

Landscape Construction Standard of Care: Irrigation Systems

A tired executive returns home in the evening from a long day at work, while walking along the pathway to the front door he trips over a sprinkler head in the adjacent planter bed, loses his balance and falls awkwardly, breaking his neck and suffering paralysis from the neck down.

While attending a crowded outdoor festival, a family decides they want some ice cream, but the sidewalk to the store is packed with people attending the outdoor event, so they decide to follow others and take a short cut across a planter area to avoid the crowd. The mother trips and falls over an irrigation remote control valve box, resulting in a broken ankle, lost work, and a long painful rehabilitation.

A general contractor directs the landscape sub-contractor to install a temporary irrigation hi-line above grade. Over a holiday weekend, the irrigation hi-line breaks, flooding the work site and destroying the open footing trenches. The general contractor sues the landscape contractor for defective work and resultant damages exceeding 100K.

If you are a construction negligence and defect attorney, you have most likely encountered cases similar to the examples noted above. From my experience, irrigation systems and their components are the cause for many landscape construction defect cases.

WHAT CAUSED THE PROBLEM AND WHO TO BLAME?

Naturally, plaintiff and defendant counsel must discover how and why the accident occurred. Passive irrigation related accidents typically involve tripping over irrigation components, especially when the system is not running. Tripping hazards may include sprinkler heads on risers, vaults and boxes. Operational or active accidents include broken main lines, sprinkler heads, stuck valves or improperly programmed controllers. Operational accidents usually result in property damage while passive tripping hazards result in personal injury, in some cases severe injury or death may result. To determine the cause of the accident, investigation should center on one or all of the following:

1. Design, Construction or Maintenance?

- A. The investigation must determine whether the accident was caused by defective or negligent design, construction or maintenance.
- B. A design flaw can exist when a landscape professional is contracted to

provide an irrigation design. A licensed landscape architect is typically used for most public works projects, subdivision or commercial work, or any type of landscape project where a public jurisdictional agency and permit requirement exists.

- C. Design related deficiencies can be determined by inspecting landscape/irrigation development drawings, working drawings, permitted landscape plans, specifications, details, soil reports and other construction documents.
- D. Construction defects usually relate to the irrigation contractor who installed the work. However, what may appear to be an obvious irrigation construction issue might relate to inaccurate or incorrect irrigation design or might be the result of poor maintenance practices.
- E. Construction defect will center on field investigation and testing, inspecting contract documents, plans, specifications, inspection and daily reports, third party and agency correspondence.
- F. Other parties or improper maintenance may have caused what might appear to be a construction defect.
- G. Irrigation maintenance can be an overlooked cause of irrigation accidents. Irrigation systems provide water, which in turn causes plant growth. Over time, plant and root development affect the surrounding grade, flatwork, masonry and other surrounding site features. Roots cause pavement to lift and break irrigation pipes. Originally installed valve boxes may raise out of grade creating a tripping hazard. Sprinkler heads spray pattern may become blocked by plant growth, causing localized flooding, erosion and other safety related issues.
- H. Irrigation components have mechanical, hydraulic and increasingly sophisticated digital and computerized components. As with any machine or mechanical system, maintenance is required. Without regular recurring maintenance inspections and testing, accidents are unavoidable.
- I. It can be a very difficult and complex situation to unravel the causes and assess fault over time due to the nature of constantly changing and evolving landscape systems. It is not uncommon for a combination of causes including design, contracting and maintenance to result in an accident.

Investigating irrigation accidents inevitably leads to questions concerning the proper expectation of standard of care for irrigation design, construction and maintenance. This is where the lines blur and standard of care becomes difficult to assess because of varying degrees of irrigation sophistication.

Construction projects managed by municipal, state, and federal agencies, large commercial and sub-division projects possess the most stringent standard of care. Landscape construction contract documents include plans, details, specifications, schedules and related documents. The landscape contractor awarded a public works contract is usually pre-qualified and meets experience and insurance requirements. Details and specifications of are the highest order and protecting public safety is a high priority.

In contrast is residential landscape construction, where a layperson (homeowner) manages the project. There is minimal if any design process or plans, no details, specifications or other relevant documents. The standard of care the homeowner may expect might differ from what the contractor might provide.

WHO DETERMINES THE LEVEL OF CARE AND EXPERTISE?

2. Hierarchy of Standard of Care (from most to least stringent):

- A. Public works, including municipal, state and federal projects have the most stringent level of standard of care for landscape construction projects. A landscape architect is required to process entitlements, provide conceptual, working and permitted plans, details and specifications.
- B. Public agencies typically require pre-qualified licensed, insured, experienced landscape contractors for public bidding. That being said, public agencies often award contracts to the lowest bidder, which sometimes might be the contractor who forgot something in their bid.
- C. Commercial, sub-division, industrial and recreational facilities, multi family housing and large, non-governmental projects usually have a landscape professional, such as a landscape architect involved in the design process. These types of projects typically have a high level of care because the project is exposed to and used by the public. The work is usually permitted and therefore inspected by a third party for compliance issues.
- D. Complicating matters, a subdivision developer may employ one set of specifications for a public improvement within the subdivision, such as a tot lot or park, while employing less stringent specifications for individual residential front yard irrigation systems.
- E. Residential landscape and irrigation construction comprise the least stringent standard of care. This is a highly regrettable situation because the homeowner as a layperson, require the greatest protection from unscrupulous contractors. Without having professional assistance, the homeowner is left to rely on the contractor or even

worse, unlicensed gardeners and handymen. The homeowner might expect a certain standard of care the contractor cannot deliver.

- F. Typically, the landscape contractor also acts as the landscape designer, often resulting in conflict of interest between design and contracting issues the homeowner might not be aware of until it is too late.
- G. Safety issues are typically not the focus for residential landscape. This leads to cheaper, more hazard prone components used, such as a shrub head on a riser next to a sidewalk rather than using a more expensive pop up head.
- H. There is rarely any kind of third party review or inspection.

Additional layers of complexity arise when the accident involves a general contractor-landscape subcontractor conflict. In this scenario, an irrigation defect, be it design or construction may have been caused by incorrect supervision by the general contractor or even a directive by a governing agency to the landscape contractor. The reverse situation can occur whereby a negligent landscape subcontractor creates a hazard resulting in extensive damage to the general contractor's work.

Design build projects are another form of contracting that have the potential for conflict of interest and diminished standard of care. Landscape architects are licensed for design, landscape contractors are licensed to construct. When a contractor is hired to both design and construct, abuses can occur. Many qualified landscape design build contractors have licensed landscape architects on their staff which helps avoid conflict problems. Design build contractors are best utilized by savvy professionals who already understand the construction process and can benefit from the synergy of these kinds of firms.

COMMON IRRIGATION DEFICIENCIES AND DEFECTS:

Irrigation defects may arise from a single issue or a combination of design, construction or maintenance defects. The defect may in some way lead to an accident, either through an operational problem or passive hazard. The following discusses commonly encountered issues.

3. Common design, construction and maintenance defects:

I. Design:

- A. Failure to segregate irrigation valves based on sun-shade orientation and or plant type.

- B. Lacking proper backflow prevention system design or incorrect components.
- C. Over-stretching a valve system leading to unbalanced precipitation rate, drought and or flooding.
- D. Using spray or rotor heads on risers instead of pop up heads adjacent to sidewalks, curbs, decking, trails or pathways.
- E. Incorrect location of controller boxes or RP backflow devices impeding traffic sight distance and sight line corridors.
- F. Lack of master control, isolation or control valves to turn off the irrigation main line in an emergency.
- G. Failure to design or specify thrust block for mainline protection.
- H. Failure to account for low head drainage.

II. Construction:

- A. Failure to adhere to the irrigation design, plans, details and specifications.
- B. Contractors and unlicensed gardeners designing irrigation systems without knowledge of hydraulic flows or public safety issues.
- C. General contractors acting as design or professional consultants in making construction decisions.
- D. Landscape contractors performing non contract work without written authorization.
- E. Landscape contractors inadvertently or otherwise acting as landscape architects or professional consultant, making decisions outside of their field of expertise.
- F. Contractor cutting corners using cheaper components such as heads on risers rather than pop up heads.
- G. Incorrect RP back flow protection or no protection at all.
- H. Incorrect trenching and backflow, using contaminated or rock infested backfill, failure to properly bed pipe in a trench.

- I. Incorrect solvent welds, wrong or missing primer and applicable PVC glue.
- J. Failure to properly regulate the pressure in a system.
- K. Temporary hi-line irrigation mainlines improperly supported on grade, failure to bracket and or sand bag.
- L. Failure to install thrust blocks at angles and changes in elevation.
- M. Setting valve boxes and subterranean vaults at incorrect finish grade.
- N. Setting irrigation pop up and heads on risers at incorrect elevation or finish grade.
- O. Failure to install check or swing valves to reduce low head drainage.

III. Maintenance:

- A. Failure to properly inspect, clean and adjust sprinkler heads.
- B. Failure to inspect and regularly adjust and program the irrigation controller.
- C. Failure to adjust irrigation heads blocked by growing plants.
- D. Failure to adjust valve boxes and subterranean vaults as grade changes occur.
- E. Incorrectly staking irrigation heads creating tripping hazard.
- F. Overwatering turf and planter areas leading to erosion and runoff creating slipping hazards for pedestrians and vehicular hazards for motorists

The items listed above represent only the most common irrigation defects. A leaking irrigation head or valve system may go unnoticed for years until one day; a motorist loses control of their vehicle or pedestrian slips and injures himself or herself, then the resultant lawsuit.

Whether council for a defendant or plaintiff, a systematic investigation into the cause of the accident should include analysis of the design, construction and maintenance aspects. Determination of standard of care involves the level of construction management and sophistication, whether the project is

governmental, public works, commercial, sub-division or residential and will vary accordingly.

In order to properly distill the facts from assumptions, use an experienced, educated, knowledgeable landscape professional for investigative forensic work.