Irrigating High Traffic Turfgrass and Sports Fields

Considerations for New and Retro Athletic Field Systems....

ASBA Technical Meeting, 2014
Why Start with “Considerations”

- Old system with “doughnuts” on grass
- New system with “doughnuts” on grass
- No system – brown grass!
- Cost of water, pumps, labor
- Safe, playing surfaces
- New type of playing surface (synthetic or natural)
- New “trends” available
Irrigating High Traffic Areas
What Should I Consider for a Retro and/or New System?

- Types of playing surfaces
- Local codes
- Cost $$$
- Professional Certified Consultant - design
- Professional/Certified/knowledgeable contractor (sub) - installation
- Knowledge of ongoing management & maintenance
What Should I Consider for a Retro and/or New System?

- Site specifics - challenges
- Location
- Water source
- Water quality
- Electrical
What Should I Consider for a Retro and/or New System?

- Available hydraulics
- Design capacity & dynamic pressure available (how much water and pressure do I have and need?)
- Equipment
Basics of Irrigating High Traffic Turf

- Design
- Installation
- Maintenance
- Scheduling/ Management
Efficient Irrigation Design
Design Considerations

- Site specific “basics”
- Equipment selection
- Zoning of sprinklers
- Specification and installation details
- Compliance to local and national codes
- Site inspections
What comes first in designing an efficient system?

- Determine available flow
- Determine pressure available at point of connection
- Estimate pressure available for sprinkler operation (booster pump?)
- Estimate the number of sprinklers that can be operated on a single zone
Provide a “road map”....
Provide installation details....
Design: Component Locations

- Sprinklers
- Valves
- Quick couplers
- Controllers
- Sensors
- Volkswagen versus Cadillac
Cadillac...
Sports Field Designs....

SYSTEM PERFORMANCE DATA

<table>
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<tr>
<th>ZONE</th>
<th>SIZE</th>
<th>FLOW</th>
<th>PR</th>
<th>DU%</th>
<th>SC</th>
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VALVE ID GUIDE

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<tr>
<th>VALVE</th>
<th>STATION NUMBER</th>
<th>GPM</th>
<th>VALVE SIZE</th>
<th>PRECIPITATION RATE</th>
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</table>
Local Codes...

**Reduced Pressure Backflow Preventer**
Model 825YD 2½” through 10”

- Install with minimum clearance of 12” from the point of entry, flow, or grade. Install for easy accessibility. Protect from freezing. Use support blocks to prevent flange damage.
- Majority of local codes restrict pit installation.

**Double Check Backflow Preventer**
Model 805YD 2½” through 10”

- Install with adequate clearance and easy accessibility for testing and maintenance purposes. Protect from freezing. Install horizontally or vertically without flow. Larger sizes should be installed horizontally for ease of service and should have support blocks to prevent flange damage.

**Pressure Vacuum Breaker Assembly**
Model 765 ½” through 2”

- Install at least 12” above the highest piping or outlet downstream of the device and in a manner to preclude backpressure. Install for easy accessibility for testing and maintenance purposes.
- Locate where discharge will not be objectionable. Protect from freezing. Must not be installed where back pressure may occur. Discharge pressure should be maintained above 3.0 PSIG on the ½” through 1 ¼” sizes and above 5.0 PSIG in the 1 ½” and 2” sizes.

**Atmospheric Vacuum Breaker**
Model 710 ½” through 2”

- Install on the discharge side of the last shutoff valve. Install a minimum of 6” above the highest overflow level, with the air inlet in an elevated position.
Local Codes...

Irrigation Wires and Cables & Electrical Code Requirements (NEC® and CEC®)
Local Codes...

American Society of Irrigation Consultants

ASIC Guideline 100-2002 (January 2, 2009)
For Earth Grounding Electronic Equipment in Irrigation Systems

For the latest rev, go to http://www.asic.org/design_guides.htm

American Society of Irrigation Consultants
P.O. Box 616
125 Paradise Lane
Rochester, MA 02770
Phone: (508) 763-8146
Fax: (508) 763-8162
Website: www.asic.org
E-mail: info@asic.org

Figure 2 - Up to 64 Stations, Non-Rocky Soils
No Scale

Top View

Side View

Controller
Concrete Pad
Ground Rod

Gravel/Grout Material, Whatever is Deepest
Grounding Controllers

GROUNDING CONTROLLERS

The following details are the minimum requirement for supplementary grounding and bonding of any irrigation controller, weather station, interface, etc. Other details, for a multitude of field situations, are available from the American Society of Irrigation Consultants, ASIC Guideline 100-2002 (www.asic.org, “Design Guides”).

The grounding/bonding circuit includes:
- A copper clad steel ground rod
- A solid copper ground plate
- Two 50-pound bags of Earth Contact Material [PowerSet™ for loose soils or PowerFill™ (lower cost) for clay soils]
- 6 AWG solid bare copper Bonding wires
Other Design Criteria

- Main line size
- Equipment selection
- Hydro zones
- Infields
- Two-wire Decoder systems
- Synthetic surfaces
Irrigating Multiple Zones

Correct main line size important!
Equipment Selection

- Check with your local irrigation distributor & manufacturer’s rep
- Obtain new product catalogues at tradeshows!
- Check with your local sales representative
- Ask your neighbor
Equipment Selection
Unique Features in Rotors
Hydro Zones
Infields

High Speed Rotor for Dust Control
Decoder/ Two-Wire Systems
How Decoder Systems Work

The single pair of wire is run from the controller through the area to be irrigated. Usually with the main pipeline.

A decoder is spliced into the two-wire path.

Decoders, in turn, are connected to their solenoids.

Additional decoders are spliced in as needed.
How Decoder Systems Work

When the controller turns on a station, it sends power down the wire pair, along with the digital Station Number for the decoder.

When the decoder hears its own “Address”, it applies voltage to the solenoid.
Two-wire technology for large systems

Decoder technology allows us to run multiple valves over a single pair of wires... for miles!

The power for the solenoids and a digital signal (for the zone we want to operate), are sent over the same 2 wires.
## Where Decoder Systems Work Best

<table>
<thead>
<tr>
<th>Athletic complexes</th>
<th>Industrial Parks</th>
<th>Sports Fields</th>
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<tbody>
<tr>
<td>Cemeteries</td>
<td>Commercial Projects</td>
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<td>Schools</td>
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<td>Multi-Family Home projects</td>
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- Systems with 15 valves and larger are usually the best candidates for decoder applications.

- Phased projects where it would be difficult and expensive to run wires back to a controller, or where the final number of zones is undetermined...
SYNTHETIC
Why Synthetic Turf Irrigation

- To cool high heat generated by synthetic turf surfaces
- To clean / flush the synthetic turf surface
- Flow and Pressure are critical in design!
Vaults

- Pre-cast hole sized for the rotor provides lateral thrust support
- Access port for remotely located On-Off-Auto selector
- Access port for quick-coupler valve
For the Irrigation Consultant / Specifier

- A “kit” of products that provide the complete solution
- Clear and specific installation details to help ensure the correct products are installed properly
Irrigating Synthetic Turf
Synthetic

A Guide to Synthetic and Natural Turfgrass for Sports Fields
Selection, Construction and Maintenance Considerations

www.stma.org
Installation Criteria

- Main line & lateral depth
- Sprinklers and quick couplers
  - Grade
  - Boxes
- Trenches properly backfilled and compacted
- Correct wiring installation
Require/ Provide an “As-Built”

- Each zone color coded
- Laminated
- One copy for office and one copy in controller for easy reference
Installation...
Proper Installation Heights
Proper Installation Practices...

- How deep?
- Compaction?
- Bedding?
- What about Expansion and Contraction?
- Thrust Blocking?
  - What?
  - Where?
Proper Installation Practices...

DBRY-6; 3M Connectors
Professional Irrigation Installation

Site inspections are cheap insurance policies!
Efficient Irrigation Maintenance/Management
Maintenance Criteria

- Proper nozzling
- Head/ arc adjustment
- Visual site inspections
- Clogged screens
- Rotation
- Component damage
- Grade readjustment
Maintenance Check-list

- Set pressures to specifications
- Adjust heads to correct grades
- No missing heads or broken sprinklers
- No interference to heads by landscape
- Annual equipment check-up
- Understand proper winterization & spring start-up techniques
Efficient Irrigation Maintenance/Management...
Efficient Irrigation Maintenance/Management...
Efficient Irrigation Maintenance/Management...
Why is Maximizing Water Use & Maintaining Optimum Uniformity Important?

- **Environmental**
  - Water Conservation
  - Energy Conservation
  - Eliminate Nutrient Leaching $$$
  - Reduce Weed and Disease Control Needs
Why is Maximizing Water Use & Maintaining Optimum Uniformity Important?

- **Turf Management**
  - **Safety**
  - Manage Salinity / Poor Water Quality
  - Improve Playing Conditions
  - Improve Aesthetics
  - Healthier Turf
The Facts....

- Outdoor water use is under increased, if not constant observation
- Water is our #1 most valuable resource, **worldwide**!
- Large percentage of water is wasted due to inefficient systems
What Is The Answer?

- More efficient irrigation systems!
  - The irrigation system is only as good as the designer/ installer/ operator/ manager
  - The irrigation system is only as good as the **written** specifications the builder/contractor must follow
Water Use Trends

- High Efficiency Nozzles
- Weather Sensors
- Check Valves
- Pressure Regulation
- MP Rotators
- Climatic Controllers (EPA WaterSense Label)
Legislative Trends for Water Conservation
“When the well is dry, we learn the worth of water.”
Ben Franklin, Poor Richard's Almanac 1733
Water Resources and Population Growth, 2000-2020

Source: DOE/NETL (M. Chan, July 2002)
DROUGHT …Mother Nature still holds the trump card
Real Estate’s Latest Movement

The New York Times
Editorial
Build Green, Make Green

The Greening of America’s Campuses

It’s Easy Being Green
LEED
V.4
There are five rating systems that address multiple project types:

- Building Design and Construction (BD+C)
- Interior Design and Construction (ID+C)
- Building Operations and Maintenance (O+M)
- Neighborhood Development (ND)
- Homes
Sustainability Design Opportunities

**Water efficiency**
credits promote smarter use of water, inside and out, to reduce potable water consumption.

**Sustainable sites**
credits encourage strategies that minimize the impact on ecosystems and water resources.
Sustainable Sites Initiative

- ASLA
- Lady Bird Johnson Wild Flower Center
- United State Botanic Gardens
- November 5, 2009 – Pilot Projects for tests of the rating system
- Involves efficient design, installation, maintenance practices
- http://www.sustainablesites.org/
Considerations for Irrigating High Traffic Turf & Field Renovations....

- Conservation of Water
- Healthy Plant Material
- Aesthetically Pleasing Landscapes
- Prevent Liabilities - SAFETY
- Overall Lower Costs
- Resources & Knowledge
Considerations...
Considerations...
Considerations...
Before.....
After....
US Soccer Foundation – Field Grants

http://www.ussoccerfoundation.org

Irrigation - grants are awarded for the purchase of our irrigation products to irrigate natural grass or synthetic turf fields (while irrigation is not required for synthetic turf, it is recommended for cleaning and cooling purposes). Funding does not cover installation.

- Grant Amount: **Up to $15,000**
- Irrigation funding can ONLY be used for sprinklers, valves, and/or controllers; funding does NOT cover pipes, wires, fittings, electrical splices, etc
US Soccer Foundation – Field Grants

**Safe Places to Play Grants** (Synthetic Turf, Lighting, Irrigation, Sport Court)

- **2014 Fall Grant Cycle**
  - Application deadline - October 1, 2014
  - LOIs due by 9/24/2014

- **2015 Spring Grant Cycle**
  - Application deadline - February 6, 2015
  - LOIs due by 1/30/2015

- **2015 Summer Grant Cycle**
  - Application deadline - June 5, 2015
  - LOIs due by 5/29/2015

GRANTS: The U.S. Soccer Foundation annually awards grants to support both soccer programs and field building initiatives in underserved areas nationwide.
STMA = SUCCESS!

SportsTurf
MANAGERS ASSOCIATION

Experts on the Field, Partners in the Game.
Your #1 Resource

www.sportsturfmanager.org
Thank you!

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