

**PSPE PHILADELPHIA CHAPTER
OUTSTANDING ENGINEERING ACHIEVEMENT AWARD NOMINATION FORM – 2018/2019**

Project Information:

Name of Project:

West Deptford Amazon

Location of Project:

240 Mantua Grove Road, West Deptford, Gloucester County, New Jersey

Description of Project, Include specific details (use two additional pages if necessary):

Please see attached

Construction Cost: \$ 120 mil Completion Date: 10 / 30 /18 Project or component must be complete in 2018

Primary Engineering Disciplines Represented by the Project (check those that apply):

Mechanical _____; Electrical _____; Civil X _____; Structural _____; Chemical _____

Organizations/Firms That Contributed to the Project and are Responsible for the Achievement (provide additional sheets as required):

Names: MacGregor Associates, Architects Phone: 678-504-1492

Address: 2727 Paces Ferry Road SE, Atlanta, GA 30339 Email: siseman@maamail.com

Contact Person: Scot Iseman, AIA LEED DB&C Title: Project Architect

Client/Owner:

Names: Hillwood - Developer Phone: 843-276-6053

Address: 751 Johnnie Dodds Blvd. Suite 200, Mount Pleasant, SC Email: mac.utsey@hillwood.com

Contact Person: Mac Utsey Title: Vice President

Submitted by:

Firm/Organization: Pennoni Associates Phone: 856-656-2870

Signature: _____ Email: cgaullrapp@pennoni.com

To be Presented on December 6th by: Chad Gaulrapp, PE

Email cgaullrapp@pennoni.com Cell Phone: 609-841-7341

A \$50 Entry Fee is required and is to be submitted with the Nomination Form.

The entry fee is to be made payable to PSPE, Philadelphia Chapter.

Nomination is due: November 19, 2018 Presentations: Thursday, December 6, 2018

Send by Email or Fax Nomination to: oea@pspe-philly.org or 215-885-3732

Payment of the Application Fee may be check or by credit card.

To pay by credit card, click to [PAYPAL BUYNOW](http://www.pspe-philly.org/oea/entryfee.htm) button on our website <http://www.pspe-philly.org/oea/entryfee.htm>

To pay by check please mail to:

Fredric L. Plotnick, Ph.D., Esq., P.E. Chairman, Outstanding Engineering Achievement Awards

261 Old York Road #732, Jenkintown, PA 19046 Phone: 215-885-3733, Fax: 215-885-3732,

email: oea@pspe-philly.org or oea@fplotnick.com or fplotnick@fplotnick.com

West Deptford Amazon PSPE Philadelphia Chapter

Outstanding Engineering Achievement Award 2019

Project Description

Pennoni was retained by Hillwood to prepare design and construction documents and construction administration services for the development of a 652,000-sf Amazon “Sort” facility. The facility includes two mezzanine levels resulting in a total gross floor area in excess of 1.5 million sf. On-site improvements include a 1,568-space parking lot, 60 truck loading bays, and 150 trailer parking spaces; stormwater management facilities including 14,700 of conveyance system, one wet pond, and one detention basin which directs discharge to Mantua Creek; a sanitary sewer lift station; exterior booster pump facility; and extensive landscaping utilizing native plant species and LED lighting. Necessary off-site improvements include highway widening of Mantua Grove Road (County Route 656) including two new signalized site entrances, one unsignalized right-in/right-out driveway, modifications to the adjacent signalized intersections with Grove Street and Kings Highway, and modifications to the signalized intersections with the Interstate 295 interchange ramps. Due to the high volume of vehicle trips generated by the Amazon employee shift changes, the traffic impact study was performed for 11 surrounding intersections. We engaged in the survey, civil, geotechnical, traffic and transportation, and materials testing for the project.

Project Challenges and Solutions

Since the property received prior approvals for spec warehouse buildings, we were challenged with the need to prepare a design for a completely new site layout while maintaining compliance with the BMP rules, and not voiding certain New Jersey Department of Environmental Protection (NJDEP) permits which included a variety of general permits, wetlands transition areas, and riparian buffer mitigation. This approach was critical to Amazon’s construction schedule. The stormwater management design was performed to maintain the basin routings and avoid needing a new US Army Corp of Engineer’s permit for the discharge to Mantua Creek. The highway widening created the need for new NJDEP permitting to account for exceptional value wetlands along the opposite (north) side of Mantua Grove Road. We were able to design the north side improvements to avoid the need for a freshwater wetland individual permit, and coordinated with the DEP staff to expedite the review and approval of the wetlands general permit.

The required access and highway improvements also created the need to obtain approvals from the Gloucester County Engineering Department and New Jersey Department of Transportation (NJDOT). Interim highway improvement design was prepared to allow for the Amazon accesses and traffic signals to be constructed while DEP approvals were pending for the north side widening adjacent to wetlands. The interim design was prepared to accommodate passage of a reduced Amazon employed staff, delivery vehicles and construction vehicles controlled by a modified traffic signal timing sequence. This was accomplished while maintaining expected levels-of-service to the highway through traffic, as well as entering and exiting vehicles. Progression analyses including time-space diagrams were prepared to model the traffic along the Mantua Grove Road corridor, and coordination of the new site traffic signals with the existing traffic signals provides for optimal progression.

Due to the scale of the project, NJDEP Water Extension and Treatment Works approvals were required. Since public gravity sewer mains do not exist along the property frontage, we evaluated discharge options including main extensions to vicinity pump stations. Since the nearby pump stations connection options

proved to be relatively infeasible, we were able to coordinate with the Gloucester County Utilities Authority for a direct private force main connection to the 30-inch County force main located within Mantua Grove Road.

Geotechnical services included coordinating and overseeing drilling operations consisting of test borings, performance of laboratory testing as well as evaluation of unsuitable soils in the pavement areas during construction. We performed soil investigations to offer recommendations for building and pump facility foundation design and subgrade preparation. We provided an evaluation of acidic soils beneath foundations, remediation of pavement subgrades including soil-cement mix designs for improvement of high construction traffic areas and permanent pavement areas. Challenges during foundation construction and earthwork operations included the remediation of moisture sensitive soils during wet periods, design and application of soil-cement mixtures within the parking areas, drive aisles and utility trenches.

Project Benefits

The obvious direct benefits of the Amazon Sort facility are the improved ability to receive and redistribute a high volume of retail goods to the public. The geographic location was selected to reduce the overall delivery mileage to perform this service. This facility has created more than 3,000 new jobs, most of which are produced within Gloucester County.

Site selection was a critical component supporting the benefit of the project. The 69-acre parcel is zoned for industrial use and located less than ¼ mile from the Interstate 295 interchange. The project is surrounded by industrial uses to the north and east, and a photovoltaic system to the west. The site itself was an abandoned industrial facility with significant impervious cover and no stormwater management.

The proposed Amazon Sort facility generates significant daily truck traffic and employee traffic during the AM and PM shift change (the facility is a 24 hour, 7 days per week operation). Under most circumstances, this trip generation would not be tolerable to surrounding uses and infrastructure. In this case, the site selection allows for the majority of truck and passenger vehicle traffic to access Interstate 295 on a route with only one other industrial driveway access from Mantua Grove Road. The closest proximal residential areas located to the east and west of the site do not use Mantua Grove Road to access Interstate 295.

The redevelopment of the project arguably enhances the surrounding environment, as uncontrolled stormwater runoff from the prior abandoned use is replaced with conveyance, detention and treatment facilities which reduce runoff while increasing water quality. Both sides of the facility are lined with vegetated swales designed to promote filtration and recharge of runoff prior to reaching the on-site stormwater facilities. Unlike the previous use, Amazon does not engage in the processing or production of any materials which result in the discharge of solid, liquid or airborne wastes. Package material wastes are managed indoors and removed by a licensed waste management firm.

The Amazon Facility opened for operation in September 2018.