

Site Suitability Analysis – Engineering Rebuttal Report

Site in the Township of Middletown:

Block 1045, Lots 2-4 (1114 West Nut Swamp Road)

Referred to as “West Nut Swamp Road Site”

Prepared:

October 2, 2024

Prepared by:



T&M Associates

11 Tindall Road, Middletown Township, NJ 07748

*The original of this document has been signed
and sealed in accordance with New Jersey Law.*



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A. Executive Summary

Block 1045, Lots 2-4 are located at 1114 West Nut Swamp Road. For the purposes of this report, the subject property shall be referred to as the “*West Nut Swamp Road Site*”. The subject property consists of approximately 17.06 acres in area (per Tax Map sheet 214) whereas deed plotting results in a lot area of ±18.71 acres. The property is located within the Township’s R-45 “Low Density, Single-Family Residence Zone”.

Based upon this office’s review of aerial imagery and a site visit, the site is wooded and undeveloped. Property records indicate that all three (3) lots in the tract are “Vacant Land”. The site is situated with frontage on West Nut Swamp Road, a 50 ft. wide Township right-of-way (Per Tax Map), which is accessed from Crawfords Corner Road (C.R. 52). The first 950 ft. of West Nut Swamp Road is asphalt paved, with a width varying from 18-20 ft. The balance thereafter (approximately 700 ft.) is unimproved, consisting of a dirt and gravel mix. The width of the unimproved section of roadway varies from 14-16 ft., but narrows in areas due to adjacent vegetative growth. An informal unimproved circular turnaround exists at the terminus.

It is our understanding that the Owner of the Property desires to construct an inclusionary development on the subject property, consisting of 115 townhouse dwelling units in 18 buildings and 28 Affordable low-rise apartment dwelling units in 2 buildings, for a total of 143 residential dwelling units. This would equate to approximately 19.6% units that are set aside for affordable housing.

The Property Owner has provided the following documents in support of this development proposal:

- Letter correspondence regarding “Proposed Builder's Remedy Requests/Development Proposals” as prepared by Donna M. Jennings, Esq. of Wilentz Attorneys At Law, dated July 19, 2024;
- A report entitled “Site Suitability Analysis”, as prepared by Cofone Consulting Group, LLC, dated July 18, 2024. In addition to the “*West Nut Swamp Site*”, the report also focuses on an additional site located on Red Hill Road, Block 1045, Lot 12. The following document is enclosed under Appendix ‘A’ of this report:
 - NJDEP Freshwater Wetlands Letter of Interpretation: Line Verification, File No.: 1331-06-0004.1, Activity Number: FWW23001, dated August 23, 2023;
- A report entitled “Traffic Impact Assessment for 1114 West Nut Swamp Road”, as prepared by Dolan & Dean Consulting Engineers, LLC, dated July 17, 2024;
- A report entitled “Steep Slopes Analysis of Middletown and Surrounding Municipalities”, as prepared by MidAtlantic Engineering Partners, LLC, dated July 2, 2024;

- Letter correspondence regarding proposed retaining walls for the “Nut Swamp Affordable Housing Site” as prepared by Robert Larsen, RA. of MidAtlantic Engineering Partners, dated July 18, 2024.
- A plan entitled “Conceptual Residential Development Plan, West Nut Swamp Road, Block 1045; Lots 2-4, Township of Middletown, Monmouth County, New Jersey”, as prepared by Joseph Mele, P.E. & P.L.S. of MidAtlantic Engineering Partners, dated June 28, 2024, last revised 07-15-2024, consisting of five (5) sheets.
- A photograph exhibit of an “Affordable Building Example” for Nut Swamp Road Site, Adoni Property Group, July 18, 2024.
- An Architectural rendering exhibit of a “Market Rate Townhouse” for Nut Swamp Road Site, Adoni Property Group, July 18, 2024.
- A “Water Service Availability” letter prepared by Kevin Rodier of New Jersey American Water (NJAW), dated June 20, 2024.
- A “Will Serve Letter” prepared by Paul Thomson, Staff Engineer of the Township of Middletown Sewerage Authority, dated July 16, 2024.

The following reports have been prepared by other professionals, on behalf of the Township of Middletown, for the subject property:

- A report entitled “Environmental Resource Inventory, Block 1045, Lots 2, 3 & 4”, as prepared by Princeton Hydro, dated September 2024;

We have reviewed the above documents provided by the Owner of the Property and the Township of Middletown and have prepared the following Rebuttal Report regarding the suitability of the site for the proposed development concept from an Engineering perspective. The affordable housing rules require affordable housing sites to be approvable, available, developable and suitable, as defined in N.J.A.C. 5:93-1. Below please find a summary of our findings, which are more extensively summarized in Section G at the end of this Report.

Available site – A site with clear title, free of encumbrances which preclude development for low and moderate income housing.

- We have not been presented with any information which demonstrates the site does not meet this standard.

Approvable Site – A site that can be developed for low and moderate income housing in a manner consistent with the rules or regulations of all agencies with jurisdiction over the site. The site may be approvable although not currently zoned for low and moderate income housing.

- The Development Concept does not comply with many provisions of the Township of Middletown Development Regulations, especially those related to steep slopes, critical areas, and stormwater management, causing a risk of adverse effects on downstream and

neighboring areas. The Developer appears to have made no effort to reduce impacts on steep slopes and critical areas, often worsening conditions. The site layout fails to meet several RSIS requirements regarding sidewalk placement and permissible road slopes, and it does not comply with ADA standards for sidewalk widths and slopes. Achieving compliance would further increase lot coverage, which already surpasses R-45 zone limits.

Significant retaining walls and fences violate R-45 setback requirements, pose safety risks, and obstruct safe access for pedestrians, vehicles, and emergency services in several locations. Safer design alternatives, like tiered retaining walls, would likely alter the site layout and reduce the scale of the development. Trip generation appears underestimated, worsening existing sight distance issues at the West Nut Swamp Road and Crawfords Corner Road intersection due to increased reliance on motor vehicles as a result of the site's lack of proximity to sidewalks and mass transit. A comprehensive redesign is necessary to comply with regulatory standards, many of which pertain to resident and public safety, which would likely result in an overall reduction to the number of units that can be accommodated onsite.

Developable site – A site that has access to appropriate water and sewer infrastructure, and is consistent with the applicable areawide water quality management plan (including the wastewater management plan) or is included in an amendment to the areawide water quality management plan submitted to and under review by NJDEP.

- Although the Developer has provided a "Will Serve Letter" from TOMSA and a "Water Service Availability" from NJAW, they have not provided any anticipated sewer nor water demand calculations for the Development Concept for Township review and comment. The absence of detailed calculations regarding both sewage and water demands, including requirements for fire suppression for townhouses in accordance with state law, raises concerns about whether the Development Concept will meet capacity limitations at the time of development, potentially necessitating a reduction in the planned development scale.

Suitable Site – A site that is adjacent to compatible land uses, has access to appropriate streets and conforms to the environmental policies delineated in N.J.A.C. 5:93-4.

- The increased traffic resulting from the Development Concept is likely to worsen existing sight distance issues at the intersection of West Nut Swamp Road and Crawfords Corner Road, which the Developer may not be able to ameliorate without approvals from the County and private property owners. The site's lack of pedestrian pathways to public mass transit and convenience services exacerbates reliance on vehicles, further increasing traffic. Extensive proposed tree clearing violates Township Code's woodland preservation



standards, which is then compounded by the lack of an adequate landscape buffer and building height exceedance. This will heighten visual impacts to and the availability of air, light and open space to neighboring properties. The Development Concept's insufficient and non-compliant sidewalk designs per RSIS and ADA standards, pose safety risks. For the Developer to rectify same, this results in an impermissible increase in lot coverage in terms of R-45 zone requirements and reduction in available open space. We estimate that 32.1% of the site (6.01 ac.) of the site contains slopes greater than 15%, and the Development Concept proposes to disturb approximately 91% of these areas onsite, and in many areas the Developer proposes to worsen (steepen) slopes compared to the existing condition. The Development Concept does not comply with numerous R-45 zone setback requirements, as well as setback requirements for retaining walls and fences. To rectify these issues, particularly for those improvements located along the east side of the tract, it would necessitate the shifting of these improvements further west into the site, thereby increasing impacts to regulated wetlands and associated transition areas. Without New Jersey Department of Environmental Protection (NJDEP) Flood Hazard Area (FHA) verification, impacts to these sensitive areas remain unknown. Overall, the project necessitates significant modifications to address these environmental, compliance, and safety challenges adequately, which would likely result in an overall reduction to the number of units that can be accommodated onsite.

B. Availability of Public Sewer for Connection

1. Sewer Service Area

As can be seen from Figure 1 below, based on our review of the GIS data provided by the NJDEP and Monmouth County, the West Nut Swamp Road Site is located within the sanitary sewer service area operated by the Township of Middletown Sewerage Authority (TOMSA). A portion of Lot 2 is not located within the sewer service area. However, this area overlaps with wetlands and a state open water onsite, which have been verified by a Letter of Interpretation from NJDEP (referenced later in this report), and it does not appear that the Developer is proposing any Dwelling Units within same. The Developer has obtained a "Will Serve Letter" from TOMSA, indicating that TOMSA has capacity "at this time" to meet a 52,200 gpd sewage flow from the site.

However, the Developer has not provided any breakdown for the number of anticipated bedrooms within each of the proposed 143 dwelling units. In addition, the Development Concept also includes a proposed $\pm 4,800$ s.f. "Clubhouse" and a $\pm 8,100$ s.f. "Pool/Amenity Area" that will feature a variety of amenities, such as a lounge, theater, golf simulator/virtual sports room, business center with quiet room, conference room, outdoor pool and hot tub, cold plunge pools, BBQ area, and playground. It is unclear whether these indoor activities will be housed in a separate building or within the "Clubhouse." NJAC 7:14A-23.3 outlines project flow criteria for "Clubs," with varying

sewer demand based on residential and non-residential membership. **Since the Developer has not provided anticipated sewage demand calculations, it's unclear whether TOMSA considered the appropriate breakdown of bedrooms and dwelling units, along with the additional clubhouse and amenity uses, in their review for issuing a "Will Serve Letter."**

2. Township of Middletown Sewerage Authority Available Infrastructure (TOMSA)

Based on discussions with and our review of GIS mapping provided by TOMSA, there is no public gravity sanitary sewer infrastructure available along the West Nut Swamp Road property frontage. Furthermore, TOMSA has indicated the nearest sanitary sewer gravity main is located approximately 0.50 miles (by traveling roadway footage) south of the site within Cypress Neck Road, near the intersection with Crawfords Corner Road (C.R. 52). The existing sanitary sewer along Cypress Neck Road is an 8" gravity main that is approximately 8 feet deep.

Currently, there are several residential homes located along West Nut Swamp Road; However, TOMSA has indicated that they are all connected via an individual pressure sewer system that runs along West Nut Swamp Road and down Crawfords Corner Road, before connecting to the infrastructure within Cypress Neck Road. In TOMSA's Will Serve Letter, they indicate that new pump stations and a force main will likely be required to accommodate the Development Concept, and that the Developer is responsible for all cost, permits and construction. **A Pump Station and force main is required in order to pump sewage 35-40 ft. uphill from the lowest point of West Nut Swamp Road frontage to the Crawfords Corner Road right-of-way. The routing of the force main will cross over Monmouth County culvert structure MT-49A located on West Nut Swamp Road, which will likely require approval from the County. Depending on the size and depth, the County may require the Developer to make improvements and/or replacement of same. This will also likely require permits from NJDEP as Nut Swamp Brook is a regulated watercourse, as noted later within this report.**

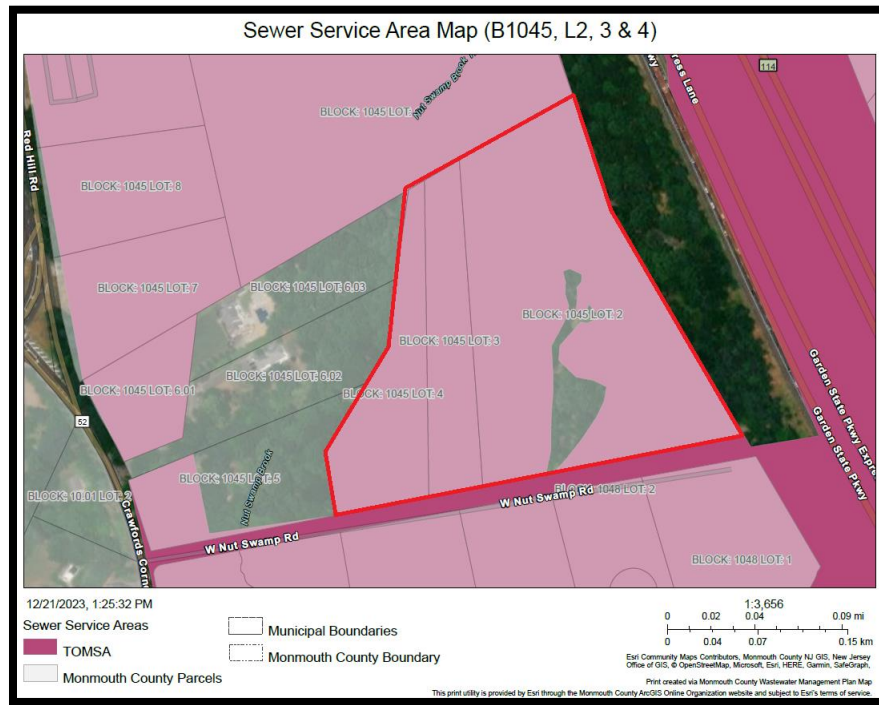


Figure 1: Wastewater Management Plan Viewer (West Nut Swamp Road Site)

3. Regulatory Approvals Required

i. Treatment Works Approval

Pursuant to NJAC 7:14A-22.3, a Treatment Works Approval (TWA) from NJDEP would be required as such a development would require the installation of a new sewer main that would convey more than 8,000 gpd of flow to a treatment works. Although the Development Concept does not provide a breakdown of the anticipated number of bedrooms within each of the 143 dwelling units, based upon the project flow criteria set forth in NJAC 7:14A-23.3, assuming that each dwelling unit consisted solely of 3-bedrooms, the project flow criteria for the development concept would be 42,900 gpd. It should be noted that this estimation does not include the sewage demand for the clubhouse, which should be provided by the Developer.

SUMMARY & CONCLUSIONS: The site is located within the mapped sewer service area within which TOMSA operates, and the Developer has received a “Will Serve Letter” from TOMSA. Pump stations and a force main will be required to pump sewage from the site to existing infrastructure located over 0.5 mile away within Cypress Neck Road, which TOMSA indicates the Developer shall bear all costs for same. Although TOMSA indicates their infrastructure can accommodate an anticipated 52,200 gpd sewage flow, the Developer has not provided any projected sewage demand calculations for the site demonstrating same. It is unclear whether the appropriate breakdown of bedrooms per dwelling unit, and whether the

“clubhouse” and various indoor amenity uses have been accounted for. TOMSA’s “Will Serve Letter” also indicates sewer capacity is available “at this time”. Should other development occur in the vicinity, available capacity may be reduced. As a result, the Development Concept may need to be reduced to meet capacity limitations at the time of development.

C. Availability of Public Potable Water for Connection

1. New Jersey American Water Infrastructure

The site is located within the New Jersey American Water (NJAW) franchise service area and the Developer has obtained a “Water Service Availability” letter from same. NJAW has indicated that they currently have availability capacity in their system, but the closest 12” water main is located more than 1,600 ft. (0.30 miles) to the northwest of the site at the corner of Everett Road and Middletown Road. NJAW indicates the developer would need to fund all costs for a main extension to the site.

The letter from NJAW does not indicate the anticipated water demand for the site, nor has the Developer provided any calculations for same. Notably, the State of New Jersey passed Senate Bill 281 on January 16, 2024 which requires newly constructed townhouses to be installed with automatic fire sprinkler systems. The bill does not apply until the first day of the seventh month after enactment, which is on or about August 1, 2024. **The “Water Service Availability” letter issued by NJAW is dated June 20, 2024, prior to the effective date of the law, and indicates that it is not a “Will Serve Letter”, nor an approval nor a guarantee for water service. It is unclear if the Developer and NJAW appropriately considered water demand for fire suppression in accordance with this new law, as no calculations have been provided by the Developer.**

2. Regulatory Approvals Required

i. Safe Drinking Water Permit Certification

Pursuant to NJAC 7:10A-12.39d, as the private water service to the proposed development will serve more than 50 realty improvements (143 dwelling units proposed), a Safe Drinking Water Permit Certification would be required from NJDEP.

SUMMARY & CONCLUSIONS: The site falls within the New Jersey American Water (NJAW) service area, and the Developer has received a “Water Service Availability” letter indicating current capacity availability. However, the closest 12” water main is over 1,600 ft. away, requiring the Developer to fund the extension of same to the site. The letter does not specify the site's anticipated water demand, and the Developer has not provided calculations for same. Importantly, New Jersey Senate Bill 281, effective on or about August 1, 2024, mandates automatic fire sprinkler systems in new townhouses, yet the NJAW letter, dated

before this law's effective date, is not a "Will Serve Letter" nor a guarantee of water service. It remains unclear if both NJAW and the Developer considered the additional water demand for fire suppression, as no relevant calculations have been supplied. As a result, the Development Concept may need to be reduced to meet capacity limitations at the time of development.

D. Availability of Other Public Utilities

1. Natural Gas

Per NJ GeoWeb online mapping, the site is situated within the Territory Mapping for New Jersey Natural Gas (NJNG) and GIS mapping provided by NJNG shows the presence of an existing 2" steel gas main within the West Nut Swamp Road right-of-way, within asphalt paved portion of the roadway, terminating in the vicinity of the eastern boundary line of Lot 4.

Based upon this information, it is presumed that gas service is available to the site. However, based on the scale currently proposed, NJNG will likely require both enlargement and extension of the main to accommodate the Development Concept, which the Developer will be responsible to fund same.

2. Electric

Per NJ GeoWeb online mapping, the site is situated within the Territory Mapping for Jersey Central Power and Light (JCP&L).

Based upon the presence of an existing overhead electric service along south side of West Nut Swamp Road adjacent to the site frontage, it is presumed that electric is available to the site.

3. Cable/Phone/Internet

The property is located in known areas of the service providers Comcast, Cablevision and Verizon and overhead utility lines are present along south side of West Nut Swamp Road adjacent to the site frontage.

Based upon this information, it is presumed that cable/phone/internet service is available to the site.

SUMMARY & CONCLUSIONS: Natural Gas (NJNG) and Overhead Electric (JCP&L) infrastructure is available within the West Nut Swamp Road right-of-way. Although, NJNG will require the Developer to bear infrastructure extensions and upgrades to the serve the

Development Concept. The site is also in known areas of several Cable/Phone service providers (Comcast, Cablevision and Verizon) with overhead utility poles present within the Red Hill Road right-of-way.

E. Site and Environmental Constraints

1. Steep Slopes

DEVELOPMENT CONCEPT

i. Disturbance of Existing Steep Slopes

We have gathered the statewide 10-foot resolution Digital Elevation Model (DEM) topography data from the NJ Office of GIS Open Data website and created a surface model. Based upon our review of this data, we have generated mapping and approximated areas of steep slopes, between 10-15%, 15%-25% and those which exceed 25% slopes. We have also overlayed the developer's concept plan for comparison purposes (See Exhibit 1). We have compared these approximated areas of steep slopes with the steep slope regulations per §540-636 and the critical area requirements per §540-624 and find the following:

- The approximate area of steep slopes between 10-15%, 15%-25% and which exceed 25% slopes for the West Nut Swamp Road Site can be found in Table 1.

Table 1 Steep Slopes Analysis – West Nut Swamp Road Site

STEEP SLOPES ANALYSIS			
BLOCK 1045, LOTS 2-4			
STEEP SLOPES RANGE	AREA (S.F.)	AREA (A.C.)	PERCENTAGE OF LOT AREA (%)
10-15%	173,295	3.98	21.3%
15-25%	153,257	3.52	18.8%
>25%	108,567	2.49	13.3%
TOTAL > 10%	435,119	9.99	53.4%

- In accordance with §540-636, a maximum of 30% of the total area of slopes between 10-15% may be used for construction purposes.
 - Approximately 21.3% of the West Nut Swamp Road Site consists of slopes between 10-15%.

After taking into account the overall project limit of disturbance, which includes the Developer's proposed regrading to the bounds of the



property and into wetlands transition areas onsite, we estimate that the proposed development will disturb approximately 85% of these areas onsite, which exceeds that allowed by the Middletown Township Code.

- In accordance with §540-636, disturbance of slopes greater than 15% shall only be permitted where the applicant demonstrates that each disturbance is essential to the reasonable use of the property.
 - Approximately 32.1% of the West Nut Swamp Road Site is slopes greater than 15%.

After taking into account the overall project limit of disturbance, which includes the Developer's proposed regrading to the bounds of the property and into wetlands transition areas onsite, we estimate that the proposed development will disturb approximately 91% of these environmentally sensitive areas onsite.

- In accordance with §540-624, areas of steep slopes greater than 25% are considered Class I Critical Areas.
 - Approximately 13.3% of the West Nut Swamp Road Site are slopes >25%.

After taking into account the overall project limit of disturbance, which includes the Developer's proposed regrading to the bounds of the property and into wetlands transition areas onsite, we estimate that the proposed development will disturb approximately 94% of these environmentally sensitive areas onsite.

NOTE: The Township has enlisted the services of Princeton Hydro (PH) to perform an Environmental Resource Inventory for the site, which includes an analysis of the impact of the proposed Development Concept to steep slopes present onsite. The total square footage/acreage and the percent area of steep slopes identified in the PH report varies slightly from that presented in this report, which can be attributed to the differing LIDAR topographic source data utilized by T&M and PH. However, the results and findings are generally consistent.

ii. Lack of Minimization to Steep Slopes

According to the letter from the Developer's Attorney, the Development Concept has been revised, reducing the number of proposed units from the original 408 multifamily apartments to the current proposal of 115 townhouses and 28 affordable low-rise apartments, totaling 143 units. Despite this reduction, it seems minimal effort has been



made to lessen the disturbance to the site's steep slopes, and in fact, the proposed disturbance seems to have increased.

The earlier iteration of the Development Concept showed wetlands and assumed transition areas based on NJDEP GIS mapping, which was generally more conservative than what was later determined through onsite field delineations and verified by an LOI from NJDEP. It was found that the confirmed wetlands and transition areas within Lot 2 were significantly smaller than what the GIS mapping suggested. Additionally, the verified wetlands and transition areas along the western property line are mostly offsite, whereas the GIS mapping had indicated significant encroachment onto the site.

However, most of these areas where the wetlands and associated transition areas have been reduced, contain significant steep slopes. The current iteration of the Development proposal now proposes further incursion into these areas of steep slopes, thereby increasing the overall disturbance to steep slopes proposed onsite.

iii. Proposal of New Steep Slopes

The Development Concept not only proposes increased disturbance to the existing steep slopes onsite, it also worsens the steep slope condition in many areas, including but not limited to the following locations:

- Along the west side of Conceptual Basin #3, Townhouse Buildings #8 and 10 as well as long the southwest side of the Clubhouse and Pool/Amenity Area, existing steep slopes ranged predominantly from 25-33% slope. **The Development Concept worsens (steepens) steep slopes in these areas in the range of 40-50% slope.**
- Along the east side of retaining walls adjacent to Townhouse Buildings #15-19, existing steep slopes generally range from 10-15%. **The Development Concept worsens steep slopes in these areas in the range of 25-50%.**
- North of Conceptual Basin #2, existing slopes are 15% or less. **The Development Concept worsens (steepens) steep slopes in these areas in the range of 50-80% slope.**

The PH report outlines the numerous negative impacts the proposed disturbance of steep slopes will likely have on the local and downstream environment. **These effects are worsened because the existing steep slope areas to be disturbed are heavily wooded and vegetated. Replacing them with slopes greater than 33% (3:1), which are**

highly prone to erosion, is likely to exacerbate negative downstream environmental impacts.

iv. Comparison to Recent Middletown Planning Board Approvals

RECENT MIDDLETOWN TOWNSHIP PLANNING BOARD APPROVALS

The Developer's Engineer analyzed recent Middletown Planning Board approvals where waivers were granted for exceeding steep slopes and critical area limits, including 911A Navesink River Road, where waivers were granted for slope disturbances deemed essential to the use of the property as a permitted single-family residence. 500 Central Avenue, where a non-conforming commercial use in a residential zone was replaced with permitted single-family residences. Proposed slope disturbances for the 500 Central Avenue project were within previously disturbed/maintained areas onsite and reflected a minimal percentage of the overall tract. T&M also reviewed more recent Middletown Planning Board approvals, where applicants successfully demonstrated reasonable use of the property while significantly limiting impacts to steep slopes onsite. Although disturbance to steep slopes and critical areas were proposed in most cases, significant efforts had been made by applicants to mitigate the environmental impacts of development by minimizing the disturbances proposed, implementing compliant stormwater management infrastructure, matching existing slope grading, reducing or minimizing impervious cover and adhering to both outside regulatory and Township planning and development standards. It does not appear that the Development Concept has made any such effort to minimize disturbance to these areas, and the likelihood that the Developer could minimize without reducing the scale of the development is unlikely. A further detailed account of these recent Planning Board approvals can be found in Appendix A.

2. Wetlands

i. Letter of Interpretation

The Developer has obtained a Freshwater Wetlands Letter of Interpretation: Line Verification, File No.: 1331-06-0004.1, Activity Number: FWW23001, from NJDEP dated August 23, 2023. The LOI confirmed one freshwater wetland and one State open water onsite predominantly within Lot 2, as well as offsite freshwater wetlands, located to the west of the Site. All wetlands were determined to be of intermediate resource value with an associated 50 ft. transition area (buffer). PH has indicated that the onsite state open water does not possess a transition area under N.J.A.C. 7:7A, therefore it will be discussed under further sections pertaining to Flood Hazard Areas and Riparian Zones.



As noted in the PH report, PH performed a separate freshwater wetlands delineation in March 2024, which largely confirmed the findings of the 2023 LOI obtained by the Developer. However, the 2024 delineation identified an additional freshwater wetland along the northwest site border, which PH has identified to be of intermediate resource value with a 50 ft. transition area. This would ultimately need to be verified by an LOI from NJDEP.

ii. Potential Regulatory Impacts

Based on the Development Concept, at a minimum it appears that a transition area averaging plan waiver per NJAC 7:7A-8.2 will be required for the following activities:

- Extensive tree removal, slope grading (35-40% slope) and a 17 ft. high retaining wall is proposed along the northwestern property line, in the vicinity of Townhouse Buildings 8-11, within identified transition areas.
- Tree removal and slope grading is proposed within identified transition areas in the vicinity of Townhouse Building 1, 2, and 7 as well as along the eastern circulation road through the site. This disturbance includes portions of the road and associated retaining wall as well as a portion of Townhouse Building 7 and associated site walks.
- Along the site frontage where roadway widening and sidewalk improvements are proposed on the north side of West Nut Swamp Road in the vicinity of the wetlands associated with the unmapped state open waters as well as wetlands associated with West Nut Swamp Brook.

Additional Freshwater Wetlands General Permits and Individual Permits in accordance with NJAC 7.7A may be required as the Development Concept is furthered to a fully engineered site plan. However, we cannot opine on the full extent of same, as the plans lack details regarding the proposed locations of Outfalls for onsite stormwater management BMPs as well improvements within the West Nut Swamp Road right-of-way. The scope of the Development Concept may need to be reduced to comply with permissible conditions of the regulatory permits that may be required.

3. Flood Hazard Areas and Riparian Zones

i. Presence of Regulated Waters

New Jersey's waters and their floodplains are also regulated under the New Jersey Flood



Hazard Area Control Act Rules (N.J.A.C. 7:13), which establishes regulated flood hazard areas (FHAs) and riparian zones around regulated waters. As can be seen in Exhibit 1, we have reviewed the NJDEP and Monmouth County GIS Data and have depicted the most current stream mapping from the National Hydrography Dataset (NHD).

Per the Princeton Hydro (PH) September 2024 report, the state open water present on Lot 2 is an unmapped and unnamed tributary (UNT) that originates onsite and flows through a culvert that crosses under West Nut Swamp Road, ultimately to Nut Swamp Brook. PH indicates this UNT does not possess a Flood Hazard Area (FHA) but is a regulated water and would likely be assigned a 50 ft. riparian buffer under N.J.A.C. 7:13-4.1.

PH also indicates that segments of the Nut Swamp Brook west and north of the site would also be considered a regulated water under the FHA rules. An associated riparian zone varying from 50 ft. to 300 ft. from top of bank may be assigned. However, further assessment is ultimately required to determine the applicable riparian zone as well as to determine if these waters collect more than 50-acres of contributory drainage area, in which they would have a regulated FHA.

ii. Potential Regulatory Impacts

The Developer has not obtained an FHA Verification from NJDEP to determine whether an FHA is associated with Nut Swamp Brook, and to determine the associated riparian zones. Therefore, it is difficult to opine what specific FHA permits may be required for the onsite improvements.

However, it appears the Developer is proposing the widening of West Nut Swamp Road where it crosses Nut Swamp Brook at Monmouth County culver MT-49A. The widening of the roadway as well as any improvements to the culvert structure that may be required of the Developer by the County, would be regulated under N.J.A.C. 7:13.

In addition, the widening of West Nut Swamp Road and installation of sidewalks, in the vicinity of the UNT culvert crossing to Nut Swamp Brook, would also be regulated under N.J.A.C. 7:13. Additional permits could also be required if the culvert crossing need to be replaced to allow for the proposed roadway widening activities.

SUMMARY & CONCLUSIONS: The Township of Middletown regulates disturbances to environmentally sensitive areas by imposing limits on activities affecting steep slopes (§540-636) and other critical areas (§540-624), including wetlands, wetland transition areas, surface waters, and watercourses present on a site. These regulations aim to protect and prevent negative impacts on downstream environmentally sensitive areas.

Based on this office's review of topographic data, more than 53% of the property is situated on slopes greater than 10%. We estimate the proposed Development Concept will disturb over 88% of the steep slopes greater than 10%, 85% of slopes between 10-15%, 89% of Class II Critical Areas (15-25% slope) and 94% of Class I Critical Areas (>25%) onsite. Overall, this is a disturbance of 91% of all environmentally sensitive steep slopes greater than 15%. Many other recent Planning Board approvals have been able to demonstrate a reasonable use of the property, while minimizing disturbances to these areas. It does not appear that the Development Concept has made any effort to minimize disturbance to these areas. In fact, the disturbance to steep slopes seems to have increased with the current iteration of the Development Concept, and in many cases, exacerbates the existing condition by replacing them with slopes greater than 33% (3:1), which are highly prone to erosion, and which is likely to exacerbate negative downstream environmental impacts.

Freshwater Wetlands (FWW) transition area averaging permits will likely be required for proposed onsite activities within same. Additional FWW permits may likely be required, in association with the proposed stormwater management infrastructure onsite as well as associated with the proposed widening of West Nut Swamp Road. An FHA Verification is required to determine FHAs and applicable riparian zones associated with nearby Nut Swamp Brook and the UNT onsite. It is likely that FHA Permits will be required for the proposed widening of West Nut Swamp Road in the vicinity of the two (2) culvert crossings located along the route. Overall, the Development is still significantly lacking in detail in regard to proposed stormwater management infrastructure.

F. Engineering Concerns with the Proposed Concept Development

1. Site Layout and Design – Conformance with Middletown Regulations

As part of any application to the Township of Middletown Planning or Zoning Board for Site Plan approval, the Developer would be required to demonstrate compliance with Chapter 540 "Planning and Development Regulations" of the Township of Middletown Code, or seek relief from the applicable Board for same. Below is a summary of several provisions of the Code with which the proposed Development Concept does not appear to comply with:

i. Location of Multi-Family Development

- §540-604 of the code provides design standards and guidelines to assist the Middletown Township Planning and Zoning Board in the review of specific proposals for residential development. §540-604C(5) specifies that multifamily

housing should be located in proximity to convenience services. Convenience Services commonly include, but are not limited to the following:

- Convenience Stores: Small retail shops that offer everyday items like groceries, snacks, beverages, and basic household goods. **Although Bell Works includes a convenience store, it is at least a 34-minute walk from the site, and the nearest sidewalk for pedestrians is 0.6 miles away. The closest grocery store is the ACME Markets on Newman Springs Road in Lincroft, which requires over a 1 hour and 23-minute walk from the site. There is no mass transit to this location, and the nearest continuous sidewalk along West Front Street is 1.9 miles away, or about a 40-minute walk from the site.**
- Banks or ATMs: Financial services offering everyday banking transactions. **Although Bell Works houses an Ocean First Bank, it is at least a 34-minute walk from the site, with the nearest sidewalk 0.6 miles away. The next five closest banks are all more than a 1 hour and 20-minute walk from the site. Sidewalks along these routes are either limited or nonexistent, and there is no mass transit available to reach these locations.**
- Pharmacies: Stores that provide prescription medications and over-the-counter health products. **The nearest pharmacy is Holmdel Village Pharmacy on Holmdel Road, located over 3.1 miles from the site, which takes about 1 hour and 9 minutes to walk. The route lacks sidewalks for most of the distance.**

ii. Steep Slope and Critical Area Regulations

- The Development Concept does not comply with the Slope Regulations as set forth in §540-636. **The Development Concept disturbs more than 85% of slopes greater than 10% on the property, which is driven by the scale of the proposed development. The Development Concept cannot comply with the Township's Slope Regulations for this reason. Please refer to the section of this report pertaining to "Steep Slopes".**
- The Development Concept does not comply with Critical Area requirements as set forth in §540-624. **The Development Concept disturbs 89% of Class II Critical Areas (15-25% slope) and 94% of Class I Critical Areas (slopes >25%) on the property, which is driven by the scale of the proposed development. Please refer to the section of this report pertaining to "Steep Slopes". Overall, this is a**

disturbance of 91% of all environmentally sensitive steep slopes greater than 15%.

iii. Open Space

- The Development Concept prepared by the Developer's Engineer purports that 12.25 ac. (65.7%) of the Lot Area is to be set aside as Open Space/Pervious Space. However, this calculation is flawed for the following reasons:
 - **Lot Coverage (Impervious Coverage) calculations are significantly underestimated, as outlined in the following section of this report (Section F.1.iv).**
 - The Township's definition for Open Space limits areas of wetlands, open bodies of water or watercourses, slopes greater than 25%, SWM Basins, drainage swales and other drainage infrastructure, to not more than 50% of the area set aside for Open Space. **The site's open areas include state open waters, wetlands with transition areas, and both existing and proposed slopes greater than 25%. No calculations have been provided by the Developer to show compliance with this restriction.**

iv. R-45 Zone Bulk Standards

- The Development does not comply with the following R-45 zone bulk standards set forth in §540-908:
 - A 50 ft. front yard setback is required to the principal structure whereas Townhouse Building #1 is proposed ±20.5 ft from the West Nut Swamp Road ROW line after dedication. **The Development Concept does not comply. To achieve compliance, the building would need to be shifted 29.5 ft. further into the site, which would conflict directly with Townhouse Building #2, necessitating the elimination of some townhouse units.**
 - A 50 ft. rear yard setback is required to the principal structure whereas several structures are proposed with a 25 ft. setback. **The Development Concept does not comply. To achieve compliance, the following buildings would need to be moved 25 feet further into the site:**



- Townhouse Building #11 is proposed with a 25 ft. rear yard setback. **If this building were shifted to achieve compliance, at least one townhouse unit and associated driveway would be in conflict with the proposed roadway and sidewalk, requiring elimination of at least one unit, or further shifting of improvements into areas of onsite steep slopes.**
 - Townhouse Building #12 is proposed with a 25 ft. rear yard setback. **If this building were shifted to achieve compliance, at least one townhouse unit and associated driveway would be in conflict with the proposed visitor parking area and sidewalk, requiring elimination of the unit to maintain the parking area and sidewalk, or further shifting of improvements into areas of onsite steep slopes.**
 - Townhouse Building #15 is proposed with a 25 ft. rear yard setback. **If this building were shifted to achieve compliance, this would reduce the setback between Townhouse Building #15 and #16 from 30 ft. to 5 ft. and could create fire access limitations.**
- A maximum Building Coverage of 8% is permitted whereas the Development Concept indicates 15.1% is proposed. **Furthermore, a Lot Area of 813,129 sf was used for the calculation. This lot area is measured to the centerline of West Nut Swamp Road. The Development Concept depicts a 25 ft wide (±30,444 sf) ROW dedication. Therefore, the Lot Area after dedication would be 782,685 sf (17.97 ac), and result in a proposed building coverage of 15.7%.**

The Development Concept does not comply with building coverage requirements. Building Coverage directly contributes to the rate and volume of Stormwater Runoff generated by a site. As noted in the PH report, this can lead to downstream issues such as stream bank erosion, stream migration and stability issues, and flooding.

- A maximum Lot Coverage of 15% is permitted whereas the Development Concept indicates 34.3% is proposed. Furthermore, the impervious coverage, as calculated on the Development Concept, is significantly underestimated as detailed below:
 - A Lot Area of 813,129 sf was used; however, this lot area is measured to the centerline of West Nut Swamp Road. The Development Concepts depict a 25 ft wide (±30,444 sf) ROW

dedication. Therefore, the Lot Area after dedication would be 782,685 sf (17.97 ac).

- The Development Concept states the proposed impervious coverage is 279,684 sf (6.42 ac). However, this office calculated $\pm 283,350$ sf (± 6.50 ac) for just the buildings, roads, on-street parking and driveways. **Including the proposed sidewalk as currently shown on the Development Concept, the proposed impervious coverage would be $\pm 300,500$ sf (6.90 ac) which equates to $\pm 38.4\%$.**
- Per RSIS §5:21-4.2 – Table 4.3, sidewalks are required on both sides of all streets whereas same is not provided. **The Development Concept does not comply. Providing sidewalk on both sides of all streets will increase the impervious coverage.**
- The Development Concept depicts 3 ft wide sidewalks. **As further detailed in the “Access and Circulation” section of this report, to comply with ADA requirements the sidewalk would need to be widened to 5 ft and/or 4 ft with passing spaces. These revisions will increase the proposed impervious coverage.**
- The impervious coverage calculation also does not account for several improvements that will be required and/or will likely be proposed including:
 - Pump station.
 - Structures for other utilities (transformer pads, building mechanicals, etc.)
 - Patios/decks to the rear of the Townhouses.
 - Curbing.
 - Impervious coverage associated with the proposed 8,000 sf pool/amenity space.
 - Impervious coverage associated with the proposed children play areas, bench and planting areas, and other proposed amenity spaces depicted on the Development Concept.
 - Retaining walls.
 - Cluster mailboxes.
 - Emergency access roads.
 - SWM Basin access roads.

The Development Concept does not comply with impervious coverage requirements. As noted in the PH report, this can lead to negative downstream impacts such as stream bank erosion, stream migration and

stability issues, flooding, non-point source water pollution, and a reduction of water quality.

- A maximum building height of 2-1/2 stories and 35 ft. is permitted. We note the following:
 - **All 115 Market Rate Townhouses and all 28 Affordable Buildings proposed do not comply. The renderings provided by the Developer for the Market Rate Townhouses and Affordable Buildings are 3 stories in height.**
 - The Township code defines building height as “The vertical distance measured from the average elevation of the existing predevelopment grade and/or highest adjacent grade as defined herein at the four corners of the smallest possible square or rectangle encompassing the proposed building to the mean height level of the distance measured between the eaves and ridge for gable and hip roofs.” **Based on the Cut & Fill Analysis provided by the Developer’s Engineer, we note the following:**
 - **Affordable Building #20 is proposed in 8.5-9.0 ft. of fill as measured from the average of the four corners.**
 - **Townhouse Building #11 is proposed in 4.5-5.0 ft. of fill as measured from the average of the four corners.**
 - **Townhouse Building #12 is proposed in 4.0-5.0 ft. of fill as measured from the average of the four corners.**

The Developer has not provided any architectural plans nor elevations (to scale) for these buildings. However, due to the proposed amount of fill, it is likely that a building height variance, and possibly a d(6) height variance, may be required for Affordable Building #20, Townhouse Building #11 and Townhouse Building #12 for non-compliance with the R-45 zone standards.

v. Earthwork and Grading

- Per §540-616B, all fences shall be set back a minimum of three feet from the top of a structural retaining wall. Any fence proximate to or associated with a structural retaining wall shall be set back at least 15 feet from a property line. **The Development Concept does not comply as detailed below:**



- The retaining wall north and west of Townhouse Building #11 is proposed to be positioned less than 3 feet from the side property line and less than 10 feet from the rear property line. Additionally, portions of the associated fence would be less than 15 feet from the property lines. **To comply, Townhouse Building #11 would need to be moved further into the site.**
- The retaining wall to the west of Townhouse Building #12 is proposed with a zero-foot setback from the rear property line. Also, portions of the associated fence would be less than 15 feet from the property line. **To comply, Townhouse Building #12 would need to be moved further into the site.**
- The retaining wall along the eastern property line is proposed to be 9 ft. from the side property line. The accompanying fence would be 6 ft. or closer to the side property line. **To comply, the fence, wall, and Townhouse Buildings #15, 16, 17, and 18 would need to be shifted at least 9 ft. further into the site. Shifting Buildings #15 and 16 along with associated driveways to the west to comply, would put their associated driveways and roadway in conflict with Townhouse Building #14 (8 units) and their associated driveways. Shifting Building #17 and 18 along with the associated driveway to the west to comply would conflict with the proposed roadway. For the roadway to be shifted to eliminate this encroachment, it would result in additional impacts to the wetlands transition areas onsite.**
- The retaining wall surrounding Affordable Building #19 is proposed to be as close as 5 ft. to the side property line, with the associated fence being 2 feet or closer. **To comply, the fence, wall, and building would need to be shifted at least 13 ft. further into the site. Building #19 along with the associated driveways would conflict with the proposed roadway and visitor parking. For the roadway and visitor parking to be shifted to eliminate this encroachment, it would result in additional impacts to the wetlands transition areas onsite.**
- Structural retaining walls are not permitted to exceed three (3) feet in height within a required setback area in accordance with §540-616l(1). **The Development Concept does not comply as detailed below:**
 - The retaining wall to the north and west of Townhouse Building #11 is proposed to be less than 3 ft. from the side property line and less than 10 ft. from the rear property line, and it exceeds 3 feet in height. **To comply with the R-45 setback requirements, Townhouse Building #11 would need to be relocated at least 22 ft. from the side property line and 40 feet**

from the rear property line. At least 1-2 townhouse units and associated driveway would be in conflict with the proposed roadway and sidewalk, requiring elimination of the unit, or further shifting of improvements into areas of onsite steep slopes.

- The retaining wall to the west of Townhouse Building #12 is proposed with a zero (0) ft. setback from the rear property line. **To comply with the R-45 setback requirements, Townhouse Building #12 would need to be shifted 50 ft. further into the site. At least 1-2 townhouse units and associated driveway would be in conflict with the proposed roadway and sidewalk, requiring elimination of the unit, or further shifting of improvements into areas of onsite steep slopes.**
- The retaining wall along the eastern property line is proposed 9 ft. from the side property line. **To comply with the R-45 setback requirements, Townhouse Buildings #15, 16, 17 & 18 along with the associated driveway and adjacent roadway would need to be shifted 16 ft. further into the site. The shifting of Buildings #15 and #16 would require the entirety of Townhouse Building #14 (8 units) to be eliminated, the shifting of Townhouse Buildings #17 and 18 and would result in further impact to wetlands transition areas.**
- The retaining wall surrounding Affordable Building #19 is proposed as close as 5 ft. to the side property line. **To comply with the R-45 setback requirements, Affordable Building #19 would need to be shifted at least 20 feet further into the site. Affordable Building #19, its associated driveways and adjacent roadway and visitor parking would then be shifted further into the site, which would create further impacts to the wetlands and associated transition areas.**
- No fence or wall shall be erected so as to encroach upon a public right-of-way in accordance with §540-616l(1). **The Development Concept does not comply. The retaining wall to the northeast of Affordable Building #19 is proposed as close as 5 ft. to the side property line (Garden State Parkway right-of-way). As proposed, the geogrid reinforcing for this wall would likely extend into Garden State Parkway right-of-way.**

vi. Pedestrian Access and Circulation

The Development Concept does not comply with Township code, Residential Site Improvement Standards (RSIS, §5:21), and Americans with Disabilities Act (ADA) requirements as noted below:



- Sidewalks with a minimum width of four feet and a minimum thickness of four inches shall be provided in all parking areas for five or more vehicles, between parking areas and principal structures, along aisles and driveways, and wherever pedestrian traffic shall occur, in accordance with §540-603F. **The Development Concept does not comply as it depicts 3 ft. wide sidewalk and lacks sidewalks connecting several visitor parking areas to the various buildings.**
- The Development Concept does not comply with RSIS (§5:21) requirements for sidewalks as noted below:
 - In accordance with §5:21-4.2 – Table 4.3, sidewalks are required on both sides of all streets. **The Development Concept does not comply, as sidewalk is only proposed on one side of the street in most areas.**
 - In accordance with §5:21-4.16(d), where sidewalks abut curb, the sidewalk shall be at least 6 ft. wide. **The Development Concept does not comply as all proposed sidewalk that abuts curbing is 3 ft. wide.**
- The Development Concept does not comply with the ADA requirements for sidewalks as noted below:
 - The grade of the pedestrian access routes shall not exceed 1:20 (5.0%). **The Development Concept does not comply. Slopes of up to 20% are proposed along internal site roadways. Therefore, the sidewalks depicted adjacent to roadways which exceed 5% will not be ADA compliant. Any site plan would need to be revised to comply with these requirements.**
 - The cross slope of a pedestrian access route not contained within a crosswalk shall be 1:48 (2.1%) maximum. **The Development Concept does not comply. Several areas of proposed sidewalk exceed 2.1% cross slope.**
 - The continuous clear width of pedestrian access routes shall be 48 inches (4 ft) minimum, exclusive of the width of any curb. Additionally, where the clear width of pedestrian access routes is less than 60 inches (5 ft), passing spaces shall be provided at intervals of 200 feet maximum. Passing spaces shall be 60 inches (5 ft) minimum by 60 inches (5 ft) minimum. **The Development Concept does not comply. The proposed sidewalk on the Development Concept is 3 ft wide. At a minimum, sidewalk would need to be widened to 4 ft and passing spaces provided.**

For the Development Concept to comply with Township Ordinance, RSIS, and ADA requirements, a substantial increase to the amount (width and location) of

sidewalk proposed is required. For the Developer to provide this infrastructure, it would increase the Lot Coverage (Impervious Coverage), which already exceeds the 15% maximum allowed in the R-45 zone. The PH report highlights negative effects on downstream areas from stormwater runoff caused by land development and impervious surfaces. In addition, to comply with ADA slope requirements, significant modification to the site layout is required, which may impact site layout and could reduce the number of buildings proposed.

vii. Landscape Buffering

- §540-606 of the Township code requires a 50 ft. buffer around the perimeter of all multi-family zoned properties. **The absence of such a buffer along the property's frontage and side property lines would:**
 - Heighten the visual impact of the proposed development on neighboring properties.
 - The visual impact is worsened as the Development Concept proposes the complete removal of all existing mature wooded vegetation and specimen trees within these areas (See following section regarding “Tree Clearing”).
 - The absence of a buffer would worsen the impact of the non-compliant building height on the air, light, and open space available to neighboring properties. This is especially true for properties on the south side of West Nut Swamp Road, which are at a lower elevation than the subject site.
 - The Developer’s rendering for the proposed Affordable buildings depicts balconies. Notably, renderings of the rear elevations were not provided. **Should balconies be proposed at the rear of Affordable Building #20, the lack of buffer will impact the right to privacy, particularly for those properties on the south side of West Nut Swamp Road, which are at a lower elevation than the subject site. This is further exacerbated as the finished first floor for Building #20 is proposed to be 8.5-9.0 ft. above existing grade and the proposed Stormwater Management Basin #5 prevents any realistic opportunity for landscape buffer screening.**

To achieve compliance with landscape buffer requirements, the proposed improvements would need to be shifted, as much as 50 ft. in some instances, further into the site, which would require significant changes to the proposed building and site layout and would result in the elimination of townhouse/affordable units and possibly entire buildings.



- **Along the West Nut Swamp Road frontage:**
 - Conceptual Basin #4 would be located within the required 50 ft. buffer. Shifting the basin to the north would put it in direct conflict with Townhouse Building #3 (6 units).
 - Conceptual Basin #5 would be located within the required 50 ft. buffer as well as the proposed right-of-way dedication. Shifting the basin to the north would put it in direct conflict with Affordable Building #20 (at least 12 units).
 - 3 units within Townhouse Building #1 are located within the required 50 ft. buffer.
 - Approximately 2,500 s.f. of the Pool/Amenity space would be located within the required 50 ft. buffer. Eliminating same would reduce recreational amenities to the residents. Maintaining the footprint and shifting into the site would put it in conflict with the clubhouse and associated parking area.
- **Along the western property line:**
 - Approximately 1,400 s.f. of the Pool/Amenity space would be located within the required 50 ft. buffer. Eliminating same would reduce recreational amenities to the residents. Maintaining the footprint and shifting into the site would put it in conflict with the clubhouse and associated parking area.
 - Approximately 850 s.f. of the clubhouse would be located within the required 50 ft. buffer. Eliminating same would reduce amenities to the residents. Maintaining the footprint and shifting into the site would put it in conflict with the associated parking area, resulting in a reduction in parking spaces.
 - Elimination of the proposed steep slope grading behind Townhouse Building #8 and 10 within the required 50 ft. buffer would require the proposed retaining wall height to be significantly increased, or required additional tiered retaining walls, which would require shifting of these Townhouse units and associated driveways with the roadway.
- **Along the northern property line:**
 - Townhouse Buildings #11-14 would be located within the required 50 ft. buffer. Shifting these buildings to the south to eliminate the encroachment would conflict with the roadway and visitor parking, and would require elimination of up to 8 units, or further shifting of improvements into areas of onsite steep slopes.



- Conceptual Basin 2 and the conflicting roadway would be located within the required 50 ft. buffer. These would have to be eliminated completely, or shifted to the south, which would conflict with up to 4 units, or further shifting of improvements into areas of onsite steep slopes.
- Along the eastern property line:
 - Townhouse Building #15, 16 and associated retaining walls would be located within the required 50 ft. buffer. Shifting these improvements to the west to comply, would put their associated driveway and roadway in conflict with Townhouse Building #14 (8 units) and their associated driveways.
 - Townhouse Buildings #17, 18, and Affordable Building #19, along with their associated retaining walls are located within the required 50 ft. buffer. Shifting these improvements to the west to comply would result in the shifting of the associated driveways, roadways and visitor parking west, further impacting onsite wetlands and associated buffers.
 - The proposed retaining wall located to the northeast of Affordable Building #20 along with the associated roadway and visitor parking is located within the required 50 ft. buffer. Shifting these improvements to the west would result in further impacts to onsite wetlands and associated buffers.

viii. Tree Clearing

- In accordance with §540-651A, in all districts in the Township where the maximum percent of lot coverage is 15% or less, no more than 20% of such wooded areas within the net tract area may be cleared or developed. The remaining 80% shall be maintained as permanent open space or preserved within the lot. **As can be seen from Exhibit 2, based upon our review of June 2024 NearMap Aerial Imagery, we approximate that the proposed Development Concept will result in the clearing of ±688,500 s.f. which equates to approximately 92.7% and 84.5% of the Lot Area by Tax Map and Deed Plotting, respectively. This Tree Clearing could increase should additional residential amenities such as decks and patios be proposed adjacent to Townhouse Buildings #1, 2 and 7. This is concerning as trees provide many benefits to the ecosystem including but not limited to:**
 - Trees are critical habitats for wildlife, birds, and insects. Clearing trees can lead to the displacement of animal species and a reduction in biodiversity. **This is concerning as, per the PH report, approximately half of the site is**

mapped as Rank 1 or Rank 3 Threatened and Endangered Species Habitat.

- Trees stabilize soil with their roots. Removing them increases the risk of soil erosion, which can lead to sediment buildup in nearby waterways, negatively affecting aquatic habitats. **This is concerning as the Development Concept proposes to disturb more than 88% of the steep slopes greater than 10% onsite, and the PH report shows a significant number of specimen trees within these areas, which will be removed as a result of the development.**
- Trees play a vital role in filtering air by absorbing pollutants and carbon dioxide while releasing oxygen. Removing trees diminishes air purification and carbon sequestration capabilities. **This is of particular concern as trees act as carbon sinks, storing carbon that would otherwise contribute to climate change. The negative effect is further compounded as the development will result in increased motor vehicle trips, which are a significant generator of greenhouse gases.**
- Trees absorb significant amounts of rainwater. Their removal leads to increased surface runoff, raising the risk of flooding in developed and surrounding areas. **This effect is compounded as the Development Concept does not demonstrate compliance with both NJDEPs and the Township's stormwater management regulations. Nut Swamp Brook is located to the south and west of the site, and may have associated Flood Hazard Areas, which may be impacted as a result of the development.**

SUMMARY & CONCLUSIONS: The Development Concept significantly lacks compliance with the Township's Planning and Development Regulations. The site is not well-located in proximity to convenience services, which does not adhere to the guidelines at §540-604C(5). The project disturbs steep slopes in violation of Township regulations, impacting over 85% of slopes greater than 10% and over 89% and 94% of Class II and I Critical Areas, which risks soil erosion and other environmental issues. Overall, this is a disturbance of 91% of all environmentally sensitive steep slopes greater than 15%. It does not appear that the Developer has made any effort to minimize disturbances in those regards. The Developer's open space calculation is inaccurate, underestimating impervious coverage and does not demonstrate compliance with maximum allowable percentages of open space to be occupied by watercourses, wetlands, steep slopes, etc. Furthermore, the plan fails to comply with R-45 zone standards for building coverage, lot coverage, principal setbacks, and building height as well as minimum setback requirements for retaining wall and associated fencing from property lines, all of which would require potentially extensive reconfiguration to meet these

standards and in some cases would result in a reduction in units proposed, in other cases, further impacts to wetlands and associated transition areas onsite.

The Development Concept also lacks sidewalks of sufficient width and location to demonstrate compliance with Township code and the Residential Site Improvement Standards (RSIS, §5:21). Compliance would result in an increase in lot coverage, which already exceeds the R-45 zone permissible limits. Sidewalk slopes also exceeds Americans with Disabilities Act (ADA) requirements, which creates safety issues. The project lacks sufficient landscape buffer widths, as required by Township Code for multi-family development. This, along with non-compliance with building height limitations, increases impacts neighboring properties' privacy, and heightens visual impacts. Tree clearing, which would affect over 92% of the lot, poses environmental concerns, including habitat loss, erosion, and increased flood risks. This large-scale tree removal, coupled with non-compliance in stormwater management, further exacerbates threats to local ecosystems and air quality. Overall, the lack of compliance by the Development Concept with Township regulations raises significant concerns regarding the visual and environmental impact to neighboring properties, downstream water courses and downstream environmentally sensitive areas.

2. Building Layout/Configuration

The Development Concept proposes eighteen (18) market rate townhouse buildings and two (2) affordable buildings. Below is a summary of several provisions of the Township's Architectural and Building Design Standards (§540-604) with which the proposed Development Concept does not appear to comply:

i. Building Setback Variation

- Building setbacks should be varied to the extent practicable in order to provide an interesting interplay of buildings and open spaces, in accordance with §540-604B(4). **The Development Concept does not comply. No building setback variation is proposed throughout the development. The Developer's placement of buildings in a rowhouse orientation and their proximity to sidewalks, roads, and rear retaining walls does not allow for significant variation in setbacks.**

ii. Articulation

- Buildings shall be designed to avoid long, straight, unbroken lines, in accordance with §540-604C(6). **The Development Concept does not comply because it lacks building projections or recesses throughout the development. The proximity of the townhouse buildings to the rear retaining walls, along with the proposed minimum driveway length according to RSIS standards, suggests that the layout**



cannot accommodate any building projections or recesses. These issues stem from the Developer's chosen placement of the proposed improvements.

iii. Building Design Variation

- Each development in excess of 100 dwelling units shall contain at least three substantially different, yet architecturally compatible, principal building design and elevations, in accordance with §540-604C(8). **The Development Concept does not comply. The Developer has provided one (1) Market Rate Townhouse example and one (1) Affordable Building example; however, at least three (3) substantially different, yet architecturally compatible designs would be required. Incorporating a third design of varying footprint would likely impact the layout and potentially the number of dwelling units that could be accommodated in the site layout.**

iv. Other Issues

We also note the following issues regarding the proposed building layout/configuration, as depicted on the Development Concept:

- The proposed number of affordable units is unclear. While the Development Concept mentions that 28 affordable units will be provided, the plan appears to show only 20 units. **Accommodating 28 units may require adding extra building stories, which would worsen the non-compliance with R-45 zone height limitations. Additionally, since Affordable Building #20 is planned on significant fill, this may necessitate a d(6) height variance.**
- **If only 20 affordable units are proposed, the Development Concept would not meet the Council on Affordable Housing's (COAH) minimum 15% set-aside requirement for rental units. This is because 20 affordable units would account for only 14.8% of the total 135 dwelling units.**
- The Development Concept does not contemplate the need for patios or decks at the rear of the proposed buildings. **The inclusion of same would exacerbate Lot Cover.**
- We have concerns about the viability of Townhouse Building #7 from a public safety standpoint. **The driveways for Building #7 are directly next to and at a 90-degree angle to those of Townhouse Building #6, causing line-of-sight problems for both drivers and pedestrians. Vehicles exiting these driveways would also need to perform multi-point turns to leave the site.**
- Affordable Building #19 is proposed to be significantly lower than the surrounding ground level, necessitating the construction of substantial retaining walls on three sides. **These walls range from 10 to 17 ft. in height. Being close to such large**

retaining walls will impact the availability of adequate air, light, and open space for the building's residents, which disproportionately impacts low- and moderate-income residents compared to the market rate Townhouse Buildings proposed.

SUMMARY & CONCLUSIONS: The Development Concept presents several compliance issues with the Township's Architectural and Building Design Standards (§540-604). The plan lacks building setback variation, articulation, and diversity of building design. Furthermore, the proposal includes ambiguities concerning the number of affordable units proposed; while 28 are mentioned, only 20 appear to be shown on the plan, risking non-compliance with COAH's 15% set-aside requirement for rentals. The layout also doesn't accommodate rear patios or decks, which could further increase lot coverage which already exceeds permissible limits. Safety concerns arise from the awkward driveway configuration of Townhouse Building #7 and significant retaining wall heights around Affordable Building #19 will likely affect air, light, and open space to the residents of that building. These issues highlight a need for substantial redesign to comply with regulations, which may reduce the number of units possible on the site.

3. Site Access – Conformance with Residential Site Improvement Standards (RSIS)

The site is situated on the northern side of West Nut Swamp Road. The Development Concept proposes three (3) access roads from the site to West Nut Swamp Road. Access to the site is subject to the requirements of the Residential Site Improvement Standards (RSIS).

i. New Streets

- Per RSIS Section 5:21-4.19(a)2 – Table 4.6, the maximum allowable grade for residential access and neighborhood streets is 12%, but can be increased by 2%, up to 14% maximum, where terrain makes it necessary. Additionally, §5:21-4.19(b)4 states intersections shall be designed with a flat grade wherever practical. **We note the following non-compliance and layout issues:**
 - The westernmost site access is proposed with a ± 25 slope at the intersection with West Nut Swamp Road. **This does not comply with RSIS. In addition, the Development Concept also proposes more than 3 ft. of fill at this point on West Nut Swamp Road, which would:**
 - **Adversely affect the residential properties located on the south side of West Nut Swamp Road as it would require significant regrading disturbance of the roadway shoulder onto private property. This would create significantly steep driveway slopes impacting resident access, alter the natural drainage course and also impact regulated drainage features on these properties,**

which would require approvals from the property owners on the south side of West Nut Swamp Road as well as NJDEP.

- Furthermore, if the westernmost driveway were adjusted to match the existing grade of West Nut Swamp Road in order to mitigate the above noted adverse impacts to adjacent properties, its slope would increase to approximately 50%. **To comply with RSIS slope requirements, this site access would either need to be removed or would require significant regrading and changes to the site layout.**
- The easternmost site access is proposed with approximately 15% slope at the intersection with West Nut Swamp Road. **The site access would need to be revised to comply with RSIS requirements.**

ii. Roadway Widening

- The Development Concept does not clearly indicate this, but it appears to show proposed grading for the widening West Nut Swamp Road to 24 feet. **We cannot determine whether a 24-foot cartway width for West Nut Swamp complies with RSIS, as the Developer has not provided any estimated Annual Daily Traffic (ADT) data for the proposed Development. However, we note the following issues related to the proposed road widening:**
 - The proposed grading for West Nut Swamp Road does not properly tie to the existing roadway grading. **The proposed grading shows West Nut Swamp Road to be raised by about 3 ft. The Development Concept also fails to show the impacts on adjacent properties, especially on the south side of West Nut Swamp Road near the proposed westernmost new street access to the site, where the impacts will be extensive in many areas. As noted, it would require significant regrading disturbance of the roadway shoulder onto private property. This would create significantly steep driveway slopes impacting resident access, alter the natural drainage course and also impact regulated drainage features on these properties, which would require approvals from the property owners on the south side of West Nut Swamp Road as well as NJDEP.**
 -
 - Widening of West Nut Swamp Road would result in a significant increase in impervious coverage. **However, the Development Concept does not depict any additional stormwater management infrastructure or culvert upgrades to address the increased runoff from roadway widening.**
- The Development Concept proposed a roundabout where the easternmost site access street meets West Nut Swamp Road. **This cuts off access to the driveway which provides access to Lot 1. This will negatively impact the property owner of Lot 1.**



- **The Development Concept lacks proposed sidewalk access from the site frontage to Crawfords Corner Road (C.R. 52), which underscores the limited pedestrian access to mass transit, places of work, and convenience services.**

SUMMARY & CONCLUSIONS: The Development Concept does not comply with RSIS requirements for new streets, specifically at 2 of the 3 proposed street access points to West Nut Swamp Road. The Developer proposes a 25% slope at the westernmost access, far above the 14% maximum permitted, requiring either removal of the access point or extensive regrading and modification to the site layout to meet standards. Proposed grading does not appropriately tie in with existing roadway topography, as over 3 ft. of fill is proposed, which will significantly impact properties, particularly those to the south. It would require significant regrading disturbance of the roadway shoulder onto private property. This would create significantly steep driveway slopes impacting resident access, alter the natural drainage course and also impact regulated drainage features on these properties, which would require approvals from the property owners on the south side of West Nut Swamp Road as well as NJDEP. If the new street access were to be adjusted to match existing grade at West Nut Swamp Road, this would result in an even steeper and more non-compliant 50% slope.

The plan appears to indicate proposed widening of West Nut Swamp Road to 24 feet, but the plans do not clearly indicate same. In addition, the Developer has not provided any estimated Average Daily Traffic (ADT) data to enable review of RSIS compliance. Furthermore, widening would increase impervious surfaces and the Development Concept does not demonstrate that adequate stormwater management infrastructure has been provided, posing environmental issues from stormwater runoff. Overall, significant modifications to the site layout and grading are needed to comply with the applicable RSIS regulations and to mitigate negative impacts to neighboring properties. This would include significant regrading disturbance of the roadway shoulder onto private property, creating significantly steep driveway slopes impacting resident access, altering the natural drainage course and also impacting regulated drainage features on these properties, which would require approvals from the property owners on the south side of West Nut Swamp Road as well as NJDEP. The Development Concept lacks proposed sidewalk access from the site frontage to Crawfords Corner Road (C.R. 52), which underscores the limited pedestrian access to mass transit, places of work, and convenience services.

4. Site Circulation

i. Fire Access Requirements

- As part of any application to the Township of Middletown Planning or Zoning Board for Site Plan approval, the Developer would be required to provide Circulation Plans demonstrating that the proposed site layout provides adequate circulation for various design vehicles anticipated to frequent the site. This would

typically include a Circulation Plan for the Middletown Township Fire Truck Design Vehicle (E-One 95 Platform Cyclone II Chassis with Aerial Ladder). **We are concerned that the proposed site layout may prevent adequate fire access throughout the site, and may not provide adequate proximity to all sides of all buildings, as required per IFC 2021. Circulation plans will need to be provided for review of the Township Fire Official to determine whether adequate fire access has been provided throughout the site.**

- Appendix D of the 2021 International Fire Code (IFC) limits fire apparatus access roads to a maximum slope of 10%, although exceptions can be made for steeper grades “as approved by the Fire Code official”. **As detailed later in this section, there are several areas on the internal roads proposed with slopes greater than 10%, which also exceed RSIS maximum permitted slope. Without an exception from the Fire Code Official, significant revisions to the site layout and grading may be required.**
 - As part of any Site Plan application, the Developer would be required to submit to the Fire Official for review and approval. **We are concerned with the absence of a turnaround for fire and other emergency vehicles at the end of the proposed street between Townhouse Buildings #11 and #12, near Townhouse Building #7, and between Affordable Buildings #19 and #20. The Fire Code Official may require additional emergency access roads, which would further increase Lot Cover which already exceeds permissible limits. Additionally, the proposed site grading and retaining walls might obstruct the installation of such roads without significant modifications to the site layout.**

ii. Conformance with Residential Site Improvement Standards (RSIS)

- The Site Suitability Summary prepared by the Developer’s Engineer states “The grading and layout exhibit dated 7-15-24 for the Conceptual Residential Development generally provides a maximum grade of 5 percent on roadways with building frontage, and a maximum grade of 12 percent on roadways with no building frontage. As such, the roadway grading is consistent with RSIS requirements.” **As noted previously, RSIS §5:21-4.19(a)2 specifies that the maximum allowable grade (slope) for residential access and neighborhood streets is 14% (12% + 2% increase where terrain makes it necessary). The Development Concept does not comply as follows:**
 - Approximately 20% slope is proposed along the new street/road between the Clubhouse and Townhouse Building #4. **This does not comply with RSIS and is a safety concern.**

- Greater than 14% slope is proposed along the new street/road, in the vicinity of Townhouse Buildings #19 and 20. **This does not comply with RSIS and is a safety concern.**
 - As noted previously, the westernmost and easternmost new street/road access to West Nut Swamp Road also exceeds 14%. **This does not comply with RSIS and is a safety concern.**
- Per RSIS §5:21-4.19(b)1, street intersections shall be as nearly at right angles as possible and in no case shall be less than 75 degrees.
 - **The intersection in the vicinity of Townhouse Buildings #2 and 5 is proposed at an angle of 52 degrees. This does not comply with RSIS and is a safety concern.**
 - **The intersection in the vicinity of Townhouse Building #18 and Affordable Building #19 has an angle of 31 degrees. This does not comply with RSIS and is a safety concern.**

iii. Conformance with NJ Statute Title 39

- It is not uncommon for municipal jurisdictions in NJ to require, as a condition of a Planning or Zoning Board site plan approval, that Multi-Family Developments with private roadways be subject to NJ Statute Title 39, which governs Motor Vehicles and Traffic Regulation. **Per §39:4-138h, No Parking, Stopping, or Standing is permitted within 50 feet of a Stop Sign.**
 - It appears the 4 parking spaces located to the northeast of Townhouse Building #3 are located within 50 ft. of an anticipated stop sign location. **This does not comply with Title 39.**
 - It appears that at least 2-4 parking spaces located in the vicinity of Affordable Building #19 and #20 are located within 50 ft. of an anticipated stop sign location. **This does not comply with Title 39.**

SUMMARY & CONCLUSIONS: The Development Concept faces several compliance and safety issues. Slopes on several of the internal roads exceed the 10% limit set by the IFC as well as the 14% maximum set by RSIS, raising safety concerns. Further, the lack of fire and emergency vehicle turnarounds in several locations may restrict access to all sides of the buildings, including between the Affordable Housing Buildings, which is concerning, and ultimately subject to review and approval by the Fire Code Official. The potential need for more emergency access roads may conflict with proposed grading and location of retaining walls, and would further increase the proposed lot coverage, which already exceeds permissible limits. Proposed parking throughout the site also violates the minimum 50 ft. separation from anticipated stop sign locations should Title 39 enforcement be required by the approving agency. In addition, several of the onsite intersections are at sharper angles than what is permitted by RSIS, including in the vicinity of Affordable Building #19. These issues

demonstrate significant deviations from safety and regulatory standards, necessitating critical revisions to the development plan to ensure compliance and safety. Such changes may likely result in a reduction of the number of units that can be accommodated onsite.

5. Parking

- The letter correspondence from the Developer's Attorney states that 115 townhouse units and 28 affordable low-rise apartments are proposed. The letter also states "All of the townhouse units and approximately 80% of the affordable units will be equipped with garages. None of the units will have basements. 230 resident parking spaces and 82 visitor parking spaces are proposed for a total of 312 spaces, which is compliant with RSIS standards." **The Developer has not provided details on the expected number of bedrooms per unit. This lack of information makes it difficult to assess whether the proposed parking layout is adequate or not. This information should be provided so that we can render an opinion as to whether or not the Development Concept complies with RSIS.**
- RSIS §5:21-4.19(g)1 requires that 15% of the spaces approved by municipalities shall be make-ready or installed with EV equipment. **The Development Concept does not comply because it does not include any EV make-ready spaces. Without information on the expected number of bedrooms per unit, we cannot determine the extent of this deficiency.**
- **The Development Concept proposes a ±4,800 s.f. Clubhouse and ±8,000 s.f. pool/amenity area. Township Code §540-627R specifies the minimum off-street parking requirement for various uses:**
 - Private club. One space for each 250 square feet of gross floor area, plus one space for each 100 square feet of area devoted to bar or restaurant use. **At a minimum, it appears that 19 spaces are required whereas only 15 are proposed near the clubhouse. The deficit would be significantly larger if the Developer plans to include a bar or restaurant within the clubhouse. Providing these additional spaces would increase the Lot Coverage, which already exceeds allowable limits.**
 - Recreation facilities (indoor and outdoor). Those not specifically mentioned herein shall be determined by the approving authority based upon data submitted by the applicant. **The Developer has not provided information on the expected parking demand for the proposed pool and amenity area, so we cannot assess whether the proposed parking is sufficient for these uses.**

SUMMARY & CONCLUSIONS: The Development concept lacks a breakdown of the anticipated number of bedrooms per unit, making it difficult to determine the adequacy of the parking layout for the proposed development. This information is essential for assessing compliance with RSIS. The Development Concept also fails to meet RSIS requirements for EV make-ready spaces, as it lacks the mandated 15%. At a minimum, the $\pm 4,800$ sq. ft. clubhouse is deficient 4 parking spaces in terms of the Township requirement. The deficit would increase if a bar or restaurant is proposed. The Developer has also failed to provide any information related to the anticipated parking demand for the $\pm 8,000$ sq. ft. pool/amenity space, as required by Township Code. Overall, the Development Concept lacks sufficient detail that is required for us to render a professional opinion as to the adequacy or inadequacy of proposed parking both in terms of RSIS and Township standards.

6. Traffic Impact

i. Sight Distance Limitations at the Intersection of West Nut Swamp Road and Crawfords Corner Road

- All trips generated from the site will be directed to the unsignalized intersection of West Nut Swamp Road and Crawfords Corner Road (C.R. 52), which falls under the jurisdiction of Monmouth County. It is likely that the project will require Monmouth County Planning Board approval, and will be reviewed in accordance with “County of Monmouth Development Regulations, Volume II, Design Standards”.
- Monmouth County Development Regulations require sight triangle easements at all existing and/or proposed road or street intersections with a County Road. These are typically measured 90 ft. along the centerline of the existing road from the point where it intersects the centerline of the county road, and along the centerline of the county road 300 ft. from the centerline of the existing non-county road. **Exhibit 3 depicts the typical sight easement lines that would be anticipated in accordance with County regulations at the subject intersection. We note the following observations and concerns:**

- West Nut Swamp Road is narrow, measuring about 18-20 feet wide. **Its similarity in width to nearby residential driveways, along with several mailboxes close to the intersection, makes it easy for drivers on Crawfords Corner Road to confuse West Nut Swamp Road with a residential driveway.**
- Many single-family homes along Crawfords Corner Road, especially near West Nut Swamp Road, feature mature trees and understory vegetation



close to the public right-of-way. **Exhibit 3 shows that significant vegetation exists within the anticipated required County Sight Triangle Easement lines, as further illustrated by site photos taken by this office in Figures 3 through 5. The Developer may not be able to obtain permission from these property owners to remove any sight obstructions which fall upon private property.**

- The Developer's Traffic Engineer indicates the Nut Swamp Road projected volumes to the site are to increase significantly, from 2 entering trips and 3 exiting trips in any peak hour during the No-Build condition, to 26 entering trips and 59 exiting trips in any peak hour during the Build condition. **However, the trip generation estimates provided by the Developer's Traffic Engineer may be underestimated, as discussed in later sections of this report.**
- The intersection is located on a horizontal curve, and there is no dedicated left turn lane for drivers approaching southbound on Crawfords Corner. **The southbound lane is approximately 12 feet wide, with an additional shoulder width of roughly 3 feet. If the County mandates the addition of a left turn lane, it could be challenging for the Developer to install because:**
 - **There may be limited right-of-way width on the west side of Crawfords Corner Road and the adjacent property owners who reside in Holmdel Township might not agree to provide additional right-of-way.**
 - **Utility poles are positioned near the road's edge and would need to be relocated.**

For the above reasons, the proposed development may lead to an increase in congestion and an increased risk of traffic collisions at the intersection.



Figure 2: Sight Distance limitations at the West Nut Swamp Road and Crawfords Corner Road intersection. View from the West Nut Swamp Road approach. (Photo taken by T&M on May 29, 2024)A



Figure 3: Sight Distance limitations at the West Nut Swamp Road and Crawfords Corner Road intersection. View from southbound approach on Crawfords Corner Road. (Photo taken by T&M on May 29, 2024)



Figure 4: Sight Distance limitations at the West Nut Swamp Road and Crawfords Corner Road intersection. View from northbound approach on Crawfords Corner Road. (Photo taken by T&M on May 29, 2024)

ii. Underestimation of Background Traffic Volumes

- The Developer's traffic engineer performed manual turning movement traffic volume counts for the study area on Thursday, June 6, 2024, and Saturday, June 8, 2024. **The "No Build" baseline traffic volumes used in the analysis may be underestimated since they were recorded at the end of the typical school year when many public school districts have early dismissals or reduced schedules. Additionally, many private schools in the area usually finish their school year 1-2 weeks earlier than some public school districts.**

iii. Underestimation of Site Generated Trips

- **The Developer's Traffic Engineer has used the ITE Land Use designation 215 "Single-Family Attached Housing" in their Traffic Impact Analysis. While this designation includes townhouses and rowhouses, we question its appropriateness, as Land Use 220 "Multifamily Housing (Low-Rise)" also covers townhouses and typically leads to higher trip generation estimates. This may worsen delay and Level of Service at the intersection of West Nut Swamp Road and Crawfords Corner Road, which when coupled with the sight distance**

limitations may lead to an increased frequency of traffic collisions at the intersection. Further analysis is warranted.

iv. Underestimation of Trip Generation from Red Hill Road Site Development

- The Traffic Impact Analysis indicates that adjacent development traffic from the proposed residential development located at 490 Red Hill Road (“Red Hill Road Site”) has been added to the future “base” traffic volumes to establish the future “no-build volumes”. **Similar to the West Nut Swamp Road site, the Red Hill Road site does not offer a breakdown of the number of bedrooms or residents proposed for the 70 apartment units. The total number of bedrooms and residents should be provided for the Red Hill Road site, and the analysis should use this information as the independent variable for trip generation, as it would lead to higher site generated trips. The analysis should be revised to utilized more appropriate inputs, which may lead to a worsened delay and Level of Service at the intersection of West Nut Swamp Road and Crawfords Corner Road, which when coupled with the sight distance limitations, may lead to an increased frequency of traffic collisions at the intersection. Further analysis is warranted.**

v. Lack of Availability to Sidewalk and Mass Transit Resulting in Increased Trip Generation

- The Developer’s Planning Report cites proximity to employers such as Memorial Sloan Kettering Cancer Center Monmouth and Bell Works, as a reason why the site is suitable for such development. The FHWA Pedestrian Safety Guide for Transit Agencies indicates that the typical walking distance that most people are willing to walk is for five to ten minutes, or approximately ¼- to ½-mile to a transit stop¹. **Based on the lack of proximity to sidewalks within the public right-of-way and also to mass transit hubs, it is likely that site generated Peak Hour Trips will be on the highest end of ITE estimates, as residents rely heavily on motor vehicles for transportation. Based on review of Google Maps and Street View Imagery, we note the following:**
 - **The closest available sidewalks from the Site to Bell Works is more than 0.70 miles away, at the intersection of Crawfords Corner Road and Round Hill Road, which is approximately a 17-minute walk. (Exhibit 5A)**
 - **The walking distance from the Site to Bell Works is more than 1.5 miles away, with a walking time of approximately 34-minutes. While bicycling**

¹[https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/ch4.cfm#:~:text=Most%20people%20are%20willing%20to,stop%20\(see%20figure%20below\).](https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/ch4.cfm#:~:text=Most%20people%20are%20willing%20to,stop%20(see%20figure%20below).)

would reduce this travel time, the Roadway network of Crawfords Corner Road and Middletown Road during Peak Hour traffic is not conducive to bicycling for regular commuting purposes due to both significant traffic volumes as well as the lack of sufficient paved shoulder throughout many stretches of these corridors. (Exhibit 5B)

- The Middletown Station of NJ Transit's North Jersey Coast Line is located more than 3.5 miles from the Site. This is over a 1-hour and 17-minute walk and 23-minute bicycle ride via Red Hill Road. The vertical and horizontal geometry, lack of sidewalk and lack of sufficient paved shoulder make this generally unsafe for regular commuting purposes. (Exhibit 5C)
- The closest Academy Commuter bus stop is located more than 4.8 miles from the site on Half Mile Road in Red Bank. This is over a 1 hour and 43-minute walk and 28-minute bicycle ride. (Exhibit 5D)
- The closest NJ Transit Bus stops are located more than 2.5 miles (as the crow flies) from the Site along the Route 34 and 35 corridors. Travel distances and travel times for both pedestrians and bicyclists vary greatly depending on the bus stop location.
 - The closest that could be found along the Route 34 corridor is at the intersection of Lloyd Road in Aberdeen, which is 5.0 miles and a 1 hour and 50-minute walk. (Exhibit 5E)
 - The closest that could be found along the Route 35 corridor is at the intersection of New Monmouth Road in Middletown, which is 3.9 miles and a 1 hour and 26-minute walk. (Exhibit 5F)

vi. Lack of Analysis of Other Surrounding Intersections

- This Traffic Impact Analysis indicates that “the study therefore demonstrates that the proposed development will not have a negative or perceptible impact on operating conditions at surrounding intersections.” **However, the Report has not included any analysis of the impact of the proposed site development to the signalized intersection at the entrance to Sloan Kettering and the on/off ramp to Garden State Parkway Southbound nor the signalized intersection to the on/off ramp to Garden State Parkway Northbound. Despite making this assertion, the report has not included any analysis - so it is an unsupported conclusion.**

SUMMARY & CONCLUSIONS: The Development Concept is likely to exacerbate sight distance limitations at the intersection of West Nut Swamp Road and Crawfords Corner Road. Existing conditions, such as narrow road widths and significant vegetation in the vicinity, obstruct visibility, which the Developer may not obtain approval from adjacent property owners to remove. These physical limitations, coupled with the Developer's trip generation estimates that appear underestimated, suggest congestion and an increased risk of traffic collisions.

Background traffic volumes might also be underestimated, recorded during a period when schools may be on reduced schedules. The site's distance from sidewalks and mass transit facilities further exacerbates vehicle reliance, potentially increasing peak hour trips beyond estimates. Additionally, the lack of comprehensive analysis concerning the impact on other intersections in proximity to the site, such as those leading to the Garden State Parkway, weakens conclusions about the development's effect on local traffic conditions. Without assessments of these intersections, claims regarding the minimal impact remain unsupported. Consequently, the Development Concept necessitates further analysis and reconsideration of infrastructure, vehicular, and pedestrian connectivity to effectively address traffic safety and congestion concerns.

7. Stormwater Management

i. Township and NJDEP Regulations

The proposed Development Concept does not demonstrate compliance with the Township's Stormwater Management Regulations at Chapter 540, Article X Stormwater Management and Control of the Middletown Township Planning and Development Regulations, nor the NJDEP Stormwater Management Rules at NJAC 7:8, nor the Dam Safety Standards at NJAC 7:20 for the following reasons:

- The project is classified as a "Major Development", as it disturbs one or more acres of land and results in the creation of 0.25 acres or more of regulated impervious coverage, and will be reviewed under the requirements of the Stormwater Management Rules at NJAC 7:8, as amended on July 17, 2023. As such, the improvements must address the groundwater recharge, water quantity, water quality and green infrastructure requirements of that section. **The Development Concept does not demonstrate compliance with these regulations as noted below:**
 - Based on our review of CAD files provided by the Developer for the Development Concept, the proposed limit of disturbance is estimated to be approximately 16.4 acres. For a stormwater management basin to qualify as green infrastructure and meet the requirements of NJAC 7:8 for

groundwater recharge, water quantity, and water quality, it must serve a drainage area smaller than 2.5 acres. **The Development Concept includes five (5) conceptual stormwater management basins, but lacks detail regarding the proposed stormwater management conveyance infrastructure. However, based on the 16.4 acre area of proposed disturbance, it would appear that the 2.5 acres contributory drainage area limit may be exceeded for one or more of the basins. Furthermore, Conceptual Basin #2, located within the roadway north of Townhouse Buildings #13 and 14, would have to be eliminated, or if the roadway were to be eliminated, would further exacerbate previously explained fire and emergency vehicle access concerns. If the basin is eliminated, the remaining four (4) basins would likely exceed the 2.5-acre maximum contributory drainage area requirement, without the implementation of other stormwater management BMPs onsite.**

- The Stormwater Management Note on the Development Concept states “additional BMPs may be required such as pervious pavement, underground infiltration, and other certified stormwater management structures”.
 - **Pervious pavement is not recommended for high-traffic areas, such as the proposed internal roads. In many instances, the proposed slope also exceeds the maximum 5% surface slope permitted by the BMP Manual for pervious pavement.**
 - **It is also unclear where onsite underground infiltration basins can be accommodated, as any such proposed basin in an internal roadway would likely conflict with other required site utilities.**
 - **Moreover, both pervious pavement and underground infiltration require level stone storage beds. Given the significant proposed slopes and grade changes, creating a level stone storage bed may not be feasible in some areas or could significantly limit the size of any pervious pavement or underground infiltration system.**
 - **In areas where proposed site slopes are more moderate, placing this infrastructure may still not be feasible due to the proximity and risk of negative impact on nearby significantly high retaining walls and other proposed stormwater basins.**

For these reasons, based on the information provided by the Developer, most of the site is unsuitable for pervious pavement and underground infiltration, without significant modification to the site layout which may result in a reduction in the number of units that can be accommodated onsite.

- No soil testing has been provided confirming the permeability of site soils or for determining depth to estimated seasonal high water table (ESHWT). **The Development Concept lacks sufficient information to demonstrate the viability of Green Infrastructure (GI) stormwater management basins onsite, which are required. Without knowing the depth to the Estimated Seasonal High Water Table (ESHWT), we cannot confirm whether the proposed aboveground basins and any necessary underground basins will maintain the required minimum 2-foot separation from the ESHWT. Notably, Conceptual Basin #1 is proposing as much as 16 feet of excavation below existing grade, raising significant concerns about whether the necessary separation from the Seasonal High Water Table is achieved for this basin.**
- The NJ Dam Safety Standards at N.J.A.C. 7:20 defines a dam as any artificial dike, levee or other barrier, together with appurtenant works, which is constructed for the purpose of impounding water on a permanent or temporary basis, that raises the water level five feet or more above the usual, mean, low water height when measured from the downstream toe-of-dam to the emergency spillway crest or, in the absence of an emergency spillway, the top-of-dam. The toe-of-dam is the junction of the downstream face of a dam with the ground surface or the invert of the outlet pipe, whichever is the lowest point. **The Development Concept lacks significant detail regarding proposed basin discharges; however, it appears that several of the proposed conceptual basins would classify as dams as outlined below:**
 - Conceptual Basin #1 is designed with a top-of-berm (top-of-dam) elevation of 153. The location of the toe-of-dam is unclear, but there is a steep slope south of the basin that descends to elevation 125 in the vicinity of Townhouse Buildings #6 and #7 and further down to elevation 105 at the southern terminus of the onsite wetlands.
 - **Conceptual Basin #1 might be categorized as a Class I or II dam due to the significant impoundment of water (stormwater runoff) from top to toe of dam and due to the proximity of the townhouse buildings downstream.**
 - **Class I and Class II dams are those that pose a high hazard and significant hazard risk to downstream areas.**
 - **Even if it is not officially classified as a dam, the basin poses a safety risk, as a berm failure would result in water flowing directly**

toward the proposed downstream Townhouse Buildings #1, #2, #6 and #7.

- Conceptual Basin #2 may likely be classified as a Class IV dam as it impounds more than 5 feet of water (stormwater runoff).
- Conceptual Basins #3 , 4 & 5 may also be classified as dams.

For several of the proposed stormwater management basins, it is difficult to determine whether the basins would be considered dams, and to render an opinion on the classification, as the Development Concept lacks sufficient detail. In general, the creation of any dams, even Class IV, should be avoided as it would require regular inspection and maintenance, which would be an undue financial burden on the residents, some of which will be moderate, low and very low income. Should any basins be considered a Class I, II or III dam, NJDEP permits would be required. Revising the Development Concept to avoid the creation of dams could result in major changes to the stormwater management design, impact to the site layout and may result in a decrease in the number of units that can be safely accommodated onsite.

ii. Limiting Soil Conditions Based on USDA Soil Survey Mapping

As can be seen from Exhibit 4, USDA Soil Survey Mapping shows more than 64% of the site is situated on Phalanx loamy sand (PhbE).

- Phalanx loamy sand (PhbE) is described as Hydrologic Soil Group A, well drained, with depth to water table approximately 48" to 118" and depth to restrictive petroferic at 12" -30". **Petroferic contacts are a hard, cemented gravel layer typically impermeable to water and roots. As discussed later, the existence of mapped restrictive (impermeable) soil horizons may prevent implementation of Green Infrastructure (GI) Best Management Practices (BMPs) onsite. Per NJAC 7:8-4.6, non-GI BMPs cannot be implemented onsite without receiving a variance from the design and performance standards for stormwater management measures. This process requires a mitigation plan that must also receive approval from the NJDEP.**

iii. Lack of Detail & Design Issues

As noted, the Development Concept does not demonstrate compliance with NJDEP and Township Stormwater regulations as minimal Stormwater Management Infrastructure measures are depicted on the proposed Development Concept.



- For the Development Concept to implement an underground stormwater management basin (stormwater BMP) onsite, it would need to be located beneath the proposed guest parking areas. This is problematic for the following reasons:
 - Chapter 9 of the NJ Stormwater Best Management Practices Manual (BMP Manual) states that a minimum separation of 2 feet is required between the bottom of a GI BMP and the Estimated Seasonal High Water Table (ESHWT). **Given that the soil mapping shows the water table at 48 to 118 inches deep, there may not be space for an Underground Stormwater Management BMP. To achieve adequate separation, the parking areas may need to be substantially raised, which could impact the site layout.**
 - NJAC 7:8-5.3 requires that all proposed BMPs must be GI, which typically involves treating stormwater runoff through soil infiltration. **The presence of mapped restrictive soil horizons would limit the ability to implement GI BMPs unless the Developer obtains a variance (as described earlier).**

Steep slopes and significant changes in elevation onsite also present several challenges for the implementation of proper stormwater management for the site, including the following:

- Substantial cuts/fill and earthwork will be required per the proposed Development Concept. **It will be difficult to impossible to determine the existing soil conditions, for the purposes of SWM design, considering the amount of earthwork required to construct the site.**
- Standard detention basins are no longer permitted, and any infiltration BMP is required to be installed with a flat bottom. **It may not be possible to provide adequate separation to ESHWT, which generally follows topography of the land, without significant modification to the site layout and grading.**
- Given the significant slope of the site and downstream areas, it will be difficult to demonstrate slope stability for any proposed basin discharges, in order to obtain Plan Certification from the Freehold Soil Conservation District. **As noted by PH, disturbance of steep slopes and can result in erosion which can negatively impact downstream areas. Should the Developer be unable to demonstrate slope stability, basin discharges may need to be piped directly to the stream or wetlands which would require additional environmental permitting.**



SUMMARY & CONCLUSIONS: The Development Concept does not demonstrate compliance with the Township's and NJDEP stormwater management regulations. The proposal includes five stormwater management basins; however, Conceptual Basin #2 directly conflicts with the proposed internal roadway infrastructure. Elimination of the basin likely triggers non-compliance of the remaining basins with maximum permissible 2.5-acre contributory drainage area limitations. Conversely, elimination of the internal roadway would further exacerbate fire and emergency access concerns presented by the site layout.

The implementation of pervious pavement and underground stormwater management BMPs may not be feasible without significant modification to the site, due to potential conflicts with other necessary utility infrastructure, design limitations complicated by proposed steep roadway slopes, and the mapped presence of ESHWT at 48" below grade and restrictive soil horizons.

Moreover, the project's impoundment structures may be classified as dams under NJ Dam Safety Standards. Creating dams would impose significant inspection and maintenance burdens, safety risks, and financial strain on residents, including those with moderate or low incomes. Comprehensive redesigns may be necessary to avoid these classifications, impacting the site layout and potentially reducing the number of units that can be accommodated onsite.

Overall, the Development Concept lacks necessary details and presents several compliance issues related to adherence with NJDEP regulations for stormwater management infrastructure and dam safety.

8. Feasibility of Construction and Use

The proposed Development Concept depicts several inconsistencies and conflicts between proposed improvements as noted below:

- The Development Concept does not properly tie into existing grade at the southwest corner of the site and no retaining wall(s) are proposed in this area.
 - **The proposed grade represents a vertical drop as much as 28 ft. below the existing grade right at the common property line with adjacent Lot 5. A variable height retaining wall (as high as 28 ft.), or the installation of a series of tiered retaining walls is required, which would likely impact the proposed clubhouse and pool/amenity area.**
 - **Although a single retaining wall of such a height could conceivably be designed, we have significant concerns regarding the constructability of same given the immediate proximity to the property bounds. The wall**

would have to be sufficiently setback from the property line to allow for the installation of it's associated extensive geogrid reinforcing system behind the wall. We are also concerned regarding the risk to the health, safety and general welfare to residents in the event of a wall failure, given the proximity to the proposed pool/amenity area.

- If no retaining walls are proposed in this area, the clubhouse and pool/amenity area would need to be modified and/or shifted into the site significantly or possibly eliminated entirely as it would conflict with the proposed club house, parking area and internal roadway.
- The retaining wall adjacent to Townhouse Building #12 is located on top of proposed sidewalk. **This prohibits safe pedestrian circulation through the site.**
- A retaining wall is proposed through the road between Buildings #18 & 19. **This prohibits safe circulation of motor vehicles as well as fire and emergency vehicles through the site.**
- Several retaining walls of significant height are proposed throughout the site, in close proximity to the property boundary, and to structures onsite. **Tiered retaining walls are generally preferred as they are structurally more stable, easier and safer to construct, and present less of a risk to the health, safety and welfare of onsite residents and to the general public in the event of a failure and/or in event of a fall from atop the retaining wall. If tiered retaining walls were to be provided, this would impact the proposed site and building layout.**
- We question the feasibility of several proposed onsite amenities given significant proposed slopes:
 - The pool/amenity area near clubhouse is proposed with 10 ft of grade change ($\pm 10\%$ slope) across it.
 - The community garden is proposed with 7 ft of grade change ($\pm 14\%$ slope) across it.
 - The dog run area is proposed with 8 ft. of grade change ($\pm 16-17\%$ slope) across it.
 - The children play area adjacent to Affordable Building #20 is proposed with 7 ft. of grade change ($\pm 12-15\%$ slope) across it.
 - The $\pm 1,300$ s.f. benches and plantings between Townhouse Building #17 and 18 is proposed with 11 ft. of grade change ($\pm 20\%$ slope) across it.
 - The $\pm 1,300$ s.f. benches and plantings between Townhouse Building #4 and 5 is proposed with 8 ft. of grade change ($\pm 15-18\%$ slope) across it.
 - The $\pm 2,300$ s.f. amenity area adjacent to Townhouse Building #3 is proposed with 4-5 ft. of grade change ($\pm 11-12\%$ slope) across it.

It appears that substantial retaining walls would be needed to reduce the proposed slopes to a level where these amenities can be effectively used by residents, including the children's play area adjacent to low- and moderate-income residents of Affordable Building #20. Additional retaining wall would impact the site layout and potentially reduce the number of units that can be accommodated onsite.

SUMMARY & CONCLUSIONS: The proposed Development Concept presents several feasibility concerns from a constructability and usability perspective. Notably, the southwest corner of the site requires substantial retaining wall(s), with heights up to 28 feet. The feasibility of constructing high retaining wall in such close proximity to property boundaries, as well as in close proximity to buildings in many other areas onsite, raises safety concerns. Construction of tiered retaining walls is generally a safer and more stable alternative, which if proposed, would likely impact the site layout and potentially the number of units that can be accommodated onsite. Many of the proposed amenities, including the pool, garden, play areas and benches/planting areas feature excessive slope changes (10-20%), which undermines their usability, necessitating significant retaining walls to mitigate same which would further impact site design. The combination of these issues necessitates careful reconsideration of the development's feasibility, potentially impacting the number of units and altering the overall site configuration.

G. Engineering Site Suitability Summary

The affordable housing rules require affordable housing sites to be approvable, available, developable and suitable, as defined in N.J.A.C. 5:93-1. These terms are defined as follows:

- **Available site** – A site with clear title, free of encumbrances which preclude development for low and moderate income housing. **We are unaware of any encumbrances which would preclude the development of the property at this time.**

CONCLUSION: We have not been presented with any information which demonstrates the site does not meet this standard.

- **Approvable Site** – A site that can be developed for low and moderate income housing in a manner consistent with the rules or regulations of all agencies with jurisdiction over the site. The site may be approvable although not currently zoned for low and moderate income housing. **We offer the following:**
 - The Development Concept does not comply with several key provisions of the Township of Middletown Planning and Development Regulations. Specifically, it exceeds the steep slope and critical area disturbance limits, affecting 88% of

slopes over 10% and disturbing significant percentages of Class I (94%) and II (89%) Critical areas. Overall, this is a disturbance of 91% of all environmentally sensitive steep slopes greater than 15%. **It does not appear that any attempt has been made to minimize these disturbances. It should be noted that these calculations are conservative, as they do not include the Developer's proposed disturbance of wetlands transition areas (which do not overlap steep slopes), which are also classified as Class II critical areas. In other words, the estimated disturbance to Class II areas are higher.**

- The Development Concept fails to adhere to R-45 zone bulk standards, including front yard setback, rear yard setback, building height, building coverage and lot coverage. The concept lacks required sidewalks, which will further exacerbate the exceedance of lot coverage, and also lacks adequate perimeter buffering, which is further exacerbated by proposed tree clearing to the bounds of the property. **Overall, the lack of compliance by the Development Concept with Township regulations raises significant concerns regarding accessibility for pedestrians, the visual and environmental impact to neighboring properties, downstream water courses and downstream environmentally sensitive areas. For the Development Concept to comply in many locations, the site layout including several buildings and retaining walls would need to be shifted further into the site, resulting in a conflict with other proposed infrastructure, resulting in a reduction in the number of buildings and dwelling units proposed and/or also result in further impacts to steep slopes, wetlands and associated transition areas onsite.**
- The Development Concept fails to adhere to R-45 zone minimum setback requirements for retaining walls and associated fences throughout the site. **For the Development Concept to comply in many locations, the site layout including several buildings and retaining walls would need to be shifted further into the site, resulting in a conflict with other proposed infrastructure, resulting in a reduction in the number of buildings and dwelling units proposed and/or also result in further impacts to steep slopes, wetlands and associated transition areas onsite.**
- The Development Concept does not comply with Township code, Residential Site Improvement Standards (RSIS, §5:21), and Americans with Disabilities Act (ADA) requirements in terms of sidewalk width, location, and slopes. **For the Developer to comply, it would increase the Lot Coverage (Impervious Coverage), which already exceeds the 15% maximum allowed in the R-45 zone. In addition, to comply with ADA slope requirements, significant modification to the site layout**



is required, which may impact site layout and could reduce the number of buildings proposed.

- The Development Concept does not appear to comply with several provisions of the Township's Architectural and Building Design Standards (§540-604) including building setback variation, articulation, and design variation. **To comply, the site layout and number of units may be reduced.**
- The proposal includes ambiguities concerning the number of affordable units proposed, as no architectural plans have been provided for the market rate Townhouses, nor the Affordable Buildings. **While 28 are mentioned, only 20 appear to be shown on the plan, risking non-compliance with COAH's 15% set-aside requirement for rentals.**
- The Development Concept does not comply with RSIS requirements for new streets, at the proposed access points to West Nut Swamp Road, as well as throughout the site. **Maximum permitted roadway slopes of 14% are exceeded up to 25% in locations. The Developer proposes to raise West Nut Swamp Road by 3 ft. or more at westernmost site access, which would adversely impact neighboring residential properties located on the south side of West Nut Swamp Road as it would require significant regrading disturbance of the roadway shoulder onto private property. This could create significantly steep driveway slopes impacting resident access, alter the natural drainage course and also impact regulated drainage features on these properties, which would require approvals from these property owners as well as NJDEP. If the new street access were to be adjusted to match existing grade at West Nut Swamp Road, this could result in an even steeper and more non-compliant 50% slope. In addition, several onsite intersections proposed exceed the maximum angle permitted by RSIS.**
- The Development Concept also raises concerns with Fire Access requirements as well as Title 39. **The lack of fire and emergency vehicle turnarounds in several locations is concerning, and ultimately subject to review and approval by the Fire Code Official. The potential need for more emergency access roads may conflict with proposed grading and location of retaining walls, and would further increase the proposed lot coverage, which already exceeds R-45 zone permissible limits. Proposed parking throughout the site also violates the minimum 50 ft. separation from anticipated stop sign locations, should Title 39 enforcement be required by the approving agency, and would impact parking that is proposed to service the Affordable Housing Buildings.**

- The Development Concept is likely to exacerbate sight distance limitations at the intersection of West Nut Swamp Road and Crawfords Corner Road. **Trip Generation appears to be underestimated for both the West Nut Swamp and Red Hill Road site. Furthermore, the site's distance from sidewalks, mass transit facilities, and convenience services, further exacerbates vehicle reliance, potentially increasing peak hour trips beyond estimates.**
- The Development Concept does not demonstrate compliance with Township's and NJDEP stormwater management regulations. **At least one (1) proposed conceptual basin directly conflicts with a proposed onsite roadway, which likely triggers non-compliance with maximum permissible contributory drainage area limitations to the other basins proposed. The implementation of pervious pavement and underground stormwater management BMPs may not be feasible without significant modification to the site, due to potential conflicts with other necessary utility infrastructure, design limitations complicated by proposed steep roadway slopes, and the mapped presence of ESHWT at 48" below grade and restrictive soil horizons. Furthermore, the proposal of potentially several dams onsite imposes significant inspection and maintenance burdens, safety risks, and financial strain on residents, including those with moderate or low incomes.**
- The proposed Development Concept presents several feasibility concerns from a constructability and usability perspective. **Several retaining walls of significant height are proposed throughout the site, and at least one which is not shown but would be required for the Development to be built, would be up to 28 ft. in height. Construction of tiered retaining walls is generally a safer and more stable alternative. In addition, many of the amenity spaces onsite would require significant retaining walls to reduce proposed slopes to a level where they would be realistically usable. To address these issues, it would likely impact the site layout and potentially the number of units that can be accommodated onsite.**

CONCLUSION: The Development Concept does not comply with many provisions of the Township of Middletown Development Regulations, especially those related to steep slopes, critical areas, and stormwater management, potentially causing adverse effects on downstream and neighboring areas. We estimate that 32.1% of the site (6.01 ac.) of the site contains slopes greater than 15%, and the Development Concept proposes to disturb approximately 91% of these environmentally sensitive areas onsite, and in many areas the Developer proposes to worsen (steepen) slopes compared to the existing condition. The Developer appears to have made no effort to reduce impacts on steep

slopes and critical areas, often worsening conditions. The site layout fails to meet several RSIS requirements regarding sidewalk placement and permissible road slopes, and it does not comply with ADA standards for sidewalk widths and slopes. Achieving compliance would further increase lot coverage, which already surpasses R-45 zone limits.

Significant retaining walls and fences violate R-45 setback requirements, pose safety risks, and obstruct safe access for pedestrians, vehicles, and emergency services in several locations. Safer design alternatives, like tiered retaining walls, would likely alter the site layout and scale of the development. Trip generation appears underestimated, worsening existing sight distance issues at West Nut Swamp Road and Crawfords Corner Road intersection due to increased reliance on motor vehicles as a result of the site's lack of proximity to sidewalks and mass transit. A comprehensive redesign is necessary to comply with regulatory standards, many of which pertain to resident and public safety, which would likely result in an overall reduction to the number of units that can be accommodated onsite.

- Developable site – A site that has access to appropriate water and sewer infrastructure, and is consistent with the applicable areawide water quality management plan (including the wastewater management plan) or is included in an amendment to the areawide water quality management plan submitted to and under review by DEP. **We offer the following:**
 - Public Sewer
 - The site is located within the mapped sewer service area within which TOMSA operates, and the Developer has received a “Will Serve Letter” from TOMSA. Pump stations and a force main will be required to pump sewage from the site to existing infrastructure located over 0.5 mile away within Cypress Neck Road, which TOMSA indicates the Developer shall bear all costs for same.
 - **Although TOMSA indicates their infrastructure can accommodate an anticipated 52,200 gpd sewage flow, the Developer has not provided any projected sewage demand calculations for the site demonstrating same.**
 - **It is unclear whether the appropriate breakdown of bedrooms per dwelling unit, and whether the “clubhouse” and various indoor amenity uses have been accounted for.**
 - **TOMSA’s “Will Serve Letter” also indicates sewer capacity is available “at this time”. Should other development occur in the vicinity, available capacity may be reduced.**

As a result, the Development Concept may need to be reduced to meet capacity limitations at the time of development.

○ **Public Water**

- The site falls within the New Jersey American Water (NJAW) service area, and the Developer has received a "Water Service Availability" letter indicating current capacity availability. However, the closest 12" water main is over 1,600 ft. away, requiring the Developer to fund the extension of same to the site.
 - **The letter does not specify the site's anticipated water demand, and the Developer has not provided calculations for same. Importantly, New Jersey Senate Bill 281, effective on or about August 1, 2024, mandates automatic fire sprinkler systems in new townhouses, yet the NJAW letter, dated before this law's effective date, is not a "Will Serve Letter" nor a guarantee of water service.**
 - **It remains unclear if both NJAW and the Developer considered the additional water demand for fire suppression, as no relevant calculations have been supplied.**

As a result, the Development Concept may need to be reduced to meet capacity limitations at the time of development.

CONCLUSION: Although the Developer has provided a "Will Serve Letter" from TOMSA and a "Water Service Availability" from NJAW, they have not provided any anticipated sewer nor water demand calculations for the Development Concept for Township review and comment. The absence of detailed calculations regarding both sewage and water demands, including requirements for fire suppression for townhouses in accordance with state law, raises concerns about whether the Development Concept will meet capacity limitations at the time of development, potentially necessitating a reduction in the planned development scale. The Developer's failure to provide this pertinent information makes it difficult at this time to evaluate whether the site is developable at the proposed scale.

- **Suitable Site** – A site that is adjacent to compatible land uses, has access to appropriate streets and conforms to the environmental policies delineated in N.J.A.C. 5:93-4.



- The Report prepared by the Developer's planner makes the following statements:
 - "There is direct access to multiple roadways that feed into the local and regional road network, including the proximate Garden State Parkway." **The increased traffic resulting from the Development Concept is likely to exacerbate sight distance issues at the intersection of West Nut Swamp Road and Crawfords Corner Road. Existing conditions, such as narrow road widths and significant vegetation in the vicinity, obstruct visibility, which the Developer may not obtain approval from adjacent property owners to remove. These physical limitations, coupled with the Developer's trip generation estimates that appear underestimated, suggest potential congestion and an increased risk of traffic collisions. Additionally, the lack of comprehensive analysis concerning the impact on other intersections in proximity to the site, such as those leading to the Garden State Parkway, undermines the Developer's conclusion that the development will not adversely affect local traffic conditions.**
 - "The site is also within walking distance to Memorial Sloan Kettering Cancer Center Monmouth, a major employer, and a quick drive to Bell Works, another employer." **The site lacks realistic pedestrian access to sidewalks within the public ROW and to public mass transit hubs. The closest sidewalk to the site is 0.7 miles, which is then an additional 0.8 mile walk to Bell Works. The Middletown Train Station is more than 3.5 miles from the Site. The Academy Commuter bus stop in Red Bank is more than 4.8 miles and the closest NJ Transit bus stops are located more than 2.5 miles (as the crow flies) from the Site, respectively. The site is also not in close proximity to convenience services, with the closest grocery store more than 3.9 miles, which requires over a 1 hour and 23-minute walk from the site. The closest pharmacy is over 3.1 miles from the site, which requires about a 1 hour and 9 minutes to walk. Sidewalk and mass transit along both routes is significantly lacking or non-existent.**
 - "From a site planning perspective, there is a significant amount of open space proposed on the site, as well as sufficient room for site circulation and other associated improvements, which is clear evidence that the site is not proposed to be over-developed." **§540-651A of the Township Code states that no more than 20% of such wooded areas within the net tract area may be cleared or developed, for zones such as the R-45 where the maximum percent of lot coverage is 15% or less. We approximate that the proposed Development Concept will result in the clearing of**



±688,500 s.f. which equates to approximately 92.7% and 84.5% of the Lot Area by Tax Map and Deed Plotting, respectively. It appears that no effort has been made by the Developer to minimize proposed tree clearing.

The proposed tree clearing also highlights that the project lacks sufficient landscape buffer widths, as required by Township Code for multi-family development. This, along with non-compliance with building height limitations, increases impacts to neighboring properties' privacy, and heightens visual impacts.

The Developer's open space calculations are flawed as lot coverage (impervious coverage) calculations are significantly underestimated due to the lack of plan detail. The Development Concept also lacks sidewalks of sufficient width and location to demonstrate compliance with Township code and the Residential Site Improvement Standards (RSIS, §5:21). Compliance would result in an increase in lot coverage, which already exceeds the R-45 zone permissible limits. Sidewalk slopes also exceed Americans with Disabilities Act (ADA) requirements, which creates safety issues.

- "According to FEMA FIRM data, this site is not located within a flood zone." To our knowledge, the Developer has not obtained a FHA verification from NJDEP. The impacts of the proposed development on such areas cannot be known without this information. We estimate that 32.1% of the site (6.01 ac.) of the site contains slopes greater than 15%, and the Development Concept proposes to disturb approximately 91% of these environmentally sensitive areas onsite, and in many areas the Developer proposes to worsen (steepen) slopes compared to the existing condition. The Development Concept does not comply with numerous R-45 zone setback requirements, as well as setback requirements for retaining walls and fences. To rectify these issues, particularly for those improvements located along the east side of the tract, it would necessitate the shifting of these improvements further west into the site, thereby increasing impacts to regulated wetlands and associated transition areas.

CONCLUSION: The increased traffic resulting from the Development Concept is likely to worsen existing sight distance issues at the intersection of West Nut Swamp Road and Crawfords Corner Road, which the Developer may not be able to ameliorate without approvals from the County and private property owners. The site's lack of pedestrian

pathways to public mass transit and convenience services exacerbates reliance on vehicles, further increasing traffic. Extensive proposed tree clearing violates Township Code's woodland preservation standards, which is then compounded by the lack of an adequate landscape buffer and building height exceedance. This will heighten visual impacts to and the availability of air, light and open space to neighboring properties. The Development Concept's insufficient and non-compliant sidewalk designs per RSIS and ADA standards, pose safety risks. For the Developer to rectify same, this results in an increase in lot coverage and reduction in available open space. Without New Jersey Department of Environmental Protection (NJDEP) Flood Hazard Area (FHA) verification, impacts on sensitive areas remain unknown. Overall, the project necessitates significant modifications to address these environmental, compliance, and safety challenges adequately.

H. Conclusion

Although the site is **Available**, the site **May Not be Developable** at the scale proposed, and the Developer's failure to provide pertinent information relative to the Development Concept, makes the assessment very difficult to determine at this time. The site is **Not Approvable**, and **Not Suitable** for development of high density multifamily housing without significant modification to the scope of the Development Concept, including a reduction in the number of dwelling units proposed to address many of the non-compliance issues pertaining to Township, Monmouth County, RSIS, and ADA development regulations.






EXHIBITS 1 - 6

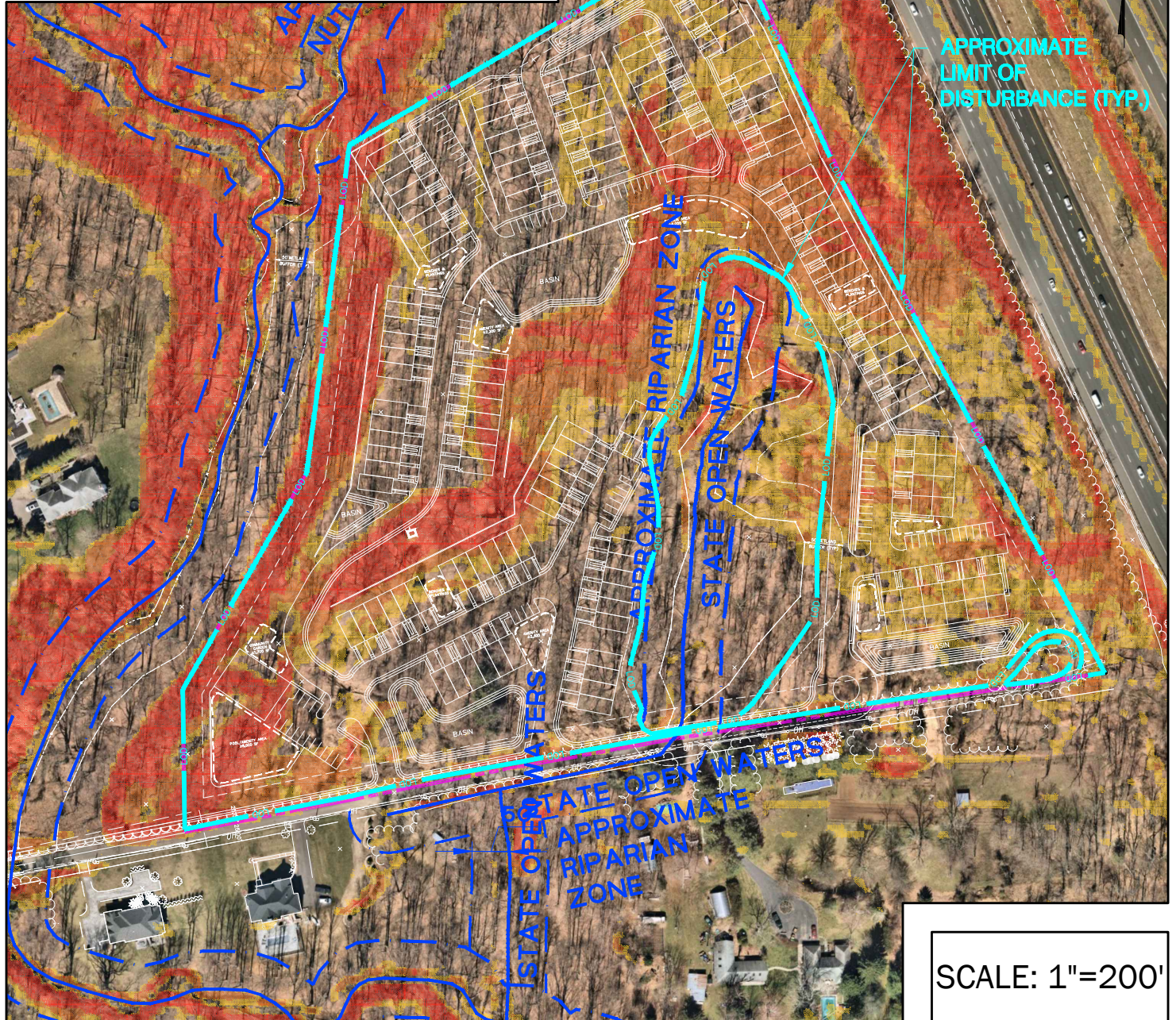
Exhibit No.	Description
Exhibit '1'	Sheet No. 1 of 1: Steep Slopes Exhibit – “West Nut Swamp Road Site”
Exhibit '2'	Sheet No. 1 of 1: Proposed Tree Clearing Exhibit – “West Nut Swamp Road Site”
Exhibit '3'	Sheet No. 1 of 1: Monmouth County Sight Triangle Easement at Crawfords Corner and West Nut Swamp Road – “West Nut Swamp Road Site”
Exhibit '4'	USDA Soil Mapping Exhibit – “West Nut Swamp Road Site”
Exhibit '5'	5A - Walking Distance to Sidewalk
	5B - Walking Distance to Bell Works
	5C - Walking Distance to Middletown Train Station
	5D - Walking Distance to Academy Bus (Lincroft/Red Bank)
	5E - Walking Distance to NJ Transit Bus (New Monmouth Road & Rt. 35, Middletown, NJ)
	5F - Walking Distance to NJ Transit Bus (Lloyd Road & Rt. 34, Aberdeen, NJ)



EXHIBIT 1

LEGEND

-  SITE BOUNDARY
-  NHD STREAMS
-  STEEP SLOPES, 10-15%
-  STEEP SLOPES, 15-25%
-  STEEP SLOPES, >25%



SCALE: 1"=200'

USDA SOIL MAPPING EXHIBIT
 "WEST NUT SWAMP ROAD SITE"
 BLOCK 1045, LOTS 2-4
 MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ

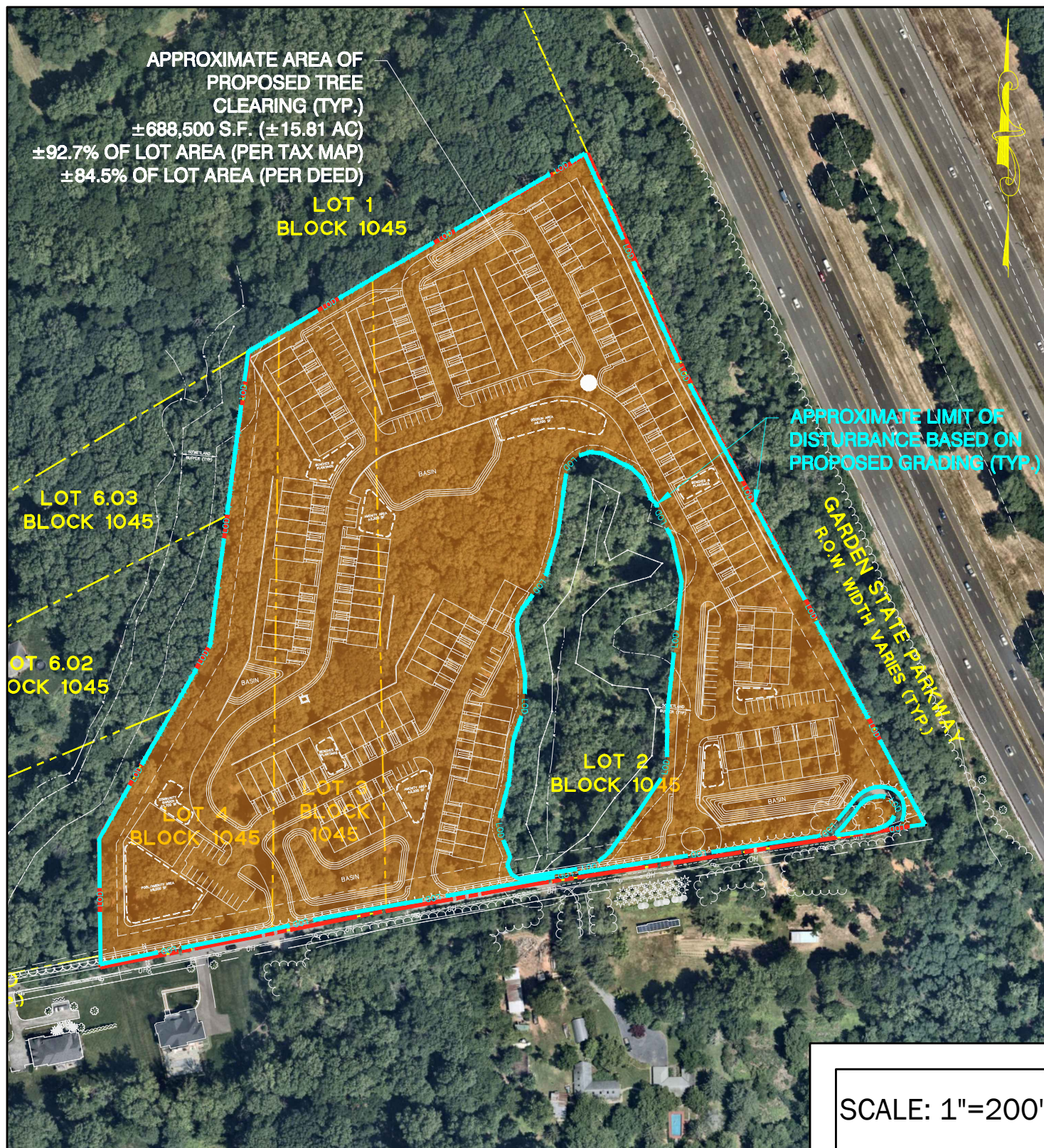


1144 HOOPER AVENUE, SUITE 202
 TOMS RIVER, NJ 08753
 TEL 732-473-3400
 FAX 732-473-3408

NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS
 AND LAND SURVEYORS
 CERTIFICATE OF AUTHORIZATION 24CA27987500



EXHIBIT 2



SCALE: 1"=200'

PROPOSED TREE CLEARING EXHIBIT
"WEST NUT SWAMP ROAD SITE"
BLOCK 1045, LOTS 2-4
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



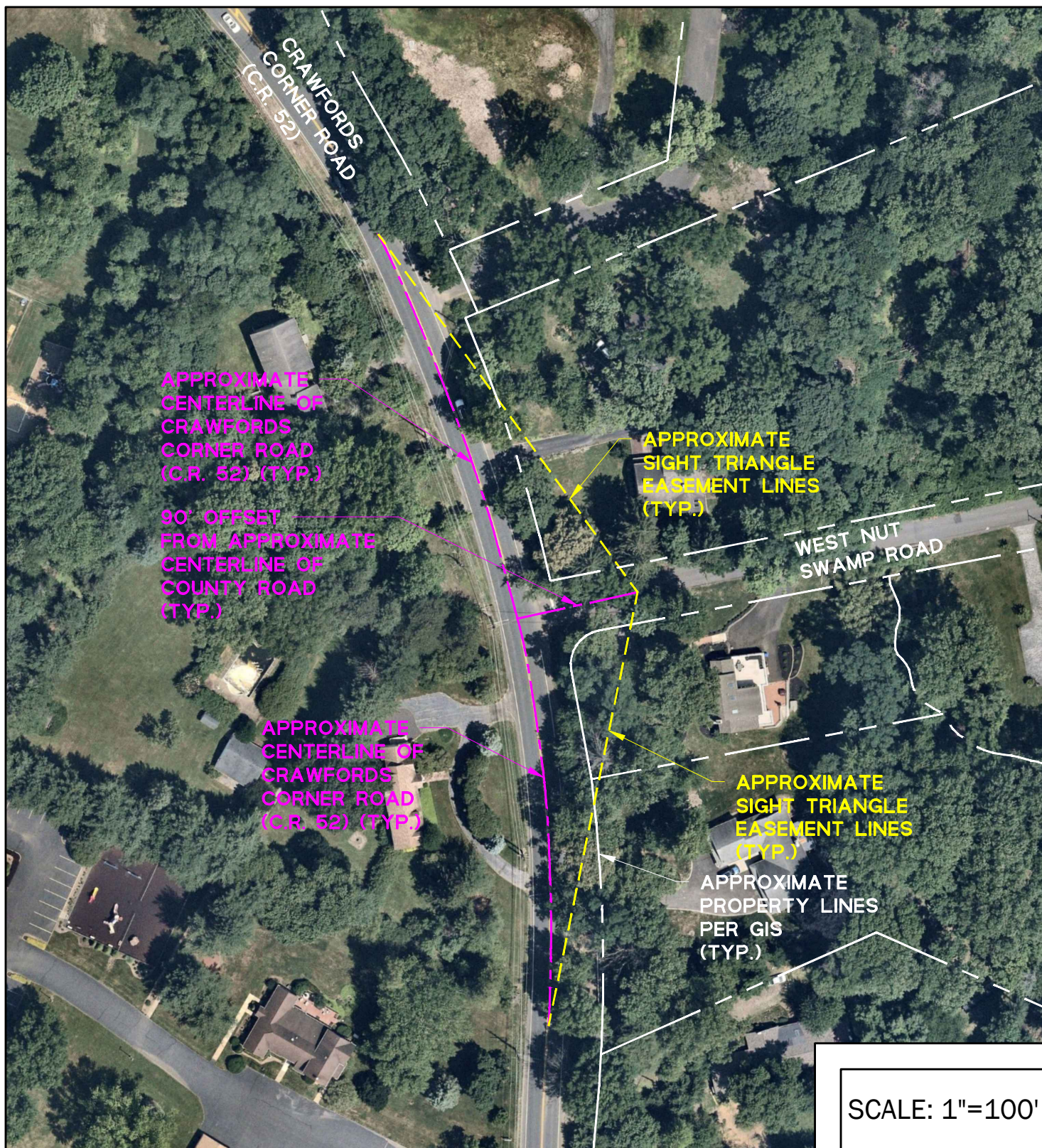
YOUR GOALS. OUR MISSION.

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AND LAND SURVEYORS
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EXHIBIT 3



SCALE: 1"=100'

MONMOUTH COUNTY SIGHT TRIANGLE
EASEMENT REQUIREMENTS
"WEST NUT SWAMP ROAD SITE"
BLOCK 1045, LOT 2-4
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



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EXHIBIT 4



USDA SOIL MAPPING EXHIBIT
 "WEST NUT SWAMP ROAD SITE"
 BLOCK 1045, LOTS 2-4
 MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ

SCALE: 1"=200'



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EXHIBIT 5

EXHIBIT 5A

Walking Distance to Sidewalk

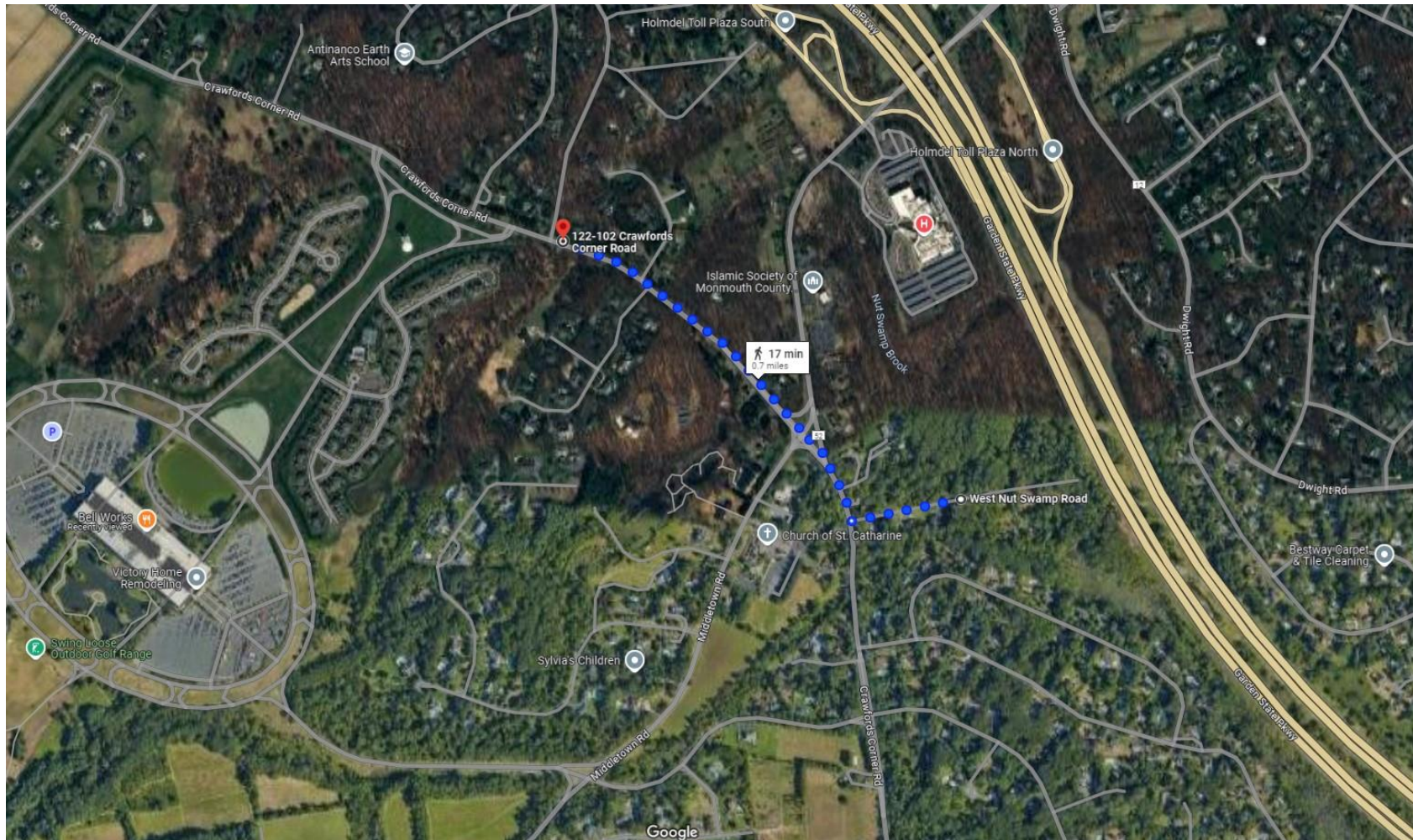




EXHIBIT 5B

Walking Distance to Bell Works

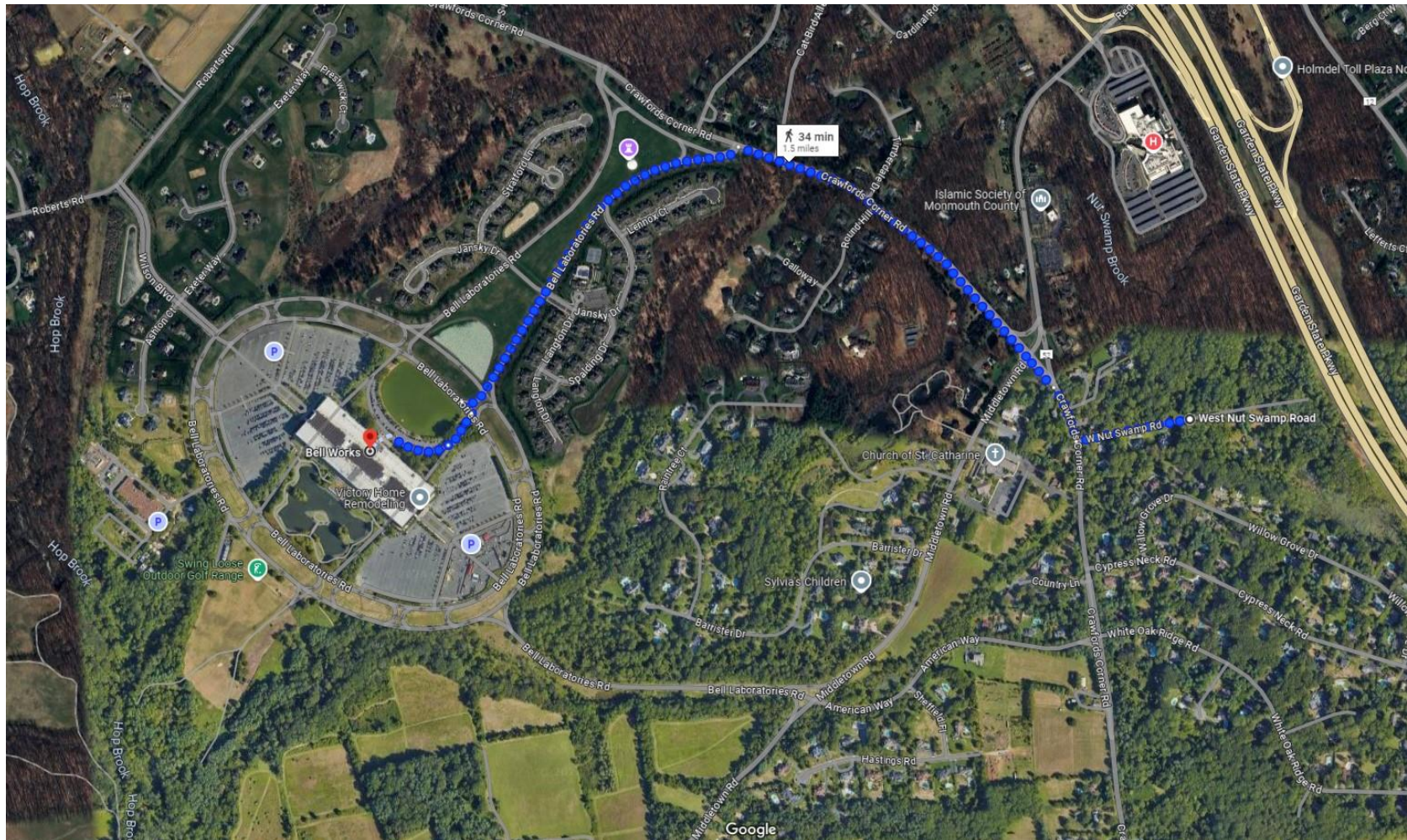


EXHIBIT 5C

Walking Distance to Middletown Train Station

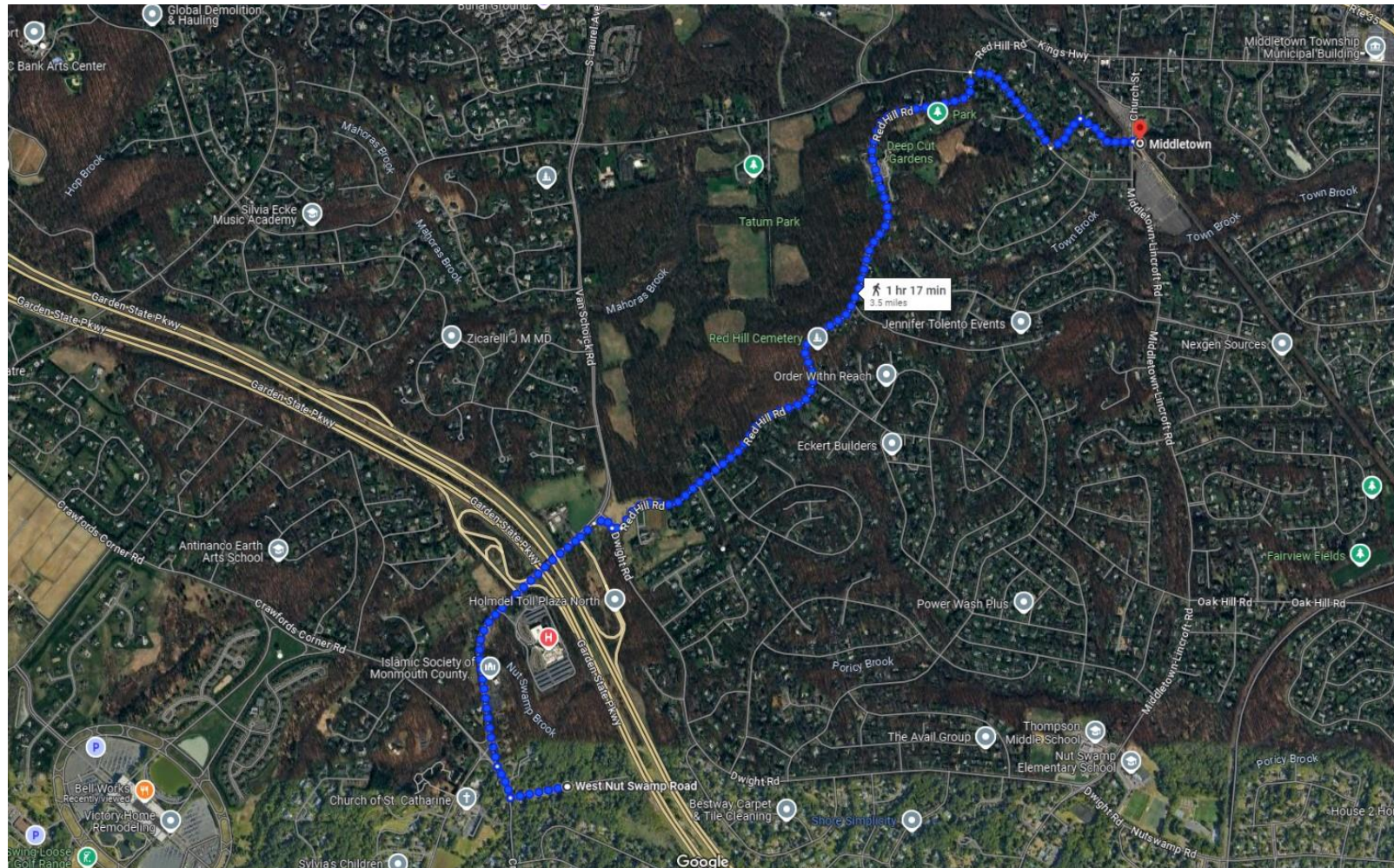


EXHIBIT 5D

Walking Distance to Academy Bus (Lincroft/Red Bank)

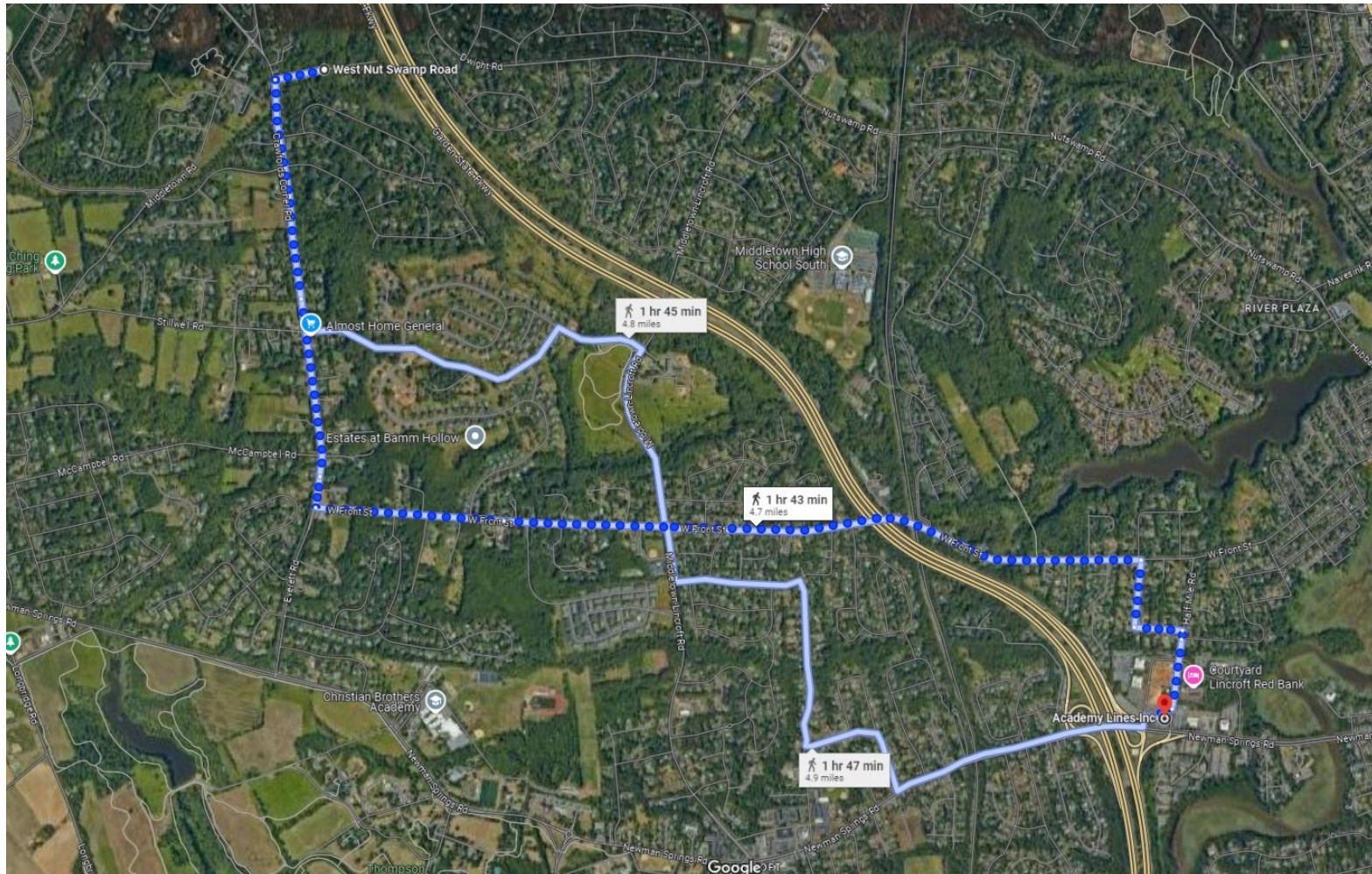




EXHIBIT 5E

Walking Distance to NJ Transit Bus (New Monmouth Road & Rt. 35, Middletown, NJ)

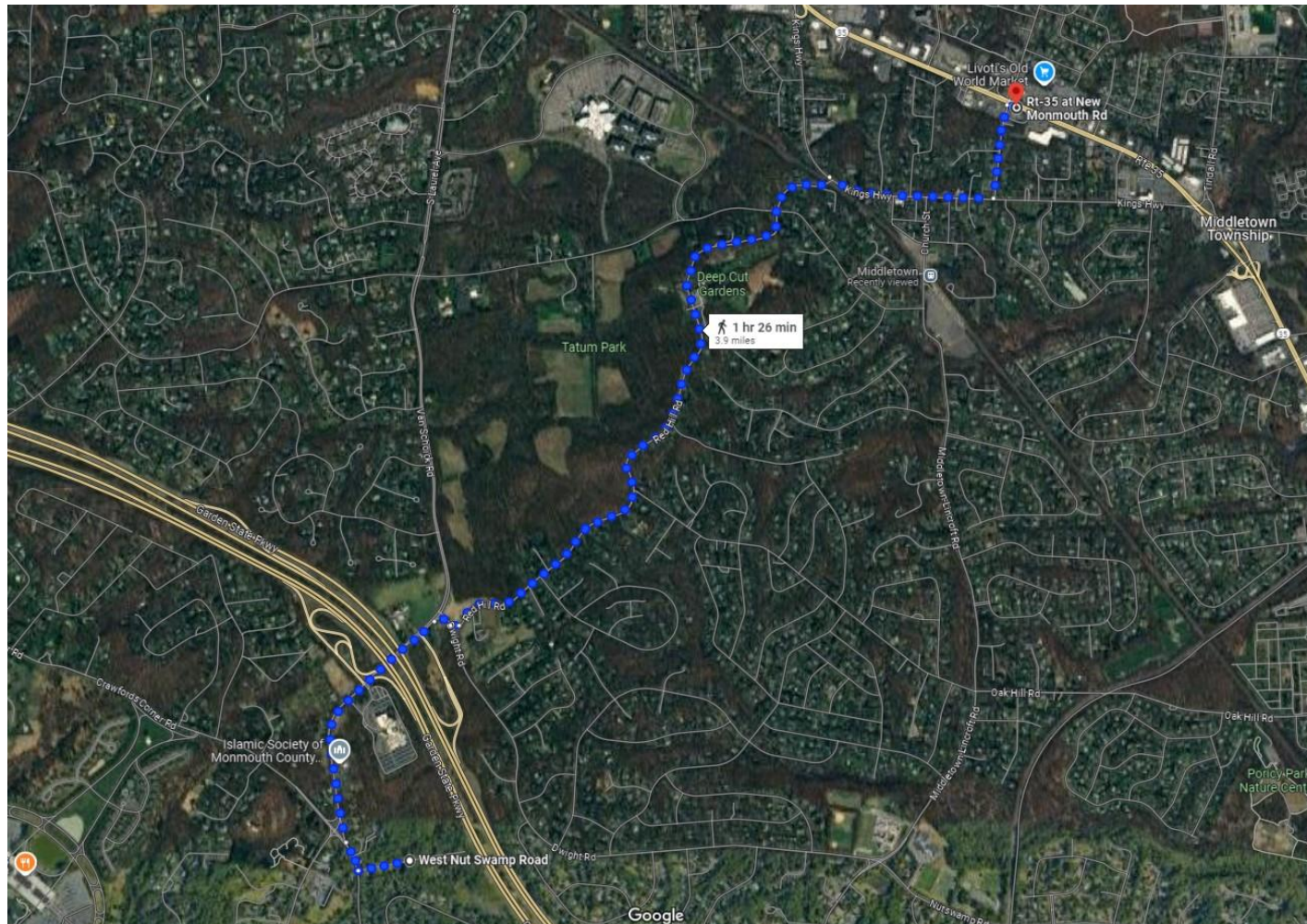
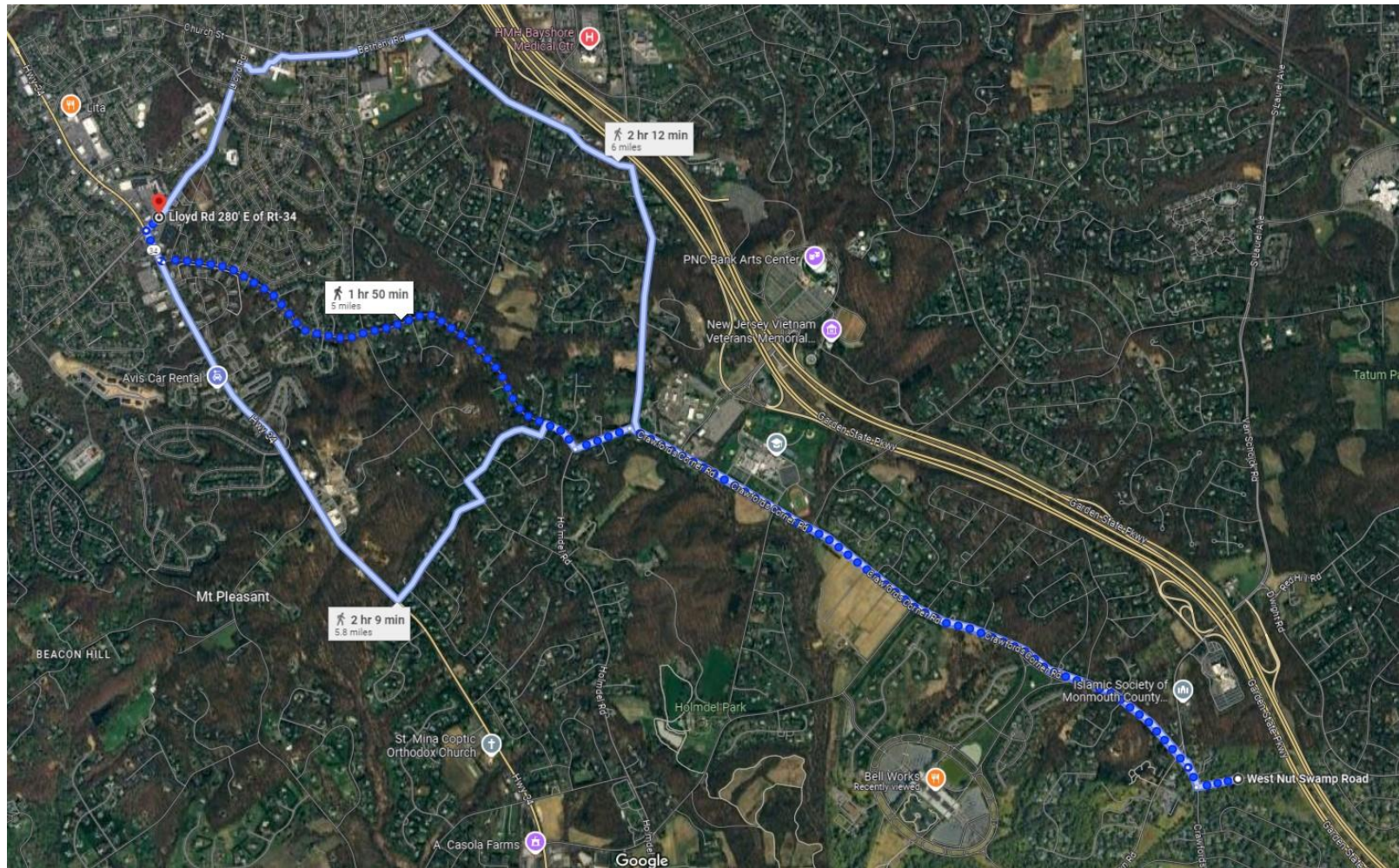


EXHIBIT 5F

Walking Distance to NJ Transit Bus (Lloyd Rd & Rt. 34, Aberdeen, NJ)



APPENDIX A

Recent Middletown Planning Board Approvals



RECENT MIDDLETOWN TOWNSHIP PLANNING BOARD APPROVALS

The Developer's Engineer has prepared a report which analyzes recent Planning Board approvals within Middletown Township, where waivers have been granted by the Board for exceeding steep slope and critical area thresholds set forth in the Township Code.

The subject report cites several projects within the Borough of Atlantic Highlands, which is a separate Municipal jurisdiction. Therefore, a response to same has been omitted from this report for that reason.

Below is a summary of the Middletown Planning Board applications referenced in the subject report, with our contextual responses noted in **BOLD**:

911A Navesink River Road

Block 840, Lot 69.03

Middletown Planning Board File #2023-100

Minor Subdivision

(Approved 02-01-2023, Memorialized 03-01-2023)

The applicant was granted approval to subdivide a 10.459 +/- acre parcel containing Lot 69.02 and Lot 69.03. The subdivision was essentially a lot line adjustment, which expanded Lot 69.03 by an additional 16,689 SF, on which they have proposed a 2-story dwelling. The resulting new property line will expand lot 69.03 from 2.631 to 3.014 acres. Lot 69.03 has frontage on Deep Hollow Road and Navesink River Road. The property is located the R-110 Zone.

Waivers Granted

- The applicant was granted a waiver for disturbing 55.23% of the slopes between 10-15% on proposed Lot 69.03, whereas a maximum of 30 % is permitted.*

The Board made a finding that compliance with the design standard was impracticable. Please see "Additional Context" below.

- The applicant was granted a waiver for disturbing 42.98% of the slopes between 15-25% on proposed Lot 69.03.*

Disturbance of these areas is only permitted where the applicant demonstrates that each disturbance is essential to the reasonable use of



the property. The Board made a finding that compliance with the design standard was impracticable. Please see “Additional Context” below.

ADDITIONAL CONTEXT:

- The applicant proposed the development of a single-family residential use, a permitted use within the zone, along with associated accessory structures.
- All proposed impervious areas onsite are captured, collected and attenuated by a proposed stormwater management infiltration basin.
- The applicant demonstrated compliance with NJAC 7:8 and the Township’s Stormwater Control Ordinance through the submission of an engineered plan and Stormwater Management Report.
- The stormwater management discharge from the site was planned to connect to an existing conveyance system and discharge, which will help mitigate downstream erosion and stormwater runoff issues.
- According to NJ GeoWeb mapping, the closest mapped wetlands are located more than 600 feet northeast of the site, while the nearest mapped water body, the Navesink River, is situated over 500 feet south and 1,200 feet east of the site.
- The intervening land primarily consists of previously developed single family residential properties and a public right-of-way.

500 Central Avenue

Block 460, Lots 2,3,4 & 5

Middletown Planning Board File #2023-400

Major Subdivision

(Approved 03-06-2023, Memorialized 04-03-2023)

The applicant was granted major subdivision approval to subdivide the 2.03-acre Lot 4 into five (5) new lots. The property is located within the R-10 zone. At the time of the application, the site mainly consisted of a 1-story commercial building and wooded areas. The project site contains frontage on Central Avenue, Hillside Avenue & Prospect Avenue, with its main frontage along Central Avenue.

The applicant proposed to remove the existing improvements and construct a 2 ½ story dwelling on each of the 5 proposed lots. Each newly created dwelling was proposed to have a recharge system for roof runoff as well as a surface infiltration basin. Utility extensions through Central Avenue and Prospect Avenue were proposed for each new dwelling.

Waivers Granted

- *The applicant was granted a waiver for disturbing 90% of the slopes between 10-15% on proposed Lot 4.01.*

Based on our review of Google Earth aerial and street view imagery (Error! Reference source not found.), the area in question appears to be an existing landscape strip situated between a previously disturbed and maintained grass yard area and an existing gravel driveway. The applicant proposed to generally match the existing slope grading, and little to no new impervious coverage was proposed within this area. It is important to note that the area of steep slopes to be disturbed (596 s.f.) represents approximately 0.7% of the overall tract being developed.



Figure 5: Google Street View Image of Steep Slopes to be disturbed on Lot 4.01

- *The applicant was granted a waiver for disturbing all 917 s.f. of Class I Critical Steep Slopes on Proposed Lot 4.03.*

Our review of Google Earth aerial and street view imagery indicates that this steep slope area appears to be a previously disturbed and

maintained grass yard situated between the existing building and the gravel driveway/parking area on the site (Error! Reference source not found.). It is important to note that the steep slope area designated for disturbance (917 square feet) represents approximately 1.0% of the total tract.



Figure 6: Google Street View Image of Steep Slopes to be disturbed on Lot 4.03

ADDITIONAL CONTEXT:

- The application eliminated a non-conforming commercial use in the R-10 zone and replaced it with five (5) permitted single family residential use(s), on a previously developed site.
- The overall development leads to a reduction in impervious lot coverage by more than 4,250 s.f., or 5.1% , compared to the existing condition.

The Middletown Township Planning Board has approved other development applications more recently, involving considerable steep slopes and critical area constraints. Below is a summary of these applications and the proposed disturbances to such areas:

127 Red Hill Road

Block 769, Lot 7

Middletown Planning Board File #2023-105

Minor Subdivision

(Approved 05-01-2024, Memorialized 06-05-2024)

The applicant was granted Minor Subdivision approval in the R-45 zone to subdivide the 4.60-acre parcel into two (2) lots. Proposed Lot 7.01 (1.66 ac) will include an existing dwelling, detached garage, and associated improvements, while proposed Lot 7.02 (2.94 ac) will contain a new dwelling, along with a driveway and other associated improvements.

ADDITIONAL CONTEXT:

- **Proposed Lot 7.02 consisted of 32,973 s.f. (0.76 ac) of Class II Critical Slopes between 15-25% slopes and 38,579 s.f. (0.89 ac.) of Class I Critical Slopes greater than 25%. This equates to approximately 56% of the Lot Area.**
- **The applicant successfully demonstrated reasonable use of the property by disturbing only 9,129 s.f. (0.21 ac) or 27.7% of the Class II Critical Slope areas, and 1,735 s.f. (0.04 ac) or 4.5% of the Class I Critical Slope areas.**

Oak Hill Road

Block 865, Lot 136

Middletown Planning Board File #2023-201

Minor Site Plan w/Conditional Use

(Approved 06-05-2024, Memorialized 07-01-2024)

The applicant was granted Minor Site Plan with Conditional Use approval in the R-22 zone to construct a 10,765 s.f. gravesite and/or private mausoleum area on the property, including a 15 ft. wide perimeter gravel driveway and an 18 ft. wide paved asphalt driveway from Oak Hill Road, with associated improvements on Lot 136 consisting of 20.764 acres.

ADDITIONAL CONTEXT:

- **The property consists of 174,525 s.f. (4.0 ac) of slopes between 10-15% slopes and 87,303 s.f. (2.0 ac.) of slopes greater than 25%. This equates to approximately 29% of the Lot Area.**
- **The applicant successfully demonstrated reasonable use of the property by disturbing only 5,102 s.f. (0.12 ac) or 2.9% of 10-15% slope areas and 208 s.f. (0.004 ac.) or 0.24% of areas greater than 25% slopes.**



APPENDIX B

Curriculum Vitae



Education

Rowan University, MS Civil Engineering, 2014

Rowan University, BS Civil Engineering, 2011

Professional Registrations / Affiliations

Licensed Professional Engineer in New Jersey

Licensed Professional Planner in New Jersey

Certified Municipal Engineer in New Jersey

American Society of Civil Engineers

Years in the Industry

11

Areas of Expertise

Civil Engineering, Land Use Planning, Athletic Fields, Sports Courts

Summary of Qualifications

Mr. Cunliffe has 11 years of experience in Public Works projects providing municipal engineering and planning services to numerous municipalities throughout New Jersey. He has designed and administered the construction of numerous roadway, drainage, park, athletic field, dredging and waterfront projects. He is involved with development application reviews and serves as a Consulting Engineer for various municipalities, Planning, Zoning, or Land Use Boards in Monmouth and Ocean Counties including the Boroughs of Beachwood, Ocean Gate, Point Pleasant Beach, and Tuckerton as well as the Townships of Colts Neck, Howell, Little Egg Harbor, Ocean (Waretown), Stafford, Upper Freehold and Wall.

While studying at Rowan University, he conducted research to determine the feasibility of implementing RCA in new PCC accompanied by a recommendation for best practices and specifications for NJDOT. In May 2014, Mr. Cunliffe finished his graduate work and completed his thesis entitled "Impact of Structure, Material Properties, Temperature Curling, and Trafficking on Load Transfer Efficiency," in order to receive his Masters in Civil Engineering. This work was sponsored by the Federal Aviation Administration and involved analysis of full-scale accelerated pavement test data from the FAA's National Airport Pavement Test Facility.

Current Appointments

- Upper Freehold Township, Township Engineer
- Howell Township, Special Projects Engineer
- Howell Township Zoning Board, Board Engineer
- Borough of Ocean Gate Land Use Board, Board Engineer
- Borough of Tuckerton Land Use Board, Board Engineer
- Borough of Bound Brook Planning Board, Board Engineer

Key Projects

Sports Court Improvements at Corliss Park and Sands Point Park, Township of Ocean, Ocean County, NJ. Project Manager/Lead Designer for the reconstruction and expansion of sport courts at two public parks. Improvements include tennis court resurfacing, pickleball court resurfacing, and conversion/expansion of two basketball courts into six pickleball courts, as well as ancillary site improvements.

Mystic Beach and Parkertown Beach Replenishment & Stabilization, Little Egg Harbor Township, Ocean County, NJ. Project Manager/Lead Designer for the design of 11,500 CY of beach replenishment including six offshore stone breakwaters and two jetties for stabilization. Improvements also include marsh restoration, parking lot improvements, and recreational amenities.

Twin Boro Park Multipurpose Field, Borough of Bergenfield, Bergen County, NJ. Lead Designer for the construction of a multi-use artificial turf field including two full size soccer field layouts also including football and baseball fields. The project included construction of an underground stone infiltration basin underneath the artificial turf field to manage stormwater runoff. The project also included site clearing, soil erosion and sediment control, excavation, grading, curb reconstruction, retaining walls, sports field lighting, site and field amenities, various site drainage and restoration. (2022-2023)



Cedar Drive Middle School Tennis & Basketball Court Reconstruction, Colts Neck School District, Monmouth County, NJ. Project Manager and Lead Designer for the reconstruction of three existing tennis courts and two existing basketball courts. The project also included the installation of a perimeter underdrain system to mitigate impact of seasonal high-water table and poor site soil conditions. The project also included site clearing, soil erosion and sediment control, excavation, grading, perimeter curbing and fencing, windscreens, court and site amenities and restoration. (2022-2023)

NJDOT Municipal Aid Road Program, Improvements to Aldrich Road West, Howell Township, Monmouth County, NJ. Client/Project Manager/Lead Designer for the resurfacing of Aldrich Road West from Route 9 to the Jackson Township Border. The project included site clearing, soil erosion and sediment control, replacement of curbing and driveway aprons, HMA Base Repair and resurfacing of the roadway. Due to significant traffic volumes, extensive coordination and public outreach was required for the night milling and paving activities.

2020 Capital Program #3 – Various Out Roads, Howell Township, Monmouth County, NJ. Client/Project Manager/Lead Designer for the reconstruction and resurfacing of various roadways located throughout the Township. The scope of work included re-design of roadway horizontal and vertical geometry accompanied with MUTCD compliance signage to improve safety for the general motoring public as well as drainage infrastructure design to correct areas of localized flooding. The work required coordination with various Utilities including Verizon, New Jersey American Water, New Jersey Natural Gas and the Township Sewer Authority. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

Mystic Island East Maintenance Dredging Phase 1, Little Egg Harbor Township, Ocean County, NJ. Lead Designer and Project Engineer for the design, permitting, bidding, contract administration, and inspection of dredging improvements (35,000 CY) within the Mystic Island (East) section of the Township.

Rehabilitation of Athletic Fields, Lincroft Campus, Brookdale Community College, Monmouth County, NJ. Lead Designer for the rehabilitation of an existing baseball, softball and soccer field including associated site amenities, located at the college's main Lincroft campus. The project included construction of an underdrain system beneath each field to improve upon the existing poor field drainage caused by underlying restrictive site soils. The project also included site clearing, soil erosion and sediment control, excavation, grading, curb reconstruction, various site drainage, irrigation, dugouts, backstops, fencing, bleachers and turf grass (sod) restoration.

Iowa Ct and South Green St Living Shorelines Project, Little Egg Harbor Township, Ocean County, NJ. Lead Designer for the construction of living shoreline improvements along Iowa Court and South Green Street. Improvements included shoreline stabilization at Iowa Ct via a 775-foot-long stone marsh sill, and the restoration one acre of coastal wetland marsh that was previously eroded.

Mystic Island West Phase 1 Maintenance Dredging, Little Egg Harbor Township, Ocean County, NJ. Lead Designer and Project Engineer for the design, permitting, bidding, contract administration, and inspection of dredging improvements (110,000 CY) within the Mystic Island (West Phase 1) section of the Township.

Five Points Park All Purpose Field, Colts Neck Township, Monmouth County, NJ. Lead Designer for the construction of a multi-use artificial turf field including baseball, soccer, football and lacrosse fields. The project included construction of an underground drainage basin underneath the artificial turf field to manage stormwater runoff. The project also included site clearing, soil erosion and sediment control, excavation, grading, curb reconstruction, various site drainage and restoration.

Mystic Beach and Parkertown Beach Replenishment & Stabilization, Little Egg Harbor Township, Ocean County, NJ. Lead Designer and Project Engineer for the design of 11,500 CY of beach replenishment including six offshore stone breakwaters and two jetties for stabilization. Improvements also included marsh restoration, parking lot improvements, and recreational amenities.

Veterans Park Improvements, Little Egg Harbor Township, Ocean County, NJ. Lead Designer and Project Engineer for the design, bidding, contract administration, and inspection of a new Veterans Park. The project included a Green Acres Change of



Use as well as stormwater management infrastructure, parking areas, lawn areas, walkways, a pavilion, monument walls, benches, flagpoles, etc.

Osborn Island Maintenance Dredging, Little Egg Harbor Township, Ocean County, NJ. Project Engineer for the bidding, contract administration, and inspection of dredging improvements (18,000 CY) within the Osborn Island section of the Township.

Bryant Road Bulkhead and Dock Improvements, Township of Ocean, Ocean County, NJ. Project Engineer for the reconstruction of a 200-foot-long timber T-Dock and 120 feet of Vinyl Bulkhead damaged during Superstorm Sandy at the end of Bryant Road on the Barnegat Bay. Also included in the project was the construction of a 6-foot-wide timber boardwalk landward of the bulkhead, storm drainage improvements, and roadway repairs.

2018 Roadway Improvement Program, Township of Ocean, Ocean County, NJ. Lead Designer and Project Engineer for the replacement and new installation of stormwater infrastructure along four waterfront roadways. Roadway re-grading/paving, curb replacement, driveway replacement and striping were also included in the project.

Mystic Island Drainage Improvement Project Phase 2, Little Egg Harbor Township, Ocean County, NJ. Lead Designer and Project Engineer for the replacement and new installation of stormwater infrastructure along six waterfront roadways. Roadway re-grading/paving, curb replacement, driveway replacement and striping were also included in the project.

Roadway Improvements to Saint Louis Avenue – Phase 1 & 2, Point Pleasant Beach, Ocean County NJ. Lead Designer and Project Manager for roadway design and drainage improvements for a deteriorated roadway with insufficient drainage. The roadway was redesigned to provide adequate crown and slope, drainage was resized and replaced. Sidewalk updated to provide for handicapped accessibility.

Enhancements to Aldrich Lake, Howell Township, Monmouth County, NJ. Assistant Designer and Resident Engineer for the dredging of Aldrich Lake. Assisted in preparation of design plans for permitting pertaining to safe disposal of dredge materials and oversaw the project for the duration of construction. The lake had been identified by numerous studies as one of the main contributing factors to poor water quality of the downstream Metedeconk River, for which it had been identified that dredging of Aldrich Lake would be an effective means to improve the quality of the downstream watershed. The project also included the installation of a dock to enhance public recreation access to the lake. Project required coordination with NJDEP.

Arnold Avenue Sidewalk Improvements, Point Pleasant Beach, Ocean County NJ. Lead Designer and Project Manager for replacement of dilapidated sidewalk in a high pedestrian traffic area from Baltimore to Ocean Avenue. The new 8' wide sidewalk and curbing was redesigned to promote positive cross slope and gutter drainage along with ADA compliant curb ramps.

Mayo Park Recreation Center, Beachwood Borough, Ocean County, NJ. Project Engineer for site and building improvements associated with the Mayo Park Recreation Center. The project included demolition of the existing recreation building and construction of new commercial grade building. Responsible for coordination with the Project Architect and various utilities.

Garfield Avenue Boat Ramp, Toms River Township, Ocean County, NJ. Lead Designer for the construction of a new concrete boat ramp located in a park along Garfield Avenue. The existing park area vegetation became overgrown over the years and the existing parking area was in disrepair. The 20' wide by 58' long ramp provides access to the Toms River and greater Barnegat Bay waterways. The improvements also included a 6' wide boardwalk and pier as well as a 2' wide finger pier to provide safe boater loading and offloading. A new access road that implemented both HMA and clam shell pavement sections was constructed from the existing parking area. The existing asphalt parking area was also reconstructed. The project required permitting from the New Jersey Department of Environmental Protection and Army Corps of Engineers.

Bay Avenue Boat Ramp, Borough of Point Pleasant, Ocean County, NJ. Lead Designer for the replacement of the existing concrete boat ramp located at the southern end of Bay Avenue. The existing ramp was damaged and had been in disrepair since Superstorm Sandy. The proposed 16' wide by 58' long ramp provided access to the Metedeconk River



and greater Barnegat Bay waterways. The improvements also included a 6' wide pier to provide safe boater loading and offloading. The existing roundabout at the end of Bay Avenue was also reconfigured to improve ease of access to the ramp. The project required permitting from the New Jersey Department of Environmental Protection and Army Corps of Engineers.

2016 Pipe Replacement Program, Howell Township, Monmouth County, NJ. Lead Designer and Resident Engineer for the replacement of various pipe crossings located within Howell Township. The improvements included the upsizing of pipes and installation of perforated HDPE to increase the capacity of several drainage systems. Several collapsed pipes and rusted corrugated metal pipes were replaced with more resilient material pipe (RCP, Ductile Iron, HDPE) depending on the allowable site conditions. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2016 Capital Program #3 – Full Reconstruct – Aldrich Estates, Howell Township, Monmouth County, NJ. Lead Designer and Resident Engineer for the reconstruction of various roadways located within the Aldrich Estates section of Howell Township. Project included the installation of 30" RCP at depths of up to 12' and required coordination with various Utilities including Verizon, New Jersey American Water, New Jersey Natural Gas and the Township Sewer Authority. Drainage calculations were performed to properly size the proposed drainage improvements. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2015 Streetscape Improvement Project, Little Egg Harbor Township, Ocean County, NJ. Lead Designer for streetscape improvements to Mathistown Road and Radio Road in Little Egg Harbor Township. Improvements were funded by New Jersey Economic Development Agency Grant. Improvements include the installation of curbing and sidewalk along existing roadway edges. ADA compliant curb ramps were installed at all intersections and driveway entrances along both roads. Drainage was installed along Mathistown Road to manage existing stormwater runoff. The project required coordination with Ocean County as both roadways are County R.O.W. Relocation of Bus Shelters required coordination with NJ TRANSIT. The project included site clearing, soil erosion and sediment control, site clearing and excavation, grading, paving, curb reconstruction, various site drainage and restoration.

2015 Capital Program #3 – Reconstruction of Kent Road, Howell Township, Monmouth County, NJ. Lead Designer and Resident Engineer for the reconstruction of Kent Road located in Howell Township. The existing roadway was widened to 22' to improve vehicle and pedestrian safety. Sections of the roadway were fully reconstructed to correct ponding and insufficient grading of the existing roadway. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

FY 2015 NJDOT Municipal Aid Road Program, Improvements to Larboard Street, Beachwood Borough, Ocean County, NJ. Project Engineer for the reconstruction of Larboard Street. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2014 Capital Program #3 – Full Reconstruction, Howell Township, Monmouth County, NJ. Lead Designer and Resident Engineer for the reconstruction of various roadways within the Oak Glenn section of Howell Township. The project implemented various pavement sections that utilized subgrade stabilization fabrics, roadway underdrains and full depth pavement reclamation (FDR) to mitigate poor site conditions. The Township will monitor the performance of each roadway to determine which section(s) can be used in the future to effectively mitigate the poor site conditions. The project also included stormwater infrastructure improvements within the Candlewood section of the Township. A drainage system consisting of a 15" perforated HDPE underdrain and catch basins was installed to mitigate issues related to the poorly drainage soils and high water table.

FY 2014 NJDOT Municipal Aid Road Program, Improvements to Anchor Avenue & Nautilus Street, Beachwood Borough, Ocean County, NJ. Lead Designer and Project Engineer for the reconstruction of Anchor Avenue and Nautilus Street. Drainage calculations were performed to properly size the proposed drainage improvements. The project included site clearing,



soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2014 Capital Program – Roadway Improvements, Burlington Path Road, Wygant Road and East Branch Road, Upper Freehold Township, Monmouth County, NJ. Lead Designer and Project Engineer for the reconstruction of various roadways located in Upper Freehold Township. Drainage improvements included replacement of corrugated metal pipe crossings with RCP at various locations and installation of perforated underdrains in areas where high water table was effecting roadway performance. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

FY 2013 NJDOT Municipal Aid Road Program, Colonial Drive South – Phase II, Manchester Township, Ocean County, NJ. Lead Designer for the reconstruction of Colonial Drive South in Manchester Township. The project was adjacent to Manchester Township High School and required coordination with School Officials. Project also required coordination with Conrail for proper restriping of railroad crossing located with the project limits. The project included site clearing, soil erosion and sediment control, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

Skippers Cove, 11th Street, and Seneca Blvd Water and Sewer Improvement Project, Ocean Township, Ocean County, NJ. Lead Designer for roadway and drainage improvements to various roadways located within the Skippers Cove section of Ocean Township. Project required coordination with water and sewer designers as well as other utility owners to coordinate location of improvements. Project was funded under the New Jersey Environmental Infrastructure Trust Program. The project included site clearing, soil erosion and sediment control, site clearing and excavation, grading, paving, curb reconstruction, various site drainage and restoration.

Pebble Beach Water and Sewer Replacement Project, Ocean Township, Ocean County, NJ. Lead Designer for roadway and drainage improvements to various roadways located within the Pebble Beach section of Ocean Township. Project required coordination with water and sewer designers as well as other utility owners to coordinate location of improvements. Project was funded under the New Jersey Environmental Infrastructure Trust Program. The project included site clearing, soil erosion and sediment control, site clearing and excavation, grading, paving, curb reconstruction, various site drainage and restoration.

FY 2013 Various Drainage Improvements, Beachwood Borough, Ocean County, NJ. Lead Designer and Project Engineer for the installation of new drainage infrastructure at various locations throughout the Borough. Drainage calculations were performed to properly size the proposed drainage improvements. The project included site clearing, soil erosion and sediment control, installation of drainage infrastructure, temporary pavement repair, curb/driveway apron reconstruction and restoration. The project also required coordination with the Ocean County for future Schedule 'C' paving.

Rigid Airport Pavements, for Rowan University, Glassboro, NJ. Impact of concrete material properties, joint type and support condition on airport pavement design (funded by the Federal Aviation Administration). Conducted analysis of test data from the National Airport Pavement Test Facility located near Atlantic City, NJ.

Improvements to Cooper River Park, Camden County, NJ. Assistant Designer for the dredging of Cooper River Lake located in Camden County New Jersey. Assisted in preparation of design plans for permitting pertaining to safe disposal of the effluent water once dredge material had been dewatered. Project required coordination with New Jersey Department of Environmental Protection, US Army Corps of Engineers, Camden County Municipal Utility Authority and Conrail.

FY 2013 NJDOT Municipal Aid Road Program, Improvements to Tinton Falls Road, Howell Township, Monmouth County, NJ. Resident Engineer for the reconstruction and overlay of a reinforced concrete roadway. The project included full and partial depth concrete slab replacements per NJDOT standards. The project included site clearing, soil erosion and sediment control, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

Central Regional Athletic Field And Track Rehabilitation Project, Central Regional Board Of Education, Berkeley Township, Ocean County, N.J. Resident Engineer for the construction of an 8 lane track (10 sprint lanes) and multi-use artificial turf field.



The project included construction of 36" HDPE underground drainage basin underneath the perimeter of the artificial turf field to manage stormwater runoff. The project included site clearing, soil erosion and sediment control, site clearing and excavation, grading, paving, curb reconstruction, various site drainage and restoration.

Water Main Replacement, Roadway and Drainage Improvements to Ship Avenue, Borough Of Beachwood, Ocean County, NJ.

Resident Engineer for the reconstruction of water main, drainage and roadway of Ship Avenue. The project required coordination with County officials due to ROW. The project included site clearing, soil erosion and sediment control, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2013 Road Improvement Program and Reconstruction of Lanes, Borough of Avon-By-The-Sea, Monmouth County, NJ. Lead Designer and Resident Engineer for curb, sidewalk and roadway improvements to Garfield Avenue, Jefferson Avenue and various lanes. The project included site clearing, soil erosion and sediment control, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

Beachwood Beach Outfall Relocation, Beachwood Borough & Ocean County, NJ. Lead Designer to relocate two outfalls in Beachwood Beach in an effort to improve the water quality of the Toms River and the Barnegat Bay watershed. Project scope included water sampling from 16 outfall locations, removal of two existing outfalls (municipal and county), construction of one combined outfall, reconstruction of the parking area and other ancillary improvements. Project was funded under the New Jersey Environmental Infrastructure Trust Program. Project required coordination with Ocean County Engineering, Ocean County Board of Health, and the New Jersey Department of Environmental Protection, among others.

Parking and Pedestrian Access Assessment, Brick School District Brick Township, Ocean County, NJ. Project Engineer responsible for the assessment and rating of all parking areas and pedestrian access ways located within School District Facilities. The assessment reviewed the condition of the parking areas, sidewalk and curb including cracking, patches/potholes, etc. Pedestrian access ways were also assessed for ADA compliance. A comprehensive report with mapping and photographs was provided to the District for their use in determining long term improvement programs.

Parking and Pedestrian Access Improvements, Brick School District, 2013, Brick Township, Ocean County, NJ. Project Engineer responsible for the reconstruction of curb and sidewalk and resurfacing of main parking lot at Brick Township High School. Pedestrian access ways were reconstructed to be ADA compliant. Project included coordination with various school district, township and fire officials regarding re-striping of the main lot.

FY 2013 NJDOT Municipal Aid Road Program, Improvements to Valley Forge Drive, Little Egg Harbor Township, Ocean County, NJ. Lead Designer for the reconstruction of Valley Forge Drive. The project included site clearing, soil erosion and sediment control, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

2013 Drainage Easement Improvements, Little Egg Harbor Township, Ocean County, NJ. Lead Designer for the reconstruction of drainage located within various easements in the municipality. The project included site clearing, soil erosion and sediment control, drainage, roadway excavation, grading, paving, curb/driveway apron reconstruction and restoration.

Application of a 3D Virtual Reality Tool for Community Planning and Economic Development, for Rowan University, Glassboro, NJ.

Conducted land surveys in flood prone areas of Camden and Vineland, NJ using GPS surveying systems.