

SECTION 766

IRRIGATION

DESCRIPTION

766.01 Scope - The work consists of the supply of all material, labour and equipment to install a complete and operating irrigation system as shown on the Drawings. The Contractor shall be responsible for obtaining all permits required.

766.02 Site Security - The Contractor shall be responsible for maintaining all security at the project Site at all times, and shall ensure that no damage or breakage occurs to stockpiled materials or to the partially installed irrigation system. The Contractor shall make good all damage resulting from acts of vandalism throughout the period of installation and subsequent maintenance.

766.03 Electrical Trades - The Contractor shall contact the Electrical Trades Supervisor prior to performing work on any existing Ministry owned equipment. All AC electrical connections shall be done by a qualified electrician.

766.04 Drawings and Instructions - The Contractor shall install the irrigation system as shown and detailed on the Drawings and Specifications. No deviation from the indicated make and model or installed location of valves, mains, laterals or any other irrigation system component will be allowed without first obtaining written permission from the Ministry Representative.

The Contractor shall maintain a daily record of construction activities. Upon completion of the Contract, the Contractor shall incorporate all accumulated information relevant to the Contract into the required as-built Drawings. The as-built Drawings shall be to the Ministry Representative's satisfaction, shall be reproducible, and shall be compiled by a competent professional draftsman.

The Contractor shall prepare drawings showing the final location and make of all heads, emitter locations, pipe layout and other pertinent information, and shall submit two sets of these Drawings to the Ministry Representative. The Contractor shall prepare another Drawing showing the wiring and automatic controller station numbers with all electrical data. The Contractor shall submit two copies of this Drawing and one set of the operating instructions for the controller, complete with spare parts list to the Ministry Representative. All Drawings, spare parts lists, and operating instructions shall be cerlox bound into a plastic covered 8 1/2 x 11 booklet.

After the system has been completed, the Contractor shall instruct the Ministry Representative's agent in the proper use of the equipment.

Completion will not be certified until adjustments and Drawings are approved.

766.05 References - Codes & Standards - In the absence of other instructions, the provisions of all the following codes and standards shall apply: The National Building Code of Canada; Current CSA Specifications for copper, steel and plastic pipe; AWWA Specification, current editions.

MATERIALS

766.11 General - Shipping, handling and installation of materials shall be to manufacturer's recommended instructions, and best work practice. Particular care shall be taken to avoid scratches and nicks on the plastic pipe. Pipe must be properly stacked and stored in a clean place on the Site, keeping dirt out of the pipe at all times.

766.12 Pipes and Fittings - Galvanized pipe, Schedule 40, with galvanized fittings, shall be used inside culverts. The pipe shall be connected to the plastic main or lateral 450 mm clear of the culvert.

Plastic pipe shall be used for the submain and laterals of the irrigation system. Plastic pipe shall be semi-rigid extruded from PVC (Polyvinyl Chloride) resin, Type 1, grade 2, normal impact.

The minimum classes to be used are listed in Table 766-A.

TABLE 766-A MINIMUM CLASSES OF PLASTIC PIPE

Up to 25 mm diameter	Class 200 for excavated trenches
30 mm diameter and larger	Class 160 for excavated trenches
All sizes	Class 200 for pipe flow

Fittings shall be PVC plastic, Schedule 40 or 80, designed for solvent welding to PVC pipe.

All fittings must have 1/2 to 2/3 interface fit to ensure a fully seated joint. Individual fittings shall be selected to ensure a proper fit or they will be rejected.

All pipe and fittings shall be continuously and legibly marked with at least the following information:

- Manufacturer's name or trademark;
- Pressure rating;
- Type of material.

Pipe that is not marked to the satisfaction of the Ministry Representative will be rejected and shall be removed from the Site by the Contractor.

766.13 Cement - Pipe cement for solvent welding shall be of the type and make recommended by the pipe manufacturer, supplied to the Site in sealed containers

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clearly marked with the name of the manufacturer and the lot number. The Contractor shall comply with the manufacturer's instructions and safety procedures.

766.14 Sprinkler Heads - Risers for turf heads, lawn heads, impact heads, shrub heads and quick-coupling (QC) valves shall be swing joint type, fabricated from Schedule 80 PVC or Schedule 40 galvanised pipe and fittings, as detailed in the Specifications. Teflon tape shall be used on all threaded connections.

Sprinkler heads shall be as detailed on the Drawings.

766.15 Valves - Automatic valves shall be as detailed on the Drawings and the same make shall be used throughout. Automatic valves shall have flow control stems.

Valves shall be installed in Carson Industries No. 1419 valve boxes or other approved alternative complete with extensions and covers, as required. The top of all valve box covers shall be flush with the finished grade.

766.16 Controllers - Automatic controllers shall be supplied to operate the electrically controlled automatic valves. Controllers shall be 24 volt A.C. outlet, Class 2 rating, compatible with the valves used. Controllers and automatic valves shall be by the same manufacturer, unless otherwise noted. Controllers and transformers must bear CSA or Provincial stamps of approval. Controllers shall be as detailed on the Drawings.

Controllers shall be installed in Ministry standard controller box 30-A-120/240V, weatherproof, stainless steel service panel SN1765A as shown on Drawing SP635-2.4.8, or pre-approved equal complete with a Masterlock No. 15 padlock and two sets of keys for the lock.

766.17 Wiring - Wire between controllers and automatic valves shall be of a type approved for direct burial. Where control wires are exposed or pass through culverts, they shall be installed in rigid electrical conduit.

Wire shall be minimum 14 gauge single strand T.W.U.

766.18 Selected Native Fill - Native fill selected for backfilling shall be free of stones, gravel, wood or any other debris, and shall be approved by the Ministry Representative.

CONSTRUCTION

766.31 General - Damaged Material - Damaged material shall be rejected on the decision of the Ministry Representative. The Contractor shall take care to prevent dirt from entering the pipe.

Plastic pipe shall not be repaired by patching. Where pipe has been damaged, the damaged section shall be removed and a new section shall be installed complete with new fittings.

766.32 Line Location - The Contractor shall ensure that all irrigation pre-ducts for passage of irrigation lines under roadways, medians, traffic islands and other surface impediments have been installed and are clearly marked at

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all entry points.

No irrigation line shall be installed parallel to and directly over another irrigation line or line of another trade. Lines laid in the same trench shall be a minimum of 50 mm apart. No pipe shall be installed closer than 300 mm to any parallel electric conduit as shown on Drawing SP635-1.5.2.

766.33 Compaction - Before laying the pipe, the Contractor shall be satisfied as to the extent of compaction in the lawn and planting areas.

766.34 Excavation - Excavated soil shall be carefully placed adjacent to the trench for convenient backfilling. Topsoil and subsoil shall be piled separately to avoid contamination of the topsoil.

Stones or other objects larger than 75 mm at their widest point shall be removed from the trenches. Holes below grade lines, caused by the removal of stones, must be filled in and compacted uniformly with the adjacent trench.

766.35 Laying the Pipe - Pipe shall be laid by trench excavation or by an approved vibrating pipe plough. Plastic pipe shall be laid on sand or selected native fill to a compacted depth of 50 mm. A further 75 mm of sand or selected native fill shall be placed over plastic pipes prior to backfilling. Pipes shall be run in straight lines between fittings. Pipe must not be supported at intermediate points on stones, bricks or other hard material.

All mains and laterals shall have a minimum cover of 400 mm of soil as measured from the top of the pipe to the finished grade.

Lawn and planting areas shall be disturbed as little as possible.

The Contractor shall manicure the finished grade over all mains and laterals upon completion of the pipe installation. All debris, rocks over 50 mm diameter, etc, that have been brought to the grade surface shall be removed to the Contractor's own tip. The area over all trenches shall be fine graded and shall conform to SS 751.34.

766.36 Connections - The Contractor shall make connection to the existing water supply where shown on the Drawings. The Contractor shall ensure that the recommended operating pressure of the irrigation system is not exceeded by the water pressure at the source, by installing pressure regulators as required.

766.37 Inspection and Testing - After the pipe is in place in the bottom of the trench with risers in place, the risers shall be capped where the sprinklers will be attached and all pipe fittings exposed. The maximum pressure shall be applied to the system and maintained for a minimum of one hour.

All fittings shall be visually inspected and any that leak shall be cut out and replaced. Leaks shall not be repaired by patching. The test pressure shall be maintained for one hour after replacing any defective sections. The section shall be re-inspected as before.

The system shall be flushed out to remove dirt and then the sprinklers shall be attached using Teflon tape or pre-approved non-setting pipe thread compound.

766.38 Backfill - After approval by the Ministry Representative, the trenches shall be backfilled, maintaining pressure in the line. If there is any indication of a leak, the defective section shall be located and replaced.

The trenches shall be carefully backfilled with the subsoil, followed by the topsoil. Both shall be compacted to the same density as the soil in the trench walls to minimize differential settlement. Backfill around turf heads with 0.03 m³ of sand.

766.39 Controller Installation - The location of the controllers shall be determined on Site in the areas indicated on the Drawings. The Contractor shall have a qualified electrician connect the controllers to the electrical supply.

766.40 Adjustments - The sprinkler system shall be adjusted section by section to give satisfactory coverage to all areas. Pressure at the heads and/or Q.C. valves shall be as noted on the Drawings. Turf heads, lawn heads and Q.C. valves shall be set flush with the final turf grade by adjusting the swing joint riser, as required. During the landscape maintenance/guarantee period, the Contractor will return twice and adjust the heads, as required, to be flush with the final turf grade.

These callbacks shall be done within five days of notification by the Ministry Representative and shall be considered part of the Contract requirements.

766.41 Surplus Material - Surplus material shall be removed from the Site.

766.42 Conditions for Acceptance - Completion will not be certified until adjustments are completed and as-built Drawings prepared, approved, and bound into an approved booklet to the Ministry Representative's satisfaction. A copy of the inspection certificate issued by the Ministry of Competition, Science and Enterprise indicating compliance with the Electrical Code and a copy of the "Irrigation Systems Loss Calculation Sheet" found in the Ministry of Transportation Landscape Policy - Appendix 3 shall be included in the hardcover booklet.

766.43 General - The Contractor shall monitor the operation of the system and carry out all minor repairs and required adjustments to the spray coverage of irrigation heads and operating times.

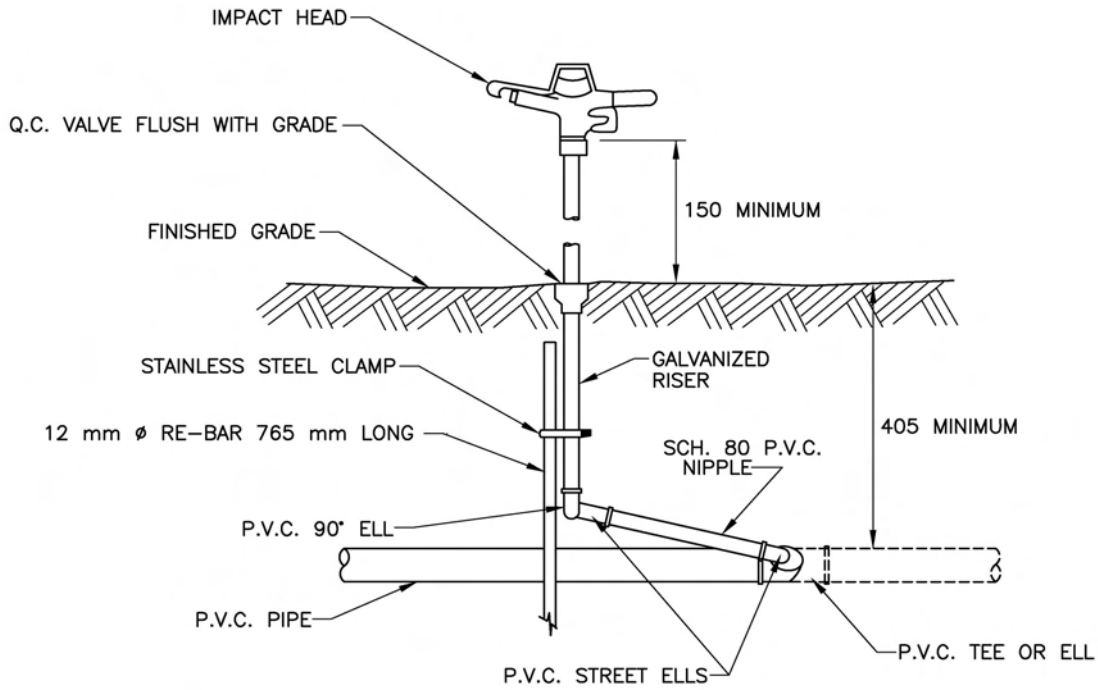
The irrigation system shall be properly winterized at the appropriate time of the season.

PAYMENT

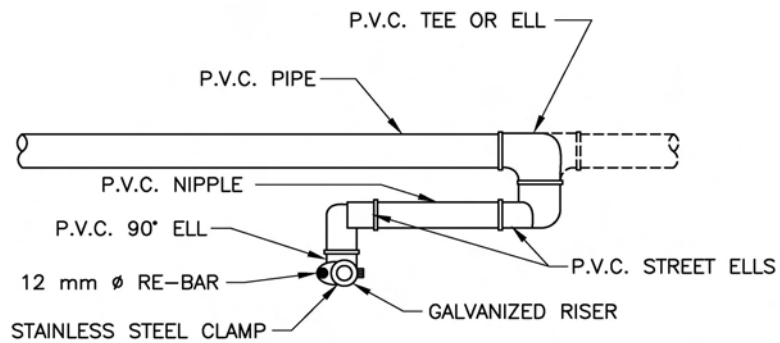
766.91 General - Payment for the supply and installation of the irrigation system will be at the lump sum bid. The lump sum price bid shall be full compensation for all labour and equipment required for the specified preparation, trenching, installation, testing, backfilling, clean-up, preparation of as-built Drawings, and instruction in the proper use of the equipment and for all incidental work not required to be separately paid for.

SWING JOINT DETAIL – IMPACT HEAD

SP766-01



ELEVATION



PLAN

SHOWN FOR IMPACT HEAD
QUICK-COUPLING VALVE SIMILAR

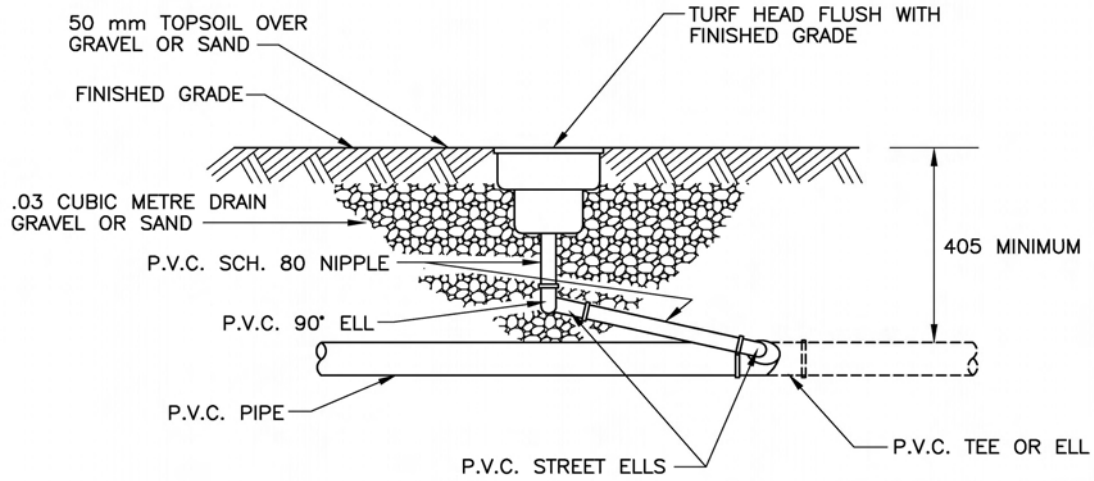
NOTE:
USE TEFLON TAPE ON ALL THREADED CONNECTIONS

NOT TO SCALE

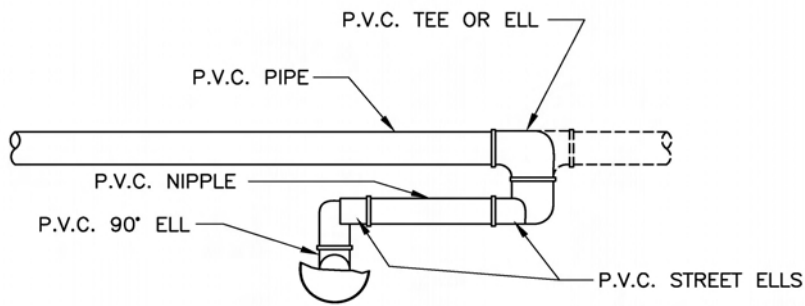
ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

SWING JOINT DETAIL – TURF HEAD

SP766-02



ELEVATION



PLAN

SHOWN FOR TURF HEAD
LAWN HEAD SIMILAR

NOTE:
USE TEFLON TAPE ON ALL THREADED CONNECTIONS

NOT TO SCALE

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED