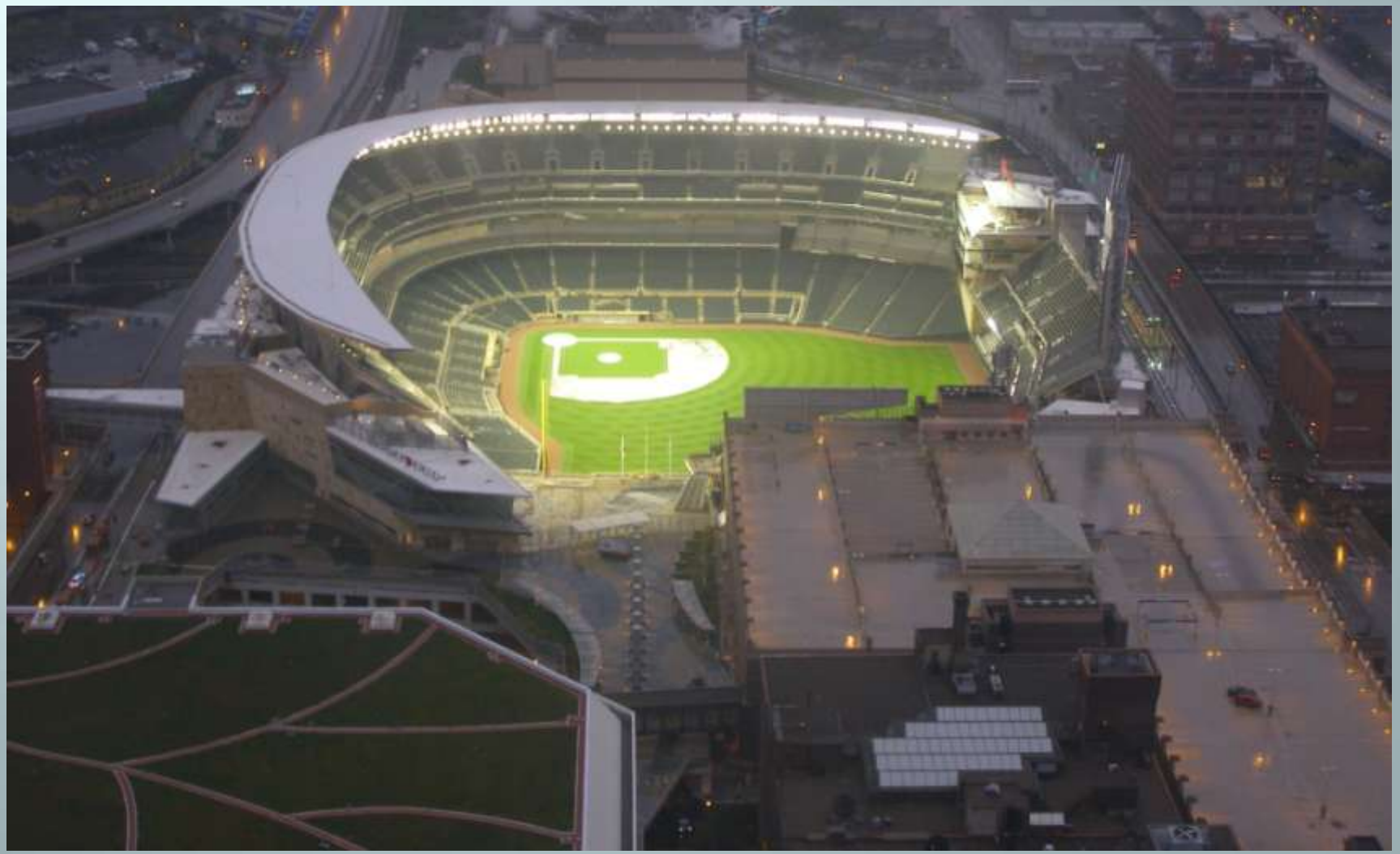
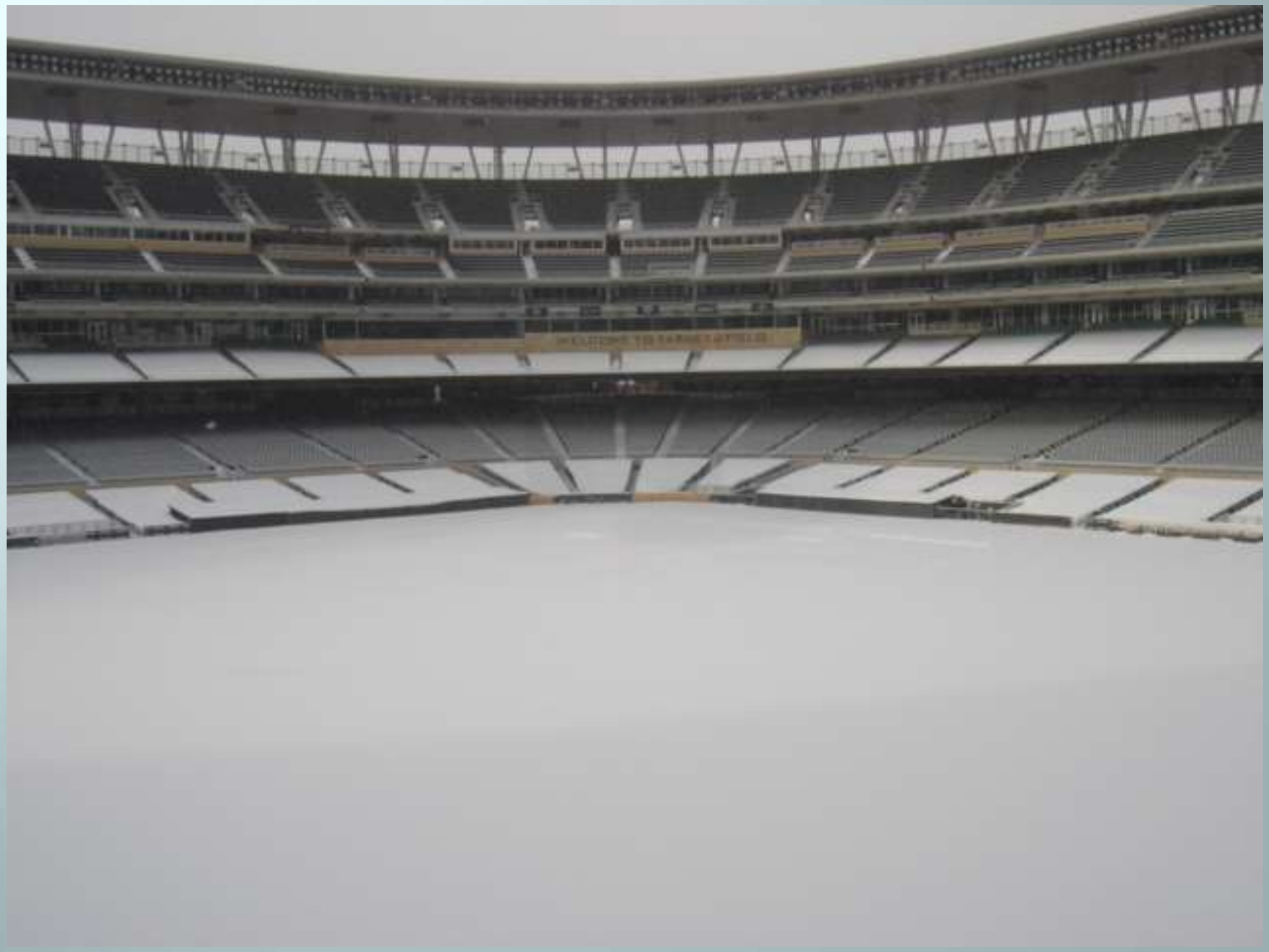
LEED Landscape Maintenance

LEED Building Construction vs. Maintenance in Landscape Setting.

Challenges in the Urban Environment.





Snow and Ice Management

- Goal is to minimize the amount of chemicals used and prevent ecological damage.
- Use less environmentally disruptive deicing chemicals such as potassium acetate or calcium magnesium acetate for small areas as much as possible.
- When applying ice melt products, the area is first plowed and then power brushed in order to help the product be most effective, allowing for reduced distribution of chemicals.

Labor Considerations

Public Pedestrian Concerns.

Usage of Acetates for Snow and Ice Control on Concrete Surfaces.

- Chlorides are water pollutants.
- Acetates are a non-chloride type of liquid that have low effective temperatures and are non-corrosive.
- Cost of acetates are higher than chlorides as they cost more to produce.
- Use potassium acetate and calcium magnesium acetate in a preventative manner to prohibit bonding of snow or ice to the surface.

Focus on Manual Labor.

Calcium Magnesium Acetate

- Many engineers specify CMA as it does not chemically attack concrete; nor does it increase spalling due to freeze/ thaw cycles.
- Optimum use at temperatures above 20*F.
- Apply ‘bottom up’ as early application is the key to effective performance; this should interfere with the ability of snow particles to adhere to each other or to the surface.
- CMA = safe for concrete; low toxicity; low corrosion; excellent inhibitor; residual effect.

The Snow Dragon

Melting Snow at 95-100* F

LEED Maintenance in Common Landscape Areas.

Sustainable Landscape and Water Management.

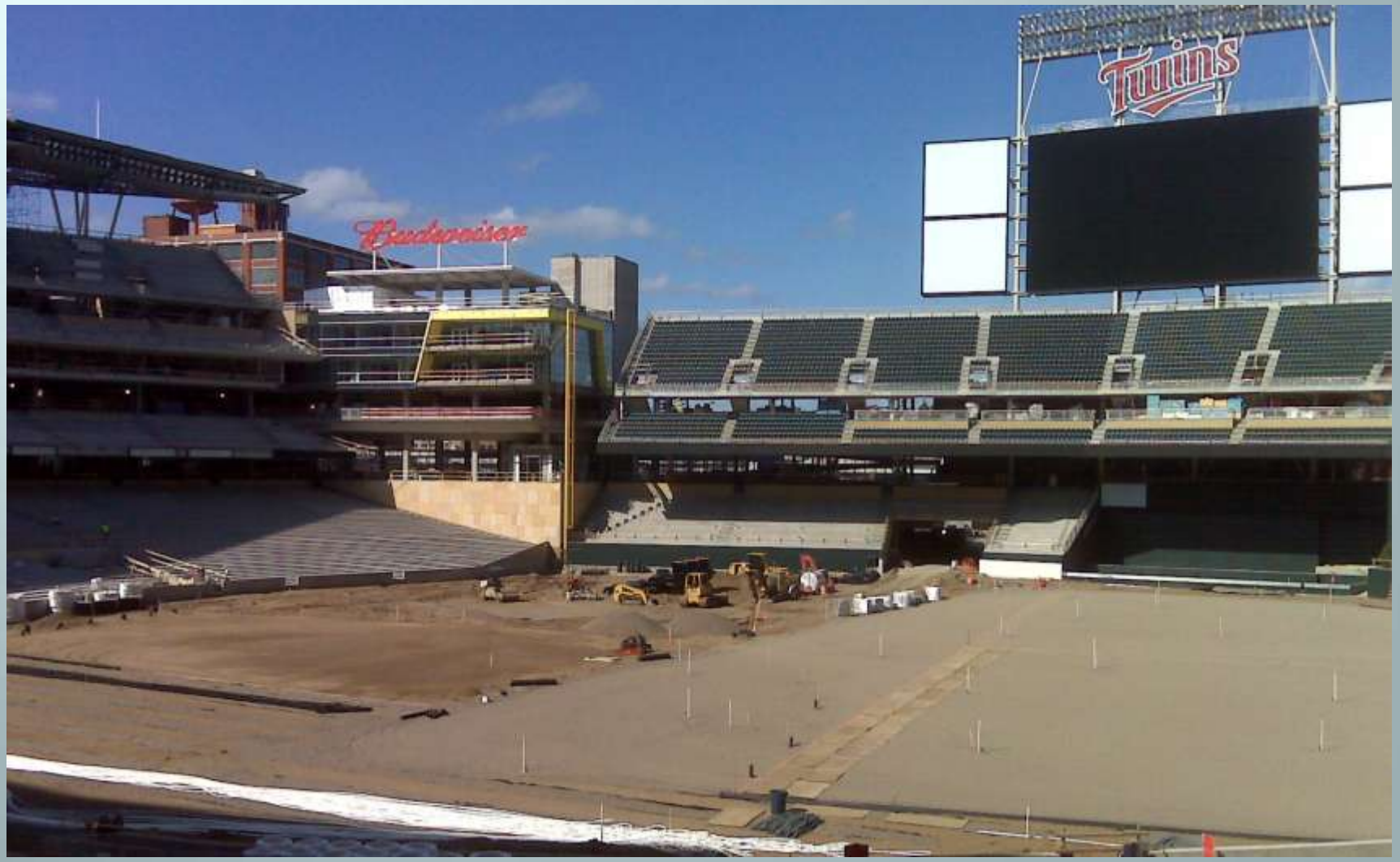
Weed Control.

Spring and Fall Cleanup.

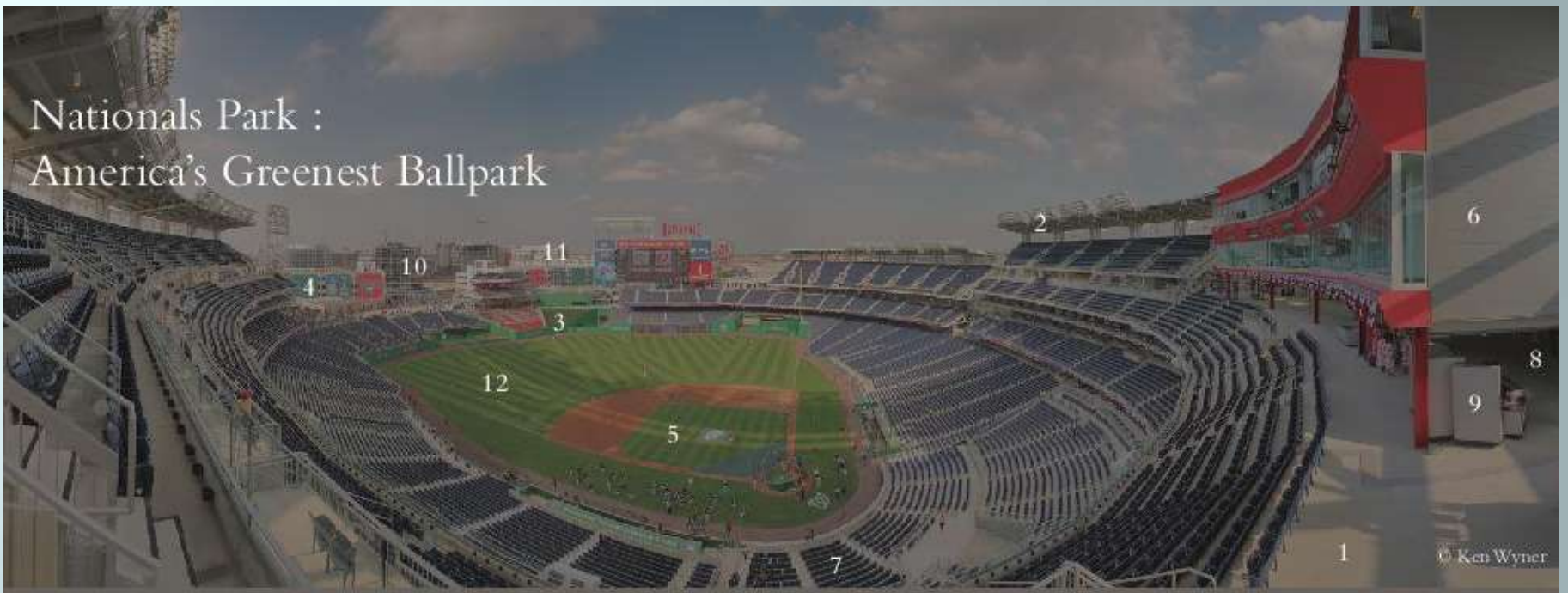
BMP's and Implementation within the Landscape Environment.

- All turf and landscape bed areas to be hand-weeded.
- All shrubs to be manually pruned.
- 100% adoption of mulching mowers; no clippings are collected.
- All landscaping waste is composted.
- Balanced fertility/ use of organics.
- Vehicles, fuels and emissions: aim for 100% adoption of electric vehicles.
- Switch to lithium ion landscape tools when possible.

Designing and Building the Facility.



Nationals Park : America's Greenest Ballpark



1. Construction Materials
Up to 20% recycled content construction materials used in building the ballpark

2. Lighting
High efficiency field lighting saves a projected 21% energy cost

3. Water Sampling
Playing field sampling manhole tests runoff quality

4. Green Roof
6,300 SF planting above concession areas minimizes heat gain

5 Site Remediation
Brownfield redevelopment site

6. Energy Savings
Optimized energy performance from exterior wall design and commissioning

7. Suites & Clubs
Low emitting materials - carpet, paint and adhesives used in interior design

8. Rest Rooms
Water conserving plumbing fixtures save a projected 3.6 million gallons of water per year

9. Recycling
Storage and recycling of glass, metal, plastic, cardboard, and paper products

10. Transportation
Access to mass transportation - Metro Bus and Metrorail systems; unique bike valet system

11. Parking
Reserved parking for fuel efficient vehicles and carpools

12. Stormwater Management
Enhanced sandfilters buried throughout the ballpark screen organic debris (peanut shells, hot dogs, etc.) and re-direct bowl wash-down to sanitary system

HOKSPORT

Challenges Building a Field Within a Stadium Construction Project.

Planning and Execution.

Early Site Development.

Water is a Critical Factor.

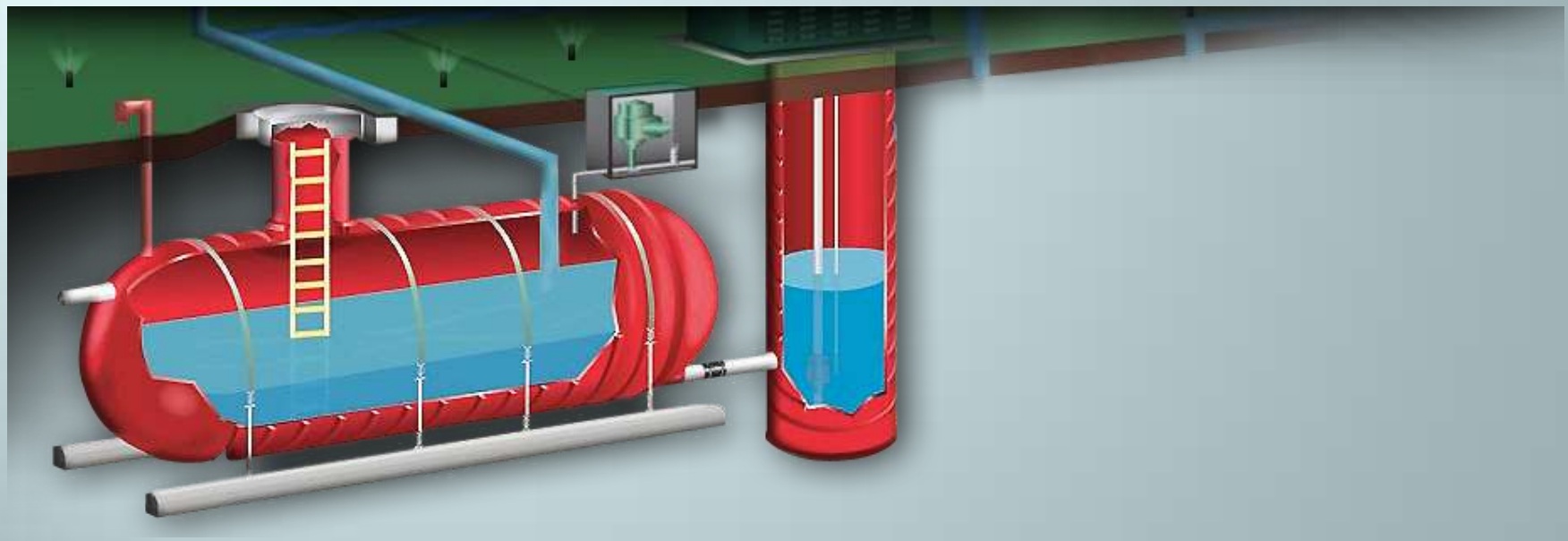
Building for Extreme Weather.

Cistern Installation for Storm Water Retention on the Site.

Field Drainage Basin.

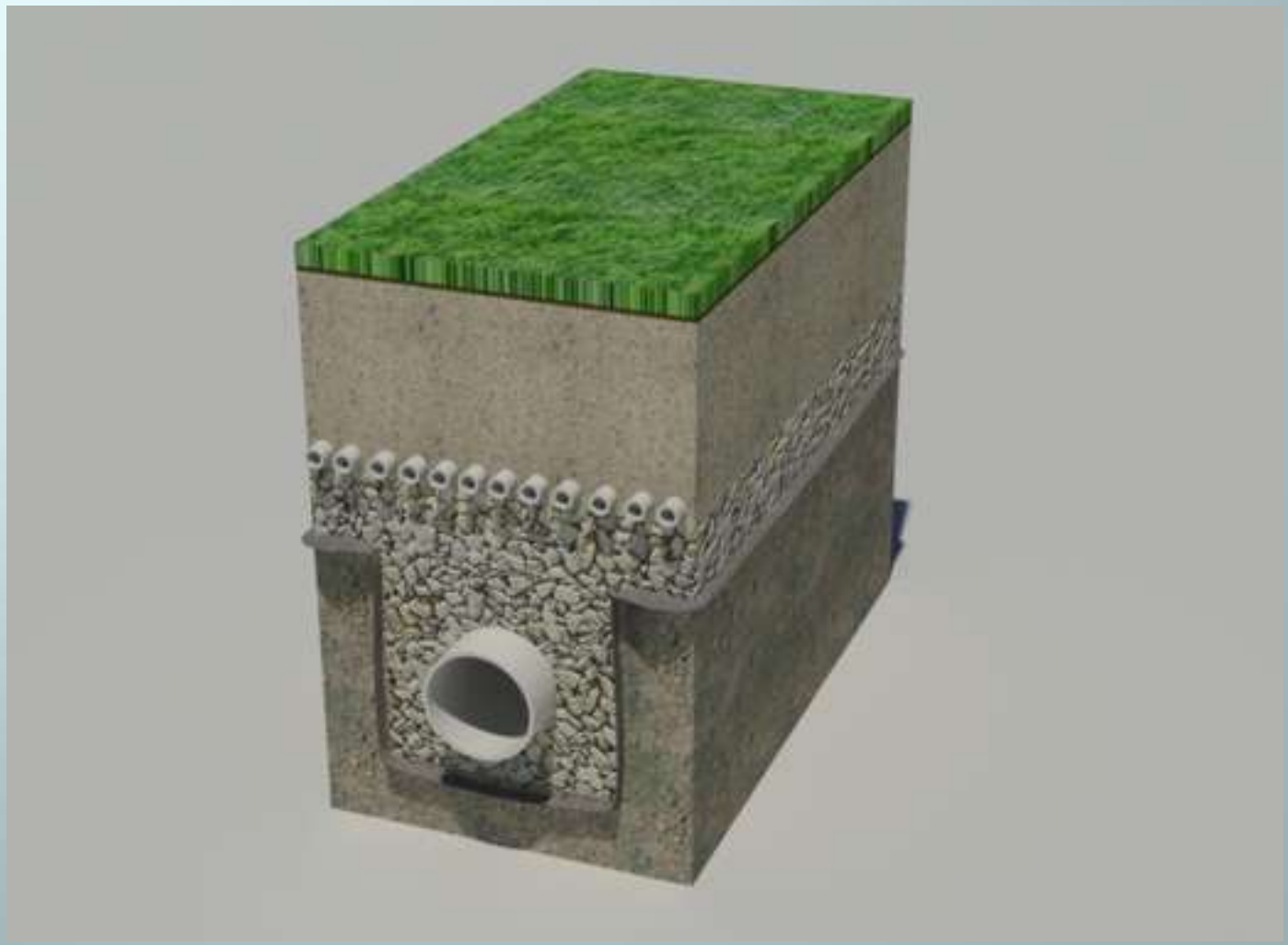
Rainwater Collection Process.

Rainwater Recycling System; Capturing Water for Cleaning Seats.



Organizational Expectations for a new facility in MLB.

Target Field Section View.



MLB-Expectations in Rain Situations and Tarp Management.

Water is Always the Isuue.

Nationals Park 2008 Field Maintenance Items

- Utilization of a ‘dirty’ rootzone, which included calcined clay and a combined 7% silt and clay.
- While still nearly 90% total sand, the rootzone provided increased nutrient and water-holding capacity that a straight sand field.
- Positive result was an excellent growing medium for Kentucky Bluegrass in the transition zone.
- Negative result was that the silt, clay and very fine sand did not drain as quickly as expected and was prone to compaction.

Target Field Turf Management

- 3 years of consistent use of a plant growth regulator results in dense canopy and no herbicide use.
- Annual bluegrass plants cut out manually.
- Zero-based irrigation scheduling; turf sensors.
- Rinse sprayer, spreader and equipment into cistern.
- Return clippings – mow with baskets only on edges.
- IPM program- alternate fungicides; use Plant Defense Activator for Induced Systemic Resistance.
- Spoon feed; foliar focus; use nitrification inhibitors.

Benefits of Plant Growth Regulators for Athletic Fields

Trinexapac-ethyl use as a PGR.

- T.E. applied as foliar uptake; rainfast in one hour.
- T.E. inhibits cell elongation by changing the plant hormone levels.
- By slowing vertical growth, T.E. will increase the lateral growth of turf blades. This shortens stems, making leaves more compact with improved density.
- Denser turf suppresses weeds and helps retain moisture in the canopy.

PGR Benefits Continued

- Proven to reduce clippings and mowing, which leads to savings on fuel, labor costs and equipment wear.
- Pre-stress conditioning helps prepare the plant for summer stress in cool-season turf.
- More compact turf reduces risk of scalping.
- Trinexapac-ethyl will help concentrate chlorophyll in shorter leaves, producing darker color.
- T.E. = more density and carbohydrate storage in shade situations.

Zero-based Irrigation Scheduling.

Turfgrass Soil Sensor/ Moisture Meter.

- Consistently records soil moisture, temperature and salinity around the clock.
- Allows the turf manager to establish moisture values for the soil that are acceptable for the rootzone and events, enabling water savings.

Hand Watering of Detail Areas = Efficient Level of Conservation.

Equipment Cleanup

- Utilize warning track for rinse cycle of sprayer.
- Finish rinse of sprayer and granular spreader at catch basin which empties into cistern for water filtration and recycling.

Mowing without baskets.

Benefits of returning clippings to the turf.

- No waste to dispose of off site.
- Nitrogen loss reduced by returning clippings.

Foliar Nutrition of Turfgrass.

- Improved results when following conditions are in place: unfavorable root-zone; less than ideal soil pH; soil temperatures are cool.
- Gives the turf manager more control over growth and safe, consistent results.
- Minimized potential for nutrient leaching.
- Efficiency of nutrient uptake in foliar applications, prior to and during times of stress, is especially helpful to turfgrass.

Spoon Feeding of Sand-based Turf.

- Spoon feeding (foliar) defined as: “ application at low, frequent levels in a sprayer. Applications of N @ .1 to .2 lbs. N/1000 (Carrow, Waddington, Rieke).
- From: Turfgrass Soil Fertility and Chemical Problems (Carrow, Waddington, Rieke) – “The best control of N response is provided by light and frequent applications of **soluble** N sources.”

Utilization of Water Soluble and Water Insoluble Organic Nitrogen.

Nitrification and Urease Inhibitors

- Nitrogen stabilizers are materials added to fertilizers to increase the time that N remains in the urea or NH 4+ form after application. By delaying the conversion of N to the NO 3- form, reduced losses of N by leaching or denitrification may be realized. (Carrow, Waddington, Rieke – p. 316).
- Use of soluble urea formulated as stabilized N on a consistent basis (i.e. @ .25 lbs N every 14 days), on a sand-based field, INHIBITS leaching of N in instances of heavy rain events.

IPM Approach

- All annual bluegrass monitored and removed by hand; replaced with sod plugs from site sod farm.
- No herbicides, pre or post.
- Insecticides as needed based on sampling and evaluation of site conditions.
- Alternate fungicides to prevent resistance. Began use of mineral oil based product, a plant defense activator, as an alternative to standard fungicides when possible.

Evolution of Sustainability in Athletic Field Management.

- Technological improvements in equipment and turf evaluation tools continue to provide better opportunities for conservation of resources.
- "…a sustainable field should be managed with minimal inputs that will give way to enhanced soil and water quality while meeting the goal of a safe playing surface." (Puhalla, Krans, Goatley – Vol. 2 – p. 481).
- Sustainability concepts have been ACCEPTED; key is in the EXECUTION of and RESULTS of them.