Summary of Survey Results
RI Stormwater Design and Installation Standards Manual:
Part #2 BMP Overview
January 19, 2011

Of the 166 attendees, 89 returned a completed survey, giving a 54% response rate. Overall the participants of the workshop felt that the material presented was highly relevant to their work and would be useful for them. They also indicated that the exercises were generally useful (although comments indicated that they could have been improved), that they planned to share the information with others, and that they are better prepared to use the new standards. Many respondents offered thoughtful and insightful comments about the workshops as well as about the manual in general.

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly Disagree (1)</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Strongly Agree (5)</th>
<th>Mean</th>
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<tbody>
<tr>
<td>4. This workshop was relevant and practical for my work.</td>
<td>0%</td>
<td>1.1%</td>
<td>6.7%</td>
<td>61.8%</td>
<td>30.3%</td>
<td>4.3</td>
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<td>5. I will be able to use what I learned in this workshop.</td>
<td>0%</td>
<td>0%</td>
<td>8%</td>
<td>59.1%</td>
<td>33%</td>
<td>4.4</td>
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<td>6. The exercises were useful.</td>
<td>0%</td>
<td>2.8%</td>
<td>29.2%</td>
<td>45.8%</td>
<td>22.2%</td>
<td>4.1</td>
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<td>7. I plan to share the information I learned with others.</td>
<td>0%</td>
<td>0%</td>
<td>5.6%</td>
<td>65.2%</td>
<td>29.2%</td>
<td>4.3</td>
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<td>8. I feel better prepared to use the new standards.</td>
<td>0%</td>
<td>0%</td>
<td>24.7%</td>
<td>53.9%</td>
<td>21.4%</td>
<td>4</td>
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9. What was the most useful part of the program?
Many attendees found the discussion of proper erosion and sediment controls to protect BMPs to be useful. Respondents also found the information regarding proper inspection to be valuable. There were many responses indicating that the explanation of design criteria and the materials specifications was extremely helpful. Responses also indicated that the installation and maintenance component of the workshop was useful particularly the slides with illustrations and pictures of proper BMP installation and maintenance. In addition, attendees found the question and answer part of the program to be informative.

Actual Responses:
- Materials Information
- Participation by all agencies
o Learning the tidbits of information for why things were done (or chosen as practices), like hard wood mulch so it doesn’t float
o Information by example, recognize appropriate professionals role as a P.E. and Landscape Architect and that required plan(s) prepared by each shall be stamped in accordance with RI state law.

° This was a great program! I anxiously await posting of the slides on the DEM website, as I have been tasked with encapsulating and presenting to my office, a RI Landscape Architecture firm.
° The illustrations for each BMP/Maintenance of, Questions/Answers for regulatory viewpoints.
° Common construction problem portion of workshop and more examples/photos of ‘don’t’ and ‘do’ this would be useful (like check dam example).
° Rich provided useful insights into origin of design criteria and common construction pitfalls
° Overview of various O & M requirements. Inspection information.
° Common construction problems and proper construction inspection and proper ESC to Protect BMPs.
° Questions and answer time
° “Design Elements…..” 8:50 – 9:20
° Installation and maintenance
° Explanation of new standards and chance to ask questions. Visually see examples of BMP’s and associated issues.
° Installation
° Examples
° The slides showing construction of various BMPs
° O & M sections
° The importance of pre-treatment with use of any of the LID BMPs presented and the required maintenance
° Listening to the questions from the audience and the responses from the panel/presenters
° Inspection picture slides and simple, concise, informative slides
° Introduction to the new standards
° Class exercises
° Materials and maintenance sessions
° BMP design was helpful though didn’t expand much on manual
° The maintenance exercise
° Highlighting the key elements
° Vegetation management and maintenance
° Design elements, erosion and sediment control
° Seeing what can go wrong with these BMPs!
° Design elements of BMPs
° Breaking down the fine points of construction problem and proper construction inspection, Case studies
° Things to look for during inspections Re: construction and maintenance
° Going through different design aspects and erosion control measures of each BMP
° Materials specifications information
° The municipal applications (more is needed)
° Maintenance exercises
° Various practices related to ESC; additional information found at CRMC (planting guide) and State regulations on RI.gov
° Audio/visual, (2) speakers
° Understanding what works best and O & M of each system
Construction problems and inspections
- Questions when permitted. Slides (pictures) of proper installations. Pictures are always helpful.
- Maintenance issues since it is a new requirement.
- The program touched upon pertinent sections of the manual and briefly discussed BMP construction and maintenance practices.
- O & M plan requirements
- Q & A periods
- Maintenance plans and guidance.
- 1) Questions and answer period and ensuing discussion, 2) Operation and maintenance practices, 3) Examples shown on slides of actual installations, 4) Appendix F → construction specifications
- Reviewing common construction errors (photo examples on screen), discussing why the problem occurred and how it should have been properly installed.
- Discussing the different proper erosion and sediment controls to protect the BMPs was something that seems like everyone will walk away with getting more knowledge. Discussing the typical and long term maintenance measures was also educational. The images chosen were also very good.
- Maintenance part of the program
- Participation of regulatory staff members
- Overall exposure to new manual highlights
- Question and answer session. Overview of practices and problems.
- January 13th session although some good discussions and outlines today.
- Examination of practical implementation and maintenance issues.
- Detail on BMPs
- BMPs – maintenance and inspection
- Proper erosion and sediment controls to protect BMPs. Typical routine and long term maintenance measures.
- Picture presentations
- The maintenance sections and ESC section
- All the slides seem to indicate that these practices fail soon after construction. This seems to indicate that either consultants should not recommend these, or they need a good inspection and maintenance program. More work for consultants.
- I liked the repetition so that in 2 days, I feel comfortable with the BMPs
- Design elements for BMPs
- Maintenance presentation.
- Discussion about erosion controls during construction.

10. What was the least useful part of the program?
There were five common answers to this question. The most common theme was that the vegetation section was not that useful (10 responses noted this). The second most common theme was that the exercises were not that useful; 7 responses commented on this, and it also was indicated in Question 6 which was left blank far more than any other question. Other items noted as least useful were the discussions of material specifications (5 responses noted this), the photos used in the slides (5 responses noted this), and the discussions of maintenance (4 responses noted this).

Actual Responses:
- Material specifications
In depth plantings  
Not having copy of presentation to follow with  
Exercise in part II session were more practical than in part I  
Exercises. Need to be clearer and more information provided to attendee  
The segments on why  
Vegetation  
A lot of material is a repeat of numerous previous sessions; vegetation section  
Going over the importance of maintenance and why proper installation is important was somewhat drawn out. The pictures were neat but could have been included in other sections.  
Vegetation maintenance  
1st session exercise needs improvement; more info; site plan in hand  
It was all at least somewhat useful  
Too much time on maintenance; group appeared to focused on design  
Overview of material specifications for BMPs  
The materials section  
Talking about UConn  
The simplistic nature of the presentations  
Too much repetition/reuse of slides  
Planting presentation  
It was all useful  
I am hard pressed to pick a topic that was “least useful,” as all of the presentations were very informative.  
All sections were useful  
Short/long term maintenance was rehashed for all BMPs, but much was repetitive. Potential opportunity for combining overarching themes  
Recitation of the manual’s maintenance requirements  
Afternoon exercise  
“Vege Maint” 2:00 – 2:30  
Maintenance exercise; photos not clear  
Vegetation Management  
Exercises  
Slides showing failed ECS measures  
Many example photos used were duplicate and did not always clearly show the particular point being made  
Don’t have one  
Vegetation management lack real detail on invasive species control  
Vegetation management and maintenance  
Too much focus on detail  
Thought it was uniformly useful  
All useful  
Too much focus on materials/vegetation; Also I do not feel the exercises work well in large audiences  
Overview of material specifications

11. What changes would you suggest if this program is offered again?  
The most common response was that the workshops needed to be condensed (8 responses noted this). Other comments that were repeated multiple times were related to providing more opportunity for question and answer (4 responses noted this); providing more success stories or additional examples of BMPs (4 responses
noted this); conducting additional follow-up workshops or workshops for separate attendees (5 responses noted this).

**Actual Responses:**
- Incorporate design examples recently submitted and approved by RIDEM using these new regulations
- I liked that the presentation was broken into many small subject; slides were hard to read, images were too dark—maybe because of screen; example photos very difficult to read
- More coffee
- Maybe condense to 1.5 days instead of 2 full
- More question and answer periods
- Make time in schedule for all questions
- More condensed ½ day sessions
- The sessions are too long. Better off making it 3 parts. Not sure of anything else.
- Need to hand out program presentation (or make available to attendees) prior to program
- More info on filing out required forms/ O&M; spend less time on individual exercises
- Separate program to new issues or changes for most personnel; program is suited mostly for designers
- A few more breaks
- Some slides have photos repeated multiple times; use other examples and repeat use
- This program could be broken up to address different individuals/groups better. What DOT/consultants are interested in is somewhat different than what specialized companies are interested to know about.
- More on maintenance
- Smaller groups; more working examples; possible this will be needed in the future at a smaller scale
- Changes all references in slides and manual to “design, professional” especially those LID proposals will allow a broader range of professionals to be involved; erosion control specialists, landscape architects, etc.
- Condense to one day if possible? Or maybe 1-1/2 days?
- More Q&A
- Focus more on design and materials
- Provide paper copies of slideshow so attendee can write notes next to slide
- More time and more specifics related to permits and permit applications
- Condensing somewhat; picking location with closer parking; ditto for restaurants
- Name tags for attendees would be helpful for my feeble memory
- Onsite examples of practices
- Step up the base level of the information. Show more practices that actually work.
- Good promotion of sustainable practices. Increase native plants. List of websites
- The section on BMPs needed more illustrations of systems and their context. Overlay LEED considerations for material selection.
- Shorter programs; 16 hours is too much
- Shorten the sessions and provide a morning snack with coffee
- Add more DOT basin and runoff
As mentioned in #10 above all subject matter presented was educational and I would not suggest any changes to the workshop at this point in time.

- Slides/photos for examples could be clearer
- You need to throw in more success stories. I’m left with a really grim outlook on how these things are going to become more of a hassle and fail, and defeat the whole purpose.
- Offer additional workshop as a follow up to offer more help in the learning curve
- Don’t want [wait] to the end of each presentation to as[k] questions. Let it be interactive.
- See #10 [maintenance]
- Weather permitting (ideally during a rain storm), incorporate a field component – review “the good, the bad, and the ugly” stormwater management techniques on campus
- Field inspection of installed LID BMPs in the future, when available
- More central location
- More on choosing appropriate BMP
- Hard to see slides with screen and/or lighting
- Eliminate the exercises as part of the program. Provide for take home option.
- Focus on O&M training/possible certification
- Include where BMPs work and don’t --with examples
- I think both workshops have flowed smoothly. I think the time given to each section was adequate; enough to not overwhelm me and yet enough to feel I have some understanding of what is expected.
- Spend time going over specific tables and checklists in manual; having audience read directly from manual.
- Keep reviewing what works and does not work for continuing improvements
- Include BMP overview helping understand the expected function of BMPs. Discuss more of reasons for design criteria.
- Maybe a specific decision-making path – here is the situation, here is the design
- I think the message of ESC and O&M can be condensed into a ½ day workshop.
- Program was brief, could go into more depth; program could be revised to be geared toward contractors, draw highway dept. and other that will be responsible for the maintenance and installation of BMPs
- I would have perhaps included more on berm/dam […] mentioned the issue of regulation of larger ones by dams program that is mentioned in the new manual. I like the mention of the slope blankets on basin slopes that was made

12. How do you plan to use the information presented today, and is there anything you will do differently?
Respondents will use this information in a variety of ways. Some attendees plan to take the information back to their offices to educate staff, employees and clients. Many will use the information during plan review for site plans, new construction and subdivisions. Multiple responses include goals to modify, review, inspect, and implement O & M plans. Others will begin utilizing the information in future design approaches and projects. Many attendees plan on reviewing the manual further.
**Actual Responses:**

- Convey information to DPW Highway, planning and building departments.
- Every year we become more aware and efficient in O & M and street sweeping. There are some sediment issues that we will have to address.
- Not sure at this point – planting design as needed.
- Municipal review of stormwater design plans.
- Need to review the manual.
- I will relay to our office through a lunchtime presentation.
- Reviewing plan to ensure LID is incorporated into projects.
- Justifying more complex designs to clients.
- Use in future highway drainage designs.
- In a small municipal setting, much of the smaller issues are handled locally. Where projects are designed by professionals, in my position I am usually addressing these issues on a smaller scale. E & S are the major issues I deal with.
- Further reading of manual and development of additional regulations for inspection and maintenance.
- I am hopeful to set up a company that specializes in installation and O & M of BMPs. I currently specialize in design installation and maintenance of OWTS.
- Incorporate the information into O & M plans.
- No.
- Will advise clients of new requirements and will incorporate in site plan design and subdivision layout.
- Review plans/proposals and provide input to either DEM or the local planning and zoning boards.
- Start implementing regulations into design.
- Ensure construction contractor installs proper demarcation of buffer areas, locations of BMPs. Suggest more construction stormwater pollution protection measures be used than just perimeter controls? Review plans to evaluate where perimeter checks will have greatest strain, & inspect often.
- Closer review of BMP O & M Plans proposed by developers. More thorough inspections during construction and after construction.
- Cost estimates for management plans.
- Presenting information to the firm for our aid in meeting the new standards.
- Yes, will be proposing changes to RIDOT standard details and specifications.
- I will think about what would be more simple and yet still effective and easy to maintain.
- As a reviewer and inspector, better documentation.
- I will likely visit some of the web sites mentioned for cost data. Also will look more into materials information brought up in the talk.
- Being a director of a DPW I will use this information and training in my Phase II stormwater requirements program in the City of Central Falls. All information and presentations given today were excellent!
- To design sediment basins along roadway.
- Yes, change of planning plat requirements.
- Help me in working with design engineer and planner who came to NBC for our permitting procedures.
- On a project on a non-profit property to control run off and auto traffic.
- Pass on the information to clients with recommendations for practices that may work for them. Strongly promoting construction inspection and maintenance.
- Design less maintenance structures.
Will likely design a few BMPs in the course of my job. This workshop has given me a good overview of the new manual and basic design requirements for BMPs.

I need to amend our stormwater ordinance to address post-construction requirements – this workshop was very helpful.

Design approach will be changes dramatically

Investigating into existing programs

Review projects, submit permits

Inspection of subdivisions – drainage systems.

Unsure at this time

Use information in reviewing subdivision plans for compliance

Public education. Internal design and review of submissions

In design of LIDs; further explain the maintenance requirements and erosion controls during construction on my plans and specifications

I will need to follow new requirements for future projects

Apply these techniques to all projects of any size, talk to local officials about community regulation changes possibly specialize in these services. We are design/build so can implement these on projects and use as marketing tool or do improvement that owner may not even be aware of.

Information is good, presentation possible to add more information and not read the presentation back.

Enforce new regulations

To follow the regulations in regard to stormwater maintenance.

I will use the knowledge when looking over documents presented to me that would have used the RI Stormwater Design and Installations Standards Manual.

I will keep in mind the various techniques of BMPs available for all unique sites with complex issues. Many tools were discussed in these workshops.

Specification (Appendix F) – immediately. Basic Design Methodologies – will take a bit of a learning curve. Local/Regional (Native) Planting list and Vegetation List.

We will be updating O & M schedules for existing BMPs

Bring back to others in Town, encourage people to attend short course. We already refer applicants to the new manual and LID

Will share all information with coworkers

Try to impress on superiors and clients the importance of BMP and LID

Need to learn the new regulations

Will need to address how we are to implement the regulations. Will put a greater emphasis on critical regulations when we have preconstruction meetings.

Scrutinize site plans/new construction and subdivisions

I have LID design and will remove pipe filter fabric and lay fabric on top as suggested.

Excellent references to manual and where the information is in the manual. The information will be used more efficiently and often on projects, with better knowledge on subject matter.

I plan to integrate with future projects/designers

I will use it as I am using the manual. It may help when looking for information.

Review manual

All information will be used moving forward with our MS4

Go over it with the planning department and public works staff. We’d like to use the template for O & M of stormwater BMPs for new, proposed projects.
Promote the use of LID, now have RIDEM requiring it – will make incorporating into design easier.

More time/thought will be put into O & M plan.

Educating my employees and clients. Specifically how this will impact design, engineering costs and construction cost. How developers/homeowners association will be required to maintain.

13. Do you have any questions from last week’s or today’s workshop that were not addressed?

**Actual Responses:**

- I hope that DEM, CRMC, other agencies hire professional landscape architects to review and comment on plans and specs.
- What happens if the regulating agencies don’t agree on the designs?
- Will RIDEM develop TMDLs for Narragansett Bay? If so, when? Definition of fill (i.e. Cannot use infiltration practice where fill is present)
- How BMPs work in cold weather?
- Missed it due to snow storm
- How was it that landscape architects were emphasized by CRMC (Jim) but not by DEM or Horsely Witten? Please correct this please.
- Impacts if property is old fill. How do we do infiltration?
- Not clear how O & M will be mandated, or enforced
- Enforcement issues have not been addressed.
- Why would a designed cistern with proper volume/retention time be left as comparable to a rain barrel? There are a few manufacturers who are producing some pretty innovative cistern (below grade) design/products.
- Proprietary devices, pretreatment
- Are BMPs place on private property subject to liability and O & M costs that are a result of stormwater flow from a R.O.W.?
- What are the responsibilities of the town? Do inspection reports have to be submitted to agencies?

14. Any final thoughts?

There were many laudatory comments about the workshop. Otherwise, there were not common themes mentioned in this section, although reading the actual responses is productive, as several attendees provided thoughtful insight about the new manual in general.

**Actual Responses:**

- I would like to comment that the workshop was well planned; all presenters were eloquent speakers and very knowledgeable with the subject they presented; “super job”!!
- Based on the question raised, keep an eye open re: any mosquito issues, but do not expect any more than with existing BMPs.
- Training for construction companies that install ESC and BMPs.
- Please consider: workshop in 6 months – What have we learned? Workshop in 12 months – What have we learned?
- Once actual samples of work from the design community are reviewed under the regulations, I would suggest another workshop to review common omissions or lessons learned.
Inspection checklists—Nice!; Require contractor installation training and certification
Great program!
Glad to hear that the training will continue next month...please consider additional training throughout the year...especially field tours
Obviously lots of work put into this. Thank you.
Field tours of proper design of BMPs
Going forward, I would welcome a continued good working relationship with DEM and municipal government. In these time of very limited budgets, it is beneficial to [?] if we can work together on these issues that both the state and the cities and towns are mandated to address. The education component is most helpful.
Presenters answered questions very well.
I appreciated the tone of the regulatory staff in that there was a willingness to listen and admit that this is an evolving process.
HW gave an example of a criteria which they admitted is confusing and had received feedback on that fact (for a WVTS 35% < 6” deep & 65% < 18” deep does not equal 100%) ... Instead of explaining it over and over, why not just rewrite it more clearly to say 30% between 6” – 18” deep? Also use of the work “buffer” continues to be a problem with the manual. You can’t call riverbank and perimeter wetlands “upland buffers” in this state! They are regulated wetlands!
Hopefully I have many years left before my “final thoughts”!!!
I agree aesthetics are important! While most will probably say the vegetation section was least useful, I feel it is a major component. These BMPs can /should be visible parts of a landscape and can be used as learning tools and a celebration of water quality on universities, etc.
Well done – a lot to pull together
Who is going to enforce and pay for this; lots of pushback from DPWs
Workshop directed toward municipal applications construction/maint./funding
Excellent workshop! Thank you for the beverage...
Nice to discuss costs of each system over and above maintenance
While it is worth the changes to the design regs I still don’t believe these improved technologies will be maintained and be effective. Utilize local conservation commissions as grassroot “eyes” for stormwater violations and lack of maintenance
Talk to the contractors! They are the people who install the BMPs wrong without any consequences
Great course!
Very nice workshop series. Possibly go over more case studies.
Having Q&A after the separate sections was good. The speakers were also very knowledgeable and were comfortable talking in front of crowds. Well done to them!
Establishing a stormwater agency is a non-starter at the municipal level. Is this something that can come from the state level?
Add landscape architect to the “standing committee” to review these new regulations as they are practiced. Thank you.
There will need to be amendments as the work is implemented. DEM should select sample projects as case studies.
Yes, always
Good workshop