Stormwater Control Measure’s (SCM) Inspection & Maintenance

Thomas Moore
Senior Stormwater Inspector
G2 Design P.A
Part I: Common SCM Constructability Issues
Part I: Common SCM Constructability Issues

Pipe & Structure Joints
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Symptom
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Cause

- Improper pipe alignment
- Improper subgrade or footing
- Joint not wrapped externally (waterproofed)
- Joint not grouted internally
- No early detection of the issue (lack of routine maintenance)
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Symptom
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Cause

- Joint infiltration
- Soil piping
- Improper pipe alignment
- Improper compaction
- Joint's not waterproofed (wrapped externally or grouted internally)
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Symptom

- Low permanent pool elevation
- Water discharging at the outlet while pond is below normal pool
Part I: Common SCM Constructability Issues
Pipe & Structure Joints

The Cause

- Improper grout type
- Pipe penetration not grouted internally & externally properly
- Stacking joint not waterproofed
Part I: Common SCM Constructability Issues

Pipe & Structure Joints

The Cause

- Outlet pipe joint infiltration
- Joint’s not waterproofed (wrapped externally or grouted internally)
- Improper pipe alignment
- Improper dam compaction
Part I: Common SCM Constructability Issues

Stone Dissipater’s
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Symptom
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Cause

- Stone (rip rap) laid flat; not concave
- 6”-17” size stone laid within 4” grade creating an elevated spillway
- Stone should be recessed into the dam in a concave profile to prevent by-pass
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Symptom
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Symptom
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Cause

- Fabric not folded and tucked properly beneath the outlet flared end section (FES)
Part I: Common SCM Constructability Issues

Stone Dissipater’s

The Cause

• Fabric not folded and tucked properly beneath the outlet flared end section (FES)

• Lack of supplemental anchoring for steep slopes
  - Metal posts, concrete slurry, hog wire, gabion baskets
Part I: Common SCM Constructability Issues

Perennial Turf Establishment
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Symptom
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Symptom
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Symptom
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

- SOIL PREPARATION!

- Not following erosion control/seeding guidelines
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

SEEDBED PREPARATION
1. CHISEL COMPACTED AREAS AND SPREAD TOPSOIL 3 INCHES DEEP.
2. RIP THE ENTIRE AREA TO 6 INCHES DEPTH.
3. REMOVE ALL LOOSE ROCK, ROOTS, AND OTHER OBSTRUCTIONS LEAVING SURFACE REASONABLY SMOOTH AND UNIFORM.
4. CONTINUE TILLAGE UNTIL A WELL-PULVERIZED, FIRM REASONABLY UNIFORM SEEDBED IS PREPARED 4 TO 6 INCHES DEEP.
5. SEED ON A FRESHLY PREPARED SEEDBED AND COVER
6. MULCH IMMEDIATELY AFTER SEEDING AND ANCHOR MULCH.
7. INSPECT ALL SEEDED AREAS AND MAKE NECESSARY REPAIRS OR RESEEDINGS WITHIN THE PLANTING SEASON, IF POSSIBLE. IF STAND SHOULD BE OVER 60% DAMAGED, REESTABLISH FOLLOWING ORIGINAL LIME, FERTILIZER AND SEEDING RATES, SEED LIGHTLY WITH SEEDING EQUIPMENT OR CULTIPACK AFTER SEEDING.
* SEE SEASONAL APPLICATION SCHEDULE

NOTE: ALL POND BERMS AND INTERIOR POND AREAS WILL REQUIRE A HEALTHY STAND OF GRASS ON A MINIMUM OF 85% OF THE TOTAL AREA AT THE TIME THE CERTIFICATION PACKAGE IS SUBMITTED TO THE CITY. THE SCM'S WILL NOT RECEIVE FINAL CERTIFICATION UNTIL THIS REQUIREMENT HAS BEEN MET.

“the many plans that specify retrofitting a layer of topsoil on slopes/dam upon permanent pond conversion are almost universally ignored”

-Marc Burke – EDGE Environmental
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

• SOIL PREPARATION!
  - Not following erosion control/seeding guidelines
  - Highly compacted
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

- SOIL PREPARATION!
  - Not following erosion control/seeding guidelines
  - Highly compacted
  - Soil not amended
Part I: Common SCM Constructability Issues
Perennial Turf Establishment

The Cause

- POOR IMPLEMENTATION
  - Wheat straw instead of matting leading to wash out
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

- **POOR IMPLEMENTATION**
  - Wheat straw instead of matting leading to wash out
Part I: Common SCM Constructability Issues
Perennial Turf Establishment

The Cause

• POOR IMPLEMENTATION
  - Wheat straw instead of matting leading to wash out
  - Seeding method: plug core aerator instead of tilling and broadcast spreader
Part I: Common SCM Constructability Issues
Perennial Turf Establishment

The Cause

- **POOR IMPLEMENTATION**
  - Wheat straw instead of matting leading to wash out
  - Seeding method: plug core aerator instead of tilling and broadcast spreader
  - Wrong seed for the time of year
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause

• POOR IMPLEMENTATION
  - Wheat straw instead of matting leading to wash out
  - Seeding method: plug core aerator instead of tilling and broadcast spreader
  - Wrong seed for the time of year
Part I: Common SCM Constructability Issues

Perennial Turf Establishment

The Cause
Part II: Common SCM Maintenance Issues
Part II: Common SCM Maintenance Issues

Vegetative Maintenance
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes & Improper mowing patterns
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes & Improper mowing patterns
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues
Vegetative Maintenance

Mowing

- Lack of comprehensive mowing; side slopes, dam, inlet’s, outlets, easements
- Over mowing of littoral shelves
- Mowing of riparian areas
- Scalping of dam and side slopes & Improper mowing patterns
- Infrequency of mowing leading to heavy detritus
Part II: Common SCM Maintenance Issues

Invasive Weed Control
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

• Cattails & Black Willows are the most common offenders
• Smartweed & Primrose
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

• Cattails & Black Willows are the most common offenders
• Smartweed & Primrose
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
- Smartweed & Primrose
- Proper plant identification
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

• Cattails & Black Willows are the most common offenders
• Smartweed & Primrose
• Proper plant identification
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
- Smartweed & Primrose
- Proper plant identification
- Weed/algae control; leads to obstructed orifices and smothering plants
Part II: Common SCM Maintenance Issues

Invasive Weed Control

Aquatic Invasive Vegetation

- Cattails & Black Willows are the most common offenders
- Smartweed & Primrose
- Proper plant identification
- Weed/algae control; leads to obstructed orifices and smothering plants
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Obstructed Orifices or Outlets

- Elevated pond level leads to decreased storage capacity
- Damage to littoral shelf plantings
- “Burn out” of pond perimeter
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Obstructed Orifices or Outlets
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Obstructed Orifices or Outlets

[Images of obstructed orifices or outlets]
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Obstructed Orifices or Outlets
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Obstructed Orifices or Outlets
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Valve Left Open

- Emergency valve left after final construction
- No maintenance in place; pond sits dry for entire first year
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Valve Left Open

- Emergency valve left after final construction
- No maintenance in place; pond sits dry for entire first year
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Draw Down Orifice Issues

- Installed but grouted or covered over
Part II: Common SCM Maintenance Issues

Maintaining Normal Pool

Draw Down Orifice Not Installed

- Installed but grouted or covered over
- Installed but “capped”
Stormwater Control Measure’s (SCM)

Inspection & Maintenance

Thomas Moore
Senior Stormwater Inspector
G2 Design P.A