IRRIGATION PROJECTS REQUIRE THE RIGHT DESIGN AND PROPER EQUIPMENT

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Many people throughout the country would hesitate to specify that a project receive irrigation. Perhaps their reluctance is formed from a past project which was improperly designed, and in turn, improperly installed.

Today, with the technology in the irrigation industry, a person can get a system that will perform economically and efficiently. If properly designed, he can also get a system that will require a minimum amount of maintenance, and when maintenance is required it can be done with a minimum amount of time.

In view of the above it must also be known that irrigation design is an art, not to be undertaken by the unknowing. When selecting a person or firm to provide irrigation designs, avoid the people who don't charge for their services. Generally they provide the plans to sell the equipment for the project, and once it is installed they show little interest about what happens in regards to equipment failure or maintenance costs. Most equipment manufacturers can provide a list of persons or firms that are trained in irrigation design. The American Society of Irrigation Consultants has members throughout the country.

An irrigation design consultant can provide the following services: 1. Preliminary studies and cost estimates 2. Preliminary plan for review 3. Construction plans and specifications 4. Assistance in receiving and reviewing bids. 5. Construction supervision 6. Final project reports. The design consultant can provide many other services. It is best to contact your local consultant for specific details. A qualified consultant can design using any manufacturers' equipment as per your choice.

The following are just a few items that if used will prevent many problems found in irrigation systems.

Velocity of water in the piping system must be controlled. If not, it can cause lines to burst or will weaken piping over a period of time. Many polyethylene (PE) pipe failures can be directly attributed to excess velocity. The Plastic Pipe Institute (PPI) recommends the following: "The maximum safe water velocity in a thermoplastic piping system depends on the specific details of the system and the operating conditions. In general, 5 ft/s is considered to be safe." Many pipe manufacturers do not recommend any velocity over 5 ft/s. for use in turf irrigation.

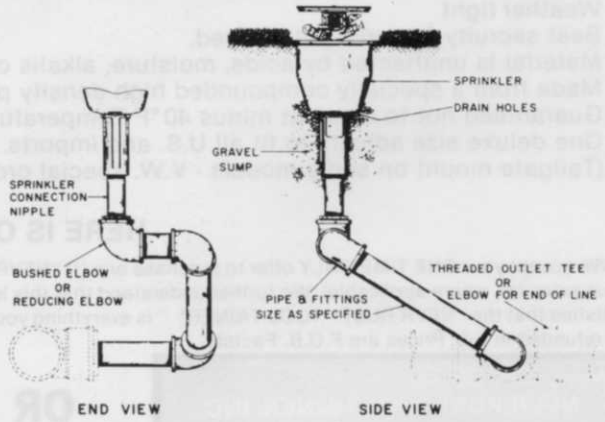
Sprinkler control valves should be equipped with manual bleeds to permit operation without the controller. This feature can save on maintenance time if controller location is not close to the valve area. Valves also should be equipped with manual flow controls to enable a person to close the valve if it fails to close automatically. Valves should be installed in valve boxes large enough to permit manual operation for removal of solenoid and/or valve cover without any earth excavation required. Box depth should extend to depth of valve to prevent any earth cave-in onto the valve. Extra wire should be provided in the valve box so that the valve cover can be removed and placed onto the earth next to the valve box without any cutting of solenoid wires. Wire connections at valves and on all underground splices should be water tight by the use of dri-splice connectors.

Sprinkler heads are rated by each manufacturer for maximum spacing and should be derated for existing wind conditions as per manufacturers recommendations. When approving alternate equipment check the maximum spacing and not necessarily the radius or diameter. Also check pressure and flow requirements.

Sprinkler spray heads should be installed a minimum of two inches away from walks, curbs, or other paved areas to prevent damage from edger operation. Many sprinkler manufacturers offer head trimmers to trim grass around heads. This trimming should be done on a regular schedule to prevent grass and debris from interfering with the operation of the sprinkler heads.

Rotary sprinkler heads should be installed on swing-joints on large projects for two reasons: 1. Protection of lateral piping against damage from heavy maintenance equipment running over heads and 2. Facilitating setting heads to proper grade.

Figure 14-53, taken from The Turf Irrigation Manual by James A. Watkins, illustrates the swing



joint. Note that the horizontal nipple just below the head is shorter than the nipple connected to the lateral. This is important. If the upper nipple is too long, and the head is depressed deep enough from the vertical load of heavy equipment, the lateral could be crushed.

These joints must be assembled from threaded nipples and fittings to be effective. Threads provide the swivel action needed to counteract either top loading or side impact. Swing-joints should be installed in a manner that the nipple into the lateral pipe fitting will loosen under load on the head, not tighten.

Caution: Pressure loss in swing-joints can affect head performance if not sized correctly. Often,

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flow required by the head will cause excessive loss if swing-joint is the same size as the head inlet. In this case, joints are sized one to three sizes larger, as required. Material may be schedule 40 galvanized steel or schedule 80 PVC. The latter is preferred because it is non-corrosive.

Impact rotary heads should never be installed without a gravel sump as shown. This sump will keep water drained which accumulates in the sprinkler housing during operation. If not drained, this water will fill the housing and cause dirt and debris to enter the housing, which will effect the operation of the head, cause premature wiper seal failure, and can make the head stick in the operating position after use. In sandy soils the sump should be protected in a manner (tar paper, plastic, etc.) that will prevent sand from washing into the sump both top and sides. In dense soils this pit (sump) may need to be extended in depth to insure proper drainage during operation.

Precipitation rates of sprinkler heads that are valved together should be the same or as close as possible. For example: A 180° arc should apply only one-half as much water as that of a 360° arc. And a 90° arc should apply one-quarter of the GPM than that of a 360° arc. This ratio should not be exceeded by more than 15%. Many impact rotary heads and gear-drive heads must be valved separately to achieve matched precipitation rates because of pressure, flow, and spacing requirements.

Avoid system designs which use sprinkler equipment from many different manufacturers. This will only increase the cost of installation and maintenanace. Most sprinkler manufacturers offer all the equipment required for a proper system. This statement will undoubtedly be disputed by many design consultants. Selection of sprinkler equipment for a particular project should be discussed fully by the owner and consultant, with consideration of parts and service availability in years to come.

Landscaping is one of the most important factors in a proper irrigation design. Many systems perform poorly because the landscape was not considered during the irrigation planning. Or, the irrigation was not considered during the landscape planning. The irrigation consultant and landscape architect should work together on a project in regards to: 1. Shrub and tree plantings 2. Shaded and sunny areas (should be valved separate) 3. Topography 4. Soil types 5. Water requirements.

In many instances, alternate planting locations will not change the overall aesthetic effect planned by the landscape architect, nor will it increase the cost of landscaping. Additional sprinkler head locations to accomodate the landscape will increase system cost.

There are many other items that are keys to proper irrigation systems which are too numerous to list. It is hoped that the items listed will help many people to become aware of certain standards. This in turn, will insure that the irrigation system performs to a high level of satisfaction.

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