IGIG1702 – Midlothian Village Greenway Project

July 15, 2019

The Antero Group

IGIG1702
MIDLOTHIAN VILLAGE GREENWAY PROJECT

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Executed and Signed IGIG UGA 1702

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Introduction

Funding for this report provided in part, by the Governor of Illinois and the Illinois Environmental Protection Agency through the Illinois Green Infrastructure Grant. The findings and recommendations contained herein are not necessarily those of the funding agencies.

This Project Evaluation Report (Report) is in support of the Financial Assistance Agreement (FAA), Agreement Number IGIG1702 – Midlothian Village Greenway Project (Project). The Village of Midlothian (Village) secured funding from the Illinois Environmental Protection Agency (Illinois EPA) through their Illinois Green Infrastructure Grant (IGIG) program on October 31, 2015. An Amendment No. 1 to the grant agreement was executed on June 13, 2018 to extend the duration of the agreement. The purpose of this Report is to detail the planning, design, and construction of this project. Enclosed is the **Executed and Signed IGIG UGA 1702.**

Prior to this Project, the Village of Midlothian had already taken strides in implementing green infrastructure through partnerships with the Metropolitan Water Reclamation District (MWRD), Chicago Metropolitan Agency for Planning (CMAP), and Center for Neighborhood Technology (CNT). The goal of this project's partnership with the Illinois EPA is to reduce runoff to Midlothian Creek, reduce flooding, improve water quality in the area, and increase community awareness of the benefits of green infrastructure. Midlothian Creek is also a tributary to the Little Calumet River.

This Report is divided into the following sections:

- Site Selection
- Existing Conditions
- Best Management Practice Design
- Best Management Practice Analysis
- Project Costs
- Project Evaluation

There are four primary strategies outlined within the grant application and the subsequent project agreement for this project. A more detailed description of each is included below, but each merits some introductory description, herein. The selected stormwater Best Management Practice

(BMP) strategies for this grant were permeable pavement, rain gardens, native plantings, and community education. A brief description and installed size of each BMP is below:

- **Permeable Pavement; 6,725 square feet** – Stormwater can enter through the surface of the pavement into an aggregate reservoir rather than entering a waterway or sewer system.
- **Rain Gardens; 7,200 square feet** – Rain Gardens act similarly to stormwater detention basins but rather than discharging to a waterway or sewer system, rain gardens allow for stormwater to infiltrate into the natural soils.
- **Native Plantings; 13,885 square feet** – Native Plantings slow runoff and allows water to infiltrate into the soil. Plantings help remove pollutants and sediment, while also providing much needed urban habitat for wildlife.
- **Community Education, 2 signs** – Outreach provided to the community to understand the benefits of green infrastructure.

This report outlines the overall process, development, and results to-date of the Project. The Illinois EPA is to be commended of its assistance in helping to address this complex set of circumstances. The Village of Midlothian recognizes that without the help of the Illinois EPA, MWRD, CNT, and its residents, this project may not have happened. While no single solution will solve the stormwater management issues within this community, the additions funded with this generous grant will most certainly help.

Site Selection

The area south of the Village Hall was specifically targeted as part of this Project due to the prevalence of invasive species, its proximity to Midlothian Creek, and the heavily traveled Pulaski Road. This Site provided a unique opportunity to convert a former building site to a public open space that highlights the benefits of green infrastructure. A more detailed analysis of reason for the site selection is list below:

1) Invasive Species – The southern triangle of the project is home to many invasive species such as Red Mulberry, Glossy Buckthorn, and Phragmites. These species have contributed to the lack of biodiversity through the Midlothian Creek corridor.

2) Uncontrolled Runoff – The project area has no low-lying areas and stormwater runoff flow unrestricted to an inlet that discharges directly to Midlothian Creek.

3) Economic Benefit – Being located along Pulaski Road, the Site is seen by thousands of commuters daily. If this Site would be enhanced and seen as a community space, it may attract businesses to the currently vacant storefronts across the street.

The next section describes the specific locations and existing conditions of each BMP.

Existing Conditions

This section will describe the existing conditions at each of the BMP sites. It will provide context to why each of these locations was selected. Enclosed in this submittal are **Existing Conditions Photos.**

Permeable Pavement

The location of the permeable pavement is currently a hard-compacted gravel parking lot with no formal parking stalls delineated. Stormwater quickly runs off to the pavement to the east and north and drains to an inlet which discharges directly to Midlothian Creek. Pollutants associated with parking lots such as oil, grease, and sediment are sent to Midlothian Creek with no water quality measures taken.

Rain Garden

The location of the main rain garden is a combination of gravel, broken concrete, and invasive species. This was the location of a building that was demolished eight years ago. Stormwater runoff from the south passes through this area, onto the gravel parking lot, and then to Midlothian Creek.

Native Plantings

The remainder of the project area is proposed to be native plantings. This area currently consists of invasive species and no low-lying areas. Stormwater runoff enters Midlothian Creek either from sheet flow or once it travels over the gravel area.

BMP Design

This section details the design and construction of each of the stormwater BMP's selected for the project. Enclosed is the **IGIG UGA 1702 #1 Approved Design Specifications** for additional reference as well as the **IGIG UGA 1702 #9 Operation and Maintenance Plan.**

Permeable Pavement

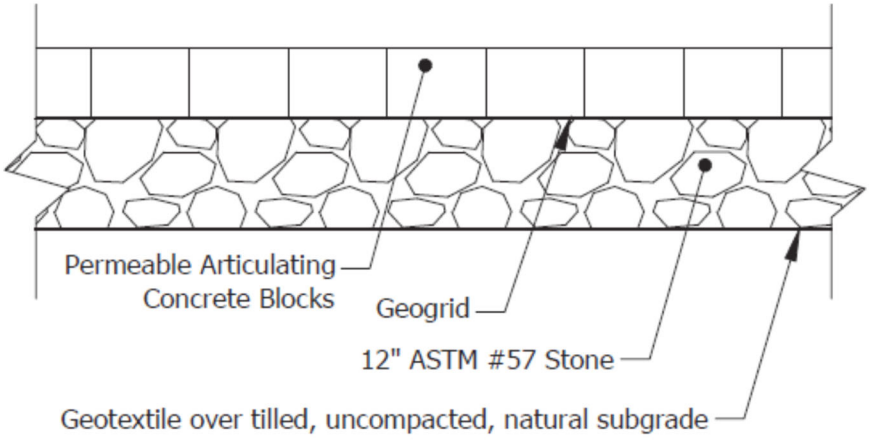
The Permeable Pavement was designed to allow water to infiltrate into the subsurface aggregate reservoir through the surface. The installed permeable pavement was 42'x160' covering a total of 6,725 square feet. Below are the site preparation and design protocols for the permeable parking lot:

Site Preparation:

- Full depth removal of existing gravel and pavement
- Over-excavate 18" below existing grade
- Till and do not compact the natural soils at bottom of excavation

Design Protocols:

- Lay non-woven geofabric along the bottom over-excavated area
- Install pavement section
    - Lay ASTM #57 stone to a depth of 12-inches
    - Geogrid
    - Permeable Articulating Concrete Block at surface



PERMEABLE ARTICULATING CONCRETE BLOCKS
TYPICAL SECTION

Rain Garden

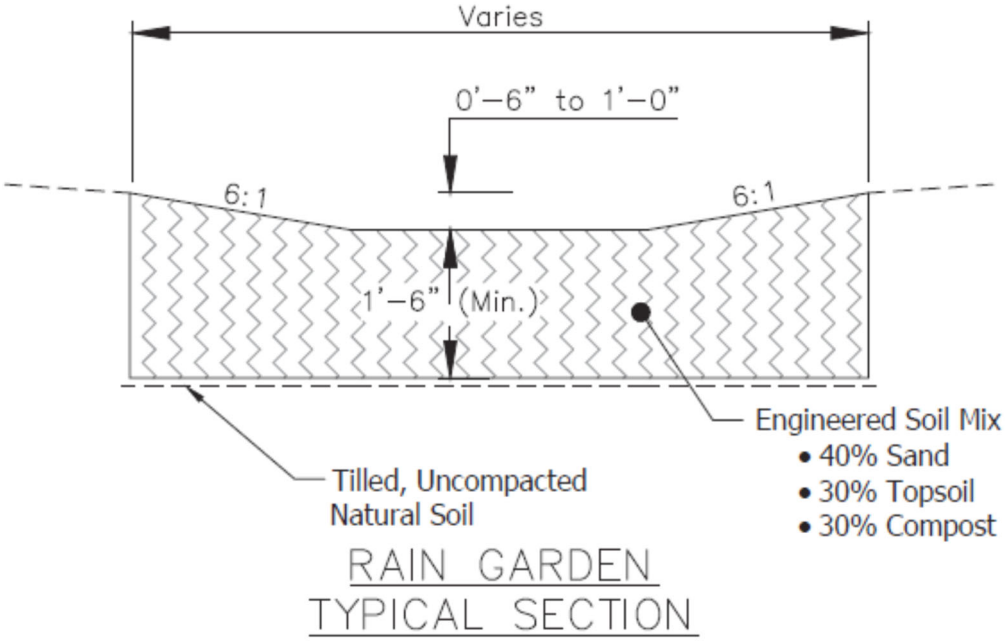
The Rain Gardens were designed to allow water to infiltrate into the subsurface through an engineered soil mix. The north rain garden is approximately 48'x120' covering 5,765 square feet; the pocket rain gardens vary in size and cover 1,435 square feet. Below are the site preparation and design protocols for the rain gardens:

Site Preparation:

- Full depth removal of gravel or broken concrete encountered
- Over-excavate 18" below existing grade
- Till and do not compact the natural soils at bottom of excavation

Design Protocols:

- Install a minimum of 12" of engineering soil mix (40% sand, 30% topsoil, 30% compost)
- Provide 6 to 12" of depression within Rain Garden
- Plant plugs at density of one plug per square foot
- Apply 4" of mulch over plant plugs area
- Seeded areas to be a mixture of stormwater seed mix and economy seed mix
- Apply straw fabric erosion control over seeded areas



Native Plantings

Native plantings will help remove pollutants and slow the runoff rate of stormwater. This will allow stormwater to infiltrate into the soil. The native plantings were installed on the balance of the site and cover 13,885 square feet. Below are the site preparation and design protocols for the Native Plantings:

Site Preparation:

- Removal of non-native species from planting zone
- Remove 4-inches of topsoil

Design Protocols:

- Install 3” to 4” of engineered soil mix
- Install combination of
    - Low-profile prairie seeding
    - Plant plugs
- Apply 4” of mulch over plant plugs area
- Seeded areas to be a mixture of stormwater seed mix and economy seed mix
- Apply straw fabric erosion control over seeded areas

Plant Species:

- Aster Laevis (*Smooth Aster)*
- Rudbeckia (*Black-eyed Susans)*
- Ratibida (*Upright Prairie Coneflower)*
- Pinnata (*Panigrahi)*
- Pycnanthemum Virginianum (*Mountain Mint)*
- Bouteloua (*Lag)*
- Curtipendula (*Sideoats Grama)*

BMP Analysis

This section details the constructed area of the BMPs, pollutant load reduction, and stormwater retention. For pollutant load reduction calculations, the EPA Region 5 Model, dated March 15, 2018 was used.

Permeable Pavement

IGIG Agreement Requirements:

- Permeable Pavement = 6,700 square feet

Constructed:

- Permeable Pavement = 6,725 square feet

BMP Impact:

The below summarizes the approximate tributary area, stormwater retained, and estimated pollutant load reduction of the Permeable Pavement.

- Tributary Area to Permeable Pavement = 0.62 acres
- Stormwater Retained = 4,035 cubic feet = 30,184 gallons
- Estimated Pollutant Load Reduction:

	Load before BMP (lbs/yr)		**Load after BMP (lbs/yr)**		**Load Reduction (lbs/yr)**
BOD	9		U		U
COD	170		34		136
TSS	407		41		366
LEAD	0		0		0
COPPER	0		U		U
ZINC	1		0		1
TDS	1,514		U		U
TN	3		0		2
TKN	4		U		U
DP	0		U		U
TP	0		0		0
CADMIUM	0		U		U

Rain Garden

IGIG Agreement Requirements:

- Rain Gardens = 3,600 square feet

Constructed:

- North Rain Garden = 5,765 square feet
- Pocket Rain Gardens = 1,435 square feet
- Total Rain Garden Construction = 7,200 square feet

BMP Impact:

The below summarizes the approximate tributary area, stormwater retained, and estimated pollutant load reduction of the Rain Gardens.

- Tributary Area to Rain Gardens = 0.47 acres
- Stormwater Retained = 4,320 cubic feet = 32,316 gallons
- Estimate Pollutant Load Reduction:

	Load before BMP (lbs/yr)		**Load after BMP (lbs/yr)**		**Load Reduction (lbs/yr)**
BOD	1		U		U
COD	30		11		20
TSS	47		12		35
LEAD	0		0		0
COPPER	0		U		U
ZINC	0		0		0
TDS	569		U		U
TN	0		0		0
TKN	1		U		U
DP	0		U		U
TP	0		0		0
CADMIUM	0		U		U

Native Plantings

IGIG Agreement Requirements:

- Native Plantings Area = 14,400 square feet

Constructed:

- Native Plantings Area = 13,885 square feet
  Note: shortfall in Native Plantings Area is made up by additional Rain Garden Area

BMP Impact:

The below summarizes the approximate tributary area, stormwater retained, and estimated pollutant load reduction of the Native Plantings.

- Tributary Area to Native Plantings = 0.34 acres
- Estimate Pollutant Load Reduction:

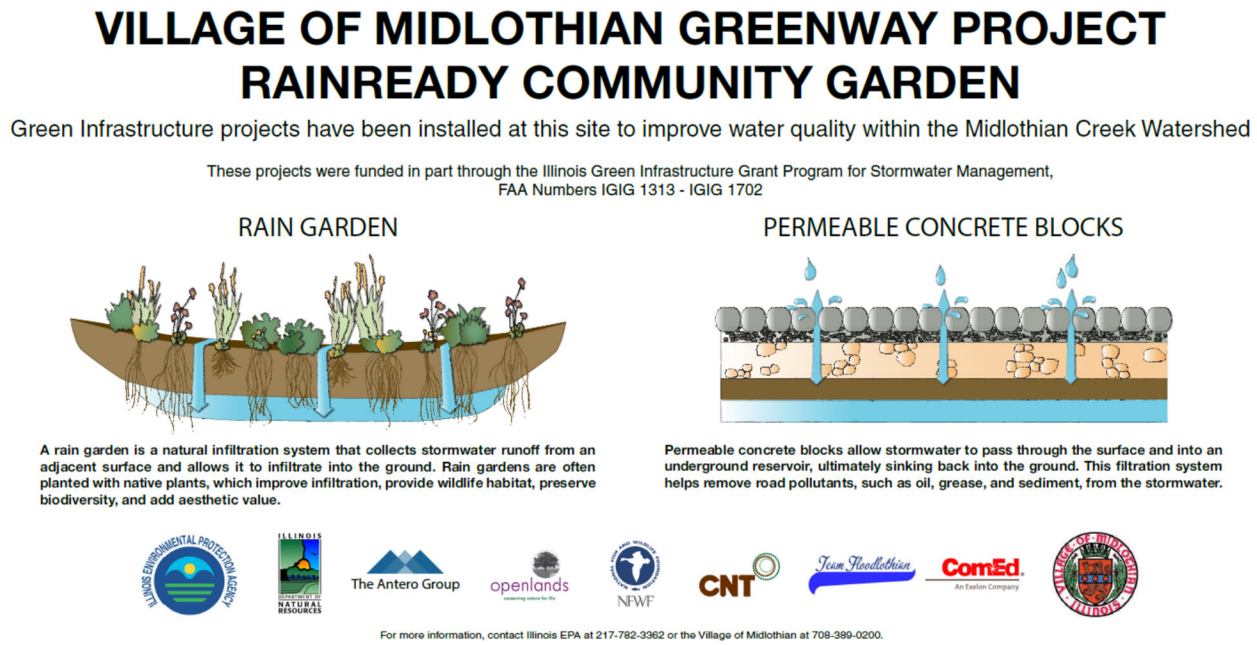
	Load before BMP (lbs/yr)		**Load after BMP (lbs/yr)**		**Load Reduction (lbs/yr)**
BOD	1		0		0
COD	22		13		9
TSS	34		9		25
LEAD	0		0		0
COPPER	0		U		U
ZINC	0		0		0
TDS	411		U		U
TN	0		0		0
TKN	1		U		U
DP	0		U		U
TP	0		0		0
CADMIUM	0		U		U

Project Costs

Agency	Total Cost by Agency
Illinois EPA	
Construction	**$51,922.00**
Village of Midlothian	
Personnel	*$5,164.00*
Contractual Services	*$9,600.00*
Consultants	*$12,236.00*
Total Costs from Village of Midlothian	**$27,000.00**
National Fish & Wildlife Foundation	
Construction	**$87,200.00**
Total Project Cost	**$166,122.00**

Acknowledgement Sign Design

Below is the Funding Acknowledgment sign that will be installed at the northwest corner of the north Rain Garden, just south of the permeable pavement parking lot. This is located along Pulaski Road and a heavily traveled pedestrian route. This sign will be seen by hundreds of people daily. Upon installation, photographic documentation will be submitted to the Illinois EPA.



Project Evaluation

The **IGIG1313 Agreement** (enclosed) was entered into by the Illinois EPA and the Village of Midlothian on 10/31/2015. This was for the design and construction of a permeable pavement parking lot, rain gardens, and native plantings. Under the IGIG1313 Agreement, the design was completed, and the rain gardens and native plantings installed. In the Summer of 2016, the State of Illinois had placed a budget freeze on all IGIG projects; consequently, construction of the permeable pavement was put on hold.

In Winter of 2016, the State of Illinois had passed a budget to free up IGIG funding for projects and coordination between the Illinois EPA and Village had begun again to negotiate a new Agreement. The Illinois EPA and Village of Midlothian entered into the IGIG UGA 1702 on 04/01/2017 to complete construction of the permeable pavement parking lot. During this time, the Village was pursuing additional funding from the National Fish & Wildlife Foundation (NFWF) and was successful securing this funding. This allowed the permeable pavement parking lot surface to be revised from permeable asphalt to Permeable Articulated Concrete Blocks (PACBs).align with MWRD's preferred permeable pavement surface:

To be awarded the NFWF funding, the Village needed to perform audits which was a lengthy process. The Village could not risk installing the PACBs without an agreement in place between the NFWF and Village. Therefore, an extension to the IGIG UGA 1702 was requested to the Illinois EPA. The Illinois EPA allowed this and issued an **Amendment No. 1 to the Grant Agreement** dated 06/13/2018 (enclosed). Redesign of the permeable parking lot with the PACB was completed approved by the Illinois EPA in Fall 2018.

The permeable parking lot was always designed with a portion on the Veterans of Foreign Wars Post (VFW) property. As the project came closer to a reality, the VFW was no longer working with the Village and the permeable parking lot encroachment had become an issue. A Plat of Survey was performed to determine the precise location of the north limits of the Village's property. The permeable parking lot then needed to be redesigned to keep 100% of the PACBs on the Village's property. This was completed and Illinois EPA approved the redesign May 2019. The permeable parking lot was installed July 2019. The assistance amount of $51,922.00 of the IGIG UGA 1702 will be fully requested for reimbursement.

Based on our conversations and feedback from residents, Village officials, community leaders, and the MWRD, the IGIG1702 project has been a success. See enclosed **Constructed BMPs Photos**. The Village hosts several community events in the open space that is now occupied by rain gardens and native plantings. The RainReady volunteers are dedicated to the regular upkeep of the open space.

The requirements of the IGIG Agreement have been satisfied. Funding acknowledgement sign will be erected at the northwest corner of the rain garden next to the permeable parking lot where the Illinois EPA is cited as helping to fund this project. The Village of Midlothian is thankful to the Illinois EPA for helping fund these green infrastructure improvements and will continue to work toward addressing the stormwater management needs of this neighborhood.