SECTION 8
PARKS & RECREATION
SPECIFICATIONS

SUBSECTION 8.01
LANDSCAPING MATERIALS

I. SCOPE

A. All plants shall be top grade nursery stock, balled and burlapped or container grown except where noted otherwise; and in the varieties, quantities, and sizes called for in the plant list. All plants shall be first quality, symmetrical, and well filled.

B. All plants shall meet the current general standards specified in "American Standards for Nursery Stock" as published by the American Association of Nurserymen, Inc.

C. All plants shall have been root pruned and sheared or pruned as necessary in the nursery to give good, general conformation.

D. Plants shall not show evidence of stunting or crowding in the nursery.

E. All plants shall be free of insects and/or disease.

F. All plants not meeting the specifications as outline above shall be rejected by the SUPERINTENDENT, and shall be replaced with suitable plants of the same variety at the Contractor's total expense.

NOTE: All trees shall be guaranteed to live one year after planting.

G. No trees or turf should be planted during seasonal conditions that could affect the future quality of the plants.

II. MATERIALS

A. TREES

1. **Quality:** All trees shall be top quality stock, straight trunked, symmetrical, and of sizes called for on the plans.

2. **Caliper Measurements:** Where tree sizes are specified by caliper, the measurements shall be made as follows:
a. Deciduous trees - Six (6) inches above ground.
b. All deciduous trees a minimum of two (2) inch caliper.
c. All Evergreen trees a minimum of five (5) feet tall.

B. GRASS SEED

Grass seed for lawn shall be a mixture made up as follows, approximately:
1. 25% Rebel Fescue, 90% germination.
2. 25% Falcon Fescue, 90% germination.
3. 25% Hound Dog Fescue, 90% germination.
4. 23% Victa Kentucky Bluegrass, 87% germination.
5. Other Ingredients: 0.00% Crop, 2% Inert Matter, 0.00% Weeds (non-noxious)

NOTE: There cannot be any noxious weed seed present. This seed shall have been tested for germination within nine months prior to seeding. Each container of seed with attached labels shall be inspected to verify the above specifications. This shall be done prior to mixing. All seed shall be thoroughly mixed before application.

C. FERTILIZER
1. Commercial Fertilizer
2. Granular 18-24-6 analysis plant food.
3. Root activator such as Green Light (5-20-10) or approved equal.

III. CONSTRUCTION METHODS

A. PLANTING OF TREES

1. **Sizes:** Trees shall be of sizes and varieties called for on the plans, and shall generally be planted according to the plans. The Park Superintendent shall be the authority to move tree locations in the field prior to holes being dug in order to better take advantage of terrain or other influences which may become apparent in the field.

2. **Staking:** Prior to planting any tree, the Contractor shall stake the location of each tree, and obtain the Superintendent's approval in writing before proceeding with digging of the holes.

3. **Digging holes for ball and burlap:** Excavate hole for tree at least eight inches larger in diameter and depth than tree ball or root system. Excavated material shall be replaced with soil mixture for trees as specified.

4. **Planting ball and burlap trees:** Refill hole approximately eight (8) inches, place ball in center of hole with tree perpendicular to ground. Add three (3) more inches of soil.

Fill the remainder of the hole with a root activator mixture such as Green Light. When root activator has soaked in, fill to one (1) inch above top of ball with soil. Use garden hose to punch down into soil for better settling. Add needed amount of soil to bring level back up to top of ball. Re-water after filling. The area around each tree shall be hand raked and all excess dirt hauled off. A two (2) inch deep, four (4) foot diameter depression shall be left around each tree. No raised dirt ring shall be accepted!!!

> **NOTE:** Settling of soil shall be done with a garden hose or similar method. It shall not be stamped down or packed.

B. LAWN SEEDING

Definition:

1. **Finish Grading:** This contract shall include the finish of "Fine" grading of the site which shall be accomplished with a tractor drawn, leveling type blade. The area shall be smooth to eliminate major depressions and rough area, and to make the area suitable for mowing with a reel-type mower.

2. **Seed Bed Preparation:**

a. **Tilling:** Till the soil to a depth of at least four (4) inches going over the entire area at least four times. Each tilling is to be at right angles to the previous one.

b. **Broadcast Application:** Apply a broadcast application of 18-24-6 plant food at the rate of four and one-half (4.5) pounds per one thousand (1000) square feet.

c. **Approval of Grading and Seed Bed:** Prior to seeding grass, the Superintendent must inspect and approve the grading and seed bed preparation. Water must drain off the area in an adequate manner to allow turf to grow.

d. **Lawn Planting (Hydromulching):** Grass seed specified under "Landscape Material" shall be hydromulched at a rate of eight (8) pounds per one thousand (1000) square feet.

e. **Lawn Planting (Mechanical):** Plant grass seed specified under "Material" in the specifications at the rate of five (5) pounds per one thousand (1000) square feet. Seed are

to be planted with a commercial type grass seeder (such as Billion) which rolls and firms seed bed before and after the seed are planted. Seed are to be planted in two (2) passes at right angles.

f. Final payment for hydromulching: Final payment for hydromulching shall be made only after a stand of grass has been established.

g. Payment for grass or grass seed: No payment for grass or grass seed shall be made until a stand of grass has been established.

h. A "Stand" of Grass: Any seeded areas of at least one hundred (100) square feet ten (10) feet by ten (10) feet that does not have growing grass at least one and one-half (1 1/2) inches apart at the end of the first thirty (30) days after planting shall be reseeded in the manner originally specified, at no extra cost to the owner. SPOT SEEDING WILL ALMOST CERTAINLY BE REQUIRED.

IV. MISCELLANEOUS

A. All fertilizer, seed, and plant material shall be inspected before installation.

B. It shall be the Contractors responsibility to stake all sprinkler irrigation equipment prior to tilling of the soil.

V. MEASUREMENT

A. Measurement of work complete is based on the number of plants installed, or in the case of seeding projects, the number of square feet of area complete.

B. Percent of project complete may also be consistent in some cases.

VI. PAYMENT

A. Partial payment can be made on plant materials received, invoiced, and inspected by the City.

B. Payment on seeding projects will be held until a "stand" of grass has been established as defined in III.B.h.

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SUBSECTION 8.02
INSTALLATION OF AUTOMATIC SPRINKLER IRRIGATION SYSTEM

I. SCOPE

The Contractor shall furnish all materials, ditching, back filling, labor, tools, supervision, and whatever else may be necessary for the installation of the sprinkler-irrigation system as shown on the plans.

A. WORKMANSHIP: All work shall be performed in accordance with the best standards of the industry and in accordance with all plumbing and electrical codes and regulations of the City of Amarillo, Texas.

B. GUARANTEE: The Contractor shall guarantee all sprinkler system materials and workmanship against defects for a period of twelve months after the date of completion of the project to the extent of repair or replacement at his own total expense.

C. GENERAL CONDITIONS:

1. **Interpretation:** It is the intent of this contract that all work shall be done and all materials shall be furnished in accordance with the generally accepted practice. In the event of any discrepancies between the plans and specifications, or otherwise; or in the event of any doubt as to the meaning and intent of any portion of the contract, specifications or plans, the Superintendent or his agent shall define which is intended to apply to the work.

2. **Substitutions:** Substitutions in materials or deviations from the plans must be approved in advance by the Superintendent.

3. **Changes and Alterations:** The Contractor agrees that the City of Amarillo may make such changes and alterations as may be deemed necessary in plans, materials, or dimensions of the work being contemplated, either before or after the beginning of construction and without affecting the validity of this contract and accompanying bond. If such changes or alterations increase the amount of work or materials, such work or materials will be paid for according to the quantity actually done and the unit price established for the same type work or materials under this contract.

4. **Permits and Inspection:** Contractor shall obtain a permit from the City of Amarillo for this installation and all work must be inspected and passed by the City of Amarillo Plumbing Project Representative. Permits are free for the project.

5. **Protection of Work:** The Contractor shall provide and maintain all necessary barricades, red lights, flares, danger signals, signs, watchmen, and any and all other necessary items for the protection of the work and for the safety of the public. It is the responsibility of the Contractor to protect his work against weather, vandals, and any and all things that may mar the finished appearance and/or quality of the work. Any damage caused to the sprinkler system components shall be cause for removal and replacement of the damaged part or parts.

6. **Protection of the Work of Others:** It shall be the responsibility of this Contractor to exercise extreme care to prevent marring the finished appearance of any work performed by others such as damage to pavement, concrete, buildings, etc. It shall be the Contractor's responsibility to repair or have repaired at his own total cost, any damage caused by his workmen to the work of other contractors. If the Contractor fails to have such damage repaired, the City of Amarillo may have the damage repaired and deduct the cost of the repairs from the payments made to this Contractor.

7. **Clean Up:** When the construction of each unit of this contract has been otherwise completed, the Contractor shall remove all left over construction materials, equipment, scraps, debris, and rubbish from the site and leave the site in a first class, workmanlike manner equal to the condition that originally existed.

8. **Order of Completion of Work and Payment:**

a. All work under this contract must be completed within the number of working days bid.

b. Payment for completed work will be made in accordance with provisions of the General Conditions of the Agreement. Payment will be made in full upon final acceptance of the project if the project value is under $25,000.

9. **General Requirements:** Contractors shall agree to all conditions in the City of Amarillo Standard Specifications as it applies to general requirements of the contract. A copy is on file for Contractors review in the Parks and Recreation Office, second floor of the Municipal Building.

II. MATERIALS

A. AUTOMATIC CONTROLLER

1. **Electric Irrigation Controllers:** As specified on plans.

2. Independent station control panels mounted in one heavy duty housing, each station 0-99 minute station timing seven (7) day dual watering. Four (4) start times per program. Shall have short sensor which detects shorted valve, skips that valve and displays flashing signal to signal the short. Valve power de-activation switch. Capable of programming with one independent selector switch for ease and independent station inspection. 120 volt 60 HZ volt output. Shall be as "Weathermatic" Mark A Series or equal. Controller will be grounded with three (3) five-eighths (5/8) inch by eight (8) foot copper weld ground rods, connected by #8 solid wire. Rods to be laid out in a triangular spacing.

B. PIPE

1. All pipe shall be new, Class PR-200, PVC 200, PVC 1120, ASTM D 2241-67, CS-236-63, SDR-21, "Ring Tight" or Solvent Weld.

2. **Marking and Identification:**

a. All PVC pipe shall be continuously and permanently marked with the following information: Manufacturer's name, pipe size, class or schedule, type of pipe, and material.

b. All pipe valves, fittings, or other materials used in construction of this project shall be new, American made materials.

C. **PIPE FITTINGS:** All plastic pipe fittings shall be schedule 40, standard manufactured, PVC fittings except where otherwise specified. May be either "Ring Tight" type or solvent weld type except where otherwise specified. All 90 elbows, tees, or crosses in mainlines shall be sufficiently reinforced to prevent damage from excessive movement caused by water hammer.

D. **SOLVENT CEMENT:** Solvent cement used must be manufactured by a reputable manufacturer of the PVC glue industry.

E. CONNECTORS TO BE USED AS RISERS

1. One-half (1/2) inch Flex PVC hose to fit schedule 40 PVC fittings for small rotary heads.

2. Shall be Excalibar brand hose.

3. Appropriate length shall be used to avoid "kinks."

F. LARGE SPRINKLER HEADS ROTARY POP-UP

1. Sprinkler casing shall be constructed of heavy duty vandal resistant material.

2. Positive spring retraction of pop-up.

3. Screen area to protect nozzle from debris.

4. Pop-up stroke to be at least two (2) inches.

5. Access to all parts should be through the top of the head.

6. Adjustable precipitation spray.

7. One (1) inch NPT inlet.

8. As Toro Model #640 or Hunter Model I-40 with #43 nozzle on full and #42 on 1/2, 3/4 and 1/4.

G. MEDIUM SPRINKLER ROTARY POP-UP

1. Sprinkler casing shall be constructed of heavy duty vandal resistant material.

2. Positive spring retraction of pop-up.

3. Pop-up stroke to be a minimum of three (3) inches.

4. Screen area to protect nozzle from debris.

5. Access to all parts shall be through the top of the head.

6. Adjustable or fixed arcs.

7. Variable discharge rates and spray radius.

8. Three-fourths (3/4) inch NPT inlet.

9. To be as Hunter P-Series, Toro 700 series or equal.

H. SMALL SPRINKLER ROTARY POP-UP

1. Sprinkler casing shall be constructed of heavy duty cycolac.

2. Positive spring retraction or pop-up.

3. Serviceable screen

4. Pop-up stroke approximately twelve (12) inches.

5. One-half (1/2) inch NPT. inlet

6. As Hunter "P" Series, S type or equal.

I. QUICK COUPLING VALVES

1. The body of the valve shall be made of red brass with a wall thickness guaranteed to withstand normal working pressure of one hundred fifty (150) psi without leakage.

2. All quick coupling valves shall be two piece. The valve mechanism shall be constructed so that the valve seat is closed before the coupler can be removed. The coupler disc shall close with and open against water pressure. The valve seat disc plunger body shall be spring loaded, so that the valve is normally closed under all conditions when the coupler is not inserted.

3. Snap valve riser shall consist of one (1) inch PVC schedule 40 pipe in conjunction with one (1) inch PVC Swing Joint Kit. As SPEAR #591-010 or approved equal.

4. The top body shall house a rubber flange washer to form a water tight seal around the coupler when it is inserted and while the valve is open. The valve plunger construction in the two (2) piece valve shall be such that the top body may be removed to replace the flange washer while the valve is under the pressure.

5. All valves shall have a single lug insertion for a single lug coupler.

6. Each valve shall have a one (1) inch ips.

7. Quick coupling will be housed in meter box as shown on plans.

J. AUTOMATIC VALVE

1. Manual flow control.

2. 150 psi cwp rating.

3. Suitable for underground burial.

4. Electrically operated. Normally closed 24 vac.

5. Shall have a noncorroding seat.

6. As Hydro Rain 100 Series Automatic Valve or equal. (Size indicated on drawing).

K. VALVES (INSTALLED IN LINES WITHIN THE SYSTEM): Gate valves two (2) inches and over shall be AWWA front body double disc. Cold water working pressure shall be not less than two hundred (200) psi Cla-Val or approved equal.

L. VALVE BOXES (FOR HAND VALVES): Install cast iron extension type water valve box at each hand valve. Valve boxes shall be two (2) pieces, cast iron, five and one fourth (5 1/4) inch diameter valve boxes, screw container type with eight and one half (8 1/2) inch diameter bell bottom for extension from eighteen (18) to twenty-four (24) inches with water valve box drop covers.

M. ORISEAL VALVE (INSTALLED IN LINES WITH THE SYSTEM)

1. Oriseal valves will be used where two (2) inch and smaller gate valves and three-fourths (3/4) drinking fountains are shown on plans. Valves shall have:

a. Low friction thrust washer of plastic.

b. Body sealing "O" ring.

c. Free turning plug with automatic stop at one fourth (1/4) turn.

d. Port sealing "O" ring.

e. Protected seating surfaces.

f. High strength integral checks.

g. Hefty tee head.

h. Low friction insert.

i. As Mueller Company Mark II Oriseal valve or approved equal.

N. VALVE BOXES (FOR AUTOMATIC HYDRAULIC VALVE, AND QUICK COUPLING VALVES)

1. Sides to be twenty (20) gauge corrugated metal.

2. Diameter of opening to be twelve (12) inches.

3. Boxes will have minimum four (4) inches dirt cover over box.

4. Shall be as shown on plans.

5. Boxes shall be set on concrete blocks 8"w X 4" depth and shall be cut out a minimum of four (4) inches higher than pipe to prevent settlement of box onto pipe.

O. ELECTRICAL

1. **Power controller:** Power to controller shall be provided by owner.

2. **Electrical equipment to be installed:** Electrical wiring for the electric valves shall be 14 ga. cu with 4/64 coating. All system wires will be installed in Electrical PVC conduit. PVC conduit used for electrical wiring will have fittings (sweep elbows etc.) for proper electrical installation. All wire connectors shall be done with dry-splice connectors.

III. **EQUIPMENT:** Contractor shall furnish the equipment to perform the construction properly.

IV. INSTALLATION INSPECTION AND TESTING:

A. All pipe, valves, and fittings shall be installed in strict accordance with manufacturer's recommendation and/or accepted practice of the trade. All installation shall be in accordance with the City Plumbing Code. Contractor shall install double check valve on the main water line in accordance with the City Plumbing Code.

B. Pipe Installation Procedures:

1. **Handling of PVC pipe and fittings:** The Contractor is cautioned to exercise care in handling, loading, unloading, and storing PVC pipe and fittings. All PVC pipe and fittings will be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subject to undue bending or concentrated external load at any point. Any section of pipe that has been dented or damaged will be discarded until said section of pipe is cut out and rejoined with a coupling.

2. Laying of Pipe:

a. Minimum ground cover over all pipe shall be twenty-four (24) inches. Any pipe not covered to the depth shall be removed and replaced.

b. All lumber, rubbish, and large rocks shall be removed from the trenches. Pipe shall have a firm, uniform bearing for the entire length of each pipe line to prevent uneven settlement. Wedging or blocking of pipe will not be permitted.

c. Pipe shall not be laid when there is water in the trench.

d. PVC pipe will expand or contract one half (1/2) inch per one hundred (100) feet per 10 degrees (10°) Fahrenheit, change in temperature. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.

e. PVC pipe will expand or contract one half inch (1/2) per one hundred feet (100') per 10 degrees Fahrenheit, change in temperature. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.

f. All foreign matter or dirt shall be removed from the inside of the pipe before welding or connecting; and piping shall be kept clean by approved means during and after laying of pipe.

3. **Threaded Connections:** On PVC to metal connections, the Contractor shall work the metal connections first. A non-hardening pipe dope such as Permatax #2 or equal shall be used on all threaded PVC to metal joints and threaded PVC to PVC fittings, light wrench pressure is all that should be used. Where threaded PVC connections are required, use threaded PVC adapters into which the pipe may be welded. No teflon tape will be allowed.

C. PVC Pipe and Fitting Assembly

1. **Solvent Welds:** Contractor shall use only the solvent supplied and recommended by the manufacturer to make solvent welded joints. The pipe and fittings shall be thoroughly cleaned of dirt, dust, and moisture, before applying solvent. Contractor will make solvent welds with a nonsynthetic bristle brush in the following sequence:

a. Cut pipe square with fine tooth hack saw.

b. Burr the cut pipe end.

c. Clean dirt and moisture from pipe and fitting socket. (Use thinner if necessary).

d. Apply the solvent to outside of pipe.

e. Apply solvent to inside of fitting socket.

f. Reapply solvent to outside of pipe.

g. Stab pipe to stop in fitting socket, rotate approximately one fourth (1/4) turn.

h. Hold joint about thirty (30) seconds to set.

i. Allow joint about thirty (30) minutes (depending on temperature and humidity) for joint to attain handling strength before disturbing.

2. **Plugging Ends:** All open ends of pipe or fittings shall be plugged with a cap, plug, other device as approved by the Project Representative, prior to leaving the job each day.

3. **Testing:** All tests shall be completed prior to back filling; however, sufficient back fill material may be placed in trenches between fitting to insure the stability of the line under pressure. In all cases, fittings and couplings must be open to visual inspection for the full period of the test. No testing shall be done until the last solvent welded joint has had twenty-four (24) hours to set and cure. The entire piping system shall be tested under normal working pressure for a period of twelve to fourteen (12-14) hours and proven tight. If leaks occur, the joint or joints shall be replaced and the tests repeated. All lines shall be inspected by the City Plumbing Inspector prior to back filling.

4. **Back Filling of Trenches:** Because of the expansion and contraction of PVC pipe, back filling shall be done in the cool part of the day. Bright colored trench tape shall be used on all mainline trenches. It should be buried approximately six (6) inches below grade. Trenches shall be water flooded to settle back fill material. Tamping of flooding shall be done to the satisfaction of the Inspecting Engineer. After the back filling is complete, the area shall be left in basically the same condition as it was prior to trenching.

D. **Flushing of Lines:** When the installation of the pipe has otherwise been complete, but before sprinklers are installed, the contractor shall uncap all risers on each system, actuate the valves, and flush the lines as follows:

Allow the water to run with all risers open for at least two (2) minutes, then begin capping risers closest to valve while water is running. Proceed down the lateral, capping each riser until the end riser or risers remain open. Allow water to run for five (5) minutes, then cut water off, install heads, and proceed to next section.

E. **Adjustments:** When the work on any unit of the sprinkler system under this contract has otherwise been completed, and prior to final acceptance and payment, the Contractor shall test and adjust all heads for coverage. System will not be finally accepted until all lines have been properly flushed, ditches backfilled and compacted, heads adjusted for proper coverage, and height of risers adjusted according to the plans and specifications.

G. **Final Completion:** Contractor will provide an "As Built" plan of the irrigation system within ten (10) days after the project is complete.

V. **MEASUREMENT:** Sprinkler-irrigation system shall be measured as provided on project plan and accepted proposal.

VI. **PAYMENT:** Request for payment may be made at the end of each month or upon completion of the project. Payments may be made based on measured quantities of product installed, percent of worth completed, or invoiced materials on hand.

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