

Appendix E

Construction Site Stormwater Activities

July 6, 2015

RE: Clean Water Works Partnership Opportunity

Dear Construction Company Owner:

The City of Bend Stormwater Utility would like to partner with you to help keep our waters clean. If you appreciate clean water *and* business enhancement, please consider this voluntary opportunity. The City of Bend is undertaking an exciting new incentive-based watershed campaign entitled Clean Water Works. Please see our website at: bendoregon.gov/cleanwaterworks. Here you can see that we have both educational and partnership aspects to the campaign.

We are seeking to support businesses that are working to keep our waters clean. We have selected Construction Industry businesses within the City of Bend as potential Clean Water Works Partners. Should you choose to participate, the City would like to reward you by providing the following promotional materials:

JIM CLINTON
Mayor

SALLY RUSSELL
Mayor Pro Tem

VICTOR CHUDOWSKY
City Councilor

DOUG KNIGHT
City Councilor

NATHAN BODDIE
City Councilor

CASEY ROATS
City Councilor

BARB CAMPBELL
City Councilor

ERIC KING
City Manager

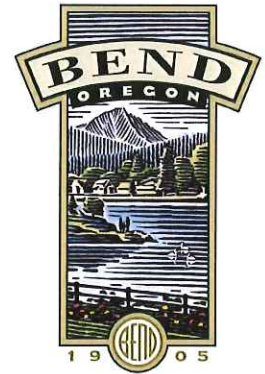
PAUL RHEAULT
Utility Department Director

➤ **Promotion** on our "Discounts and Partners" page on our website (bendoregon.gov/cleanwaterworkspartners) and by other electronic media means (e.g., mention on Facebook, Twitter, or radio advertisements). We will actively encourage people to visit this page beginning in August through October, 2015 and likely beyond. The campaign will include: TV, radio, print, events and social media.

➤ **Decal**—The City will provide you a Clean Water Works window decal (see image at right) to help advertise your business as one that cares about Clean Water!

➤ **Discount Card**—The City will list your business and the discount of your choosing (e.g., 5% off supplies, free estimate, free hat) on our website "Discount and Partner" page, and if you respond by July 20, 2015 we will on a first come/first served basis list your business and discount on the back of our discount cards that we will print and distribute at outreach events during the fall 2015 campaign and mention your business in a Clean Water Works partner radio advertisement. The discount card will also be available on line for your customers to print. (See back for an example discount card layout.)

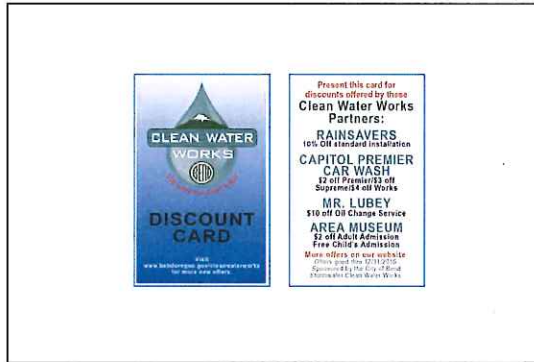
➤ **Water Bottle**—The City will provide you at least two stainless steel Clean Water Works Partner logo-ed water bottles for your use and enjoyment.



UTILITY
DEPARTMENT



- **Display Holder Promotion** for your customer waiting area with a Clean Water Works Partner outreach sheet promoting your participation as a company that cares about clean water to your customers.



The partnership works like this—if you meet the following basic steps for your business category, just fill out the attached certification form and you can take part.

The criteria for your business category is as follows:

- ✓ You have registered for a Bend Business license (and if you are receiving this letter, then you already have!),
- You agree to follow best management practices for keeping construction related pollutants including sediments out of the streets and storm drains (see the attached Sediment Prevention For Businesses fact sheet and “Other Resources” materials therein for guidance);
- You agree to share the best management practices information under the “What Can You Do as a Building/Contractor?” section in the attached Sediment Prevention fact sheet with your staff and subcontractors;
- You agree to honor the discount that you specify through at least Dec. 31, 2015.

Just review the enclosed “Sediment Prevention for Businesses” fact sheet, complete the short partnership form and email it to me at wedde@bendoregon.gov or fax it to 541-317-3046. You may also mail it to my attention at: 62975 Boyd Acres Road, Bend, OR 97701. Please contact me directly at 541-317-3018 should you have any questions. And remember, if you contact me by July 20th, we will do our best to include your business name on the back of the Discount card, and a mention of your business on our fall radio commercial on a first come first served basis.

Remember, this is a voluntary program and a means to appreciate your interest and efforts in keeping our river and drinking waters clean. Should you have any questions or if you wish additional fact sheets or illustrated best management practices guides to distribute to your staff/subcontractors, please do not hesitate to contact me at the phone number or email above.

We look forward to working with you.

Sincerely,

Wendy Edde, CSM
Stormwater Program Manager
City of Bend Utility Department

Att: Sediment Prevention for Businesses, Clean Water Works Partnership form

SEDIMENT PREVENTION FOR BUSINESSES



Pollutant of Concern: Sediments

Help Keep Excess Sediment Out of Our Rivers & Stormwater Facilities.

What is sediment?

Sediment is loose soil like sand, clay, small rocks like gravel, or silt that can come as a result of soil erosion, winter traction materials, or plant decomposition.

Soils are Natural, So What's the Problem?

While some sediment is natural in surface water, in urban areas the amount of man-made sediment is high above natural levels. Sediment covers, compacts and clogs.

- ◆ Sediment can make water cloudy (turbid) and prevent animals from seeing food. The Deschutes River through Bend is listed for sediment and turbidity as a pollutant of concern.
- ◆ Sediment can clog fish gills, cover spawning areas and the habitats where the small organisms that form the basis for the food chain live.
- ◆ Nutrients transported by sediment can accelerate algae and plant growth that can ultimately affect oxygen levels in the water. The Deschutes River through Bend are listed for these types of pollutants of concern.
- ◆ Sediment deposits in rivers can alter the flow of water and reduce water depth, which makes navigation and recreational use more difficult.

Sediment can clog stormwater facilities and result in flooding problems. If the sediment clogs beyond the drywell cylinder and into the surrounding drainage rock, the entire drywell would need to be replaced, which unnecessarily adds costs. Drill holes clog even more easily

What can you do as a commercial business?

Prevention is key. Use best management practices (BMPs) to keep soils from moving in the first place, and to keep sediments swept up and managed.

All

- Excess sediment is considered an illicit discharge. If you spot excess sediment in the roadway or sediment that could potential reach stormwater facilities (such as picture at right), contact City of Bend at 541-317-3000.



Commercial Business

- Vegetate bare spots in your landscaping.
- Sweep entrances, sidewalks, driveways and parking lots on a regular basis instead of hosing them off. Washing these areas results in sediment and other pollutants running off into streams, rivers and lakes.
- Inspect and clean your onsite stormwater facilities annually.
- Train landscape maintenance staff to blow dirt, dust and grass clippings back into the grass and not onto sidewalks or paved surfaces, or to collect and compost or dispose of properly in a bin.
- Avoid mowing within 10 to 25 feet from the edge of a stream or river. This will create a safe buffer zone that will help minimize erosion and naturally filter stormwater runoff that may contain sediment.

POLLUTANT: SEDIMENT



What Can You Do as a Builder/Contractor?

Builders/Contractors

- Install erosion control BMPs (e.g., catch basin inlet protection, wattles or silt fence) before you begin site clearing/grading.
- Install temporary gravel construction entrance, never use erodible materials (i.e., gravel, dirt or sand) as ramps for protecting existing curbs.
- Never stockpile any material in the roadway. Properly secure stockpiles.
- Sweep up material that gets tracked out onto the roadway daily.
- **Sediment is not allowed to come off any construction site**, whether or not your site is required to have an erosion and sediment control plan or a grading and drainage permit. For additional information, review the Central Oregon Stormwater Manual, Chapter 9 and the "ACWA Construction Site Stormwater Guide" (see Other Resources, below).



Other Resources:

ACWA Construction Guide

www.oracwa.org/documents/ACWASWSiteGuide0313w.pdf

Central Oregon Stormwater Manual, Chapter 9

<https://newcoic.files.wordpress.com/2012/09/2010rev-chapter-9-esc.pdf>

Bend Code Title 16.10, Clearing Grading, and Erosion Control on Construction Sites

<http://www.bend.or.us/Modules/ShowDocument.aspx?documentid=7216>

[See Sections 16.20 \(Illicit Discharge\); 16.10.20 \(Grading Permits\)](#)

Oregon DEQ 1200-C Permits

<http://www.deq.state.or.us/wq/stormwater/constappl.htm>

For additional information on permitting requirements contact the City of Bend Permit Center at 541-388-5570.

Fines & Penalties

Violating Bend Code Title 16 is a Class-A Civil Infraction, and could result in a maximum civil penalty of \$750.00 per day. Each day that a violation remains uncured in effect is a separate violation.



Accommodation Information for People with Disabilities

To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape please contact Karen Morris at 541-693-2141 or email kmorris@bendoregon.gov.



UTILITY DEPARTMENT

Clean Water Works Partnership Participation



Yes! I would like my business to be recognized as a Clean Water Works Partner! I certify that I/my business will meet the overall criteria of the Clean Water Works Partnership program to participate.

Name (Please Print)

Signature

Business Name

Business Category

Discount I Will Offer and Honor

Discount End Date (if any)

So that we may contact you to coordinate on the promotional materials, please provide the following information:

Email Address

Phone

Business Website

Please scan and email to Wendy Edde, Stormwater Program Manager, City of Bend at wedde@bendoregon.gov, fax 541-317-3046, or mail to 62975 Boyd Acres Road, Bend, OR 97701. Any questions, please contact Wendy at 541-317-3018.



Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic fomals and audio cassette tape please contact Karin Morris at (541) 693-2141, or email Kmorris@bendoregon.gov.



UTILITY DEPARTMENT



CERTIFIED EROSION & SEDIMENT CONTROL LEAD (CESCL) WORKSHOP

Monday and
Tuesday, March
28 & 29, 2016

8:00 am to 5:00 pm

Lunch will be
provided!

LOCATION: 62975
Boyd Acres Road
Bend, Oregon



UTILITY DEPARTMENT

FREE WORKSHOP

**Contractors, developers, engineers, municipal
inspection and construction staff...**

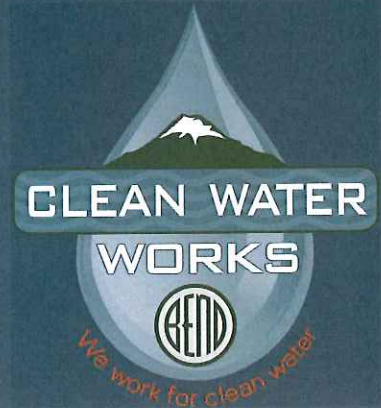
If you are not completely familiar with the new state 1200C requirements (December 2015), you do not want to miss this! This is your opportunity to get certified ahead of the deadline! The City of Bend Stormwater Utility is hosting an Erosion & Sediment Control Certification Workshop brought to you by Clean Water Technologies, LLC. Become a DOE Certified Erosion & Sediment Control Lead (CESCL) that can assist you on your next project to meet state and local requirements. **A \$300 value, free to you this year.** But hurry to register as space is limited! Workshop includes an active field component.

The registration deadline is Monday March 21, 2016 at Noon.

Please register by contacting David Buchanan (City of Bend), at dbuchanan@bendoregon.gov or 541-693-2176 with your name, agency/company and contact information. In order to receive the CESCL certification, attendees must participate in both days of the workshop and pass a written exam.



Accommodation Information for People with Disabilities
To obtain this information in an alternate format such as Braille, large print, electronic formats and audio cassette tape please contact Karin Morris at (541) 693-2141, or email Kmorris@bendoregon.gov.



CESCL Certification Day 1

3/28/2016

Wendy	Edde	City of Bend	<i>Wendy Edde</i>
David	Buchanan	City of Bend	<i>David Buchanan</i>
Bill	Brackett	Century West Engineering	<i>William K. Brackett</i>
Eileen	Obermiller	Dappled Earth	
Krista	Ratliff	Oregon DEQ	<i>Krista Ratliff</i>
Ian	Klotz	City of Bend	<i>Ian Klotz</i>
Doug	Straw	City of Bend	<i>Doug Straw</i>
David	Oak	City of Bend	<i>David Oak</i>
Michael	Anderson	City of Bend	<i>Michael Anderson</i>
Jennifer	VanCamp	Harper Houf Peterson Righellis	
Patrick	Konop	City of Bend	<i>Patrick Konop</i>
Jason	Simpson	City of Bend	<i>Jason Simpson</i>
Evan	Malone	City of Bend	<i>Evan Malone</i>
Chani	Haynes	Knife River Corporation Northwest	
Brian	Johnston	Alex Hodges Construction	<i>Brian Johnston</i>
Kelly	Meyer	Aspen Landscape Development	
Lisa	Ziegler	High Desert Aggregate and Paving	<i>Lisa Ziegler</i>
Ben	Moore	High Desert Aggregate and Paving	<i>Ben Moore</i>
Kevin	Jenison	ACF West	<i>Kevin Jenison</i>
Amber	Hudspeth	Farallon Consulting	<i>Amber Hudspeth</i>
Parker	Emahiser	Farallon Consulting	<i>Parker Emahiser</i>
Noah	Cervantes	Tye Engineering and Surveying, Inc.	<i>Noah Cervantes</i>
Dirk	Durye	Tye Engineering and Surveying, Inc.	<i>Dirk Durye</i>
John	Umberger	City of Bend	<i>John Umberger</i>
Greg	Bridge	Storm Water Services	<i>Greg Bridge</i>
Dennis	Collins	Storm Water Services	

Stelley Chance Tye Engineering

Jason Simpson City

Doug Straw

Mike H

Chris

[Signature]

CESCL Certification Day 2

3/29/2016

Wendy	Edde	City of Bend	<i>Wendy Edde</i>
David	Buchanan	City of Bend	<i>David Buchanan</i>
Bill	Brackett	Century West Engineering	<i>Bill Brackett</i>
Eileen	Obermiller	Dappled Earth	
Krista	Ratliff	Oregon DEQ	
Ian	Klotz	City of Bend	<i>Ian Klotz</i>
Doug	Straw	City of Bend	<i>Doug Straw</i>
David	Oak	City of Bend	<i>David Oak</i>
Michael	Anderson	City of Bend	<i>Michael Anderson</i>
Jennifer	VanCamp	Harper Houf Peterson Righellis	<i>Jennifer VanCamp</i>
Patrick	Konop	City of Bend	<i>Patrick Konop</i>
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Noah	Cervantes	Tye Engineering and Surveying, Inc.	<i>Noah Cervantes</i>
Dirk	Duryee	Tye Engineering and Surveying, Inc.	<i>Dirk Duryee</i>
John	Umbarger	City of Bend	<i>John Umbarger</i>
Greg	Bridge	Storm Water Services	<i>Greg Bridge</i>
Dennis	Collins	Storm Water Services	

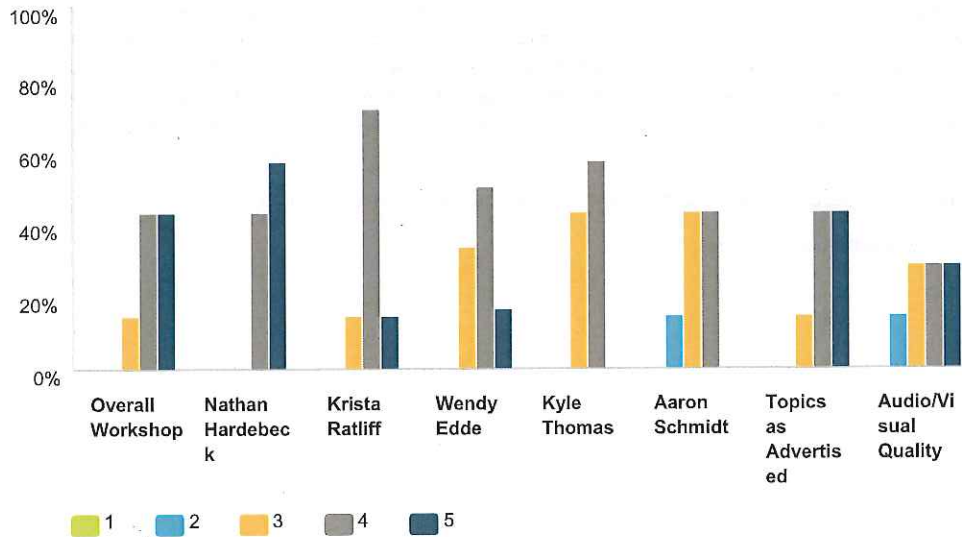
Chance Stehly Tye Engineering

Casey

Certified Erosion and Sediment Control Lead Training Course Evaluation

Q1 Please evaluate the presentation (1 being poor, 3 average, 5 excellent)

Answered: 7 Skipped: 0



	1	2	3	4	5	Total
Overall Workshop	0.00% 0	0.00% 0	14.29% 1	42.86% 3	42.86% 3	7
Nathan Hardebeck	0.00% 0	0.00% 0	0.00% 0	42.86% 3	57.14% 4	7
Krista Ratliff	0.00% 0	0.00% 0	14.29% 1	71.43% 5	14.29% 1	7
Wendy Edde	0.00% 0	0.00% 0	33.33% 2	50.00% 3	16.67% 1	6
Kyle Thomas	0.00% 0	0.00% 0	42.86% 3	57.14% 4	0.00% 0	7
Aaron Schmidt	0.00% 0	14.29% 1	42.86% 3	42.86% 3	0.00% 0	7
Topics as Advertised	0.00% 0	0.00% 0	14.29% 1	42.86% 3	42.86% 3	7
Audio/Visual Quality	0.00% 0	14.29% 1	28.57% 2	28.57% 2	28.57% 2	7

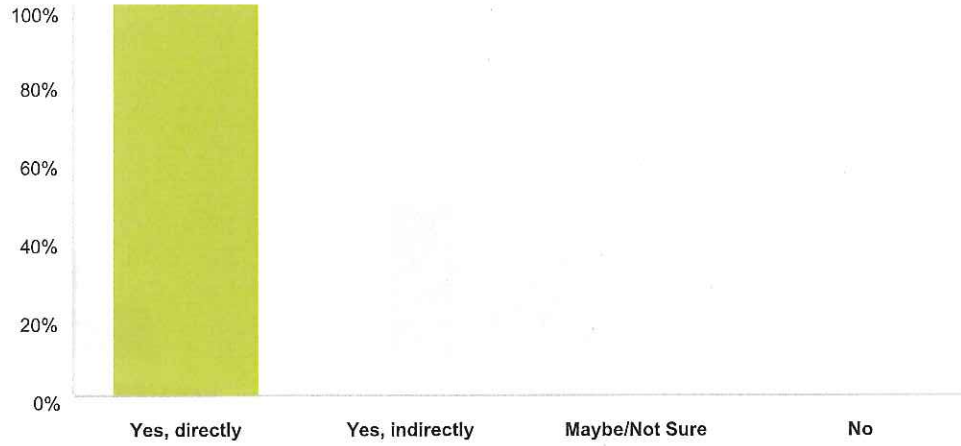
#	Please provide any comments/suggestions for improvement (please specify)	Date
1	I think a demonstration located at a construction site with many of the attributes discussed in class would be an improvement.	4/1/2016 1:54 PM

Certified Erosion and Sediment Control Lead Training Course Evaluation

2	<p>As this was a water quality at construction sites workshop, I would have liked to see more on proper housekeeping (debris disposal, excess paint disposal, material control, etc.) rather than a section on post-construction controls if you are going to add on beyond ESC. It appears the spill control section was skipped and I would have chosen to have that included together with general housekeeping over the sales pitch for underground post construction controls/permeable pavement as it is more applicable to the topic at hand. If you are going to provide information on post construction controls then you should examine life-cycle costs across the board. The benefits of surface infiltration is that you can easily monitor when they need maintenance and do not need confined entry to access. I felt the brief presentation of those was severely biased and perhaps as a result that the speaker would stand to benefit economically by the purchase of the structural post-construction controls presented in a more positive light. I am not sure if the entire audience recognized the potential conflict of interest there, but this did not sit well with me. To the degree possible, use presenters who are not potentially biased in the future. More on technical specs and drawings, and record keeping would be useful--are there electronic means of recordkeeping that can incorporate photos and send to multiple contacts easily?</p>	3/30/2016 11:16 AM
3	Colors on the slides don't show up on the screen very well...might be a projector problem?	3/30/2016 10:28 AM
4	It was a very well organized course.	3/30/2016 10:08 AM

Q2 Have you/will you be able to use the information that you gained from the workshop in your work?

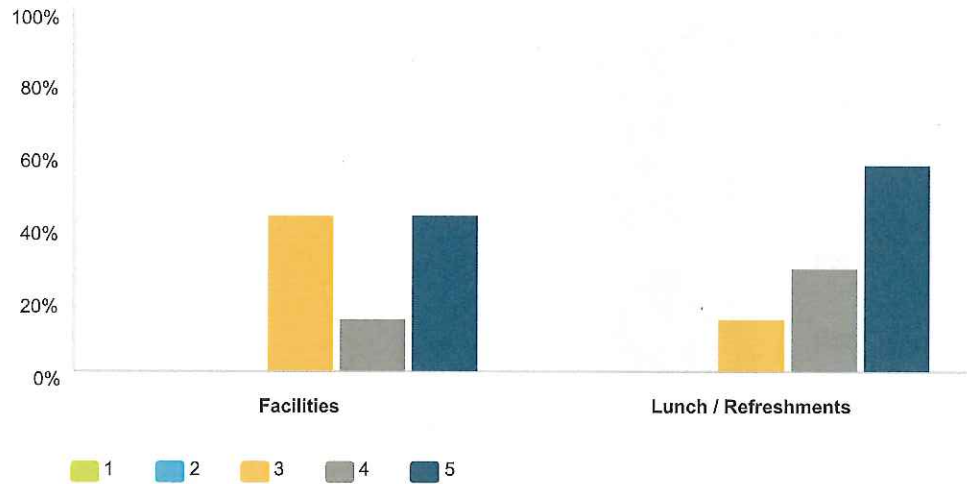
Answered: 7 Skipped: 0



Answer Choices	Responses	
Yes, directly	100.00%	7
Yes, indirectly	0.00%	0
Maybe/Not Sure	0.00%	0
No	0.00%	0
Total		7

**Q3 Please rank the facility and refreshments
(1 being poor, 3 being average, 5 being excellent).**

Answered: 7 Skipped: 0



	1	2	3	4	5	Total
Facilities	0.00% 0	0.00% 0	42.86% 3	14.29% 1	42.86% 3	7
Lunch / Refreshments	0.00% 0	0.00% 0	14.29% 1	28.57% 2	57.14% 4	7

#	Comments/Suggestions for Improvements (please specify)	Date
1	Just one presentation screen is better vs 2 even if you have to go bigger.	4/1/2016 1:54 PM
2	If windy, apply dust control at field site ahead of time. Field site location was excellent in relation to the workshop location. Some additional site cleanup would be nice prior to any future workshops using it. It would have been more informative to demonstrate the storm drain inlet protection devices in the parking lot of the workshop rather than in the dirt area of the field location.	3/30/2016 11:16 AM
3	Lunch was great.	3/30/2016 10:28 AM
4	Everything was great.	3/30/2016 10:08 AM

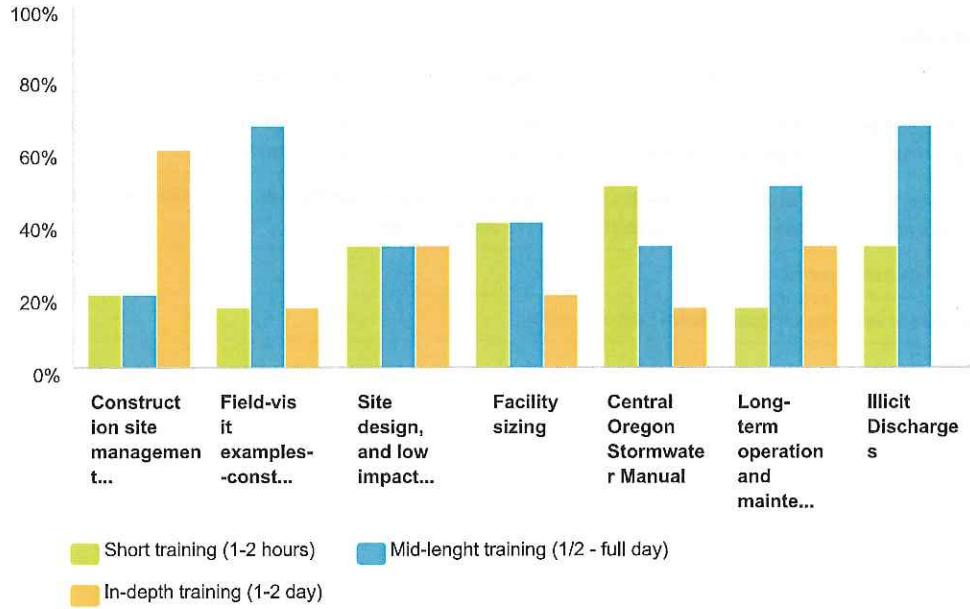
Q4 Please list one or more new things that you learned as part of the presentation(s).

Answered: 5 Skipped: 2

#	Responses	Date
1	Crushed Concrete is toxic and can alter the ph in stormwater runoff and have ill effects on the local ecosystem.	4/1/2016 1:54 PM
2	I learned that permits must be obtained and erosion control measures must be installed and maintained throughout the duration of the project to prevent sediment from entering storm systems and other properties.	4/1/2016 6:48 AM
3	That losing the top 1/8" of soil on The graphic illustrating how sediment impacts fish was very useful. The case studies and back and forth on how to approach a problem at a site was super useful.	3/30/2016 11:16 AM
4	applicable erosion control measures	3/30/2016 10:28 AM
5	I was able to see different types erosion control in action.	3/30/2016 10:08 AM

Q5 What additional stormwater training(s) would you feel would be useful (mark all that apply)?

Answered: 6 Skipped: 1



	Short training (1-2 hours)	Mid-length training (1/2 - full day)	In-depth training (1-2 day)	Total Respondents
Construction site management (erosion control and pollution prevention)	20.00% 1	20.00% 1	60.00% 3	5
Field-visit examples--construction site management	16.67% 1	66.67% 4	16.67% 1	6
Site design, and low impact development	33.33% 2	33.33% 2	33.33% 2	6
Facility sizing	40.00% 2	40.00% 2	20.00% 1	5
Central Oregon Stormwater Manual	50.00% 3	33.33% 2	16.67% 1	6
Long-term operation and maintenance	16.67% 1	50.00% 3	33.33% 2	6
Illicit Discharges	33.33% 2	66.67% 4	0.00% 0	6

#	Other (please specify)	Date
1	I think more training for city staff on the COSM and other city standards would be helpful for the workers in the field,	4/1/2016 6:48 AM

Certified Erosion and Sediment Control Lead Training Course Evaluation

Q6 Please provide any additional comments/suggestions for improvement.

Answered: 4 Skipped: 3

#	Responses	Date
1	Creation of chapter in ccb study guide/exam as a part of education for contractors license to operate a business in Oregon.	4/1/2016 1:54 PM
2	Some how we need to get the contractors educated on the importance of erosion and sediment control. Contractors are ignoring these issues on their job sites with no consequences.	4/1/2016 6:48 AM
3	It was nice having the cards available at the end; and good length of time each day. Very helpful information. Thank you.	3/30/2016 11:16 AM
4	Great job!	3/30/2016 10:28 AM

STORMWATER QUALITY WEBINAR SERIES

FALL 2015



The City of Bend Stormwater Utility is sponsoring the following upcoming webinar training opportunities. Attendance is free, PDHs/ CEUs are available for the CWP webinar.

US EPA Webinar - Winter O&M for Green Infrastructure			
Date:	November 3, 2015 (Tues.)	Time:	10:00 am to 11:30 am
Location:	City of Bend Utilities, 62975 Boyd Acres Rd.		
Session 1	Green Infrastructure Maintenance: Facts, Fiction, Cold Weather, and Costs		
Session 2	Clean Water & Safe Roads: Finding the Balance		
<p>From the U.S. Environmental Protection Agency Website: Operations and maintenance (O&M) is critical to the long-term effectiveness and success of green infrastructure practices in any community. However, wet weather in colder climate communities often presents unique challenges to green infrastructure maintenance - from snow, sediment, and salt to storage and drainage. This webcast will showcase two presentations that illustrate some of the realities and best practices of winter O&M and will build off of the information shared in EPA's 2014 O&M webinar.</p>			

CWP Webinar - Checking in on Post-Construction Stormwater Management			
Date:	November 18, 2015 (Wed.)	Time:	10:00 am to 11:30 am
Location:	City of Bend Utilities, 62975 Boyd Acres Rd.		
<p>From Center for Watershed Protection Website: For many MS4s, the post-construction minimum measure is the most complicated, and the one that requires the highest level of local program development. Post-construction stormwater management involves development of stormwater standards, plan review, inspections, and verification of long-term maintenance. This program is also becoming more prominent as state MS4 permits are revised and reauthorized. This webcast will explore innovations and trends in post-construction stormwater management, with MS4 case studies featuring program components and budgets.</p>			

Also, check out the ASCE On-Demand Webinar Series that kicks off November 17, 2015.
Attendance is free and each section is worth 1 PDH.

TO REGISTER

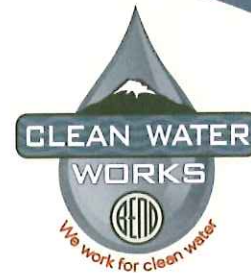
For the webinars, please register by emailing or calling David Buchanan, City of Bend, dbuchanan@bendoregon.gov or (541) 693-2176 with your name, agency/company, and contact information, and which series and/or sections you would like to attend.

Register today—seating is limited



UTILITY DEPARTMENT

ASCE ON-DEMAND STORMWATER MANAGEMENT WEBINAR SERIES



EARLY WINTER 2015

The City of Bend Stormwater Utility is sponsoring the following upcoming American Society of Civil Engineers (ASCE) On Demand Webinar Training opportunities. Attendance is free, each session is a 1-hour webinar worth 1 PDH.

Webinar Training (Series 1) – Construction Site Management			
Date:	November 17, 2015 (Tues.)	Time:	1:00 pm to 3:15 pm
Location:	City of Bend Utilities, 62975 Boyd Acres Rd.		
Session 1:	Design of Erosion Control Measures for Small Channels		
Session 2:	Construction Stormwater BMPs		

Webinar Training (Series 2) – Stormwater Facility Considerations			
Date:	December 1, 2015 (Tues.)	Time:	1:00 pm to 3:15 pm
Location:	City of Bend Utilities, 62975 Boyd Acres Rd.		
Session 1:	Hydrologic Trespass and Nuisance Considerations in Stormwater Design		
Session 2:	Storm Water Management Alternatives for Small Commercial Sites		

Webinar Training (Series 3) - Permeable Pavement: Design			
Date:	December 15, 2015 (Tues.)	Time:	1:00 pm to 2:00 pm
Location:	City of Bend Utilities, 62975 Boyd Acres Rd.		
Session 1:	Permeable Pavement: Design Considerations and Tips for Avoiding Failures		

TO REGISTER

For the webinars, please register by emailing or calling Wendy Edde, City of Bend, wedde@bendoregon.gov or (541) 317-3018 with your name, agency/company, and contact information, and which series and/or sections you would like to attend.

Register today—seating is limited



UTILITY DEPARTMENT

ASCE ON-DEMAND STORMWATER MANAGEMENT SERIES 1



The City of Bend Stormwater Utility is sponsoring the following upcoming webinar training opportunities. Attendance is free, each session is a 1-hour webinar worth 1 PDH.

Date: November 17, 2015 **Time:** 1:00 pm to 3:15 pm

Location: City of Bend Utilities, 62975 Boyd Acres Rd.

SESSION 1 - Design of Erosion Control Measures for Small Channels

Purpose and Background from ASCE Website:

Activities affecting drainage around project sites have come under more intensive scrutiny from regulatory agencies in recent years. Properly designed channel linings can ensure that drainage ditches and channels provide effective drainage without causing erosion in the channel, and at the same time satisfy regulatory requirements. Traditional methods have consisted of lining erodible channels with rigid liners such as riprap or concrete, but effective non-traditional methods can also be employed under the right circumstances. For instance, flexible linings, such as vegetative linings, erosion control mats, and turf reinforcement mats can be appropriate methods that can provide effective solutions as well. The selection of a proper channel lining for erosion control depends on site conditions, such as soil type, drainage area, estimated channel flows, and channel slope, and this webinar will explore the variety of options and help you determine the best method for your circumstances.

Instructor: Jerry Michel, P.E.

BREAK (15 Minutes)

SESSION 2 - Construction Stormwater BMPs

Purpose and Background from ASCE Website:

Many construction projects include excavation and fill. These soil disturbing activities create the potential for erosion and necessitate the use of Best Management Practices (BMPs). A wide variety of BMPs have been developed, but some designers and contractors use only a few of them. Sometimes this is due to unfamiliarity with other options and sometimes it is due to the mistaken impression that one BMP can be used for all situations.

BMPs for slopes include silt fence, slope roughening and erosion control blankets. BMPs for small drainages include sedimentation basins, sediment traps, check dams, fiber rolls and straw bales. BMPs for inlets include silt fence, straw bales, fiber rolls and inlet covers.

Instructor: Mark Peterson, P.E., M.ASCE

INTENDED AUDIENCE

Civil engineers, contractors and inspectors involved in designing, installing or inspecting storm water BMPs for construction projects will benefit from this webinar.

TO REGISTER

For the webinars, please register by emailing or calling Wendy Edde, City of Bend, wedde@bendoregon.gov or (541) 317-3018 with your name, agency/company, and contact information, and which series and/or sections you would like to attend. **Register today—seating is limited**

THANK YOU FOR ATTENDING!

American Society of Civil Engineers

Construction Site Management - Webinar Series 1

Date: November 17, 2015 Time: 1:00 am to 3:15 am



UTILITY DEPARTMENT

PLEASE SIGN IN

	Name	Affiliation	Session 1 (Initial Sessions Attended)	Session 2
1	Adam Erlandson	Harper Houf Peterson Righellis Inc.	A	A
2	Corey Charon	The Green Consultant	CC	CC
3	David Buchanan	City of Bend	DB	DB
4	Garrett Sabourin	City of Bend		
5	Nicolae Oltean	City of Bend		
6	Chris Chambers	DevTech Engineering	CC	CC
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None Responded
0/3



CITY OF BEND

Webinar Effectiveness Evaluation Form

Workshop Title:

American Society of Civil Engineers

Session 1: Design of Erosion Control Measures for Small Channels

Session 2: Construction Stormwater BMPs

Date: November 3, 2015

- 1. Please Rate the First Session Design of Erosion Control Measures for Small Channels Presentation (1 being poor, 3 averages, 5 excellent)**

NA 1 2 3 4 5

Comments:

- 2. Please Rate the Second Session, Construction Stormwater BMPs Presentation (1 being poor, 3 averages, 5 excellent)**

NA 1 2 3 4 5

Comments:

- 3. Please Rate the facility and refreshments (1 being poor, 3 average, 5 excellent)**

Facilities NA 1 2 3 4 5

Refreshments NA 1 2 3 4 5

Comments:

Thank you for your time and input to help us improve our offerings!

4. Please list one or more things that you learned in the first session.

5. Please list one or more things that you learned in the second session.

6. Please provide any additional comments/ suggestions for improvements, or for other training that you would find useful.

Thank you for your time and input to help us improve our offerings!

ASCE On-Demand Stormwater Management Webinar



Series 2

The City of Bend Stormwater Utility is sponsoring the following upcoming ASCE webinar training opportunities. Attendance is free, each session is a 1-hour webinar worth 1 PDH.

Date: ~~December 1, 2015~~ **RESCHEDULED Tues., Dec. 29, 2015** **Time:** 1:00-3:15 pm

Location: City of Bend Utilities, 62975 Boyd Acres Rd.

SESSION 1 - Hydrologic Trespass and Nuisance Considerations in Stormwater Design

Purpose and Background from ASCE Website:

With the advent of numerous stormwater regulations, the use of stormwater BMPs to manage and treat runoff has become a critical component of any site development project. This use of stormwater management measures, while intended to protect the environment and control the quantity and quality of runoff, can still alter hydrology in ways that may give rise to legal issues and litigation from downstream landowners. Claims of "hydrologic trespass," nuisance, and other actions deriving from the broad area of water law can sometimes arise even when the designer has properly followed the local regulations. This one-hour webinar will discuss the basic principles of water law, drainage law claims of nuisance and trespass, and other legal actions as they relate to stormwater management design.

Instructor: Ian Jewell

BREAK (10 Minutes)

SESSION 2 - Storm Water Management Alternatives for Small Commercial Sites

Purpose and Background from ASCE Website:

Many projects involve development of a small commercial facility on a site that currently has limited or no impervious area. In many jurisdictions, it is necessary to reduce the peak flow to predevelopment levels. However, typical solutions to peak flow reduction, such as large detention ponds, are not practical on a small site. There are alternative approaches to storm water management on small commercial sites that can reduce costs, improve aesthetics, meet the storm water regulations and possibly provide LEED credits for the project.

Storm water detention ponds can still be used, but they must be much smaller, which limits the types of outlet devices that can be used. They must also be molded into the landscape to improve the aesthetics. Retention ponds and rain gardens become viable options on small sites, but must still be designed to perform storm water functions.

Instructor: Mark Peterson, P.E., M.ASCE

INTENDED AUDIENCE

Civil engineers, contractors and inspectors involved in designing, installing or inspecting stormwater BMPs for construction projects will benefit from this webinar.

TO REGISTER

For this webinar, please register by emailing or calling David Buchanan, City of Bend, dbuchanan@bendoregon.gov or (541) 693-2176 with your name, agency/company, and contact information and which series and/or sections you would like to attend.

Register today—seating is limited

THANK YOU FOR ATTENDING!

American Society of Civil Engineers

Stormwater Facility Considerations - Webinar Series 2

Date: December 29, 2015

Time: 1:00 pm to 3:15 pm



UTILITY DEPARTMENT

PLEASE SIGN IN

	Name	Affiliation	Session 1 (Initial Sessions Attended)		Session 2	
			Initial	Sessions	Initial	Sessions
1	Terry Angle	Angle Consulting Engineering				
2	David Buchanan	City of Bend				
3	Chris Chambers	Devtech Engineering Inc.				
4	Corey Charon	The Green Consultant				
5	Jennifer VanCamp	HHPR				
6	Wendy Edde	City of Bend				
7	Mark Ellington	Bend Park and Recreation				
8	Larry Morse	City of Redmond				
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Hydrologic
Process +
Watershed
Considerations

SW Mgmt
Atts for
Small
Communities



CITY OF BEND

Webinar Effectiveness Evaluation Form

Workshop Title:

American Society of Civil Engineers - Stormwater Facility Considerations

Session 1: Hydrologic Trespass and Nuisance Considerations in Stormwater Design

Session 2: Storm Water Management Alternatives for Small Commercial Sites

Date: December 29, 2015

- 1. Please Rate the First Session Hydrologic Trespass and Nuisance Considerations in Stormwater Design Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments:

- 2. Please Rate the Second Session Storm Water Management Alternatives for Small Commercial Sites Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments:

- 3. Please Rate the facility and refreshments (1 being poor, 3 average, 5 excellent)

Facilities NA 1 2 3 4 5

Refreshments NA 1 2 3 4 5

Comments:

Thank you for your time and input to help us improve our offerings!

- 4. Please list one or more things that you learned in the first session.**

- 5. Please list one or more things that you learned in the second session.**

- 6. Please provide any additional comments/ suggestions for improvements, or for other training that you would find useful.**

Thank you for your time and input to help us improve our offerings!



CITY OF BEND

Webinar Effectiveness Evaluation Form

Workshop Title:

American Society of Civil Engineers - Stormwater Facility Considerations
Session 1: Hydrologic Trespass and Nuisance Considerations in Stormwater Design
Session 2: Storm Water Management Alternatives for Small Commercial Sites

Date: December 29, 2015

1. Please Rate the First Session Hydrologic Trespass and Nuisance Considerations in Stormwater Design Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments:

2. Please Rate the Second Session Storm Water Management Alternatives for Small Commercial Sites Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments:

3. Please Rate the facility and refreshments (1 being poor, 3 average, 5 excellent)

Facilities NA 1 2 3 4 5

Refreshments NA 1 2 3 4 5

Comments:

Thank you for your time and input to help us improve our offerings!

- 4. Please list one or more things that you learned in the first session.**

- 5. Please list one or more things that you learned in the second session.**

- 6. Please provide any additional comments/ suggestions for improvements, or for other training that you would find useful.**

Thank you for your time and input to help us improve our offerings!



CITY OF BEND

Webinar Effectiveness Evaluation Form

Workshop Title:

American Society of Civil Engineers - Stormwater Facility Considerations
Session 1: Hydrologic Trespass and Nuisance Considerations in Stormwater Design
Session 2: Storm Water Management Alternatives for Small Commercial Sites

Date: December 29, 2015

- 1. Please Rate the First Session Hydrologic Trespass and Nuisance Considerations in Stormwater Design Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments: interesting to look at legal side.

- 2. Please Rate the Second Session Storm Water Management Alternatives for Small Commercial Sites Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments: good review, not really alternatives

- 3. Please Rate the facility and refreshments (1 being poor, 3 average, 5 excellent)

Facilities NA 1 2 3 4 5

Refreshments NA 1 2 3 4 5

Comments: thanks Wendy!

Thank you for your time and input to help us improve our offerings!

4. Please list one or more things that you learned in the first session.

- reasonable care for engineers
- consistent records - taking notes
- more research - history, video, downstream check online.

5. Please list one or more things that you learned in the second session.

- outlets: pipe, grate, orifice, weir
- french drain - catch basin w/perforations
- permeable soils, filter fabric

6. Please provide any additional comments/ suggestions for improvements, or for other training that you would find useful.



CITY OF BEND

Webinar Effectiveness Evaluation Form

Workshop Title:

American Society of Civil Engineers - Stormwater Facility Considerations
Session 1: Hydrologic Trespass and Nuisance Considerations in Stormwater Design
Session 2: Storm Water Management Alternatives for Small Commercial Sites

Date: December 29, 2015

1. Please Rate the First Session Hydrologic Trespass and Nuisance Considerations in Stormwater Design Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments: Interesting subject.

2. Please Rate the Second Session Storm Water Management Alternatives for Small Commercial Sites Presentation (1 being poor, 3 averages, 5 excellent)

NA 1 2 3 4 5

Comments: Pretty basic content.

3. Please Rate the facility and refreshments (1 being poor, 3 average, 5 excellent)

Facilities NA 1 2 3 4 5

Refreshments NA 1 2 3 4 5

Comments:

Thank you for your time and input to help us improve our offerings!

4. Please list one or more things that you learned in the first session.

Various Water Doctrines.

5. Please list one or more things that you learned in the second session.

6. Please provide any additional comments/ suggestions for improvements, or for other training that you would find useful.

Thank you for your time and input to help us improve our offerings!

ASCE ON-DEMAND STORMWATER MANAGEMENT SERIES 3



The City of Bend Stormwater Utility is sponsoring the following upcoming webinar training opportunities. Attendance is free, this is a 1-hour webinar worth 1 PDH.

Date: December 15, 2015

Time: 1:00 pm to 2:00 pm

Location: City of Bend Utilities, 62975 Boyd Acres Rd.

Permeable Pavement - Design Considerations and Tips for Avoiding Failures

This webinar discusses various permeable pavement types, site considerations common to all permeable pavements their benefits, and tips for avoiding clogging failures.

In spite of the environmental advantages of permeable pavements, in North America, they have typically remained outside the ordinary conventions of urban design and construction. Very few state and local agencies have standards or guidelines that can be used by practicing engineers for the design of these systems. In response to these issues, the ASCE-EWRI UWRRC LID Task Committee on Permeable Pavement developed a Committee Report entitled Permeable Pavements. This webinar highlights specific content from the manual which contains individual design chapters on porous asphalt, pervious concrete, permeable interlocking concrete pavement, and other types of permeable pavement. Design considerations that are common to all permeable pavement systems are emphasized. In addition, common myths surrounding the practice are addressed, including perceptions about practice strength, durability, clogging, cold climate usage, use in clay soils, and long-term performance. Attendees gain an introduction to permeable pavement technology and capability and will be directed to the upcoming comprehensive Committee Report for more in-depth information and resources.

Instructor: Bethany Eisenberg LEED AP, A.M.ASCE & Kelly A. Lindow, PE, A.M.ASCE

INTENDED AUDIENCE

Engineers, Regulatory personnel, Plan reviewers, Landscape architects who are involved in stormwater management planning, design, review or implementation

TO REGISTER

For the webinars, please register by emailing or calling Wendy Edde, City of Bend, wedde@bendoregon.gov or (541) 317-3018 with your name, agency/company, and contact information and which series and/or sections you would like to attend

Register today—seating is limited

THANK YOU FOR ATTENDING!

American Society of Civil Engineers
 Permeable Pavement Design

Date: December 15, 2015 Time: 1:00 pm to 2:00 pm



UTILITY DEPARTMENT

PLEASE SIGN IN

	Name (Please Initial)	Affiliation	Notes/Comments
1	Chris Chambers <i>CC</i>	Devtech Engineering Inc.	
2	Corey Charon <i>CC</i>	The Green Consultant	
3	David Buchanan <i>DB</i>	City of Bend	
4	Wendy Edde <i>WE</i>	City of Bend	
5	Krista Ratliff <i>KR</i>	DEQ	
6	Jennifer VanCamp	HHPR	
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Webinar Evaluation Summary

American Society of Civil Engineers
(Series 3) Permeable Pavement Design Considerations

UTILITY DEPARTMENT

December 15, 2015

The webinar had 6 attendees, 3 of which completed an evaluation form that is summarized below.

1. Please Rate the presentation (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	0% (0)	0% (0)	75% (2)	25% (1)

Comments:

2a. Please Rate the Facility (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	0% (0)	50% (2)	25% (1)	0% (0)

2b. Please Rate the Refreshments (1 being poor, 3 average, 5 Excellent)				
1	2	3	4	5
0% (0)	0% (0)	25% (1)	75% (2)	0% (0)

Comments:

3. Please list one thing you learned:

- ASCE has a new guide as of April 2015 on permeable pavements
- Maintenance costs are similar to standard asphalt roads
- Avoid using permeable ac/concrete in turning areas

4. Please provide any additional comments/ suggestions for improvements, or for other training that you find useful:

- Double check presentation time, this went for 1-1/2 hours.

