



The Pennsylvania Housing Research Center

Land Development Project Plan July 2012 – June 2013

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Preface

Each year, the Pennsylvania Housing Research Center (PHRC) seeks to identify and prioritize a series of projects that collectively satisfy the following criteria. Projects should:

- meet the residential construction and land development industry needs and the needs of the housing consumer in Pennsylvania;
- be consistent with the mission and goals of the PHRC;
- be affordable and feasible, given the resources available and the prevailing constraints on time, expertise, and facilities; and
- be a balanced program of projects that address both the long- and the short-term needs of all sections of the industry.

This PHRC Land Development Project Plan is the result of input and assistance from the Industry Advisory Council (IAC) Land Development Subcommittee. This Subcommittee consists of builders, developers, engineers, planners, local government, conservation districts, and the Pennsylvania DEP. On March, 22, 2012 the IAC Land Development Subcommittee met to identify and discuss over 13 potential projects for the PHRC to pursue. After a thorough discourse, the members of the Subcommittee voted on projects they felt were the highest priority for the industry.

This voting resulted in a prioritization of projects. The high-priority projects are included in this plan.

The list of projects that follows identifies only those projects that are to receive funds provided to the PHRC by the Commonwealth of Pennsylvania. In most cases, we have attempted to use state funding to leverage outside support; in other cases the work is considered important enough to warrant full state support. It should also be recognized that the PHRC undertakes a wide array of additional projects that do not receive any of these funds and are therefore not listed in this plan.

Please note that with the collection of monies under Act 157 of 2006, there is not an accurate estimate of the exact amounts of funding available during the project period. Because of the lack of knowledge of future funding, this plan only considers funds on hand. Any remaining funds will be carried over for future projects. We plan to continue with our previous initiatives in the areas of training and education, modular housing, manufactured housing, and applied research.

We plan projects and allocate funds at the start of each year. However, there is a real need for the PHRC to be able to take on special projects during the year. These projects typically fall into two categories: the first includes short term and limited scope projects that are time sensitive, while the second requires the ability to allocate some funds to leverage additional outside funds in response to requests for proposals.

Part 1 - Training, Technical Assistance, & Outreach

The PHRC has a mandate to transfer knowledge by providing the necessary training and education to the wide variety of groups that make up the housing industry. The projects that are described below are in response to the recommendations from the PHRC's Industry Advisory Council Land Development Subcommittee and reflect the current needs within the land development industry.

A. Web-Based Training

Description: There is a need for technical programs with a lower-cost delivery mechanism than a formal classroom setting. This initiative will develop interactive web-based training that can be available both live and archived for future viewing.

The following are the web-based training to be developed and delivered during this fiscal year:

1. Developing MS4 TMDL Strategy Plans - A program for an audience of municipalities, and their consultants that fall in the MS4 (Municipal Separate Storm Sewer System) program on how to develop a TMDL Strategy Plan. A TMDL Strategy Plan is now required for the current version of the MS4 permit (PAG-13) for all MS4s that discharge to a water body that has an approved TDML. Approximately 415 municipalities must develop a TMDL (Total Maximum Daily Load) plan for the next MS4 permit cycle.
2. Summary of the WERF BMP Database for PA - A program for stormwater design professionals based on the findings of the project completed as part of the 2011-2012 project
3. Subdivision and Land Development Guidelines for Pennsylvania - As booklets of the Guidelines are completed webinars will be presented on each topic.

There are several regulatory changes that are expected to occur in the coming fiscal year. The following web-based training programs could be developed to quickly educate land development professionals about the updates:

- EPA National Stormwater Rule
- Pennsylvania Sewage Facilities Act (Act 537) program
- Chapter 73: Standards for Onlot Sewage Treatment Facilities
- Chesapeake Bay TMDL
- Drinking Well Standards
- Formation of Stormwater Authorities

It should be noted that the programs are subject to change and additional programs may be added to address industry demands.

Manager/PI: Blansett

Deliverable: Interactive web-based training programs that will be delivered and then archived on the PHRC website for future viewing.

B. Technology Transfer & Outreach

Description: Continuation or expansion of activities to get information and publications to builders, developers, design professionals, and others involved in the land development industry.

Manager/PI: Turns, Blansett

Deliverables: The PHRC will work with the PBA, PSPE, ASCE, and other industry and trade organizations by means of the following activities:

1. Annual Pennsylvania Housing and Land Development Conference

For 20 years this conference has been the premier technical conference for housing and land development issues in Pennsylvania. This two-day conference provides the latest information on emerging technologies and how to resolve problems facing the housing industry. The conference is intended for all sections of the housing industry including builders, remodelers, code officials, educators, design professionals and modular and HUD-code builders. The Land Development day of the conference serves as an annual forum that addresses emerging planning, design, and regulatory issues affecting the land development industry in Pennsylvania. This day is intended for anyone involved in land development activities including builders, developers, design professionals, planners, local government, and regulatory officials.

2. Speaker Service

The PHRC will hold and/or participate in talks and seminars directed at the land development industry. This may include trade and professional association functions and regional meetings, local association meetings, or state or national conferences.

3. General Outreach Activities

This includes activities to let builders, developers and design professionals know about the PHRC and the services and publications it provides. These activities may include the PHRC newsletters, mailings, promotional pamphlets, advertisements or articles in trade journals, phone calls, and the PHRC's Web site. This also involves attending relevant Pennsylvania Department of Environmental Protection (DEP) meetings (Water Resources Advisory Council, Sewage Advisory Council); participating in technical committees such as the Pennsylvania Stormwater Technical Workgroup and Chesapeake Bay TMDL Urban Stormwater Workgroup; and serving as a technical resource to legislative committees as needed

- a. **Pennsylvania Stormwater Technical Workgroup.** As part of outreach activities, Dr. Blansett will continue to serve on the Executive Board of the Pennsylvania Stormwater Technical Workgroup (PaSTW). She serves as the chair of the Low Impact Development Committee (Chapter 5) and as a member

of the Land Development Process Committee (Chapter 4). PaSTW is working to revise the DEP PA Stormwater BMP Manual. Updated chapters of this manual will be delivered to the DEP throughout the coming year.

Part 2 - Applied Projects

The applied projects deal with topics of practical and relatively immediate needs of the land development industry.

A. Subdivision and Land Development Guidelines for Pennsylvania

Description: The Pennsylvania Standards for Residential Site Design were finalized in April 2007. This set of consensus standards allows for up-to-date design innovations, and provides the flexibility needed for sustainable land development. Since the document was released it has not been as widely accepted by municipalities as was hoped. During the 2011-2012 fiscal year, the PHRC undertook a project entitled “An Update and Revamp of the Pennsylvania Standards for Residential Site Design.” This initiative solicited local government input on the Standards utilizing PSATS committees along with other local government resources. It was expected that an addendum to the Standards would be issued to address updates in reference materials and provide additional design options.

Through the input process it was determined that an addendum would not be sufficient to address the problems preventing the document from being readily used. A larger project to restructure and update the document will be completed for the 2012-2013 fiscal year. The document will be renamed the “Subdivision and Land Development Guidelines for Pennsylvania” and the chapters will be broken into individual booklets. Updated policy, regulations, and guidance will be incorporated. Typographical and formatting errors will be corrected. The Site Design Considerations Chapter (Ch 1) will be completely rewritten to better address the needs of design professionals and the input from planners. The Stormwater Conveyance and Management Facilities (Ch 5) and Streets (Ch 2) booklets will also receive more intensive revisions of content due to updated regulations and references. Appropriate regulatory organizations will be consulted to ensure that the revised document meets their requirements.

Manager/PI: Blansett

Deliverable: This project will result in a new series of booklets, Subdivision and Land Development Guidelines for Pennsylvania. The booklets will be available in PDF format on the PHRC website. Webinars will be developed as each booklet is completed and presentations will be made to land development design professionals, and local government groups. These efforts will be coordinated with PSATS, local chapters of the American Society of Civil Engineers and the American Planning Association, PBA’s Developers Council, and other professional associations. The Guidelines will be presented at the 2012 Pennsylvania Society of Professional Engineers Conference September 13-15, 2012 in Warrendale, Pa.

Part 3 - Applied Research

A very important function of the PHRC is to undertake or stimulate research and development on materials, products, procedures, etc. These efforts may have a longer-term and/or a more fundamental focus than other projects. Applied research projects foster partnerships and draw on the expertise and strengths of the persons, groups and facilities available at the Pennsylvania State University.

A. Stormwater BMP effectiveness in real residential developments

Description: This project involves the installation of flow monitoring and water sample collection equipment in residential developments to collect long-term data on the characteristics of stormwater runoff from these sites and the effectiveness of Best Management Practices (BMPs) in a typical residential development. Nitrogen (N), phosphorus (P) and sediment (TSS) are the water quality parameters of interest for this study. N, P, and TSS must be considered in the design of stormwater BMPs and water quality controls for NPDES permits. These parameters are also the targets of the EPA TMDL (Total Maximum Daily Load), or pollutant diet, for the Chesapeake Bay. Flow data along with the constituent concentrations can be used to determine the total load (g) and event mean concentration (EMC, mg/L), or a flow weighted average, which is a parameter commonly used to model water quality. Data will be collected from different types of events (for example, spring rains versus summer thunderstorms versus winter rain on snow) over several years.

This is a multi-year project that involves the selection of an appropriate site, installation of equipment, continued maintenance of equipment, and the collection of both flow and water quality data during multiple precipitation events over several years. This entire project cannot be completed during the 2012-2013 project year, but will continue into the next several years. The duration of the project is dependent on annual climate conditions and the continued interest and funding in the research.

The long-term goals of this project are to:

- Define the pollutant load from residential developments,
- Define the effectiveness of different BMPs and treatment trains (BMPs in series), and
- Compare development to undeveloped areas and the modeling assumption of considering 20% of existing area to be meadow in good condition.

Over time as the project expands different types of development can be compared.

Manager/PI: Blansett

Deliverables

Short-term: During the 2012-2013 project year, the planning of the project will take place and the infrastructure for data collection will be determined. The project site will be selected, equipment purchased and installed, and preliminary data will be collected to test the experimental set up.

Long-term: In later phases of the project, flow and water quality data will be collected and analyzed from multiple events throughout different seasons. The effectiveness of the stormwater BMPs instrumented will be evaluated based on the influent and effluent pollutant concentrations. These data will be submitted to the WERF BMP database. The median event mean concentration (EMC) for the land use category of residential housing will be calculated and compared to typical reference values.

The long-term outcomes of this project would include peer-reviewed journal publications and technical conference presentations of the study findings and a public summary report of the data. Webinars and other presentations can be developed to disseminate the findings.

Optional long-term data collection: While field data is being collected at development sites, some other information could be collected from the same sites to expand the impact of this study. These additional projects could include:

a. Long-term operation and maintenance issues for stormwater BMPs

This part of the project would include a literature review of existing data sources on long-term operation and maintenance (O&M) needs of stormwater BMPs. While flow & water quality data are being collected at different developments, site inspections will be conducted to determine the type and frequency of maintenance needed. The literature material will be combined with site observations to develop recommendations that can be used address O&M needs of new and existing stormwater BMPs.

b. Homeowner acceptance of on-lot stormwater BMPs

Stormwater regulations are pushing more BMPs to be located on individual properties rather than a single basin for a whole development. At the development sites where BMPs are being monitored, homeowners can be periodically surveyed to find out information such as what they know about their on-lot BMP, how they feel about them, have they been provided with maintenance information and what are they doing to maintain the BMP. This information can be used to provide information about the long-term operations and maintenance of BMPs and the likeliness of them being maintained by homeowners. The data collected could lead to the development of homeowner training programs and provide local governments and the Pennsylvania DEP information about the effectiveness of regulations putting responsibility of stormwater management on to the homeowner.

Part 4 - Academic Responsibilities

As part of the responsibilities of the Land Use and Development Specialist position, Dr. Blansett will teach C E 410W: Sustainable Residential Subdivision Design for the Department of Civil and Environmental Engineering. While this activity does not use state funds, it is included here because it involves a significant time commitment. C E 410W is a writing-intensive, senior design course (or capstone design course) in which the students start with a vacant piece of property and complete a full land development project with a final project including plan set, supporting calculations and a narrative report. The students use local Zoning and Subdivision and Land Development Ordinances along with state-level regulations from the PA Department of Environmental Protection and PA Code to determine development and design requirements or options. Conservation design, cluster development, and green design principals are emphasized. The students must design lot layout, roads, grading and drainage, and water, sanitary and stormwater systems; draft their designs in AutoDesk Civil 3D; and model pre- and post-development stormwater runoff using Hydraflow.

Part 5 - Contingency Project

The PHRC may take on project ideas that were prioritized by the IAC, but lacked sufficient time for development or in-house expertise at the time this plan was issued. Below are several projects that may be undertaken contingent upon available time or outside expertise.

- BMP Installation for Contractors – a training program or webinar to identify key regulatory updates that have changed the relationship between the designer and the contractor.
- Soil Considerations for Stormwater BMPs – a webinar outlining the key considerations of soils in the design of stormwater BMPs. This program would be presented by a soils scientist as a guest presenter.
- NAHB Green Land Development – a webinar for builder/developers on the Land Development components of the NAHB National Green Building Standards (NGBS). This program would have a guest presenter from the NAHB Research Center.