plants. Spraying shall be done only under windless conditions.
  - 2. Disease and Pest Control: Disease and insect damage shall be controlled by the use of fungicides and insecticides, subject to the prior consent of the Owner's Representative. Mole and gopher mitigation shall be accomplished using legal means other than poison baits.
- D. Protection: The contractor shall maintain protection of all planting areas until Final Acceptance. Damaged areas shall be repaired or replaced at the contractor's expense. Install a temporary maintenance fence (4' blaze orange with steel driven stakes or acceptable equal) around all turf areas for the entire length of Landscape Maintenance Period.
- E. Trash: Remove trash in all project areas plus adjacent pedestrian walkways and parking areas.
- F. Replacement: Refer to the Guaranty portion of this Section.
- G. Fertilizing: Immediately after completion of planting, fertilize all turf planting areas with specified maintenance fertilizer at rates specified to be applied through the fertigation system until end of specified Landscape Maintenance Period.

02930-3.02 TURF MAINTENANCE

- A. Current cultural management practices may be modified in accordance with tissue test results or environmental conditions. Fertilizer composition, rate, and/or source may be adjusted based on current soil and tissue test results and existing environmental conditions.
- B. The following list represents the minimum required data that must be recorded in a field operations log:
  - 1. Chemical application logs – All labels, application rates, equipment used to apply chemicals shall be kept in the maintenance log. Chemicals shall include all fertilizers, bio-stimulants, growth regulators, and pesticides.
  - 2. All cultural maintenance activities such as mowing, verification, topdressing, sample collection and seeding shall be recorded.
- C. Irrigation applications – Any use of the irrigation system should be documented as to zones used, duration of application, and any problems with coverage or system components.
- D. System repair logs for each system must be maintained. Record replaced or repaired items such as irrigation heads and valves, or any drainage components in the appropriate system repair log.
- E. The City will not assume maintenance of the turf until after the dates specified and after the turf has been inspected and approved by the City Representative. The Contractor shall be responsible for maintenance.

- F. The Contractor shall be responsible for the performance and operation of the playing field system during the construction, maintenance periods and until final acceptance. The Contractor shall keep a technically qualified man on site and maintain adequate labor, equipment and supplies in reserve to immediately repair the system or components in the event of any deficiency or failure, during the interim maintenance period.
- G. Contractor shall provide all operations necessary to maintain the field through the date of acceptance. The following list of items represents the minimum operations necessary to maintain the fields. Maintenance items should, at the minimum, include:
1. Mowing: Turf will be cut with a dedicated driven rotary mower. Cutting height will be determined by environmental conditions, condition of sod, and time of year or activities. Turf height will be maintained using only sharp, equipment capable of cutting heights of .5 to 1.25 inches. The initial cutting or subsequent cuttings will remove not more than 1/3 of the grass leaf. Turf will be maintained to a neat appearance.
  2. Aerification: The turf aerification during the maintenance period after full turf establishment shall be on an as needed basis to reduce compaction. The turf will be aerified to a depth not greater than 6" using slicing tines on a 5 inch grid pattern.
  3. Fertilization: Apply through fertigation system at rates specified through the grow-in.
  4. Weed and Pest Control: The Contractor is to maintain the turf free from disease and infestation. Required treatments will be made according to the needs of the field as determined by the Owner's Representative. Comply with applicable requirements of Federal, State, and Local laws, regulations and codes having jurisdiction over chemical treatments. The contractor is to apply suitable preventative or post infection fungicides to protect the quality of the turf. Special attention shall be required during the seedling establishment period for damping off diseases.

#### 02930-3.03 TURF ACCEPTANCE

- A. The Owner's Representative will inspect the turf at the end of each day. Unacceptable turf will be removed and replaced the following workday. Daily approval does not guarantee final acceptance. Final acceptance will follow Owner's Representative's final approval of the punch list and the following criteria:
1. Turf has rooted into the rootzone mix to a depth of six inches (6") and has formed a mature sod mat.
  2. Turf is free of dead or bare spots in excess of 3 square inches.
  3. Soil and plant tissue fertility test results indicate all constituents are within target values.
  4. Maintenance log is complete and all equipment manuals and documentation delivered to the owner.

#### 02930-3.04 IRRIGATION SYSTEM

- A. System Observation: The contractor shall visually check all systems for proper operation on a weekly basis and make all necessary repairs. All equipment shall be adjusted as necessary for proper coverage and function.
- B. Controllers: Program automatic controllers for appropriate seasonal water requirements.

#### 02930-3.05 FIELD QUALITY CONTROL

- A. Final Review: At, or near the end of specified Landscape Maintenance Period, the contractor shall make written request for a final review and the work shall be reviewed for conformance with the Construction Documents. If work is not accepted at time of review, a punch-list of items requiring attention will be issued to the contractor for correction. The Landscape Maintenance Period shall be extended at contractors sole cost as necessary. Upon completion of the punch-list the contractor shall again make written request for review. If, upon re-visiting the site, it is found that the punch-list has not been completed, the review shall end and the contractor shall be back-charged for all additional visits.
- B. All re-inspections required due to contractor not being prepared or non-conformance with the Construction Documents shall be back charged to the contractor.
- C. Final Acceptance: When work is found to be in conformance with the Contract Documents, subject to the discretion of the Owners Representative, a statement of Final Acceptance shall be issued to the contractor.

#### 02930-3.06 MEASUREMENT AND PAYMENT

Payment for Sport Field Maintenance work will be made as part of the contract lump sum price, and no additional compensation will be allowed.

#### **END OF SECTION**

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## **SECTION 02445 - TEMPORARY CONSTRUCTION FENCING**

### **1.01 TEMPORARY COSTRUCTION FENCING: (Bid Area 1)**

Install a 6' tall (min.) temporary construction fence prior to beginning any site work, at the perimeter of work per the construction/project plans. The fence shall be chain link (new or used), free of openings or breaks in the fabric, with fence posts at 10' O/C maximum. The fence shall be maintained in place throughout the construction phase period through to the end of the ninety (90) day (minimum)landscape maintenance period. Install ANo Trespassing@ signs minimum 50' o.c. The temporary fence shall be removed prior to final inspection/project acceptance at the end of the maintenance period as directed by the City.

### **1.02 TEMPORARY COSTRUCTION FENCING: (Bid Area 2)**

Install a 4' tall (min.) temporary construction fence prior to beginning any section of mainline replacement work, at the perimeter of work per the construction/project plans and as agreed to by the City of Beverly Hills. The fence shall be Orange Plastic (new or used), free of openings or breaks in the fabric, with temporary fence posts at 10' O/C maximum. The fence shall be maintained in place throughout each section of main line replacement until the constructed section is deemed complete and safe to remove/relocate the fence material to the next section of work. Install A Caution/No Trespassing@ signs minimum 50' o.c. The temporary fence shall be removed prior to final inspection/project acceptance at the end of the mainline replacement period as directed and approved by the City.

**END OF SECTION**

Temporary Chainlink Fence.doc