Review Zone Application for D&R Canal Commission Decision

MEETING DATE: May 18, 2016
DRCC #: 16-4829
DATE: May 10, 2016
PROJECT NAME: NJDOT Route 1 Southbound: Nassau Park Boulevard to Quaker Bridge Mall Overpass

Latest Submission Received: April 27, 2016

Applicant: Tina Shutz
NJDOT
1035 Parkway Avenue
Trenton, NJ 08625

Engineer: Steven Arbiz, PE
WSP Parsons Brinckerhoff
2000 Lenox Drive
Lawrence, NJ 08648

Project Location:

<table>
<thead>
<tr>
<th>Road</th>
<th>Municipality</th>
<th>County</th>
<th>Block(s)</th>
<th>Lot(s)</th>
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<tbody>
<tr>
<td>Route 1 Southbound</td>
<td>Lawrence and</td>
<td>Mercer</td>
<td>n/a</td>
<td>n/a</td>
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<tr>
<td></td>
<td>West Windsor Townships</td>
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Jurisdictional Determination:

| Zone B | Major | Governmental |

Subject to Review for:

<table>
<thead>
<tr>
<th>Drainage</th>
<th>Visual</th>
<th>Subdivision</th>
<th>Stream Corridors</th>
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<tr>
<td>X</td>
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THIS STAFF REPORT IS ISSUED AS A GUIDE TO APPLICANTS IN COMPLYING WITH DRCC REGULATIONS. IT IS NOT AN APPROVAL. NO CONSTRUCTION SHALL BEGIN UNTIL A CERTIFICATE OF APPROVAL HAS BEEN ISSUED.

Documents Received: Letter from Kavita Dave and David Ahdout (3 pages) dated April 18, 2016; DRCC Application for Individual Approval dated February 2016; Stormwater Management and Drainage Report dated February 2016; Stormwater Management and Drainage Report Addendum-1 dated April 2016; DRCC Individual Approval Plans (16 Sheets) dated February 2, 2016 (Sheets 5, 6, 8, 13, and 14 dated April 18, 2016); Drainage Plans (8 Sheets) dated January 28, 2016; Drainage Plan (1 sheet) dated April 18, 2016; Flood Hazard Area Individual Permit Plan (40 Sheets) dated February 4, 2016 (Sheets 36 and 38 dated April 18, 2016); all prepared by WSP Parsons Brinckerhoff.

The application is complete and shall be presented to the Commission for their action with a staff recommendation of approval at the May 18, 2016 meeting, based upon the following analysis:

Existing Conditions: This site consists of a stretch of Route 1 roadway on the southbound side between Nassau Park Boulevard and the Quaker Bridge Mall overpass which is located
within the Townships of Lawrence and West Windsor, Mercer County, and within the Commission Review Zone B. Along this particular stretch of Route 1, there is a history of rear-end and side-swind accidents with major traffic delays and heavy congestion being a daily occurrence during the weekday PM peak period. In addition, the pavement is cracked and rutted and in need of resurfacing. The total existing pavement area within the project area is approximately 16.62 acres.

**Proposed Project:** The applicant, the New Jersey Department of Transportation (NJDOT), is proposing safety, capacity and roadway deficiency improvements along the southbound stretch of Route 1 between Nassau Park Boulevard and the Quaker Bridge Mall overpass. The improvements will consist of a combination of roadway widening, milling and resurfacing, access modifications, drainage and utility relocations. The purpose of the project is to increase the roadway capacity by adding a third southbound express lane through the area, and to improve safety by closing some of the commercial driveways along Route 1 southbound. More specifically, the project will include the following measures.

- At the former Nassau Park intersection, a sloping curb (being utilized in place of the existing barrier curb divider) will be extended approximately 1,080 feet to the north, to eliminate movements from the Nassau Park driveway to the Route 1 southbound express lanes,

- Along the frontage of the collector-distributor lanes, three access points to commercial establishments will be eliminated and alternate access would be provided,

- New signage structures will be erected at four specific locations, and

- A new drainage system will be constructed to accommodate the widened pavement and the available area within the interchange will be utilized for proposed stormwater management basins.

The project includes a net increase of 1.65 acres of new pavement, 2.26 acres of redeveloped pavement and 8.48 acres of resurfaced pavement. The proposed project will result in area of disturbance of approximately 18.76 acres.

**Stream Corridor:** The project site is located within portions of two separate stream corridors. One stream corridor is associated with a tributary to the Shipetaukin Creek and the other stream corridor is associated with Duck Pond Run. The Commission stream corridor for the tributary to the Shipetaukin Creek is defined as the area within a 100-foot buffer adjacent to the 100-year flood line associated with the watercourses. However, because Duck Pond Run discharges into the canal, the stream corridor includes the water course, and either the 100-year floodplain associated with the water course and a 100-foot buffer adjacent to the 100-year flood line associated with the water course, or 300 feet along both sides of the water course, measured from the top of the water course’s banks, whichever is greater. Both of the stream corridors have been delineated properly by the applicant.
A project is subject to stream corridor impact review if the project includes a portion of the stream corridor, N.J.A.C. 7:45-9.1(a). This project is proposing uses within the corridor including grading and roadway widening. Therefore, this project is subject to a stream corridor impact review.

The project includes redevelopment of existing roadway in a stream corridor. Specifically, 40,477 square feet of existing roadway is within the stream corridor to the Shipetaukin Creek. Staff notes that the existing roadway was placed prior to the establishment of the stream corridor regulations and therefore would be viewed as grandfathered. The Commission has viewed replacement of grandfathered surfaces as having no adverse affect on the stream corridor, N.J.A.C. 7:45-12.4(a)1. The project is also proposing 12,289 square feet of new impervious surface in the stream corridor with 8,378 square feet within the stream corridor to the Shipetaukin Creek and 3,911 square feet within the stream corridor to Duck Pond Run. The applicant is requesting that the Commission allow the intrusions for both reconstructed and new roadway as a conditional use. N.J.A.C. 7:45-9.4(a)4 and (b)3 allows roadways that cross the corridor as directly as practical. It is staff’s opinion that the project meets the requirements for this conditional use.

**Stormwater Runoff Quantity:** The applicant proposes to control increases in stormwater runoff flow and volume through a combination of stormwater best management practice (BMP) measures, including the modification of an existing detention basin into a proposed infiltration basin (Basin-1), the modification of another existing detention basin into a proposed extended detention basin by modifying the outlet control structure and the construction of a new extended detention basin (Basin-2) with outlet control structure to detain the runoff and release it at a controlled rate. The infiltration basin will be constructed by expanding the existing basin located in the southwest loop ramp infield area to provide additional volume. This basin is designed as an infiltration basin with extended detention. One of the extended detention basins will be constructed by expanding the existing basin located in the northwest loop ramp infield area. The proposed Basin-2 will be constructed in open space at the intersection of Route 1 southbound and Nassau Park Boulevard with an outlet control structure to detain the runoff and release it at a controlled rate. The project is divided between two different 14-digit Hydrologic Unit Codes (HUC-14), identified for the project as HUC-A and HUC-B. HUC-A includes a single drainage area (DA-1) that discharges to the Shipetaukin Creek watershed. HUC-B includes two separate drainage areas (DA-2 and DA-3) that ultimately discharge to an existing outfall to the Duck Pond Run watershed. As a note, Duck Pond Run discharges into the canal. The stormwater management measures for both HUC-A and HUC-B have been designed so that the post-construction peak runoff rates for the two, 10 and 100-year storm events will be no greater than 50, 75 and 80 percent, respectively, of the preconstruction peak runoff rates. The submitted calculations utilized the Natural Resource Conservation Service (NRCS) Technical Release No. 55 (TR-55) hydrologic methodology, Standard unit hydrograph rainfall distribution and current New Jersey 24-hour rainfall frequency data for Middlesex County to compute peak runoff flow rates and volumes. The proposed stormwater management measures will provide enough peak flow attenuation to meet the specific runoff quantity standards of N.J.A.C. 7:45-8.6(a).
Stormwater Outfall: The Duck Pond Run watershed flows into the canal. In 2009, the Commission regulations were amended to include specific standards for outfalls discharging to the canal at N.J.A.C. 7:45-8.3. New outfalls to the canal were prohibited, new sources of stormwater that tie into the drainage systems discharging to the canal were prohibited pursuant to N.J.A.C. 7:45-8.3(a)2, and for projects discharging to existing outfalls, removal or treatment to 95% is required. As noted above, the existing basin that is located within the northwest loop ramp has an existing outfall outlet structure that discharges to the Duck Pond Run watershed. Therefore, the outfall is not new. The applicant however is seeking a replacement of the existing outlet structure with a new outlet control structure to achieve the required peak flow reductions. In addition, although the project proposes to increase impervious surface area within the Duck Pond Run watershed, the new impervious area will be captured and conveyed to a proposed infiltration basin. The infiltration basin will infiltrate stormwater volume generated from the new impervious and redirected impervious by 100-year storm event. The BMPs on the project will also treat the runoff for water quality to provide 95% of TSS removal and attenuate the flows to reduce proposed peak discharges for 2-year, 10-year and 100-year storm events to 50%, 75% and 80% of the existing peak flows respectively. Therefore, as also outlined below the applicant is proposing to meet the 95% total suspended solids (TSS) removal rate requirement of N.J.A.C. 7:45-8.3(a)5ii.

Water Quality: The Commission requires that all proposed full depth pavement including newly and reconstructed parking and access drives that are being renewed, must meet water quality standards in accordance with Commission regulations (N.J.A.C. 7:45-8.7). As noted above, portions of the site drain to the Duck Pond watershed and to the canal. Therefore, for stormwater draining to the canal, reduction of the post-construction load of total suspended solids (TSS) in stormwater runoff generated from the water quality design storm by a rate of 95% of the anticipated load from the developed site, expressed as an annual average, is required. For the stormwater draining to the Shipetaukin Creek watershed or HUC-A, the requirement is a reduction of the post-construction load of TSS in stormwater runoff generated from the water quality design storm by a rate of 80% of the anticipated load from the developed site, expressed as an annual average. New and renewed pavement areas are being proposed onsite within both watersheds. The project design proposes a combination of structural best management practice measures (BMP) including a manufactured treatment device (MTD), two extended detention basins and an infiltration basin to meet water quality requirements. The proposed MTD uses hydrodynamic separation technology to remove TSS and will be located 500 feet to the north of the existing 48-inch RCP culvert under Route 1. More specifically, the MTD will be a continuous deflective separator (CDS) which is certified by NJDEP to provide a 50% TSS removal rate. One extended detention basin is located in the southwest loop ramp infield area of Quaker Bridge Road, while the second extended detention basin will be located in an open area at the Nassau Park Boulevard intersection. The infiltration basin will be located in the southwest loop ramp infield. A weighted average treatment calculation for each HUC area has been provided which indicates that an 80% TSS removal rate will be provided for HUC-A and a 95% TSS removal rate will be provided for HUC-B. As such, stormwater quality measures have been designed in accordance with the requirements of N.J.A.C. 7:45-8.7 for HUC-A draining to the Shipetaukin Creek watershed and with the requirements of N.J.A.C. 7:45-8.3(a)5 for HUC-B draining to the Duck Pond Run watershed.
Groundwater Recharge: The Commission regulations require that stormwater management measures maintain 100% of the average annual preconstruction groundwater recharge volume for the site; or that any increase of stormwater runoff volume from preconstruction to post-construction for the 2-year storm is infiltrated. Two separate groundwater recharge analysis calculations (NJDEP GSR-32 spreadsheet) have been submitted for HUC-A and for HUC-B. The calculations demonstrate that the annual groundwater recharge deficit for HUC-A is 2,723 cubic feet and for HUC-B is 7,770 cubic feet. This results in a total annual groundwater recharge deficit of 10,493 cubic feet for the total project site. The proposed infiltration basin will infiltrate runoff generated from the 100-year storm event from new impervious area in HUC-B (Duck Pond Watershed) and 0.46 acres of impervious area redirected from HUC-A (Shipetaukin Watershed). Since the insitu infiltration tests at the location of the infiltration basin showed low permeability rates, it is proposed to over-excavate the bottom of the basin to remove existing clay material and backfill with a sand layer (K5). The sand layer will have a maximum of 15% fines and a minimum permeability rate of 20 inches per hour. The proposed infiltration basin has been designed to provide more than the required recharge volume for HUC-A and HUC-B. Therefore, the groundwater recharge measures which meet the requirements of N.J.A.C. 7:45-8.5 have been provided for the project.

Nonstructural Methods: In accordance with N.J.A.C. 7:45-8.4, sufficient nonstructural stormwater management strategies need to be incorporated into the project site design “to the maximum extent practical”. The strategies that will be implemented for this project include protection of natural drainage features and vegetation, protection of areas that provide water quality benefits or are susceptible to erosion and sediment loss, minimization of impervious areas and disconnection of stormwater flows, minimization of land disturbance activities, minimization of soil compaction, low-maintenance landscaping that minimizes the use of pesticides and fertilizers, and source controls for the accumulation and discharge of trash and debris from the drainage system. Therefore, the project has been designed in accordance with the specific nonstructural stormwater management strategy standards of N.J.A.C. 7:45-8.4.

Stormwater Management Maintenance Plan: A stormwater management operation and maintenance plan document has been prepared for the best management practice (BMP) elements proposed for the project. The plan includes maintenance details for the proposed manufactured treatment device (MTD) and the stormwater management basins. The plan has been prepared in accordance with the requirements of N.J.A.C. 7:45-8.8.

Staff Recommendation: Staff recommends approval.

Sincerely,

Marlene Dooley
Executive Director

c: Lawrence Township Planning Board
Mercer County Planning Board