Statewide
Low Impact Development
Training Program
2017 COURSE CATALOG
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Introduction

Welcome

Welcome to the third session of the Washington Statewide Low Impact Development Training Program (Statewide LID Training Program). The Statewide LID Training Program reflects approximately four years of planning and needs assessment, and has been created to assist you—the design, implementation and maintenance community—with proper design, build, and maintenance of facilities that are aligned with LID best management practices (BMPs).

During the 2017 session (January through May), 39 trainings will be offered. The trainings (a.k.a. modules) are organized by level of training (Introductory, Intermediate, and Advanced), subject matter, and audience. The audience-specific curriculum provides fundamental, practical, and highly technical information targeted for the various disciplines engaged in LID implementation.

Planning and course creation is ongoing; audiences are encouraged to check the training program website (www.wastormwatercenter.org/lidswtrainingprogram) periodically for up-to-date curriculum, dates and location information.

About this program

The Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) general permits require widespread adoption of LID techniques into local development codes. These new practices and codes require significant changes in the way the private development community plans, designs, and builds sites, as well as the way the public sector inspects, maintains, and enforces LID BMPs.

In order to assist jurisdictions and professionals affected by new LID requirements, multiple stakeholders came together to request state funding for Ecology to develop and deliver LID trainings on the regulatory, design, and maintenance topics central to successful implementation of LID principles and practices. One initial and key product of the Statewide LID Training Program effort is the Washington State Low Impact Development Training Plan (LID Training Plan). The LID Training Plan is based on findings from an assessment that identified LID training needs among professionals across the state and determined the capacity of current and potential LID service providers to meet increased demand for training. The Statewide LID Training Program is based on this plan.

The third session of the Statewide LID Training Program consists of 39 trainings that will generally progress from Intermediate to Advanced level courses from January 2017 through May 2017. The Statewide LID Training Program will offer LID Design and Operations and Maintenance certificates for those completing the required training courses and online tests (refer to certificate policy sheet here for more details).

How to use this catalog

This course catalog is organized into four major sections, designed to assist audiences in understanding the range of courses available throughout the state:
COURSE DESCRIPTIONS
The Course Descriptions section offers continually updated descriptions of the sixteen (16) open modules offered in 2017, along with dates, locations, and assigned instructors for scheduled trainings. These modules are grouped by knowledge level (Introductory, Intermediate, and Advanced) and include:

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<th>Module</th>
<th>Course Description</th>
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<tr>
<td>1.0</td>
<td>Introduction to LID for Eastern Washington</td>
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<td>2.1</td>
<td>Introduction to LID for Inspection and Maintenance Staff</td>
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<tr>
<td>2.2</td>
<td>Introduction to LID for Developers and Contractors: Make Money be Green</td>
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<td>3.1</td>
<td>Intermediate LID Topics: NPDES Phase I and Phase II Permit Requirements</td>
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<td>Intermediate LID Design: Bioretention</td>
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<td>3.3</td>
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<td>3.4</td>
<td>Intermediate LID Design: Site Assessment, Planning, and Layout</td>
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<td>3.5</td>
<td>Intermediate LID Design: Rainwater Collection Systems and Green Roofs</td>
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<tr>
<td>3.6</td>
<td>Intermediate LID Design: Hydrologic Modeling</td>
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<tr>
<td>5.0</td>
<td>Advanced Long-term LID Operations: Bioretention</td>
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<tr>
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<tr>
<td>5.2</td>
<td>Advanced LID Design: Bioretention</td>
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<td>5.3</td>
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<td>5.6</td>
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</tr>
<tr>
<td>6.2</td>
<td>Advanced LID Design: Bioretention Media and Compost-Amended Soils</td>
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</table>

Each module targets a unique training audience and is designed to meet specific learning objectives. These objectives are listed at the beginning of each module section to guide course selection. Training events are organized within their modules by date. Courses in eastern Washington will cover materials specific to that region.

Please note that these sections will be updated as logistics are finalized. Missing information will become available as the date of the training approaches. Please visit the LID Training Program website at www.wastormwatercenter.org/lidswtrainingprogram to download the most up-to-date version of this catalog.

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1 Module 5.5 Advanced LID Design: Rainwater Collection and Green Roofs is not being offered in 2017.
SCHEDULE OF COURSES

The Schedule of Courses section provides a quick reference table of the scheduled training events organized by date and location. Course titles link back to their corresponding descriptions. Links at the far right of the schedule will take you to our online registration portal (Eventbrite).

Please double-check the date and location of your selected training upon registration. Courses are offered on multiple dates at multiple locations.

TRAINING LOCATIONS

The 2017 Statewide LID Training Program offers courses in five Washington localities:

- Bellingham
- Moses Lake
- Olympia
- Seattle
- Vancouver

You can find more information about which trainings are offered in each of the above localities in the Course Descriptions and Schedule of Courses sections.

Advanced design courses for 2017 will be held in Seattle only and are scheduled to immediately follow their intermediate design counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

Introductory courses are offered online only. Please visit http://www.wastormwatercenter.org/lidswtrainingprogram/ to access online course materials.

MEET YOUR INSTRUCTORS

The Meet Your Instructors section (page 34) offers a brief introduction to each of the LID professionals who are scheduled to instruct or co-instruct the trainings.
How to register for courses

Below is detailed information about how to register for courses, as well as a description about the waitlist, cancellation policy, and registrant follow-up.

REGISTRATION

Registration is available online through Eventbrite. There will be a fee for breakfast and/or lunch at the trainings. Please follow the step-by-step instructions below.

1. Click on the unique links in the course descriptions below to register for a specific course. Links will be available when registration for each course is open. The courses that do not have links are not yet open for registration or have already taken place.
2. Click on the link below to view a list of all courses that are currently open for registration. http://www.eventbrite.com/o/washington-state-department-of-ecology-8360043510
3. Click on the title of the event for which you would like to register.
4. If you are registering for a course that is full, you will be able to register for the course waiting list. You will be notified via email as spots open up, and will be given 24 hours to complete your registration.
5. Use the drop down menu to select the number of tickets and click “Register.”
6. Answer the mandatory registration questions.
7. Enter your contact information and click “Complete Registration.”
8. You will immediately receive an email confirmation of your order.
9. You will receive reminder emails 1 week and the day before your course with training-specific information, including how to complete any necessary pre-assignments. Be sure to check your spam folder so as not to miss the important information in the reminder emails from Eventbrite.

WAITING LIST

Each course has a maximum number of participants. The maximum number varies by course as it is dependent on the course format and the training venue. When the maximum number for a particular course is reached, registrants will be prompted to register for the waiting list. You will be notified immediately by email if a space becomes available. Registrants will have 24 hours to complete their registration before losing the spot.

CANCELLATION

If you are unable to attend a course that you have registered for, please email training@cascadiaconsulting.com or call 206-449-1163 at least two days prior to the course date. Include your name and the name of the course that you registered for. Each course will have a waitlist; therefore, it is important that you cancel your registration if you are no longer able to attend to provide waitlisted individuals with the opportunity to attend. Courses may be cancelled if there are fewer than 10 registrants within two weeks of the course date. Go to www.wastormwatercenter.org/lidswtrainingprogram for the latest information on course cancellations.

QUESTIONS

If you have any questions or difficulties with registration, please call 206-449-1163 or email training@cascadiaconsulting.com. We are happy to help you navigate the course catalog, find the right training for you, and help you register.
Course Descriptions

Please note that planning and course creation is ongoing; audiences are encouraged to check the following website periodically for up-to-date curriculum, dates, and locations:
www.wastormwatercenter.org/lidswtrainingprogram

1.0. INTRODUCTION TO LID (ONLINE ONLY)

AUDIENCE

Eastern Washington elected officials, department directors, and the construction and development community, but available to all audiences. This course focuses on LID principles and practices for eastern Washington.

LEARNING OBJECTIVES

- Understand basic LID principles and practices.
- Learn on-the-ground LID practices applicable to Eastern Washington, common approaches, and procedures for design, installation, operations, maintenance, and inspection.
- Understand the current permit requirements for LID.
- Learn where resources exist to help further advance understanding of LID and how this course fits in the larger LID training program in Washington State.

COURSE DESCRIPTION

This is an introductory level course for all audiences that provides a broad overview of LID principles, new permit regulations encouraging LID, and the basic structures and functions of primary LID practices such as bioretention, rain gardens, permeable pavement, compost-amended soils, vegetated roofs, rainwater collection systems, newly planted and retained trees, and dispersion and infiltration techniques. Introduction to LID will emphasize case studies to provide participants with practical lessons applicable to their region.

LENGTH OF TRAINING

Three hours

COURSE OFFERINGS

Online Only

Link to course: https://www.youtube.com/playlist?list=PLXny_Je3KsDzou69odipTQ2dqK0wty1oz

PREREQUISITES AND CERTIFICATE

There are no prerequisites for this course. Module 1.0 is not required for a certificate, but is recommended for those new to LID design and application as well as those considering the Intermediate and Advanced level trainings.
2.1. INTRODUCTION TO LID FOR INSPECTION AND MAINTENANCE STAFF (ONLINE ONLY)

AUDIENCE
Post-construction inspection and enforcement staff and operations and maintenance personnel.

LEARNING OBJECTIVES
- Gain a basic understanding of inspection and maintenance activities associated with LID BMPs.
- Identify priority elements when conducting inspections for LID facilities.
- Identify and understand the most common problems and associated solutions related to maintaining LID BMPs.

COURSE DESCRIPTION
This is an introductory level course for inspection and enforcement staff and operations and maintenance personnel focused on post-construction inspections and maintenance of permanent LID BMPs. This course will provide the latest recommendations for standard preventative maintenance practices necessary to support the long-term function of bioretention facilities, permeable pavement, and vegetated roofs as well as common maintenance thresholds that trigger more intensive facility repairs or retrofits.

*Modules 5.0 and 5.1 are recommended as follow-up courses that provide more in-depth information on bioretention and permeable pavement inspections and maintenance.*

LENGTH OF TRAINING
Approximately 4 hours.

COURSE OFFERINGS
Online only. Access to the course can be found here:
https://www.youtube.com/playlist?list=PL8BmI4b96dKaO00KU9g4hQuVlgs5i-oel

PREREQUISITES AND CERTIFICATE
There are no prerequisites for this course. Module 2.1 is required for the Long-term Operations certificate.

2.2. INTRODUCTION TO LID FOR DEVELOPERS AND CONTRACTORS (ONLINE ONLY)

AUDIENCE
Western Washington developers, contractors, real estate brokers, and construction management personnel.

LEARNING OBJECTIVES
- Understand efficient application of LID BMPs.
Understand new LID regulatory requirements.
Learn how LID development process and costs compare to conventional stormwater practices.
Understand the basic principles of site assessment, site layout, and construction sequencing to improve the design and long-term, effective operation of LID projects.
Learn how to minimize construction impacts.
Understand the minimum requirements for construction and protection of LID BMPs during construction.

COURSE DESCRIPTION
This is an introductory level course for developers, real estate brokers, contractors, and construction management personnel focused on efficient application of LID BMPs and construction sequencing to minimize construction impacts to LID BMPs. The course will cover site assessment and layout, construction sequencing methods for installing bioretention and permeable pavement, regulatory requirements, and cost comparisons between LID and conventional stormwater management.

Modules 3.2 through 3.4 are recommended as follow-up courses that provide more in-depth information for bioretention; permeable pavement; and site assessment, planning, and layout.

LENGTH OF TRAINING
Three hours.

COURSE OFFERINGS
Online only.

Link to course: https://www.youtube.com/playlist?list=PLXny_Je3KsDzyow0OCVaUUBgS52fvuTFV

PREREQUISITES AND CERTIFICATE
There are no prerequisites for this course. This course is not required for the certificate.
COURSE DESCRIPTION

This is an intermediate level course for all audiences that focuses on NPDES Phase I and Phase II municipal stormwater permit requirements for LID including Element 13 of MR #2 (Protect LID BMPs), MR #5 (On-site Stormwater Management), and LID operations and maintenance (O&M) requirements. This course is intended to provide an overview of all of the requirements related to LID, but will cover MR #5 (on-site stormwater management) and LID O&M requirements in the most depth. Ecology staff will be available to answer questions related to LID requirements in the NPDES Phase I and Phase II municipal stormwater permits.

LENGTH OF TRAINING

4 hours.

COURSE OFFERINGS

3.1. Intermediate LID Topics: NPDES Phase I and Phase II Permit Requirements—Vancouver

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<th>INSTRUCTOR</th>
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<tbody>
<tr>
<td>2/6/17</td>
<td>Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661</td>
<td>Dugopolski, Iftner</td>
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3.1. Intermediate LID Topics: NPDES Phase I and Phase II Permit Requirements—Seattle

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<tr>
<td>2/10/17</td>
<td>Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105</td>
<td>Dugopolski, Iftner</td>
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3.1. Intermediate LID Topics: NPDES Phase I and Phase II Permit Requirements—Bellingham

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<td>2/13/17</td>
<td>Alaska Ferry Terminal, 355 Harris Ave, Bellingham, WA 98225</td>
<td>Dugopolski, Iftner</td>
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3.1. Intermediate LID Topics: NPDES Phase I and Phase II Permit Requirements—Olympia

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<tr>
<td>2/28/17</td>
<td>Olympia Center, 222 Columbia Street NW, Olympia, WA 98501</td>
<td>Dugopolski, Iftner</td>
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PREREQUISITES AND CERTIFICATE

There are no prerequisites for this course. Module 3.1 is not required but recommended for the LID Design Certificate.
3.2. INTERMEDIATE LID DESIGN: BIORETENTION

AUDIENCE
Washington designers, engineers, planners, landscape architects, plan and permit reviewers, developers, and construction managers

LEARNING OBJECTIVES
- Gain an intermediate level knowledge necessary for proper design and implementation of both new and retrofit bioretention systems in residential and commercial settings.
- Learn skills necessary for basic site assessment and location selection for bioretention areas in residential and commercial settings.
- Learn practical skills necessary for construction of basic bioretention systems.

COURSE DESCRIPTION
This is an intermediate level course for engineers, planners, landscape architects, local jurisdiction staff, developers, construction managers, and allied disciplines that plan, design, review, and build bioretention and rain garden projects. The course provides current design guidelines, construction details, information on flow control and water quality treatment performance, and practical experience necessary to properly design and build bioretention systems and rain gardens. The field component will give participants the opportunity to discuss inspection, maintenance, performance, and aesthetics at field sites. The eastern Washington course focuses on bioretention design for that region.

LENGTH OF TRAINING
Four hours online lecture and one day (8 hours) in class with instructors. The online lecture component is a pre-training assignment and can be taken at the participant’s desired pace. The training relies on the students’ completion of the pre-training assignment. Follow this link to view the required videos before the start of training: https://www.youtube.com/playlist?list=PLXny_Je3KsDxQwfPERwGi8b6SezWv-gM1.

Advanced design courses for 2017 will be held in Seattle and are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.
### COURSE OFFERINGS

**3.2. Intermediate LID Design: Bioretention—Bellingham**
- **DATE**: 2/15/17
- **LOCATION**: Alaska Ferry Terminal (Conference Rm B), 355 Harris Ave, Bellingham, WA 98225
- **INSTRUCTOR**: Hinman, Lancaster
- **REGISTER AT**: CLOSED

**3.2. Intermediate LID Design: Bioretention—Olympia**
- **DATE**: 2/22/17
- **LOCATION**: Olympia Center, 222 Columbia Street NW, Olympia, WA 98501
- **INSTRUCTOR**: Hinman, Atchison
- **REGISTER AT**: CLOSED

**3.2. Intermediate LID Design: Bioretention—Seattle**
- **DATE**: 1/30/17
- **LOCATION**: Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105
- **INSTRUCTOR**: Hinman, Webb
- **REGISTER AT**: CLOSED

**3.2. Intermediate LID Design: Bioretention—Vancouver**
- **DATE**: 1/17/17
- **LOCATION**: Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661
- **INSTRUCTOR**: Hinman, Atchison
- **REGISTER AT**: CANCELLED

**3.2. Intermediate LID Design: Bioretention—Vancouver (rescheduled)**
- **DATE**: 4/19/17
- **LOCATION**: Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661
- **INSTRUCTOR**: Hinman, Atchison
- **REGISTER AT**: CANCELLED

**3.2. Intermediate LID Design: Bioretention—Moses Lake**
- **DATE**: 3/7/17
- **LOCATION**: Moses Lake Fire Department, 701 E. 3rd Avenue, Moses Lake WA 98837
- **INSTRUCTOR**: Hinman, Atchison
- **REGISTER AT**: CANCELLED

### PREREQUISITES AND CERTIFICATE
There are no prerequisites for this course. Module 3.2 is required for the LID Design Certificate. Students interested in receiving the LID Design Certificate must complete this entire course (online and in-person sections) and pass the associated test with a grade of 75% or higher. To earn the LID Design Certificate, each student must complete all 5 required courses and their tests. The online lecture component is required to enter the in-person course.

3.3 3.3. INTERMEDIATE LID DESIGN: PERMEABLE PAVEMENT

AUDIENCE
Washington designers, engineers, plan and permit reviewers, developers, and construction managers

LEARNING OBJECTIVES
- Gain an intermediate level knowledge necessary for proper design and implementation of permeable pavement systems in residential and commercial settings (new and retrofit).
- Learn skills necessary for basic site assessment and location selection of permeable pavement areas in residential and commercial settings.
- Learn practical skills necessary for construction of basic permeable pavement systems.

COURSE DESCRIPTION
This is an intermediate level course for engineers, planners, landscape architects, local jurisdiction staff, developers, construction managers, and allied disciplines that plan, design, review, and build permeable pavement projects. The course provides current design guidelines, water quality treatment performance data, construction details, and practical experience necessary to properly design and build permeable pavement systems. The field component will give participants the opportunity to discuss installation procedures and structural characteristics and test infiltration capabilities of permeable pavement.

LENGTH OF TRAINING
Four hours online lecture and one day (8 hours) in class with instructors. The online lecture component is a pre-training assignment and can be taken at the participant’s desired pace. The training relies on the students’ completion of the pre-training assignment. Follow this link to view the required videos before the start of training: https://www.youtube.com/playlist?list=PLXny_Je3KsDzC6aDC6XzZyRr_jlUspkap.

Advanced design courses for 2017 will be held in Seattle and are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS
3.3. Intermediate LID Design: Permeable Pavement—Bellingham

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3.3. Intermediate LID Design: Permeable Pavement—Olympia

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<tr>
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<td>Olympia Center, 222 Columbia Street NW, Olympia, WA 98501</td>
<td>Hinman, Gwilym</td>
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REGISTER AT CLOSED

3.3. Intermediate LID Design: Permeable Pavement—Seattle

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<td>Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105</td>
<td>Hinman, Webb</td>
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REGISTER AT CLOSED

3.3. Intermediate LID Design: Permeable Pavement—Vancouver

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<tr>
<td>2/3/17</td>
<td>Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661</td>
<td>Hinman, Webb</td>
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REGISTER AT CLOSED

PREREQUISITES AND CERTIFICATE

There are no prerequisites for this course. Module 3.3 is required for the LID Design Certificate. Students interested in receiving the LID Design Certificate must complete this entire course (online and in-person sections) and pass the associated test with a grade of 75% or higher. To earn the LID Design Certificate, each student must complete all 5 required courses and their tests. The online lecture component is required to enter the in-person course.

3.4. INTERMEDIATE LID DESIGN: SITE ASSESSMENT, PLANNING, AND LAYOUT

AUDIENCE

Washington designers, engineers, plan and permit reviewers, developers, and construction managers

LEARNING OBJECTIVES

- Gain an intermediate level understanding of overall site assessment with particular attention to infiltration capability of soils for roadway, lot, and open space layout within the LID context.
- Gain an intermediate level understanding of appropriate layout for roadway, lot, and open space to protect site hydrology and create livable and attractive developments.
Gain an intermediate level understanding of techniques to protect native soil and vegetation during site development.

COURSE DESCRIPTION

This is an intermediate level course for engineers, architects, planners, landscape architects, local jurisdiction staff, developers, construction managers, and allied disciplines that plan, design, review, and build LID developments. The course provides current planning and design guidelines and case studies demonstrating proper site assessment and layout within an LID context. Participants will work on site plans, construction sequencing, and inspection processes for bioretention, permeable pavement, compost-amended soils, and vegetated roofs. The Eastern Washington course focuses on site assessment, planning, and layout for that region.

LENGTH OF TRAINING

Four hours online lecture and one day (8 hours) in class with instructors. The online lecture component is a pre-training assignment and can be taken at the participant’s desired pace. The training relies on the students’ completion of the pre-training assignment. Follow this link to view the required videos before the start of training: https://www.youtube.com/playlist?list=PLXny_Je3KsDwa5zhb5Yd_Ow1tuWPBYqZ.

Advanced design courses for 2017 will be held in Seattle and are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS

3.4. Intermediate LID Design: Site Assessment, Planning and Layout—Bellingham

<table>
<thead>
<tr>
<th>DATE</th>
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<tbody>
<tr>
<td>LOCATION</td>
<td>Alaska Ferry Terminal (Conference Rm B), 355 Harris Ave, Bellingham, WA 98225</td>
</tr>
<tr>
<td>INSTRUCTOR</td>
<td>Williams, Lathrop</td>
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<tr>
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3.4. Intermediate LID Design: Site Assessment, Planning and Layout—Olympia

<table>
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<tr>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>LOCATION</td>
<td>Olympia Center, 222 Columbia Street NW, Olympia, WA 98501</td>
</tr>
<tr>
<td>INSTRUCTOR</td>
<td>Williams, Lathrop</td>
</tr>
<tr>
<td>REGISTER AT</td>
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</table>
3.4. Intermediate LID Design: Site Assessment, Planning and Layout—Seattle

| DATE   | 2/7/17 |
| LOCATION | Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105 |
| INSTRUCTOR | Williams, Lathrop |
| REGISTER AT | CLOSED |

3.4. Intermediate LID Design: Site Assessment, Planning and Layout—Moses Lake

| DATE   | 3/9/17 |
| LOCATION | Moses Lake Fire Department, 701 E Third Ave, Moses Lake, WA 98837 |
| INSTRUCTOR | Williams, Lathrop |
| REGISTER AT | CANCELLED |

3.4. Intermediate LID Design: Site Assessment, Planning and Layout—Vancouver

| DATE   | 2/23/17 |
| LOCATION | Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661 |
| INSTRUCTOR | Williams, Lathrop |
| REGISTER AT | CLOSED |

**PREREQUISITES AND CERTIFICATE**

There are no prerequisites for this course. Module 3.4 is required for the LID Design Certificate. Students interested in receiving the LID Design Certificate must complete this entire course (online and in-person sections) and pass the associated test with a grade of 75% or higher. To earn the LID Design Certificate, each student must complete all 5 required courses and their tests. The online lecture component is required to enter the in-person course.

3.5. INTERMEDIATE LID DESIGN: RAINWATER COLLECTION SYSTEMS AND GREEN ROOFS

**AUDIENCE**

Western Washington designers, engineers, landscape architects, architects, plan and permit reviewers, developers, and construction managers

**LEARNING OBJECTIVES**

- Learn basic design and implementation approaches for rainwater collection systems and vegetated roofs in residential and commercial settings (new and retrofit).
- Learn practical skills necessary for construction of basic rainwater collection systems and vegetated roofs.
COURSE DESCRIPTION

This is an intermediate level course for engineers, planners, landscape architects, architects, local jurisdiction staff, developers, construction managers, and allied disciplines that plan, manage, review and inspect rainwater collection systems and vegetated roof projects. The course provides current design guidelines, basic construction details, basic flow control and water quality treatment performance information, and practical experience necessary to work with designers and contractors to ensure proper installation of these systems.

LENGTH OF TRAINING

Four hours online lecture and one day (4 hours) in class with instructors. The online lecture component is a pre-training assignment and can be taken at the participant’s desired pace. **The training relies on the students’ completion of the pre-training assignment.** Follow this link to view the required videos before the start of training: [https://www.youtube.com/playlist?list=PLXny_Je3KsDxEKFys1MBneQR-uHJBOs38](https://www.youtube.com/playlist?list=PLXny_Je3KsDxEKFys1MBneQR-uHJBOs38)

COURSE OFFERINGS

3.5. Intermediate LID Design: Rainwater Collection Systems and Green Roofs—Seattle

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<td>LOCATION</td>
<td>Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105</td>
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<tr>
<td>INSTRUCTOR</td>
<td>Webb, King</td>
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3.5. Intermediate LID Design: Rainwater Collection Systems and Green Roofs—Vancouver

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<tbody>
<tr>
<td>LOCATION</td>
<td>Water Resources Education Center</td>
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<td>Webb, King</td>
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<td>REGISTER AT</td>
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PREREQUISITES AND CERTIFICATE

There are no prerequisites for this course. Module 3.5 is required for the LID Design Certificate. Students interested in receiving the LID Design Certificate must complete this entire course (online and in-person sections) and pass the associated test with a grade of 75% or higher. To earn the LID Design Certificate, each student must complete all 5 required courses and their tests. The online lecture component is required to enter the in-person course.
3.6. INTERMEDIATE LID DESIGN: HYDROLOGIC MODELING

AUDIENCE
Washington designers, engineers, landscape architects, architects, plan and permit reviewers

WESTERN WASHINGTON LEARNING OBJECTIVES
- Gain a basic level of knowledge using WWHM and MGSFlood to predict pre- and post-development flow volumes and durations.
- Learn basic skills to size bioretention, permeable pavement, rainwater collection systems and vegetated roofs in residential and commercial settings using WWHM and MGSFlood.
- Understand the advantages and limitations of WWHM and MGSFlood and learn about additional modeling tools for specific predictions.

EASTERN WASHINGTON LEARNING OBJECTIVES
- Gain a basic level of knowledge using HydroCAD and StormSHED to predict pre- and post-development flow volumes.
- Learn basic skills to size bioretention, permeable pavement, rainwater collection systems and vegetated roofs in residential and commercial settings using HydroCAD and StormSHED.
- Understand the advantages and limitations of HydroCAD and StormSHED and learn about additional modeling tools for specific predictions.

COURSE DESCRIPTION
This is an intermediate level course for engineers, planners, landscape architects, architects, local jurisdiction staff, and allied disciplines that produce and review modeling outputs for LID projects. The course provides current continuous simulation modeling tools and methods and practical experience necessary to predict flow volume and durations when designing LID facilities through hands-on modeling exercises. The eastern Washington course focuses on hydrologic modeling approaches for that region.

LENGTH OF TRAINING
One day (6 hours). Advanced design courses for 2017 will be held in Seattle and are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS
3.6. Intermediate LID Design: Hydrologic Modeling—Bellingham

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<tr>
<td>LOCATION</td>
<td>Bellingham Technical College (Lab CC200), 3208 Lindbergh Ave., Bellingham, WA 98225</td>
</tr>
<tr>
<td>INSTRUCTOR</td>
<td>Dugopolski, Feller</td>
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### 3.6. Intermediate LID Design: Hydrologic Modeling

#### Olympia

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<td>Evergreen State College (Library Computer Lab), 2700 Evergreen Parkway NW, Olympia, WA 98505</td>
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#### Vancouver

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<tr>
<td>LOCATION</td>
<td>Clark College (East Campus), 18700 SE Mill Plain Blvd, Vancouver, WA 98683</td>
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<td>INSTRUCTOR</td>
<td>Matsumura, Atchison</td>
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#### Bothell

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<td>University of Washington – Bothell (Founders Hall), 18115 Campus Way NE, Bothell, WA 98011</td>
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#### PREREQUISITES AND CERTIFICATE

There are no prerequisites for this course. Module 3.6 is required for the LID Design Certificate. Students interested in receiving the LID Design Certificate must complete this entire course and pass the associated test with a grade of 75% or higher. To earn the LID Design Certificate, each student must complete all 5 required courses and their tests.
AUDIENCE
Washington inspection and enforcement staff and operations and maintenance personnel

LEARNING OBJECTIVES
- Gain an understanding of the structure and function of bioretention components.
- Develop an in-depth understanding of inspection activities to track and guide long-term facility maintenance.
- Know the requirements for primary prevention and intensive maintenance in bioretention facilities.
- Understand how to adaptively manage bioretention facilities by tracking trends in facility conditions and outcomes of maintenance activities.

COURSE DESCRIPTION
This is an advanced level course for inspection and enforcement staff and operations and maintenance personnel focused on post-construction inspections and maintenance of bioretention facilities and rain gardens. Designers who develop maintenance guidelines will also benefit from this course. The course will cover in-depth information on what to look for during inspections of bioretention and the latest maintenance recommendations. The field component of the class will provide participants the opportunity to conduct bioretention inspections and consider solutions with particular attention to plant maintenance.

LENGTH OF TRAINING
One day (8 hours).

COURSE OFFERINGS

5.0. Advanced Long-Term LID Operations: Bioretention—Bellingham
- DATE: 3/21/17
- LOCATION: Alaska Ferry Terminal (Conference Rm B), 355 Harris Ave, Bellingham, WA 98225
- INSTRUCTOR: Dugopolski, Donofrio
- REGISTER AT: CLOSED

5.0. Advanced Long-Term LID Operations: Bioretention—Seattle
- DATE: 5/9/17
- LOCATION: Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105
- INSTRUCTOR: Dugopolski, Donofrio
- REGISTER AT: Eventbrite page

5.0. Advanced Long-Term LID Operations: Bioretention—Olympia
- DATE: 5/3/17
- LOCATION: Olympia Center, 222 Columbia Street NW, Olympia, WA 98501
- INSTRUCTOR: Forester, Donofrio
- REGISTER AT: Eventbrite page
5.0. Advanced Long-Term LID Operations: Bioretention—Vancouver

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<td>3/23/17</td>
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5.0. Advanced Long-Term LID Operations: Bioretention—Moses Lake

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<td>Moses Lake Fire Department, 701 E 3rd Avenue, Moses Lake, WA 98837</td>
<td>Dugopolski, Donofrio</td>
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</table>

PREREQUISITES AND CERTIFICATE

While not required, Module 2.1: Introduction to LID for Inspection and Maintenance Staff (Western Washington) is highly recommended for this course. Module 5.0 is required for the Long-Term LID Operations Certificate.

5.1. ADVANCED LONG-TERM LID OPERATIONS: PERMEABLE PAVEMENT

AUDIENCE

Washington inspection and enforcement staff and operations and maintenance personnel

LEARNING OBJECTIVES

- Gain an understanding of the structure and function of permeable pavement components.
- Have an in-depth understanding of the primary inspection activities and tools to maintain permeable pavement function over time.
- Know the primary maintenance requirements for permeable pavement.
- Identify maintenance problems associated with permeable pavement areas and their solutions.

COURSE DESCRIPTION

This is an advanced level course for inspection and enforcement staff and operations and maintenance personnel focused on post-construction inspections and maintenance of permeable pavement (pervious concrete, porous asphalt, permeable pavers, and grid systems). Designers who develop maintenance guidelines will also benefit from this course. The course will cover the in-depth information on what to look for during inspections of permeable pavement and the latest maintenance recommendations. The field component of the class will provide participants the opportunity to conduct permeable pavement inspections and consider solutions with particular attention to pavement infiltration over time.

LENGTH OF TRAINING

One day (8 hours).
## COURSE OFFERINGS

### 5.1. Advanced Long-Term LID Operations: Permeable Pavement—Bellingham

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<td>Gwilym, Dugopoliski</td>
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### 5.1. Advanced Long-Term LID Operations: Permeable Pavement—Seattle

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<td>5/12/17</td>
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### 5.1. Advanced Long-Term LID Operations: Permeable Pavement—Olympia

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<td>4/18/17</td>
<td>Olympia Center, 222 Columbia Street NW, Olympia, WA 98501</td>
<td>Gwilym, Donofrio</td>
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### 5.1. Advanced Long-Term LID Operations: Permeable Pavement—Moses Lake

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<td>4/26/17</td>
<td>Moses Lake Fire Department, 701 E 3rd Ave., Moses Lake, WA 98837</td>
<td>Dugopoliski, Gwilym</td>
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### 5.1. Advanced Long-Term LID Operations: Permeable Pavement—Vancouver

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<tr>
<td>4/18/17</td>
<td>Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98661</td>
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### PREREQUISITES AND CERTIFICATE

While not required, Module 2.1: Introduction to LID for Inspection and Maintenance Staff (Western Washington) is highly recommended for this course. Module 5.1 is required for the Long-Term LID Operations Certificate.

## 5.2. ADVANCED LID DESIGN: BIORETENTION
AUDIENCE
Washington designers, engineers, planners, landscape architects, and plan and permit reviewers

LEARNING OBJECTIVES
- Gain an advanced level of knowledge necessary to properly design and implement bioretention systems in complex residential and commercial settings (new and retrofit).
- Learn site assessment skills necessary for innovative residential and commercial site layouts for bioretention in more complex physical settings.
- Learn practical skills necessary for construction of bioretention systems.

COURSE DESCRIPTION
This is an advanced level course for engineers, planners, landscape architects, local jurisdiction staff, and allied disciplines that plan, design, review, and build bioretention systems. The course provides current design guidelines, construction details, and practical experience necessary to properly design and build bioretention systems. Flow control and water quality treatment performance will be discussed briefly as part of the design topics.

The advanced courses focus on the design aspects of LID and spend considerably less time on review than intermediate courses. Advanced trainings are hands-on and will include design exercises, discussion, and testing throughout the course. The field component will give participants the opportunity to critique actual projects and inform their own design details and construction sequencing approaches.

LENGTH OF TRAINING
One day (8 hours). Advanced design courses are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS

5.2. Advanced LID Design: Bioretention—Seattle

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<th>DATE</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>1/31/17</td>
<td>Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105</td>
<td>Hinman, Atchison</td>
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</table>

PREREQUISITES
There are prerequisites for this course. There are four options for fulfilling entrance requirements to Advanced Topics for LID Design.

<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
<th>Option 3</th>
<th>Option 4</th>
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</thead>
<tbody>
<tr>
<td>To fulfill the requirement for individual advanced courses, complete the intermediate level LID design course associated with this advanced training topic. For this course, Intermediate LID Design: Bioretention</td>
<td>To fulfill requirements for all advanced courses, attain the Certificate through the Statewide LID Training Program.²</td>
<td>To fulfill requirements for all advanced courses, attain the Washington State University (WSU) LID Technical Workshop Series Certificate.³</td>
<td>To fulfill requirements for all advanced courses, complete the University of Washington (UW) LID Certificate in Green Stormwater</td>
</tr>
</tbody>
</table>
Potential candidates for the advanced trainings that have not completed any of the above courses but have significant LID design experience can sign up on a waitlist. Waitlist candidates without the above prerequisites will be asked to respond to a set of pre-screening questions. This option for entry into the advanced courses is only available if the course is not full with participants meeting prerequisite options 1-4.

### 5.3. ADVANCED LID DESIGN: PERMEABLE PAVEMENT

**AUDIENCE**

Washington designers, engineers, planners, landscape architects, inspectors, and plan and permit reviewers

**LEARNING OBJECTIVES**

- Gain an advanced level knowledge necessary to properly design and implement permeable pavement systems in complex residential and commercial site development settings (new or redevelopment and retrofit).
- Learn site assessment skills necessary for innovative residential and commercial site layouts for permeable pavement in more complex physical settings.
- Learn practical skills necessary for construction of permeable pavement systems.

**COURSE DESCRIPTION**

This is an advanced level course for engineers, planners, landscape architects, local jurisdiction staff, and allied disciplines that plan, design, review, and build permeable pavement. The course provides current design guidelines, construction details, and practical experience necessary to properly design and build permeable pavement systems. Flow control and water quality treatment performance will be discussed briefly as part of the design topics.
The advanced courses focus on the design aspects of LID and spend considerably less time on review than intermediate courses. Advanced trainings are hands-on and will include design exercises, discussion, and testing throughout the course. The field component will give participants the opportunity to critique actual projects and inform their own design details and construction sequencing approaches.

**LENGTH OF TRAINING**

One day (8 hours). Advanced design courses are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

**COURSE OFFERINGS**

5.3. Advanced LID Design: Permeable Pavilion—Seattle

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<td>Gwilym, Webb</td>
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**PREREQUISITES**

There are prerequisites for this course. There are four options for fulfilling entrance requirements to the Advanced Topics for LID Design.

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<tr>
<td>To fulfill the requirement for individual advanced courses, complete the intermediate level LID design course associated with this advanced training topic. For this course, Intermediate LID Design: Permeable Pavement. Please note: Classes from the WSU LID Technical Workshop Series associated with specific advanced courses can also be used as prerequisites for entering the advanced courses.¹</td>
<td>To fulfill requirements for all advanced courses, attain the Certificate through the Statewide LID Training Program.²</td>
<td>To fulfill requirements for all advanced courses, attain the Washington State University (WSU) LID Technical Workshop Series Certificate.³</td>
<td>To fulfill requirements for all advanced courses, complete the University of Washington (UW) LID Certificate in Green Stormwater Infrastructure Design and Management.</td>
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¹ You must be in attendance throughout each of the above prerequisite courses and attendance recorded by signing in and signing out to qualify for the advanced training.

² See the policies for completing the Statewide LID Training Program Certificate on the Washington Stormwater Center website (http://www.wastormwatercenter.org/lidsrtrainingprogram/).

³ See WSU policies for completing the LID certificate on the Washington Stormwater Center website (http://cm.wsu.edu/ehome/index.php?eventid=85334&).

Potential candidates for the advanced trainings that have not completed any of the above courses but have significant LID design experience can sign up on a waitlist. Waitlist candidates without the above prerequisites will be asked to respond to a set of pre-screening questions. This option for entry into the advanced courses is only available if the course is not full with participants meeting prerequisite options 1-4.
5.4. ADVANCED LID DESIGN: SITE ASSESSMENT, PLANNING AND LAYOUT

AUDIENCE
Washington designers, engineers, planners, landscape architects, and plan and permit reviewers

LEARNING OBJECTIVES
- Gain an advanced understanding of overall site assessment with particular attention to identification and integrated analysis of site opportunities and constraints, soil suitability for infiltration, and criteria for roadway, lot, and open space layout within the LID context.
- Understand appropriate layout and siting for roadway, lot, building, infrastructure, and open space to protect site hydrology and create livable and attractive developments.
- Learn a variety of techniques to plan and layout sites to protect native soil and vegetation, incorporate stormwater management strategies, and minimize overall impacts during site development.

COURSE DESCRIPTION
This is an advanced-level course for engineers, architects, planners, landscape architects, local jurisdiction staff, developers, construction managers, and allied disciplines that plan, design, review, and build LID developments. The course provides current planning and design guidelines and design case studies demonstrating proper site assessment and layout within an LID context. The course will also emphasize soil and subsurface hydrologic analysis and innovative site layout at a level necessary to layout LID projects in complex physical settings. Participants will work on site plans to assess opportunities and constraints, overlay data sources, and develop conceptual site plans for projects that incorporate bioretention, permeable pavement, compost-amended soils, and vegetated roofs.

The advanced courses focus on the design aspects of LID and spend considerably less time on review than intermediate courses. Advanced trainings are hands-on and will include design exercises, discussion, and testing throughout the course. The field component will give participants the opportunity to critique actual projects and inform their own design details and construction sequencing approaches.

LENGTH OF TRAINING
One day (8 hours). Advanced design courses are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS

5.4. Advanced LID Design: Site Assessment, Planning and Layout—Seattle

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<td>Lathrop, Williams</td>
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PREREQUISITES

There are prerequisites for this course. There are four options for fulfilling entrance requirements to the Advanced Topics for LID Design.

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<tr>
<td>To fulfill the requirement for individual advanced courses, complete the intermediate level LID design course associated with this advanced training topic. For this course, Intermediate LID Design: Site Assessment, Planning and Layout. Please note: Classes from the WSU LID Technical Workshop Series associated with specific advanced courses can also be used as prerequisites for entering the advanced courses.¹</td>
<td>To fulfill requirements for all advanced courses, attain the Certificate through the Statewide LID Training Program²</td>
<td>To fulfill requirements for all advanced courses, attain the Washington State University (WSU) LID Technical Workshop Series Certificate.³</td>
<td>To fulfill requirements for all advanced courses, complete the University of Washington (UW) LID Certificate in Green Stormwater Infrastructure Design and Management.</td>
</tr>
</tbody>
</table>

¹ You must be in attendance throughout each of the above prerequisite courses and attendance recorded by signing in and signing out to qualify for the advanced training.

² See the policies for completing the Statewide LID Training Program Certificate on the Washington Stormwater Center website (http://www.wastormwatercenter.org/lidswtrainingprogram/).

³ See WSU policies for completing the LID certificate on the Washington Stormwater Center website (http://cm.wsu.edu/ehome/index.php?eventid=85348).

Potential candidates for the advanced trainings that have not completed any of the above courses but have significant LID design experience can sign up on a waitlist. Waitlist candidates without the above prerequisites will be asked to respond to a set of pre-screening questions. This option for entry into the advanced courses is only available if the course is not full with participants meeting prerequisite options 1-4.

5.6. ADVANCED LID DESIGN: HYDROLOGIC MODELING

AUDIENCE

Washington designers, engineers, planners, landscape architects, and plan and permit reviewers

WESTERN WASHINGTON LEARNING OBJECTIVES

- Gain an intermediate to advanced level of knowledge using WWHM and MGSFlood to predict pre- and post-development flow volumes and durations.
- Learn intermediate to advanced level skills to size bioretention, permeable pavement, and vegetated roofs in residential and commercial settings using WWHM and MGSFlood.
- Understand the advantages and limitations of WWHM and MGSFlood and be introduced to additional modeling tools for specific predictions.
COURSE DESCRIPTION

This is an advanced level course for engineers, planners, landscape architects, architects, local jurisdiction staff, and allied disciplines that produce and review modeling outputs for LID projects. The course provides current continuous simulation modeling tools and methods and practical experience necessary to predict flow volume and durations when designing LID facilities. The Western Washington course will use hands-on modeling exercises to explore the more advanced capabilities of WWHM and MGSFlood to better describe water movement through bioretention, routing water through connected facilities and other aspects of distributed LID systems. The Eastern Washington course will use hands-on modeling exercises to explore the more advanced capabilities of HydroCAD and StormSHED to better describe water movement through bioretention, routing water through connected facilities and other aspects of distributed LID systems.

The advanced courses focus on the design aspects of LID and spend considerably less time on review than intermediate courses. Advanced trainings are hands-on and will include design exercises, discussion, and testing throughout the course. The field component will give participants the opportunity to critique actual projects and inform their own design details and construction sequencing approaches.

LENGTH OF TRAINING

One day (8 hours). Advanced design courses are scheduled to immediately follow their intermediate counterparts. Interested students are encouraged to attend both the intermediate and advanced portions of design trainings.

COURSE OFFERINGS

5.6. Advanced LID Design: Hydrologic Modeling—Bothell

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>INSTRUCTOR</th>
<th>REGISTER AT</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/22/17</td>
<td>University of Washington – Bothell, 18115 Campus Way NE, Bothell, WA 98011</td>
<td>Matsumura, Dugopolski</td>
<td>CANCELLED</td>
</tr>
</tbody>
</table>

PREREQUISITES

There are prerequisites for this course. There are four options for fulfilling entrance requirements to the Advanced Topics for LID Design.
Potential candidates for the advanced trainings that have not completed any of the above courses but have significant LID design experience can sign up on a waitlist. Waitlist candidates without the above prerequisites will be asked to respond to a set of pre-screening questions. This option for entry into the advanced courses is only available if the course is not full with participants meeting prerequisite options 1-4.

6.2. ADVANCED LID DESIGN: BIORETENTION MEDIA AND COMPOST AMENDED SOILS

AUDIENCE
Western Washington designers, engineers, planners, landscape architects, and plan and permit reviewers

LEARNING OBJECTIVES
- Gain an advanced level understanding of the physical and chemical characteristics of bioretention media components and blends necessary to meet specific performance objectives.
- Understand the flow control and water quality treatment performance of current bioretention media specifications.
- Know the options for meeting BMP T5.13 and strategies for determining site soil conditions and developing a soil management plan.

COURSE DESCRIPTION
This is an advanced level course for engineers, landscape designers, architects, planners, landscape architects, local jurisdiction staff, bioretention media providers, and allied disciplines that plan, design, review, install, and
supply media for bioretention systems. The course provides the current state of knowledge on flow control and water quality treatment mechanisms and performance of bioretention media. The course will also review the guidelines for implementing Soil Quality and Depth (BMP T5.13), techniques for determining site soil conditions, and the process for developing soil management plans.

The advanced courses focus on the design aspects of LID and spend considerably less time on review than intermediate courses. Advanced trainings are hands-on and will include design exercises, discussion, and testing throughout the course. The field component will give participants the opportunity to critique actual projects and inform their own design details and construction sequencing approaches.

LENGTH OF TRAINING
One day (8 hours).

COURSE OFFERINGS

6.2. Advanced LID Design: Bioretention Media and Compost Amended Soils—Seattle

<table>
<thead>
<tr>
<th>DATE</th>
<th>LOCATION</th>
<th>INSTRUCTOR</th>
<th>REGISTER AT</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/4/17</td>
<td>Center for Urban Horticulture, 3501 NE 41st Street, Seattle, WA 98105</td>
<td>Hinman, McDonald</td>
<td>Eventbrite page</td>
</tr>
</tbody>
</table>

PREREQUISITES

There are prerequisites for this course. There are four options for fulfilling entrance requirements to the Advanced Topics for LID Design.

<table>
<thead>
<tr>
<th>Option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>To fulfill the requirement for individual advanced courses, complete the intermediate level LID design course associated with this advanced training topic. For this course, Intermediate LID Design: Bioretention. Please note: Classes from the WSU LID Technical Workshop Series associated with specific advanced courses can also be used as prerequisites for entering the advanced courses.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>To fulfill requirements for all advanced courses, attain the Certificate through the Statewide LID Training Program.</td>
</tr>
</tbody>
</table>

1 You must be in attendance throughout each of the above prerequisite courses and attendance recorded by signing in and signing out to qualify for the advanced training.

2 See the policies for completing the Statewide LID Training Program Certificate on the Washington Stormwater Center website (http://www.wastormwatercenter.org/lidswtrainingprogram/).

3 See WSU policies for completing the LID certificate on the Washington Stormwater Center website (http://cm.wsu.edu/ehome/index.php?eventid=85334&).

Potential candidates for the advanced trainings that have not completed any of the above courses but have significant LID design experience can sign up on a waitlist. Waitlist candidates without the above prerequisites
will be asked to respond to a set of pre-screening questions. This option for entry into the advanced courses is only available if the course is not full with participants meeting prerequisite options 1-4.
## Schedule of Courses

<table>
<thead>
<tr>
<th>DATE</th>
<th>MODULE AND COURSE</th>
<th>LOCATION</th>
<th>REGISTER</th>
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<tbody>
<tr>
<td>1/17/17</td>
<td>3.2 Intermediate LID Design: Bioretention</td>
<td>Vancouver</td>
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</tr>
<tr>
<td>1/18/17</td>
<td>3.4 Intermediate LID Design: Site Assessment, Planning, and Layout</td>
<td>Olympia</td>
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<tr>
<td>1/24/17</td>
<td>3.3 Intermediate LID Design: Permeable Pavement</td>
<td>Seattle</td>
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<tr>
<td>1/25/17</td>
<td>5.3 Advanced LID Design: Permeable Pavement</td>
<td>Seattle</td>
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<td>1/30/17</td>
<td>3.2 Intermediate LID Design: Bioretention</td>
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<tr>
<td>1/31/17</td>
<td>5.2 Advanced LID Design: Bioretention</td>
<td>Seattle</td>
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<tr>
<td>1/31/17</td>
<td>3.6 Intermediate LID Design: Hydrologic Modeling</td>
<td>Bellingham</td>
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<tr>
<td>2/1/17</td>
<td>3.3 Intermediate LID Design: Permeable Pavement</td>
<td>Vancouver</td>
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<tr>
<td>2/6/17</td>
<td>3.1 Intermediate LID Topics: NPDES Phase I and II Permit Requirements</td>
<td>Olympia</td>
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<tr>
<td>2/7/17</td>
<td>3.4 Intermediate LID Design: Site Assessment, Planning, and Layout</td>
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<td>2/8/17</td>
<td>5.4 Intermediate LID Design: Site Assessment, Planning and Layout</td>
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<td>2/10/17</td>
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<td>2/21/17</td>
<td>3.5 Intermediate LID Design: Rainwater Collection Systems and Green Roofs</td>
<td>Seattle</td>
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<td>2/28/17</td>
<td>3.1 Intermediate LID Topics: NPDES Phase I and II Permit Requirements</td>
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<td>3.6 Advanced LID Design: Hydrologic Modeling</td>
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<td>3/22/17</td>
<td>3.6 Advanced LID Design: Hydrologic Modeling (additional offering)</td>
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<td>3/23/17</td>
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<td>Olympic</td>
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<td>4/5/17</td>
<td>5.1 Advanced Long-term LID Operations: Permeable Pavement</td>
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<td>5.1 Advanced Long-term LID Operations: Permeable Pavement</td>
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| 4/20/17    | 3.6 Intermediate LID Design: Hydrologic Modeling                                 | Vancouver    | Click here
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<td>5.1</td>
<td>5.1 Advanced Long-term LID Operations: Permeable Pavement</td>
<td>Seattle</td>
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</table>
Meet Your Instructors

Dustin Atchison

CH2M Hill

Dustin Atchison is the US West Urban Water and Watershed Management Lead for CH2M and has 19 years of experience in consulting firms specializing in stormwater management in the State of Washington. Mr. Atchison is a recognized leader in the Puget Sound region for his expertise in the design of LID/Green Infrastructure, development of master plans, guidelines, and education for implementing LID and green infrastructure. He has served as an instructor in the University of Washington’s LID Certification Course. His recent projects include LID design for multi-disciplinary projects, green infrastructure program support, stormwater master planning, stream and wetland restoration design, and hydrologic and hydraulic modeling of green stormwater infrastructure.

Drena Donofrio

City of Seattle

Drena Donofrio, PE, is a senior engineer at Seattle Public Utilities (SPU), with over 10 years of extensive experience in managing Green Stormwater Infrastructure (GSI) and currently is SPU’s GSI O&M Asset Manager. Drena began her work by managing the development of the operations and maintenance program for the Seattle Public Utilities GSI program, which was initially outlined by the University of Washington. Drena also teaches maintenance of LID/GSI bioretention facilities both locally and nationally, sharing BMPs with other municipalities. Her work includes GSI operations and maintenance, maintenance cost and resourcing, inspector and crew training and education, design and plan review for street improvement and capital projects, code review, GSI planning and growth, GIS development, and asset and risk management.

Rebecca Dugopolski

Herrera Environmental Consultants, Inc.

Rebecca Dugopolski, PE, is a senior engineer with Herrera Environmental Consultants in Seattle, Washington with over ten years of experience in stormwater monitoring, design, and NPDES permit compliance. She received her Bachelor’s degree in Environmental Engineering from Michigan Technological University and her Master’s degree in Civil and Environmental Engineering from the University of Washington. Ms. Dugopolski recently worked with the City of Seattle to update their stormwater manual, worked with several Phase II permittees on updating their municipal code and design standards to incorporate LID, and assisted several jurisdictions with stormwater retrofit projects and implementation tools to facilitate the application of LID principles and LID BMPs.

Meghan Feller

Herrera Environmental Consultants, Inc.

Meghan Feller is a civil engineer specializing in green stormwater infrastructure (GSI) planning, design, and performance evaluation. Meghan has focused on the performance of innovative drainage practices including bioretention, permeable pavement, green roofs, infiltration trenches, and constructed wetlands. For the last six years, she has been applying her GSI expertise to a broad range of projects in the Pacific Northwest aimed at controlling
combined sewer overflows, minimizing flooding, providing creek protection, and improving water quality. Meghan currently serves as a guest lecturer in hydrology at the University of Washington in the College of Built Environments.

Kate Forester

Herrera Environmental Consultants, Inc.

Kate is an environmental designer with Herrera Environmental Consultants in Portland, Oregon who specializes in the design of vegetated stormwater facilities. Kate received her Bachelor of Science degree in Environmental Studies from the University of Oregon and her Master's degree in Landscape Architecture from the University of Minnesota. She has written design guidance for the Lake Oswego stormwater manual and the Western Washington LID O&M Guidance Document and has an extensive background in vegetated facility maintenance.

Kathryn Gwilym

MIG | SvR

Kathryn is a senior civil engineer with over 20 years of experience in engineering design, project management, and construction administration. She brings expertise in complete street design, low impact development, storm drainage, permeable pavements, and utility and site development for both public and private projects. Kathryn has worked on several complex, housing developments and multi-phase public infrastructure developments and retrofits from planning through construction and maintenance. She is a leader in the world of innovative stormwater design for permeable pavements and natural drainage systems. She has also been a guest lecturer on permeable pavements and green stormwater infrastructure at multiple technical workshops and several national webinars, a contributing author to ASCE’s “Permeable Pavement” guide, and on the task force to develop special provisions for WSDOT specifications for permeable pavements.

Curtis Hinman

Herrera Environmental Consultants, Inc.

Curtis Hinman is Senior Scientist with Herrera Environmental Consultants in Seattle, Washington. Mr. Hinman manages and provides technical guidance on a diverse portfolio of projects including bioretention media research, LID design, and statewide LID training programs. Before joining Herrera, Curtis was faculty with Washington State University (WSU) Extension and the Department of Biological Systems Engineering and was the University’s Green Stormwater Infrastructure Specialist. With WSU, he co-designed and was lead scientist for the WSU Low Impact Development Research Program which is one of the largest LID research facilities in the U.S. Mr. Hinman is the author of the “Low Impact Development Technical Guidance Manual for Puget Sound” and the “Rain Garden Handbook for Western Washington.” Mr. Hinman also serves on national and regional advisory committees that develop stormwater management policy and technical guidelines and identify funding and research needs.

George Iftner

Herrera Environmental Consultants, Inc.

Mr. Iftner is a senior scientist and CPESC with Herrera Environmental Consultants in Seattle, WA, focused on stormwater management and permit compliance, and contaminated site investigations and remediation. George works closely with municipal, industrial, and public agency clients to ensure compliance with their NPDES Phase I and II Municipal Stormwater Permits, as well as Industrial Stormwater, and Construction Stormwater General Permits. He
is currently working on the Redmond Paired Watershed Study, and supports Sound Transit Sounder Commuter Rail Projects via weekly site inspections and consultation on issues related to TESC and BMPs, wetlands, and hazardous materials management.

Scott Kindred

Scott Kindred specializes in the design and implementation of stormwater infiltration as part of LID. With expertise in hydrogeology, contaminant fate and transport, geotechnical engineering, and civil stormwater design, Scott provides a unique multidisciplinary perspective in addressing the range of issues associated with stormwater infiltration and has developed innovative infiltration approaches to address challenging sites with relatively impermeable surface soils. He is also an expert in how water migrates through biofiltration soils, filter materials, and drainage rock and is able to quickly assess and identify potential shortcomings in GSI designs.

Jason King

Jason King is a Landscape Architect and LEED accredited professional with Mithun. Throughout his 18 years of experience, he has worked on a number of innovative green stormwater projects with a focus on low-impact development techniques including green roofs, living walls, bioretention planters, green streets, permeable paving, and wetlands. He has designed over 40 rooftop projects, ranging from 200 s.f. to over 30,000 s.f., and his portfolio includes both new construction and retrofits throughout the Pacific Northwest and California. King regularly lectures and gives workshops on green design strategies for landscape architecture, including ecological design techniques and specific vegetated roof design, installation and maintenance techniques.

Alice Lancaster

Alice Lancaster is a civil engineer at Herrera with 18 years of experience offering specialized expertise in innovative stormwater management. She has worked with western Washington jurisdictions to develop LID policy, design guidance documents and engineering standards, and prepare GSI designs for both new and retrofit applications. Her expertise in the modeling and design of GSI facilities resulted in her selection by the Department of Ecology to sit on the LID Technical Advisory Committee to develop western Washington’s LID requirements and support the recent update to the “LID Technical Guidance Manual for Puget Sound.” Since 2008, Alice has provided LID instruction for Puget Sound professionals on siting, modeling, design, and construction of bioretention systems.

Jennifer Lathrop

Jennifer Lathrop, SvR Design Company, is a landscape architect and wetland specialist with over 27 years of experience working on a variety of site development, road, infrastructure, and housing projects. Her landscape design work includes grading, erosion control, plant selection, tree and vegetation protection, roadside bioretention swale siting with new and existing infrastructure, irrigation, maintenance, and restoration. Jennifer’s work emphasizes the use of native plants, preservation of mature trees, and minimization of impacts on sensitive areas through green infrastructure and the thoughtful siting of buildings and site amenities. Jennifer has worked closely on interdisciplinary teams integrating green stormwater infrastructure and LID practices both within the street right-of-
way and on parcel developments ranging from commercial to residential and has overseen numerous projects from planning, design, construction, and operations and maintenance.

**Matt Miller**

**Associated Earth Sciences, Inc.**

As a Licensed Geotechnical Engineer in the State of Washington and a Principal Engineer at Associated Earth Sciences, Inc. (AESI) Mr. Miller has over 28 years of practice in the Puget Sound area. He has been involved in LID projects that include large-scale applications of pervious pavements including one of the largest in the state at the time of construction. Mr. Miller has also participated in the design of numerous bio-filtration and infiltration projects for both municipal and private clients. He has been on the instructing crew for the WSU LID class series since its beginning, on the technical committee for the LID Manual, and on the advisory board for a Low impact Development Continuing Education class at the UW.

**Chris Webb**

**Herrera Environmental Consultants, Inc.**

Chris Webb is a licensed civil engineer in the States of Washington and Oregon and a 2011 LEED™ Fellow with over 14 years of experience with the design of LID practices. Some of Chris’ notable projects include the first pervious concrete driving surface in the public right-of-way in the state of Washington, the first permitted sole-source potable rainwater harvesting system in King and Skagit Counties, and the first bioretention cell in the public right-of-way in Bellingham. Chris has presented LID at numerous workshops and trainings since 1999.

**Jesse Williams**

**CH2M Hill**

Mr. Williams is a water resources engineer with CH2M HILL’s Water Business Group in Seattle, Washington. He has more than 12 years of civil engineering experience that includes design of green stormwater infrastructure, stormwater conveyance, stormwater flow control and treatment facilities, underground utilities, roads, zero lot line building sites, and remote communication sites.

In addition to design, permitting, and project management, Jesse has performed construction monitoring of road, utility, park, and national cemetery projects. He has also prepared specifications, cost estimates, bid packages, master plan reports, utility studies, environmental checklists, and land use applications.

Jesse is passionate about sustainable design. As a life-long learner, he strives to understand the natural processes and science behind low impact development. He believes that a multidisciplinary, cooperative, and comprehensive approach is imperative for sustainable design and enjoys collaborating with other team members to create sustainable solutions that cross the boundaries of various design disciplines. Jesse uses his practical mentality and field experience to take sustainable solutions from concepts to constructible, biddable designs.

**David McDonald**

**Seattle Public Utilities**

David McDonald is a biologist and environmental scientist with Seattle Public Utilities, focusing on soil science and environmentally friendly landscape design and development practices. He works with the public and professionals on best practices. He leads the “Soils for Salmon” initiative, which is transforming development practices around the
Northwest, and serves on the technical committees of the national Sustainable Sites Initiative, Washington’s LID training program, and the ecoPRO Sustainable Landscape Professional certification program.