SPECIAL PROVISIONS
AMENDMENTS TO THE "GREEN BOOK"
STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION

PART 2 CONSTRUCTION MATERIALS

SECTION 212 LANDSCAPE AND IRRIGATION MATERIALS

212-1 LANDSCAPE AND IRRIGATION MATERIALS

Add the following section:

212-1.0 CITY OF SAN MARCOS APPROVED MATERIALS LIST

Landscape materials supplied to the project shall comply with the City of San Marcos Approved Materials List. Substitutions are not allowed.

212-1.1 TOPSOIL

212-1.1.1 General Add the following:

Topsoil for the project, when specified, shall be designated as Class A (imported).

212-1.2 SOIL AND FERTILIZER AND CONDITIONING MATERIALS

212-1.2.1 General Add the following:

When required by the engineer, the contractor shall furnish a Certificate of Compliance stating that the material supplied to the project complies with the specifications.

212-1.2.2 Manure Delete this section.

212-1.2.3 Commercial Fertilizer Add the following:

Commercial fertilizer shall be a slow release pelletized or granular product with a nutrient release over and eight to twelve month period, and shall have a chemical analysis as specified herein. Commercial fertilizer shall be free-flowing material delivered to the project site in unopened sacks. Material which becomes cakes or otherwise damaged shall not be used.

Ingredient	Percentage
Nitrogen	16% – 21%
Phosphoric Acid	6% - 8%
Water Soluble Potash	4% - 10%

212-1.2.4 Organic Soil Amendment Delete this section and add the following:

Organic soil amendment shall be a ground or processed wood product derived from redwood, fir or cedar sawdust or from the bark of fire or pine, treated with a non-toxic agent to absorb water quickly, and shall comply with the following requirements:

TABLE 212-1.2.4 (A)

Gradation: Sieve Size	**Percent Passing (minimum)**
6.3 mm (1/4 inch)	95%
2.36 mm (No. 8)	80%
500 µm (No. 35)	30%

Nitrogen Content	(%, dry weight)
Redwood	0.4 – 0.6%
Fir	0.56 – 0.84%
Cedar	0.56 – 0.84%
Fir Bark	0.8 – 1.2%
Pink Bark	0.8 – 1.2%

Salinity

Maximum saturation extract conductivity: 2.50 millisiemens per centimeter (6.35 milliohms/inch) at 25˚C (77˚F).

Wetability

When one teaspoon of tap water is applied to four cubic inches (volumetric ration of 1:15) of the air-dry product, the material shall become completely damp in a period not exceeding two minutes. Any wetting agent shall be guaranteed to be non-phytotoxic at the rate used.

212-1.2.5 Mulch Modify as follows:

Mulch shall be as designated in accordance with the requirements herein. Mulch shall be from a bulk source approved by the engineer in advance of delivery to the work site.

Type 1 mulch (ground wood product) shall comply with the requirements for Type 1 organic soil amendment.

Type 5 mulch (fir back chips) shall be fir bark chips in the gradation specified.

Type 6 mulch (straw) shall be with threshed new straw or stable bedding material derived from rice, oats or barley. Straw in advanced state of decomposition will not be accepted.

212-1.4 PLANTS

212-1.4.2 Trees Add the following:

Trees supplied to the project shall meet the minimum standards established by the American Association of Nurserymen and the following criteria:

1. Trees shall have a straight trunk with symmetrical crown.
2. Trees shall have a substantial, single, central leader.
3. Tree bark shall not be discolored, sunken, or swollen. Cuts or scrapes measuring 1/8 of the trunk circumference or greater will not be accepted.
4. Trees showing galleries, sun scald, or frost damage will not be accepted.
5. The caliper of the tree shall be in proportion to the rootball.
6. No branches shall extend from the truck at a vertical angel greater than 45˚.
7. Trees with girdling roots wrapping around the truck will not be accepted.
8. Tree trunks with more than 10 percent off center will not be accepted.
9. Trees shall be free of crossing branches and branches growing too close to one another.
10. Freshly pruned trees will not be accepted.

Add the following section:
212-1.4.3 Excavating Adjacent to Trees

Extreme caution shall be exercised when excavating within the drip line of all trees. The use of an air spade or hand-digging is permitted; however no mechanical trenching shall be allowed. All proposed excavation shall be marked out by the contractor and approved by the City's representative prior to the start of the work.

Add the following section:
212-1.6 EROSION CONTROL MATTING

Erosion control matting shall be made of 100 percent biodegradable, weed-free wheat start of thickness and density yielding 270 grams per square meter (0.50 lb/sy) with photodegradable polypropylene netting with a density of 0.89 grams per square meter (1.64 lb/1,000 sy) having an approximate mesh interval of 50 mm by 50 mm (two inches by two inches) on each face of the straw mat. The straw mat shall be sewn together with unidirectional lines of cotton or polypropylene thread spaced approximately 50 mm (two inches) apart. Erosion control matting shall be "North American Green DS150", "BonTerra S2" or approved equal.

Add the following section:
212-1.6.1 Erosion Control Mat Staples

Erosion control mat staples shall be 25 mm by 150 mm (one inch by six inches), "U" shaped, 11-gauge mile steel staples.

212-2 IRRIGATION SYSTEM MATERIALS

Add the following section:
212-2.0 CITY OF SAN MARCOS APPROVED MATERIALS LIST

Irrigation materials supplied to the project shall comply with the City of San Marcos Approved Materials List. Substitutions are not allowed.

212-2.1 PIPE AND FITTINGS

212-2.1.4 Plastic Pipe for Use with Rubber Ring Gaskets Delete this section.

Add the following section:
212-2.1.7 Brass Pipe and Fittings

Brass pipe shall be IPS standard weight 125 lb 85 percent copper and 15 percent zinc, trade designation seamless red brass pipe conforming to the requirements of ASTM B43-91. Brass pipe fittings and connections shall be standard 125 lb class 85 percent red brass fittings and connections.

212-2.2 VALVES AND VALVE BOXES

212-2.2.7 Valve Boxes Add the following:

All valve boxes shall be branded with two inch "RCV", "BV" OR "QC", "PB" respectively. In addition, remote control valves shall be branded with two inch station numbers. RCV boxes shall have locking covers. Other boxes such as pull boxes, etc., shall be marked with appropriate identification.

Valve box size for any particular application shall be approved by the Public Works Department.

Add the following section:
212-2.2.8 Ball Valves

Ball valves in size of two inches and smaller shall be all bronze double disc wedge type with integral taper seats and non-rising stem.

Ball valve sizes greater than two inches shall be resilient wedge, brass construction, as manufactured by Clow.

Ball valves shall have bottom-loaded pressure-retaining stems, glass-reinforced seats, and reinforced TFE stem packing seals. Valve sizes 13 mm (1/2 inch) to 50 mm (two inches) shall be pressure rated at 4140 kPa (600 psi) WOG and 1030 kPa (150 psi) saturated steam. Each valve shall be tested, air under water, in the opened and closed position by the manufacturer. Ball

valve must conform to Federal Specification WW-V-35B, Type II, Class A, Style 3, End Connection A or C.

Add the following section:
212-2.2.8 Pressure Regulator Valve

Pressure regulating valves for drip irrigation systems shall conform to the following:

1. Regulate and maintain constant outlet pressure between 15 and 100 psi (1.0 to 6.9 bars) within +/- 3 psi (+/- 0.2 bars).
2. Have an adjustment knob which permits fine-tune setting in 1/3 psi (0.02 bars) increments.
3. Have an ergonomic design with snap-tight cover to prevent vandalism.
4. Have a waterproof dial cartridge to eliminate fogging and binding.
5. Corrosion-resistant, glass-filled nylon for rugged performance.
6. Operate in up to 200 psi (13.8 bars) and temperatures up to 150˚ F (66˚C).
7. Regulate pressure from 15 psi to 100 psi (1.0 to 6.9 bars).
8. Be accurate to +/- 3 psi (+/- 0.2 bars).
9. Brass construction.

212-3 ELECTRICAL MATERIALS

212-3.1 GENERAL Add the following:

All electrical materials shall conform to the requirements of the approved National Electrical Code in effect at the time of bid.

212-3.2 CONDUIT AND CONDUCTORS

212-3.2.2 Conductors Add the following:

Low voltage electric wiring running from control to the automatic control valves shall be no smaller than No. 14 solid single conductor, copper wire, 0.015 mm (60 mil) insulation, 0.015 mm (60 mil) neoprene jacket, style UF (Direct Burial), or equal, color code wires to each valve. Neutral wires shall be white, no smaller than No. 12 solid single conductor wire, 0.015 mm (60 mil) insulation, 0.015 mm (60 mil) neoprene jacket, style UF (Direct Burial).

Add the following section:
212-3.4 IRRIGATION ELECTRICAL SERVICE EQUIPMENT AND ENCLOSURES

Electrical service equipment shall incorporate the following elements:

1. One, 100-amp, 120/240-volt, single-phase load center, as approved by the engineer.

2. One, 100-amp rated commercial meter socket suitable for the San Diego Gas and Electric Company meter, with provision for test block bypass having a UL listing and EUSERC approval.
3. One, 15-amp circuit breaker for each irrigation controller energized by the service.
4. One, 20-amp circuit breaker for the duplex receptacle.
5. The design, assembly, grounding, wiring and components of the irrigation electrical service equipment and enclosure shall meet the requirements of the approved National Electrical Code at the time of bid.
6. Electrical service equipment shall be enclosed in a cabinet constructed entirely of anodized aluminum; anchoring points shall be inside the enclosure.
7. The cabinet shall have an aluminum or 304 stainless steel interior bulkhead separating the 120/240-volt electrical service section from the irrigation controller section.
8. No wood components shall be used in the enclosure.
9. Each section of the cabinet shall have full front opening doors with piano hinges, integral key lock and haps and staple, or other provision, for padlock.
10. The cabinet shall be provided with cross-flow ventilation. Ventilation openings shall be located and designed to preclude rain, irrigation splash, vermin and insects from entering the cabinet.
11. The controller side door shall have provision for mounting control schematics without the use of adhesives of fasteners. The service side door shall have a clear acrylic plastic window to allow the electrical meter to be read.
12. Concrete footings and pads supporting the electrical service equipments shall be 520-C-2500 and shall be no less than 12 inches thick.
13. Anchor bolts to secure the service equipment to the concrete pad shall be 10 mm (3/8 inch) diameter by 150 mm (six inches) long, hot dip galvanized or stainless steel headed bolts with washers, without sleeves, conforming to section 304-1.7. Anchor bolts to secure the service equipment to the concrete pad shall be embedded in the concrete slab between 65 mm (2 ½ inches) and 100 mm (four inches).
14. Base of meter pedestal to be sealed with polyurethane caulking.

SECTION 308 LANDSCAPE AND IRRIGATION INSTALLATION

308-2 EARTHWORK AND TOPSOIL PLACEMENT

308-2.3 TOPSOIL PREPARATION AND CONDITIONING

308-2.3.2 Fertilization and Conditioning Procedures Add the following:

The contraction shall cultivate the surface of all areas to be planted or hydroseeded by discing, ripping or scarifying the finish grade. After cultivation, the contractor shall clear the planning areas or stones to the depth of cultivation and shall rake the planting areas to a smooth friable and plantable surface. The contractor shall cultivate all planting areas, except slopes steeper than 3-1/2:1 (horizontal to vertical), to a depth of 12 inches. The planting areas that are slopes steeper than 3-1/2:1 shall be cultivated to a depth of six inches.

308-2.4 FINISH GRADING Add the following:

The contractor shall prepare the finish grade in hydroseed slope areas with a moderately rough texture to provide a suitable surface for adherence of the hydroseed mix.

Change section title as follows:
308-3 HEADER AND ROOT BARRIER INSTALLATION

Add the following section:
308-3.1 ROOT BARRIERS

Root barriers are required for all trees planted within 10 feet of all hardscape improvements such as, but not limited to: tree wells in paved areas, walks, walls, curbs, roads, brown ditches, drainage structures, etc.

Root barriers shall be installed in accordance with the manufacturer recommendations and these specifications.

308-4 PLANTING

308-4.1 GENERAL Add the following:

The contraction shall perform actual planting during those periods when weather and soil conditions are suitable and in accordance with locally accepted horticultural practice and as approved by the engineer. No planning shall be done in any area until it has been satisfactorily prepared in accordance with these specifications. Soil moisture level prior to planting shall be no less than 75 percent of field capacity. The contractor shall obtain engineer approval of planting pits before planting operations being. For pit planted vegetation when the soil moisture level is found to be insufficient for planting, the contractor shall fill the planting pits with water and allow them to drain before starting planting operations. No more plants shall be distributed in the planting area on any day then can be planting and watered on that day. The contractor shall plant and water all plants as herein specified immediately after removal from their containers. Containers shall not be cut prior to placing the plants in the planting area.

All plant material shall meet the minimum standards set by the American Association of Nurserymen and these specifications.

308-4.2 PROTECTION AND STORAGE Add the following:

The contractor shall provide a sheltered and secure location for on-site plant storage for engineer approval prior to the delivery of any plant materials. Any plant determined by the engineer to be wilted, broken or otherwise damaged, shall be rejected at any time during the

project, whether in the ground or not. All plants shall be handled by their containers. Any plant that has been handled by its trunk or stem shall be rejected. All rejected plants shall be removed from the site immediately.

308-4.3 LAYOUT AND PLANT LOCATION Modify as follows:

Planting areas shall be staked by the contractor and the contractor shall obtain engineer approval of the planting layout before planting operations begin.

Trees and shrubs shall not be planted within five feet of irrigation head (excluding bubblers) for all slope applications.

Change title and add the following:
308-4.7 VINE PLANTING

Soil preparation and fine grading shall be completed prior to planting. Vines shall be planted in moist soil and spaced as indicated on the planes.

Following planting, vine areas shall be regraded to restore smooth finish grade and to ensure proper surface drainage. A four inch layer or Type 1 or Type 5 mulch shall be spread over the planted areas. Watering shall begin immediately following mulching.

Vines shall be splayed and tied to walls, fences, etc., in the manner prescribed on the plans or approved by the engineer. Temporary staking shall be removed at the end of the plant establishment period.

Add the following section:
308-4.10 EROSION CONTROL MATTING INSTALLATION

Add the following section:
308-4.10.1 General

Before installation of erosion control matting, the contractor shall complete all soil preparation, fine grading and hydroseeding of the areas to receive erosion control matting. All other plant material shall be planted through the matting.

Add the following section:
308-4.10.2 Coordination with Hydroseeding

Erosions control matting shall be installed by the contractor immediately after the first application of hydroseed materials. In all cases, the contractor shall place the erosion control matting within three days after the first hydroseed material application. Should any seed in the hydroseed materials begin to germinate within the three-day period after application or before the installation of the erosion control matting, the installation of the erosion control matting

shall be considered later and the contractor shall disc the hydroseed materials into the top 100 mm (four inches) of the underlying soil, condition the soil for hydroseeding, apply hydroseeding materials at the rates and of the type specified, and then install the erosion control matting. Additional hydroseeding applications due to late installation of matting shall be at the expense of the contractor.

Add the following section:
308-4.10.3 Installation

The contractor shall install erosion control matting using the following techniques:

1. Begin at the top of the slope by placing the erosion control matting into a 150 mm (six inches) wide by 150 mm (six inches) deep trench with the end of the matting laid flat in the bottom of the trench.
2. Anchor the end of the erosion control matting with erosion control mat staples spaced no more than 300 mm (twelve inches) on centers placed at the intersection of the bottom and the downhill vertical face of the trench.
3. Roll the erosion control mattering down the slope.
4. Staple the erosion control matting on an alternating grid consisting of three across and two across lines of staples in horizontal lines spaced 900 mm (three feet) on centers.
5. Erosion control mat so stapled shall be spaced such that no less than 1 ¾ staples per square meter (1 ½ staples per square yard) are provided to anchor the erosion control matting.
6. Start the adjacent erosion control mat as in Item 1 of this section, overlapping the previously placed mat by no less than 50 mm (two inches).
7. Staple placement may be such as to use the staples to secure the adjacent mat to secure both mats along their edges.

308-5 IRRIGATION SYSTEM INSTALLATION

308-5.1 GENERAL Add the following:

Existing irrigation facilities that are being connected to new facilities shall be checked for missing or damaged components and proper operation in the presence of the engineer prior to performing new irrigation system work and at least once every 30 days thereafter until completed work is accepted. A written list of existing irrigation system deficiencies shall be submitted to the engineer within two working days after initially checking the existing facilities. Failure by the contractor to submit a list of deficiencies within the specified time frame shall constitute contractor declaration that the system is in working order and free of defects.

308-5.2 IRRIGATION PIPELINE INSTALLATION Add the following:

The contractor shall not backfill any lines until such time as they have been tested, inspected and approved by the engineer for tightness, quality of workmanship and materials.

308-5.2.3 Plastic Pipeline Add the following:

The contractor shall store all pipe and fittings under cover until used, and all pipe and fittings shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subjected to undue bending or concentrated external load at any point. Pipe ends and fittings shall be wiped with MEK, or equal, before welding solvent is applied. Welded joints shall be given a minimum of 15 minutes to set before moving or handling. All field cuts shall be beveled to removed burrs and excess before fitting and gluing together. The contractor shall center load pipe with small amount of backfill to prevent arching and slipping under pressure. Joints shall be exposed for inspection during testing. Plastic-to-plastic joints shall be solvent-welded using only solvent recommended by pipe manufacturer.

Add the following section:
308-5.2.6 Installation of Brass Pipe

The contractor shall cut brass piping by power hacksaw, circular cutting machine using an abrasive wheel, or hand hacksaw. No piping shall be cut with metallic wheel cutter of any description. The contractor shall ream and remove rough edges or burrs on all pipe so that smooth and unobstructed flow is obtained, place Teflon tape, Teflon dope, or approved equal on male threads only, and tighten to prevent any leakage. The contractor shall tighten screwed joints with tongs or wrenches. Caulking is not permitted.

308-5.3 INSTALLATION OF VALVES, VALVE BOXES, AND SPECIAL EQUIPMENT Add the following:

The contractor shall install quick couplers at 150 feet maximum spacing.

The contractor shall install each control valve in a separate valve box with a minimum of 12 inches separation between valves and six inches from any fixed object or structure.

The contractor shall install no more than one valve per box.

All valve box lids shall be marked with two inch letters/numbers by “branding” method identifying the type of valve and the controller station numbers.

Add the following section:
308-5.3.3 Backflow Preventer

The contractor shall install backflow preventer assembly in accordance with manufacturer specifications and the contract documents. Exact location and positioning shall be approved by the engineer.

308-5.4 SPRINKLER HEAD INSTALLATION AND ADJUSTMENT

308-5.4.1 General Delete this section and add the following:

In accordance with the requirements of Section 308-5.6, all mains, laterals and irrigations lines, including risers, shall be flushed and pressure tested before installing sprinkler heads and drip emitters, after which a water coverage test shall be performed.

308-5.4.2 Location, Elevation and Spacing Delete this section and add the following:

Sprinkler head and drip emitter spacing shall not exceed the maximum shown on the drawings or recommended by the manufacturer.

Pop-up type sprinkler heads are required within 10 feet of walkways, roads, trails, walls, fences, concrete drainage ditches and toe of slopes.

Shrub heads, bubbler heads and oscillating sprinklers shall be installed six inches above finish grade.

Nozzle lines shall be installed at least 12 inches above finish grade. Sprinkler head projecting above finish grade shall be at least 24 inches from adjacent curbs, walks, paving and similar improvements.

Drip irrigation tubing shall be placed at grade and shall be tested and inspected before being covered with four inches of Type 1 or Type 5 mulch.

Trees shall be irrigated with their own, independent, pop-up bubbler system or drip system.

308-5.4.4 Sprinkler Head Adjustment Add the following:

The contractor shall flush and adjust all irrigation heads and valves for optimum performance and to prevent overspray on walks, roadways, buildings, walls and other structures.

Add the following section:
308-5.4.5 Drip Emitter Adjustment

When all drip emitters are installed and the irrigation system in operating, each unit shall be adjusted and balanced, with all section control valves fully open to obtain uniform and adequate coverage.

308-5.5 AUTOMATIC CONTROL SYSTEM INSTALLATION Add the following:

The contractor shall install all portions of the electrical installation with materials and methods conforming to the requirements of the approved National Electrical Code in effect at time of

bid. The contractor shall provide no less than one control wire and one common ground wire to service each valve in system.

308-6 MAINTENANCE AND PLANT ESTABLISHMENT Delete paragraphs three, five and six, and add the following:

The City of San Marcos is enrolled in the Maxicom2 Dollars Program and as such, received a rebate for all Rain Bird equipment installed on sites they own. In order to property determine and account for these purchases, the contractor shall provide copies of all invoices or itemized purchase reports from the contractor distributor that pertain to purchases of Rain Bird equipment required by and installed on the project. The invoices or itemized purchase reports shall match the total installed quantities for the project. It shall not be necessary for the contractor to demonstrate their pricing on the invoices, only quantities. All of the aforementioned invoices shall be provided, along with other close out documents, to the City of San Marcos, Public Works Department prior to commencement of the City irrigation and landscape maintenance period.

The following items are required to receive the Rain Bird Installation and Verification and Warranty Verification: Maxicom2 Central Control Systems, Rain Bird Weather Stations, Rain Bird Cluster Control Units, Rain Bird Site Satellites and Rain Bird Satellites. Prior to final acceptances of the project, the contractor shall be responsible for contacting and coordinating installation verification for any and all of the aforementioned products required by and installed on the project. Prior to starting work on the project, the contractor shall contact Rain Bird Services Corporation (RBSC) and conduct an onsite meeting with the Public Works Department and a representative of RBSC to coordinate all required verification services in a timely manner. Prior to final commencement of the maintenance period, the contractor shall provide proof of installation verification of all required equipment by RBSC to the City of San Marcos.

308-7 GUARANTEE Add the following:

The contractor shall guarantee all 15 gallon and larger trees installed under the contract to live in a healthy state and grow for one year from the day of the final acceptance of the contract work. The engineer shall be the sole judge as to the condition of the plant material.

308-8 PAYMENT Add the following:

The lump-sum or unit prices set forth in the contract documents shall include, but are not limited to: full compensation for furnishing all labor, materials, tools and equipment and performing all work necessary to complete, maintain and guarantee the planting and irrigation work described or specified in the contract documents, including soils testing and recommended soil amendments, seed and hydroseed slurry, tree stakes, bark mulch, erosion control matting, plant materials, temporary irrigation and permanent irrigation, including reduced-pressure backflow preventer, ball valves, drip valve assembly, electric control valves, quick couplers, control wires, pull boxes, valve boxes, all piping and sleeves, electrical conduits,

irrigation heads, drip emitters, bubblers, drip irrigation equipment, connection from electrical service to irrigation electrical meter, connection from meter to irrigation controller(s), installation of controller enclosure, concrete pads, assembly and submittal of the checklist and operation and maintenance manuals and all appurtenances to the aforementioned items, as well as any maintenance effort required until the City takes over maintenance and project guarantees.