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| Project Name | | Minnesota Stormwater Manual Harvest and Use Updates | Date | | 7-22-2016 |
| To / Contact info | | Anne Gelbmann | | |
| Cc / Contact info | | Mike Trojan | | |
| From / Contact info | | Steve Pellinen, PE  Brett Emmons, PE | | |
| Regarding | | Task D: Construction Sequence | | |

Includes comments from tech team members (July 22, 2016)

Note: Unlike many other green infrastructure stormwater BMPs, typical harvesting and use systems are not as sensitive to the particular sequence of construction, as long as temporary or construction phase stormwater treatment is addressed (i.e., the storage component can serve both temporary or construction phase stormwater treatment needs as well as long-term harvesting needs). Also, installation of harvest and use systems should be coordinated with any concurrent or related construction.

**Typical Construction Sequencing**

Note that the timing between construction steps can vary depending on the project, with months to years from the start of construction until an entire system is in place. This is often the case for stormwater pond and irrigation use systems. For example, initial pond construction and pump installation in new developments could be completed months to years prior to pump installation and final site work (landscaping and irrigation system installation).

1. Verify that all necessary certifications, licenses, permits and approvals have been obtained, including those required by the [Minnesota Plumbing Code](http://www.dli.mn.gov/ccld/PlumbingCode.asp).
2. Schedule and attend a preconstruction meeting with all relevant parties responsible for design, permitting and construction of the proposed facilities. This is the time to make sure that all aspects of the design, schedule, submittals and permits are understood and any ambiguities resolved. Suggested attendees include, but are not limited to, engineers, code officials, system provider, plumbers, electricians and excavators.
3. Determine how site access will be achieved, determine location of discharge and overflow routes, obtain permission for access or work as needed from adjoining property owners.
4. Install [erosion and sediment control BMPs](http://stormwater.pca.state.mn.us/index.php/Construction_stormwater_program) as needed or required by construction documents and permits. Protect discharge and overflow routes from compaction and erosion. Harvesting storage structures can often be used as sediment control structures, as long as design capacity is restored at the end of the construction/stabilization phase.
5. Install pre-storage treatment structures and systems and any appurtenant frost and buoyancy protections.
6. Install harvesting and use storage components, including storage ponds, above and below ground tanks, in tank treatment devices and footings and buoyancy protection devices. It is recommended to install pre-storage and storage components at the same time to coordinate any elevation changes. Ideally, the installing tank company can be contracted to run conveyance piping and prefiltration as opposed to different parties.
7. Install harvesting and use distribution components, including pipes, pumps, valves, treatment systems, and other utilities and elements indicated in design documents. The specific construction sequence of these components should be determined based on the contractor’s means and methods.
8. Install post-storage treatment systems per manufacturer warranty specifications.
9. Perform interim tests and inspections as required by governing agencies including pressure testing of pipe/joints and tanks if required, cross connection testing, rpz testing and start up water quality testing..
10. Construct and stabilize discharge and overflow routes and verify that insect and rodent screens are installed on all exposed pipe and other openings and that backflow valves are installed if overflow pipes go to grade and that a trap is included on the overflow from the tank.
11. Inspect and clean all conveyance and storage elements immediately prior to system testing. Verify that the distribution intake within storage device(s) is clear of sediment and will not entrain any sediment once flow is initiated.
12. Perform and document all tests needed to verify that system components function as designed. Do not allow discharges to overflow routes until they are vegetated or otherwise stabilized (e.g. rip rap channel).
13. Complete any remaining permit and approval conditions and verify warranties for all system components, and perform a final punch list review and project closeout.
14. Assist with preparation of operation and maintenance documents and ensure that copies of these documents are in the possession of the owner/operator and the local stormwater regulatory jurisdiction.

**MPCA Stormwater Harvest and Use System Example Inspection Report**

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| --- | --- | --- |
| Project Name and Address: | | |
| Contractor Contact Information (Contact person, Company name, Address, Phone, Email): | | |
| System Supplier Information (Contact person, Company name, Address, Phone, Email): | | |
| Engineer Contact Information (Contact person, Company name, Address, Phone, Email): | | |
| Organization Responsible for Maintenance (Contact person, Organization name, Address, Phone, Email): | | |
| Secondary Practice (discharging to): 🞎 Pervious area 🞎 Bioretention 🞎 Infiltration 🞎 Channel or swale 🞎 Other (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) | | |
| Date started: | Final completion date: | As-built plan date: |

| **Note: The inspection items below are for example only. A specific list of inspections items should be developed unique to each project.** | | | | | | |
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| **Inspection Item** | **Yes** | **No** | | **Remarks** | | **Date** |
| 1. Conveyance system to the storage unit is installed and catchment area matches the plans |  |  | |  | |  |
| 2. Pretreatment structures are properly installed |  |  | |  | |  |
| 3. Storage components are properly installed |  |  | |  | |  |
| 4. Discharge and overflow routes are properly constructed and vegetated or otherwise stabilized (e.g. rip rap channel) |  |  | |  | |  |
| 5. Distribution components are properly installed, and utilities are connected |  |  | |  | |  |
| 6. Post-storage treatment systems are installed per manufacturer warranty specifications |  |  | |  | |  |
| 7. Insect and rodent screens are installed on all exposed pipe and other openings |  |  | |  | |  |
| 8. All components are clean and pass tests |  |  | |  | |  |
| **Signatures:** | | | | | | |
| Owner/agent: | | | Print name: | | Date: | |
| Inspector: | | | Print name: | | Date: | |