

MANAGING FLOODING, POLLUTION, & EROSION: EVALUATING STORMWATER SOLUTIONS IN OHIO

Stormwater Collaborative Group Project Update April 2013

Since January, the project team and partners have made great progress on design of stormwater BMPs and monitoring equipment has been installed at the Perkins Township site. As site designs neared completion, plans were made available for Collaborative Learning Group (CLG) members to review. Thanks to all who provided feedback on the designs at meetings or via email. Details regarding progress on our site-based work, stormwater modeling, and more are below.

Design and Monitoring of Local Stormwater BMPs

- Perkins Site** — Flow monitoring equipment was installed by North Carolina State University on April 2nd. Ohio Concrete has inspected potential raveling in some areas of the pervious concrete, particularly where the concrete abuts the curb and in other areas where space was limiting while pouring. Perkins Township will pressure wash the installation and repeat the inspection to determine if any sections need to be replaced.
- Old Woman Creek Site** — A design review meeting with CLG and Erie Materials participation was held on February 11. The

group discussed removing the surface course to reduce costs but it was retained due to concerns with durability and intended use as bus parking. The final plan specifies 3" base & 1" surface courses and the PG 76-22 asphalt binder. The catch basin depth was increased by one foot to address concerns with potential frost heaving. As a result of this discussion, a note to grout pipes through catch basin walls to reduce the risk of unmonitored flows was added to the catch basin detail. Pipes within the catch basin will be offset and labeled in the plan to prevent tailwater effects. NCSU will also install a small trench drain along the edge of the existing asphalt for water quality sampling. The project will be bid this spring and constructed this summer.

- Willoughby Hills Site** — A design review meeting with CLG participation was held on March 19. The plans discussed at that meeting had more of the pavers at the northern end of the parking lot and slightly less at the south end than the plans presented at the previous design meeting. The site is sloped, and the plans called for having some of the paver subgrade sloped as well. At the last design review meeting, we discussed increasing the portion of the subgrade that is flat to increase the infiltrative surface. We also talked about water quality



Monitoring installation at Perkins Township facility

monitoring options by capturing water from a catch basin located in the existing asphalt parking area to compare inlet and outlet concentrations.

- Orange Village Site** — A design review meeting with CLG participation was held on March 14. The bioretention cell is larger than what would be required to treat the water quality volume for aesthetic purposes. We discussed the slight slope in the paver subgrade and the concern that this would result in water ponding at the downslope end of the practice but not the whole practice. One suggestion was to consider sloping the pavement nearest the buildings but flattening out the grade over the rest of the site to increase the infiltrative surface.
- Pepper Pike Site** — At a 60% design-review meeting on February 11, CLG members and the project team suggested adding a sump to the design to promote water storage and infiltration. The design engineer had structural concerns about allowing water to pond beneath pavers. Examples were provided of successful paver installations with sumps. Influent water quality monitoring would be very difficult on this site.

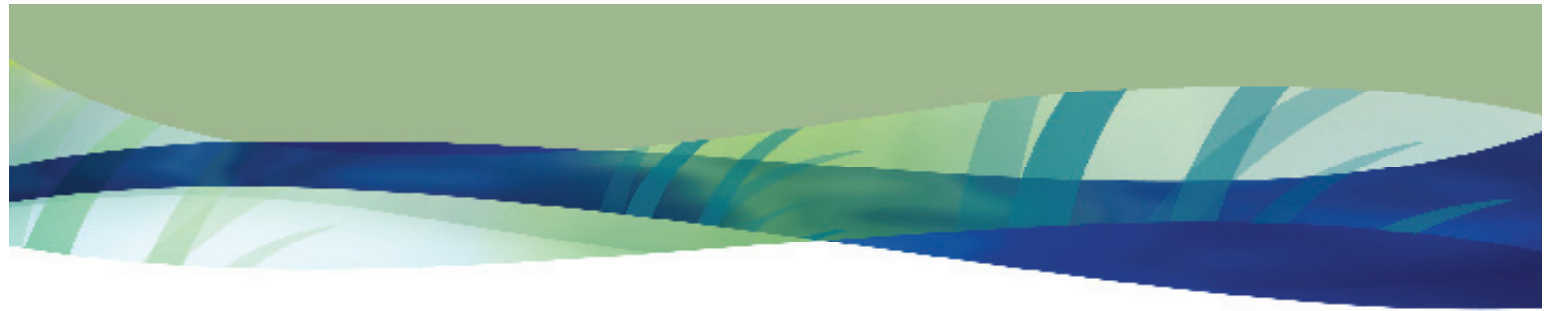
To download site plans and documentation of the design process visit:
ftp://ftp.dnr.state.oh.us/Soil_%26_Water_Conservation/public/NERR_SC/

For more info on this project, please contact Amy Brennan at abrennan@crwp.org or (440) 975-3870 or Heather Elmer heather.elmer@dnr.state.oh.us or (419) 433-4601

Monitoring Sites

BMP Type	Project Location	Status
Pervious Concrete and Swale	Perkins Township Facility	Equipment installed, data collection in process
Pervious Pavers & Bioretention	Orange Village Service Facility	CLG design review complete, construction planned for summer 2013
Pervious Pavers	Willoughby Hills Community Center	CLG design review complete, construction planned for summer 2013
Porous Asphalt	Old Woman Creek NERR	Design complete, construction planned for summer 2013
Pervious Pavers	Pepper Pike City Hall	CLG design review complete, expect to go out to bid April 2013





Other Monitoring Updates

Winter Monitoring - North Carolina State University (NCSU) explored equipment for winter monitoring with a few vendors. NCSU talked with both Hobo (the company that makes the non-telemetered water level loggers, the telemetry stations, and the weather stations) and KPSI (the company that sells the telemetered water level loggers). KPSI assured NCSU that their loggers are extremely durable in very cold weather, noting that they currently have units deployed in northern Norway. They are rated to -4°F, but KPSI has had experience with them working at even lower temperatures. The hobo water level loggers are only rated to 32°F. However, the locations in which we plan to use them (i.e. in wells 2-3 ft below ground surface in bioretention cells or under permeable pavement) will be warmer than air temperature. Also, the wells can be designed to pond 8-10 inches of water at all times to keep the approximately 6" long sensors insulated.



Weather station installation at Perkins

Water Quality Monitoring – Discussions are still underway with potential partners for water quality monitoring, but the project team is proposing assessing water quality at the Old Woman Creek NERR (porous asphalt installation) and Willoughby Hills Community Center (pervious paver installation). These sites were selected because of proximity of available staff to collect samples. Samples would be collected by Old Woman Creek NERR and Chagrin River Watershed Partners staff and potentially processed in Old Woman Creek NERR and NEORS laboratory. To facilitate monitoring of untreated and treated stormwater flows, design modifications have been considered at both sites. Sampling constituents

under consideration include conductivity, total kjeldahl nitrogen, nitrate + nitrite, total phosphorus, orthophosphate, metals, and hydrocarbons. The team is proposing to sample 2 storms per month through December 2014.

Modeling

CRWP has contracted with Cardno JF New to develop unit/base SWMM models and complete sensitivity analysis for hydrologic characterization of 9 stormwater BMPs including bioretention, pervious pavement, grassed swales, dry detention/retention basins, infiltration trenches, vegetated/grassed filter strips, soil renovation, green roof, and underground detention/retention. The consultant will also develop preliminary site-scale SWMM models for quantification, evaluation, and comparison of stormwater

BMPs for runoff volume reduction, water quality volume treatment, peak discharge control, and flow duration. More information on monitoring will be presented at the April CLG meeting.

Dates to Remember

Please mark your calendars for collaborative learning group meetings and site visits

- April 24, 2013 at the Perkins Township Service Complex and Sandusky Fire Station
- July 17, 2013 9am-3pm, location TBD
- September 18, 2013 9am-3pm, location TBD

Training and Outreach

The project is offering a 6 month unpaid internship for a graduate student to complete practicum requirements for the University of New Hampshire's TIDES Program (Training for the Integration of Decisions and Ecosystem Science). TIDES student Will Brown will join the team in June and will provide a variety of project-related support include development of case studies and assisting with management of our monitoring sites.

About this project

This project is developing science-based tools that promote the use of practices that minimize the impact of stormwater on Ohio's coastal communities and Lake Erie. Stormwater professionals are collaborating with the project team to generate credible and locally verified performance information about innovative stormwater systems. Based on these results, the team will develop credits and incentives to encourage the use of the most effective systems.

More information

- For meeting notes, progress reports, presentations and more visit the project website.

For more info on this project, please contact Amy Brennan at abrennan@crwp.org or (440) 975-3870 or Heather Elmer heather.elmer@dnr.state.oh.us or (419) 433-4601



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NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM SCIENCE COLLABORATIVE

