

Irrigation Components, a Cause of Trip and Fall Accidents and Litigation

Landscape design, construction and maintenance, these three building blocks are required for a successful landscape project. A landscape architect provides a functional, aesthetic design. The landscape contractor uses the plans and specifications provided by the landscape architect for bidding the project. If awarded the contract, the plans become contract documents that the contractor adheres to during the construction process. Following construction, the landscape maintenance contractor (who might also be the installation contractor) provides regular ongoing maintenance to ensure the installed irrigation and plant systems operate and flourish.

Whether a residential, commercial or public works landscape project, these three separate but distinct roles are required to produce a successful landscape project. What comprises a “successful” landscape project? Due to the visual prominence of the landscape, a lay - person might consider aesthetics and beauty as priorities for judging whether a landscape project is a success. A landscape architect might consider functionality as the top priority for a successful project. The landscape contractor could measure success as a project with minimal plant mortality or if the project proved profitable. For the landscape maintenance contractor, an efficient, easy to operate irrigation system and plants well suited to the environmental conditions enable successful long-term maintenance.

Another metric for measuring success might include a safe landscape. A functional, beautiful landscape should also be designed, constructed and maintained with safety in mind. Landscape plans include specifications that dictate correct installation of products and materials. If a field construction worker deviates even a little bit from a particular specification or detail, their action may create a hazard that could result in an accident.

Irrigation

Irrigation systems contain components that protrude above finish grade. Certain components, such as valve boxes, sprinkler heads on risers, vacuum breakers and controller enclosures are installed permanently above grade. Popup sprinkler heads are installed flush or slightly below grade but “pop up” during operation, remaining anywhere from 4 to 12 inches temporarily above grade.

A high incidence of trip and fall accidents can be attributed to improperly specified, incorrectly installed or poorly maintained irrigation components protruding above grade. Three problematic irrigation components are valve boxes, popup sprinklers and spray heads on risers. The correct installation of these items is dependent upon orientation to the surrounding finish grade. From a trip and fall hazard perspective, they are frequently the cause of landscape related accidents and resultant litigation.

The Remote Control Valve (RCV)

The remote control valve (abbreviated RCV) is a device that turns on, allowing pressurized water to flow through the valve to the sprinklers. The RCV is installed below grade inside of a box or vault. Setting the remote control valve box correctly with finish grade is extremely important. The objective is to have the top of the box flush with the surrounding finish surface.

Valve boxes are located within turf grass or planter areas. Therefore, the box might be surrounded by or adjacent to turf, dirt, bark mulch, decomposed granite or concrete. Setting the box height is dependent upon the surrounding finish surface. When installed within a turf area, the box is set ½” above finish grade to allow for the thickness of sod that is installed against the valve box. When installed properly, the box top is flush with the adjacent sod, allowing for turf maintenance and pedestrian traffic to occur without disruption.

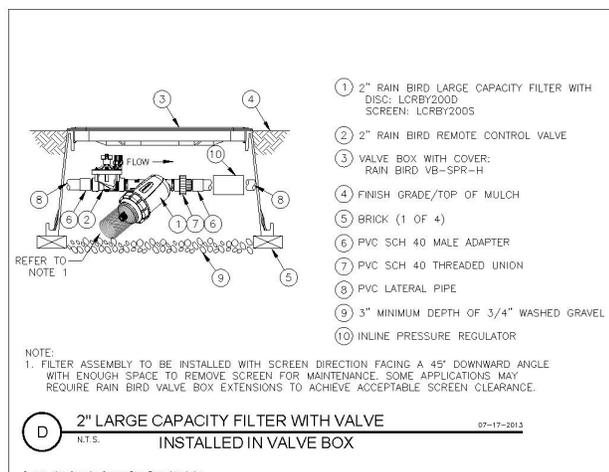


The top of box is set flush with top of turf grade. Picture by Landscapeonline.com

If the box is installed to high, protruding above the turf, it presents a physical hazard for turf care equipment and a potential trip and fall hazard for workers and pedestrians. A box installed below finish grade creates an unanticipated “hole” or low spot in a turf area. This affords an opportunity for turf to overgrow the edges of the box, further obscuring its’ visibility. A box set too low, partially hidden by turf grass is a dangerous condition for maintenance worker and pedestrians.

When installed in a planter area, the top of the remote control box must be flush with the adjacent surrounding finish grade. If the planter grade is specified to receive three inches of bark mulch, then the top of the box should be installed three inches above the planter finish grade allowing for three inches of bark mulch to be placed on grade.

Valve boxes installed in planter areas surrounded by bark mulch should be monitored for changes in adjacent finish grade. Bark mulch decomposes



over time, as it does, the bark finish grade adjacent to valve boxes lowers, resulting in the valve box protruding above grade, creating a trip hazard. Weather events may also hasten unwanted grade changes creating a trip hazard. Adding new bark mulch in planter areas as a scheduled maintenance practice will minimize change in grade issues that could lead to a trip and fall accident.



An uncovered valve creates an unexpected hole in the ground. Picture from Landscapeonline.com

An uncovered valve box creates a very dangerous condition. A valve box allows a worker to access the valve inside. To do so requires opening the valve box lid. It is extremely important the valve box cover is placed back on top of the valve box. A worker or pedestrian could very easily and unexpectedly step into the valve box and suffer significant bodily harm, not to mention damage to the irrigation system.

Valves are often located adjacent to sidewalks, removing the box cover is a common vandalism practice. This situation can be remedied by utilizing valve boxes that have a locking lid, or concrete boxes with steel hinged lids or drop in concrete covers.

Pop Up Sprinkler Heads

Spray, rotor or impact sprinkler heads are manufactured as pop up heads or as a sprinkler head affixed to a rigid riser.

In addition to being used in turf areas, pop up heads should always be used in turf or planter areas adjacent to patios, pathways, sidewalks, curbs, mow-strips, parking islands, where-ever vehicular and pedestrian traffic occur. When installed in turf, the top of the pop up head is installed approximately ½ inch above the surrounding finish grade, allowing for ½ inch of sod thickness adjacent to the sprinkler head. When properly installed, the top of the pop up is below the grass blades flush with the soil level, allowing safe, unfettered access for turf maintenance equipment and pedestrian walking conditions. Pop up heads



Pop up rotor, note cover plate is flush with grade below turf blades. Picture by diynetwork.com

in planter areas should be installed with the top of popup flush with the adjacent finish grade.

When in operation, the pop up stem protrudes several inches above the body of the pop up sprinkler. The stem retracts into the body when the valve is turned off. Over time, a pop up head may become worn and not retract properly. Dirt particles can accumulate and prevent the stem from retracting. Non-retracting pop up heads pose an exceptional hazard for maintenance worker and pedestrians. Regular scheduled maintenance should include inspection, flushing, cleaning or replacement as required to prevent this hazard from occurring.

Spray or Rotor Head on a Riser

Non-pop up spray, rotor and impact heads are installed onto a rigid riser and remain permanently above grade. Sprinkler heads in planter areas are typically specified a minimum of 12 inches above finished grade, usually on a schedule 40 or 80 PVC plastic



A staked rotor head on riser should be used where no pedestrian traffic occurs.

riser. Often times the specification may include steel or rebar staking to support the riser assembly. Because this type of installation creates an above grade hazard, it should only be used where vehicular and pedestrian traffic does not occur.

Pop up sprinkler heads are more expensive to purchase and install than a sprinkler head on a riser. Unfortunately, financial decisions to “value engineer” a project to reduce construction costs may result in inappropriate sprinkler head

installation that could create an obvious tripping hazard.

Spray heads on a riser should never be used in planters adjacent to sidewalks or trafficked areas. Even used in the back of a planter away from a path or sidewalk, they pose a danger. At night, they are all but invisible, especially without lighting. If a person travels through the planter and strays off the path, they could easily trip over this type of sprinkler installation.

Conclusion

Irrigation equipment designed, constructed and maintained below and above finish grade may result in landscape trip and fall accidents. Irrigation assemblies such as remote

control valve boxes, pop up sprinklers and fixed sprinklers on risers have the potential to create unexpected hazards for pedestrians and maintenance workers.

Landscape architects are responsible for producing plans and specifications that create functional, aesthetic landscapes that are safe for use by the public. Landscape contractors adhere to the plans and details to ensure the landscape and irrigation products are installed per manufacturer specification. Landscape maintenance contractors perform regularly scheduled maintenance to minimize or prevent hazardous or dangerous landscape and irrigation conditions that could result in an accident.

Lastly, the property owner has the overall responsibility to ensure their landscape project is safe for use by their guest, workers and the public. They can delegate the design to the architect, construction and maintenance to the contractor, but premise liability suggests they cannot delegat their responsibility to maintain their property so it does not pose a hazard to the public.