

ADDENDUM NO.1 - Mercedes Sports Park – Phase 1

DATE: Tuesday, December 11, 2018

JOB No. 2017-019

PRE-PROPOSAL DATE: Friday, December 14, 2018 @ 4:00 P.M.

PRIOR TO GENERAL CONSTRUCTION PROPOSAL OPENING

PROPOSAL DATE: Friday, December 21, 2018 @ 4:00 P.M.

Total Sheets (__13__) 8.5" x 11" w/ Cover (__3__) 24" x 36"

NOTICE:

- A. The following changes, omissions or alterations to the specifications and drawings shall be made and insofar as the specifications and drawings are inconsistent with the following, this addendum shall govern.
- B. Acknowledge receipt of this addendum by inserting its number and date of issue in the place provided for same in the proposal. This addendum forms a part of the Contract Documents.,
- C. It is imperative that this addendum be inserted INTO set of specifications.

Item No. 1: Structural Addendum Items:

A. See attached Structural addendum items. (1-24"x36") Sheet S3.03: Note new contraction joints were added.

Item No. 2: Landscape Items:

- SHERED ARCHITCT
- A. See attached Landscape Addendum items. (12-8.5x11), (2-24"x36")

Sheet L2: Added a note for sidewalk intersections, this note will refer you to detail 6/L4.

Sheet L4: Added sidewalk intersection layout detail for control/expansion joints to reduce concrete cracking.

Per attached, add Specification Section 328400 NON-Potable Planting Irrigation. This Spec Section is for the harvesting tank irrigation system use only.

Item No. 2: Irrigation Items:

A. See clarification to Irrigation notes.

Sheet IR2: Clarification to Note #20 & #25, they are not readable.

Note #20 shall states: Do not locate valve boxes in multi-use athletic field areas. All pipes going to and from RP and pump shall be sch. 80 PVC pipe. Wrap pipe with 1/8"x 2" insulation tape #4217-W3 by nu-calgon wholesale inc. st. Louis, Mo. 63146.

Note #25 shall states: All material should be considered or approved equal.

END OF ADDENDUM #1

Section 328400

NON-POTABLE PLANTING IRRIGATION

PART 1 – PRODUCTS

1.12 GENERAL

Unless otherwise noted on the Drawings, all materials shall be new and unused. The irrigation equipment catalog numbers used for reference in these Specifications are to establish minimum quality standards and may be substituted with an "approved equal" as outlined in Paragraph 1.06 of this section, unless specifically requested by the Owner.

1.13 POLYVINYL CHLORIDE PIPE (PURPLE PVC PIPE)

PVC pipe manufactured in accordance with ASTM Standards noted herein.

- A. Marking and Identification: PVC pipe shall be continuously and permanently marked with the following information: Manufacturer's name, size, type of pipe, and material, PVC number, Product Standard number, and the NSF (National Sanitation Foundation) Seal.
- B. PVC pipe fittings: Shall be of the same material as the PVC pipe specified and compatible with PVC pipe furnished. Solvent weld type shall be for Schedule 40.
- C. PVC Pipe: Lateral line pipe shall be Class 200 solvent weld, SDR-21, PS 22-70 for all sizes 3/4" 2". Mainline pipe shall schd.40 PVC, unless otherwise noted on the Drawings.
- D. Flexible PVC Risers (Nipples): All flexible PVC nipples shall be made from virgin PVC material, and shall comply with ASTM D2287, shall be tested at 200 P.S.I. static pressure for 2 hours and have a quick burst rating of a minimum 400 P.S.I. Flexible PVC pipe nipples shall be factory assembled only.
- E. Unless otherwise noted on the Drawings, no pipe smaller than $\frac{3}{4}$ " shall be used.

1.14 SWING JOINTS Swing joints shall be O-ring seal type. Use Lasco, KBI or approved equal.

- 1.15 WIRE AND SPLICES
 - A. All electrical, control and ground wire shall be of size as indicated on the Drawings or in these Specifications. All wiring to be used for connecting the automatic remote control valve to the automatic controllers shall be Type "UF" 600 volt, solid copper, single conductor wire with PVC insulation and bear UL approval for direct underground burial feeder cable.

- B. Verification of wire types and installation procedures shall be checked to conform to local codes.
- C. Wire connectors shall be King low voltage connectors, tan color.
- D. Two-wire No. 14 UF Direct Burial Cable
 - 1. Conductor: Soft-annelaed copper conforming to UL std. 719, Parts 18-22.
 - 2. Insulation: Polyvinylchloride, 60 degree C rated, conforming to UL std. 719, Parts 23-25.
 - 3. Manufacturer's Identification: Surface embossed with manufacturer's name, voltage rating, size and type of designation.
 - 4. Underwriter's Laboratories Approval: All cable shall be tested physically and electrically in accordance with UL std. 719, and shall bear UL labels.
- E. No. 10/2 UF Direct Burial Cable:
 - 1. Conductors: The conductors shall consist of solid, soft-annealed copper.
 - 2. Insulation: Over each conductor, there shall be extruded a polyvinylcholoride compound, UL rated for 60 degrees CENTIGRADE.
 - 3. Color Coding: In conformance with the National Electrical Code.
 - 4. Assembly: Flat, parallel configuration.
 - 5. Overall Sheath: A polyvinylchloride sheath compound conforming to UL 719, for "UF" cable shall be applied overall.
- F. Ground: The ground conductor shall consist of solid, uncoated soft-annealed No. 6 copper wire.
- G. Ground rod, decoders, surge protectors
- 1.16 MANUAL/ISOLATION VALVES
 - A. All isolation valves 2-1/2 inches and larger shall be resilient wedge gate valve as manufactured by Matco-Norca series 10RT. All isolation valves smaller than 2-1/2" shall be Speers PVC, double union ball valves or approved equal. All valves must be certified for a working pressure of 125 PSI with a hyrdrostatic shell test of 200 PSI and a hydrostatic seal test of 150 PSI. Both ends must be screw type for use with PVC pipe.
 - B. All isolation valves shall be housed in an appropriately sized valve box.
- 1.17 ELECTRIC REMOTE CONTROL VALVES (FOR NON-POTABLE IRRIGATION)
 - A. All electric valves shall be "normally closed", solenoid operated, 24 volt A.C., 60 Hz., Globe-Angle or Globe type valve installed in the angle or globe configuration.
 - B. Valves shall be Hunter, Pressure Regulating (XPR), Series, unless otherwise indicated on the Drawings.

C. A flow stem adjustment shall be included in each valve.

1.18 VALVE BOXES (FOR NON-POTABLE IRRIGAITON)

- A. All electrical valves shall be placed below grade within 12X18" valve boxes. Valve boxes shall be ARMOR Series. With a purple bolt down or locking cover marked "Irrigation Control Valve," or approved equal.
- B. All isolation shut-off valves shall be installed in suitable valve access boxes or proper size (ARMOR-10RND) as required for easy access to the valve. Valve boxes shall be Rain Bird (minimum size), with matching green bolt down or locking cover marked "Irrigation Control Valve," or approved equal.
- C. A valve box shall be provided for all valves.
- D. Boxes shall be suitable in size and configuration for the operability and adjustment of the valve.
- E. Extension sections will be used as appropriate to the depth of piping.
- F. All valve box covers shall bolt down or have locking mechanisms and shall be colored green.

1.19 POP-UP SPRAY, MICRO SPRAY, ROTOR AND BUBBLER HEADS (FOR NON-POTABLE)

- A. Pop-up spray, rotor and bubbler heads are specified on the Drawings.
- B. One adjustable bubbler head shall be provided per each tree location as shown on the Drawings.
- C. Spray heads shall have a minimum 4" pop-up or 12" pop-up as designated on the Drawings. The sprinkler body and all related parts shall be plastic cycolac or polycarbonate. They shall have a spring retraction for positive return action of the pop-up nozzle. The spring for retraction and the adjustable nozzle screw shall be made of corrosion resistant materials.
- D. All heads are to be operated and site adjusted to match precipitation rate of all heads in the zone with proper nozzle selection and arc adjustments.
- E. MICRO-SPRAYS -The nozzle shall be constructed of corrosion and UV-resistant plastic. The nozzle shall have a pop-up stem that when under water pressure, pops up an additional inch. It shall also have a stainless steel retraction spring to retract the stem when water pressure is released. The stem shall have an integral elastomeric flow bushing for maintaining a constant flow rate over the operating pressure range of 25 to 60 PSI (1.7 to 4.1 bars; 172 to 413 kPa). The nozzle shall be protected from debris by a stainless steel screen that is integral to the pop-up stem. The nozzle shall have standard female threads that are compatible with the threaded riser on Hunter spray heads as well as some other manufacturer's spray heads. The nozzle

shall carry a two-year, exchange warranty (not prorated). Must be installed in Institutional spray body.

1.20 DRIP IRRIGATION (FOR NON-POTABLE IRRIGATION)

- A. The dripperline shall be XFS-09-12 non-potable as manufactured by Rain Bird Irrigation, Inc. Dripper flow rate and spacing shall be as indicated on the Drawings.
- B. Soil Staples (TLS6): All on-surface/under mulch Techline CV/Techline Techlite installations shall be held in place with Techline Soil Staples spaced evenly every 3' to 5' on center, and with two staples on each change of direction.
- C. Line Flushing Valves: All Techline/Techlite systems shall be installed with Netafim Automatic Line Flushing Valves as indicated on drawings. Techline CV zones do not require an automatic line flushing valve but must have a manual flushing port(s) in the position that an automatic flush valve would be positioned.
- D. Pressure Regulator: A pressure regulator shall be installed at each zone valve or on the main line to ensure operating pressures do not exceed system requirements. The pressure regulator shall be a Netafim Pressure Regulator.
- E. Disc Filter: A disc filter shall be installed at each zone valve or on the main line to ensure proper filtration. The filter shall be a Netafim Disc Filter. Model number and mesh as indicated on the Drawings.

1.21 ELECTRIC CONTROLLER

- A. The electric irrigation controller shall be a Controller type controller capable of operating the number of stations as indicated on the Drawings. The system is designed to operate multiple valves at a time, unless otherwise noted. <u>The controller will be specified on the Drawings.</u>
- B. Power source shall be standard 120 volt 60 Cycle AC. Output for operation of companion solenoid actuated valves shall be 24 volts 60 Cycle AC., unless otherwise noted on the Drawings.
- C. Provide an automatic rain/freeze shutoff with controller.
- D. All local and applicable codes shall take precedence in the furnishing and/or connecting of the 120 volt electrical service to the controller.
- E. Adequate coverage and protect of the 24 volt service wires leading from the controllers shall be installed from the bottom of the controllers to at least six (6) inches below ground level or to floor level.
- 1.22 BACKFLOW PREVENTER (NOT FOR NON-POTABLE IRRIGATION SYSTEM)

- A. A backflow prevention device shall be located and sized as shown on the Drawings.
- B. This assembly shall be installed in a box and conform to the City Plumbing Codes and manufacturer's recommendations.
- C. Backflow preventer housing shall be called for on the Drawings.

1.23 GLUE

- A. All glue used shall be Red Christie Hot Glue.
- B. All primer shall be P-68 Purple Primer.

PART 2 – EXECUTION

2.1 INSTALLATION, GENERAL

- C. Design Pressure: This irrigation system has been designed to operate with a minimum static inlet water pressure as indicated on the Drawings. The Contractor shall take a pressure reading prior to beginning construction. If the pressure reading is 5% less than above, the Contractor shall notify the Engineer/Architect.
- D. Contractor Responsibility: The Contractor shall not willfully install the irrigation system as shown on the drawings when it is obvious in the field that obstructions, grade differences or discrepancies in equipment usage, area dimensions or water pressure exist that might not have been considered in the design. Any deviation between the Contract Documents and field conditions shall be brought to the attention of the Engineer/Architect in writing. In the event this notification is not performed, the Contractor shall assume full responsibility for any revision necessary.
- E. Staking: Before installation is started, place a stake or flag where each sprinkler is to be located, in accordance with the Drawings. Staking shall be approved by the Engineer/Architect before proceeding.
- F. Piping Layout: Piping layout is diagrammatic. Route piping around existing trees and root zones in such a manner as to avoid damage to plantings. Where access is restricted, bore under large existing trees to avoid damage and exposure of the root system. Do not dig within the ball of newly planted trees or shrubs.
- G. In areas where trees are present, trenches will be adjusted on site to provide a minimum clearance of four times the trunk diameter of the tree (at its base) between any tree and any trench.
- H. All material and equipment shall be delivered to the Worksite in unbroken reels, cartons or other packaging to demonstrate that such material is new and of a quality and grade in keeping with the intent of these Specifications.

H. Refer to the Drawings for drip installation details.

2.2 EXCAVATION AND TRENCHING

- A. All backfill operations shall conform to Title 30, TAC, Chapter 344.62, effective Jan. 1, 2009.
- B. The Contractor shall perform all excavation to the depth indicated in these Specifications and Contract drawings. The banks of trenches shall be kept as nearly vertical as practicable. Trenches shall be wide enough to allow a minimum of 4" between parallel pipelines or electrical wiring. Where rock excavation is required, or where stones or rubbles is encountered in the bottom of the trench that would create a concentrated pressure on the pipe, the rock, stones, or rubble shall be removed to a depth of six (6) inches minimum below the trench depth indicated. The over depth rock excavation and all excess trench excavation shall be backfilled with loose, moist earth or sand, thoroughly tamped. Whenever wet or otherwise unstable soil that is incapable of properly supporting the pipe is encountered in the trench bottom, such shall be removed to a depth and length required, and the trench backfilled to trench bottom grade as hereinafter specified, with course sand, fine gravel or other suitable material.
- C. Bottom of trench grade shall be continued past ground surface deviations to avoid air pockets and low collection points in the line. The minimum cover specifications shall govern regardless of variations in ground surface profile and the occasional deeper excavation required at banks and other field conditions. Excavation shall be such that a uniform trench grade variation will occur in all cases where variations are necessary.
- D. Trench excavation shall comprise the satisfactory removal and disposition of all materials, and shall include all shoring and sheeting required to protect the excavation and to safeguard employees.
- E. During excavation, material suitable for backfilling shall be stockpiled in an orderly manner a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. Material unsuitable for backfilling shall be wasted as directed by the Engineer/Architect. When excavated material is of a rocky nature and the topsoil or any other layer of excavated material is suitable for pipe bedding and backfill in the vicinity of the pipe, such material shall be separately stockpiled for use in such bedding and pipe backfill operations, unless satisfactory imported material is used.
- F. All excavations and backfill shall be unclassified and covered in the basic bid. No additional compensation will be allowed for rock or rubble encountered.
- G. Restore all surfaces, existing underground installations, etc., damaged or cut as a result of the excavations to their original conditions in a manner acceptable to the Engineer/Architect.

2.3 PIPE INSTALLATION

A. Sprinkler Mains: Sprinkler mains are that portion of piping from water source to electric valves. This portion of piping is subject to surges since it is a closed portion of the sprinkler system. Sprinkler mains shall be installed in a trench with a minimum of 18 inches of cover.

- B. Lateral Piping: Lateral piping is that portion of piping from electrical valve to sprinkler heads. This portion of piping is not subject to surges since it is an "open end" portion of the sprinkler system. Lateral piping shall be installed in a trench with a minimum of 18 inches of cover.
- C. Remove lumber, rubbish, and rocks from trenches. Provide firm, uniform bearing for entire length of each pipeline to prevent uneven settlement. Wedging or blocking of pipe will not be permitted. Remove foreign matter or dirt from inside of pipe before welding, and keep piping clean during and after laying pipe.
- D. PVC pipe shall not be installed where there is water in the trench, nor shall PVC pipe be laid when temperature is 40 deg. F or below or when rain is imminent. PVC pipe will expand and contract as the temperature changes. Therefore, pipe shall be snaked from side to side of trench bottom to allow for expansion and contraction.
- E. PVC pipe shall be cut with a hand saw or hack saw with the assistance of a square and sawing vice, or in a manner so as to ensure a square cut. Burrs at cut ends shall be removed prior to installation so that a smooth unobstructed flow will be obtained.
- F. All PVC pipe shall be installed with pipe markings facing the top of the trench.
- G. Thrust blocks shall be installed as indicated on the Drawings.

2.4 PVC PIPE AND FITTING ASSEMBLY

- A. Make solvent-welded joints following standards noted herein. Thoroughly clean pipe and fittings of dirt, dust, and moisture with an approved colored PVC primer before applying solvent.
- B. All plastic to plastic joints shall be solvent-weld joints or slip seal joints. Only the solvent recommended by the pipe manufacturer shall be used. All plastic pipe and fittings shall be installed as outlined and instructed by the pipe manufacturer and it shall be the Contractor's responsibility to make arrangements with the pipe manufacturer for any field assistance that may be necessary. The Contractor shall assume full responsibility for the correct installation.
- C. Solvent weld joints shall be made in the following manner:
 - 1. Thoroughly clean the mating pipe and fittings with approved cleaner and a clean dry cloth.
 - 2. Apply a uniform coat of solvent to the outside of the pipe with a non-synthetic bristle brush or applicator.
 - 3. Apply solvent to inside of the fitting in a similar manner.
 - 4. Re-apply a light coat of solvent to the pipe and quickly insert it into the fitting.
 - 5. Give the pipe or fitting a quarter turn to ensure even distribution of the solvent and make sure that the pipe is inserted to the full depth of the fitting socket.
 - 6. Hold in position for 15 seconds.

- 7. Wipe of excess solvent that appears at the outer shoulder of the fitting. Cure 24 hours before charging system with water.
- D. PVC to Metal Connection: Work metal connections first. Use a non-hardening pipe dope such as Permatex No. 2 or "Teflon" tape on threaded PVC to metal joints. Use only light wrench pressure. All plastic to metal joints shall be made with plastic male adapters.
- E. Threaded PVC Connections: Where required, use threaded PVC adapters into which pipe may be welded.

2.5 CONTROL WIRE INSTALLATION

- A. All electric control cables shall be of size as shown on the Drawings and/or as specified and shall be installed in the piping trenches wherever possible.
- B. Install wire in the pipe trench as detailed on the Drawings.
- C. Wire shall be placed in the trench as loose as possible and with as much slack as possible to allow for expansion and contraction of the wire. Where it is necessary to run wire in a separate trench, the wire shall have at least twelve (12) inches of cover.
- D. All wire connections at remote control valves, either direct buried or in boxes, and at all splices shall be left with sufficient slack so that in case of repair, the splice may be brought to the surface without disconnecting the wires. Slack shall be coiled in approximately 1" wraps.
- E. Each remote control valve or group of remote control valves, which are to be connected to one station of a controller, shall have wire sizes as shown in the wiring diagrams on the Drawings or as specified. All remote control valves, what are to be connected to the same controller, shall be connected to a common ground wire system entirely independent of the common ground wire system of all other controllers. Only those remote control valves which are being controlled by one specific controller, shall be connected to that controller's common ground wire system.
- F. All control wire less than 500 feet in length shall be continuous without splices or joints from the controller to the valves. Connections to the electric valves shall be made within 18 inches of the valve using connectors specified in Paragraph 2.4 of this section, unless otherwise approved by the Engineer/Architect in writing.
- G. The Contractor shall obtain the Engineer/Architect's approval for wire routing when installed in a separate ditch. Control wires may be installed in a common ditch with piping; however, wires must be installed underneath mainline piping.
- H. All wire passing under existing or future paving, sidewalk, construction, etc., shall be encased in 1" minimum PVC Schedule 40 conduit extending at least twelve (12) inches beyond edges of paving, sidewalks, or construction.

- 2.6 POP-UP SPRAY, MICRO-SPRAY, ROTORY AND BUBBLER HEADS (PURPLE FOR NON-POTABLE IRRIGATION)
 - A. Provide heads and nozzles as specified and install in locations as shown on the Contract Drawings.
 - B. All heads of a particular type and for a particular function in the system shall be of the same manufacturer and shall be marked with the manufacturer's name and identification, in such a position that they can be identified without being removed from the system. All sprinkler heads and quick coupling valves shall be set perpendicular to finished grades unless otherwise indicated on the Drawings.
 - C. Pop-up spray and micro-spray heads shall be installed on a swing joint pipe connector as detailed. Rotary heads shall be installed on a double swing joint connected to the lateral pipe. Bubbler shall be a tree well flexible riser-bubbler head on a flex pipe. Provide wire staple to secure the bubbler to the top of the root ball. Keep heads a minimum of 4 inches from paved surfaces.
 - D. Heads shall be installed with underside of flange flush with the finished grade.
 - E. Contractor will be required to adjust heads as necessary after establishment of grass or other plant material.
- 2.7 MANUAL VALVES
 - A. Manual valves shall be sized and located where shown on the Drawings.
 - B. Valve boxes shall be adjusted to be flush with finished grade.
 - C. Valve boxes shall be properly supported and of sufficient construction that tractors, mowers or
 - D. other equipment crossing over the boxes will not push boxes down and damage the pipe, valve, or box.
- 2.8 VALVE AND VALVE BOX PLACEMENT (PURPLE FOR NON-POTABLE IRRIGATION)
 - A. A ball valve shall precede each valve to provide shut off for repair of valves.
 - B. All manual, electric, and quick coupling valves shall be in boxes as specified in Paragraph 2.6 of this section, and shall be set with a minimum of six (6) inches of space between their top surface and the bottom of the valve box. The base of the box shall be filled with pea gravel per manufacturer's installation instructions.
 - C. Valves shall be fully opened and fully closed to ensure that all parts are in operating condition.

- D. Valve boxes shall be set plumb, vertical, and concentric with the valve stem.
- E. Any valve box which has moved from this required position so as to prevent the use of the operating wheel of the valve shall be reset by the Contractor at his own expense.

2.9 ELECTRIC CONTROLLER

- A. Electric controller shall be located as shown on the Drawings and shall be capable of operating the number of stations indicated.
- B. The system is designed to operate multiple sections at a time, unless otherwise noted on the Drawings in strict accordance with the manufacturer's published installation instructions.

2.10 ELECTRIC REMOTE CONTROL VALVES

- A. Remote control valves shall be located and sized as shown on the Drawings. All electrical connections shall be made when the weather is dry with connection kits as specified in Paragraph 2.4 of this section in strict accordance with manufacturer's recommended procedures. All remote control valves shall be installed in a horizontal position, in accordance to the manufacturer's published installation instructions.
- B. It shall be the responsibility of the Contractor to furnish and install the proper size wire on each of the low voltage circuits from the master control center to the various electric remote control valves.
- C. Consideration shall be given to each circuit for allowance of voltage drop and economy consistent with accepted practices of electrical installation. Under no circumstances shall the voltage of any branch circuit be reduced more than proper due to length of run exceeding the maximum allowable for the wire size used. "Up-sizing" wire to compensate for voltage drop shall be at the Contractor's expense, whether or not indicated on the Drawings.

2.11 BACKFILL AND COMPACTION

- A. After system is operating and required tests and inspections have been made, the trenches shall be carefully backfilled with the excavated materials approved for backfilling, consisting of earth, loam, sandy clay, sand, gravel, soft shale, or other approved materials, free from large clods of earth or stone. Rock, broken concrete, or pavement, and large boulders shall not be used as backfill material. The backfill shall be thoroughly compacted and made flush with the adjacent soil level.
- B. Compact trenches in areas to be planted by thoroughly flooding the backfill with water. Compact all other areas by flooding or hand tamping. The jetting process may be used in areas when flooding.

- C. Backfill for all trenches, regardless of the type of pipe covered, shall be compacted to a minimum of 90% density.
- D. Any trenches improperly backfilled, or where settlement occurs, shall be reopened to the depth required for compaction, then refilled and compacted with the surface restored to the required grade and left in a completed surface condition as described above.
- E. Specifically tamp backfill under heads and around the flange of heads in a one (1) foot radius by a suitable means after trench backfill has dried from flooding to prevent heads loosening in the ground.

2.12 FINAL ADJUSTMENT

- A. After installation has been completed, make final adjustment of sprinkler system prior to Engineer/Architect's final inspection.
- B. Completely flush system to remove debris from lines by removing nozzle from heads on ends of lines and turning on system.
- C. Check sprinklers for proper operation and proper alignment for direction of throw.
- D. Check each new section for operating pressure and balance to other sections by use of flow adjustment on top of each valve.
- E. Check nozzling for proper coverage. Prevailing wind conditions may indicate that arc or angle of spray should be other than as shown on the Drawings. In this case, change nozzles to provide correct coverage and furnish as-built data to Engineer/Architect with each change.
- F. After system is thoroughly flushed and ready for operation, each section of sprinklers shall be adjusted to control pressure at heads. Use the following method, one section at a time:
 - 1. Remove last head on section and install a temporary riser above grade. Install tee with pressure gauge attached on top of riser and re-install head with nipple onto tee.
 - 2. Correct operating pressure at last head of each section as follows: Spray Heads 20-25 psi; rotor heads 30 to 40 psi (and as recommended by the manufacturer).
 - 3. After replacing head, at grade, tamp thoroughly around head.
- G. Prior to final inspection, cycle the system through three (3) complete watering schedules of not less than twenty (20) minutes each for sprinklers and three (3) hours each for drip to assure proper function of sprinklers, valves and controller.

2.13 CLEAN-UP

A. The Site shall be thoroughly cleaned of all waste materials and all unused or salvaged materials, equipment, tools, etc.

- B. After completion of the work, areas disturbed shall be leveled and the Site shall be raked clean and left in an orderly condition.
- C. TEMPORARY IRRIGATION FOR GRASS ESTABLISHMENT
- D. If the permanent irrigation system is inoperable the Contractor shall provide temporary irrigation for all new turf areas. Temporary irrigation may include equipment securely staked above grade. It shall be the Contractor's responsibility to provide complete, consistent temporary coverage in order to establish a viable, mowable stand of grass. Any above grade equipment shall be removed by the Contractor upon acceptance of the turf by the Engineer/Architect.







