

Site Suitability Analysis – Engineering Rebuttal Report

Site in the Township of Middletown:

Block 1045, Lot 12 (490 Red Hill Road)

Referred to as “Red Hill Road Site”

Prepared:

September 30, 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, Lot 12 is located at 490 Red Hill Road. For the purposes of this report, the subject property shall be referred to as the “*Red Hill Road Site*”. The subject property consists of approximately 2.18 acres in area (per Tax Map sheet 202 and County Tax Records), whereas deed plotting results in a lot area of 2.58 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 front portion of the site is partially cleared with stone spread throughout. A mix of chain link and timber fencing with wire mesh is located along the Red Hill Road Frontage. The property is accessed from Red Hill Road via a stone driveway with metal gate access to the interior of the site. An electric service meter is located to the south of the driveway, along the Red Hill Road frontage. The balance of the site is largely wooded and undeveloped. Review of historic aerial imagery appears to show a prior single family residential dwelling use on the northernmost portion of the site.

It is our understanding that the Owner of the Property desires to construct an inclusionary development on the subject property, consisting of 70 Dwelling Units, of which 15% or 11 units are to be set aside for use as low- and moderate-income 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 “*Red Hill Road Site*”, the report also focuses on an additional site located on West Nut Swamp Road, Block 1045, Lots 2, 3 & 4. The following document is enclosed under Appendix ‘A’ of this report:
 - NJDEP Freshwater Wetlands Letter of Interpretation: Presence/Absence, File No.: 1331-23-0003.1, Activity Number: FWW23001, dated May 25, 2023;
- A report entitled “Traffic Impact Assessment for 490 Red Hill Road”, as prepared by Dolan & Dean Consulting Engineers, LLC, dated July 15, 2024;
- A report entitled “Steep Slopes Analysis of Middletown and Surrounding Municipalities”, as prepared by MidAtlantic Engineering Partners, LLC, dated July 2, 2024;
- A plan entitled “Concept Plan for Red Hill Road Property”, as prepared by CPL Partnership, dated February 21, 2023, consisting of one (1) sheet.

The Township of Middletown has prepared the following reports for the subject property:

- A report entitled “Environmental Resource Inventory, Block 1045, Lot 12”, 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 Concept Development fails to comply with many provisions of the Township of Middletown Development Regulations pertaining to steep slopes, critical areas, stormwater management, many of which may lead to adverse impacts to downstream and neighboring areas. The Development fails to demonstrate compliance with Monmouth County Standards for site access, and trip generation from the site, which may be underestimated, will likely lead to higher occurrences of crashes and collisions. The concept does not provide adequate circulation for Fire Emergency Vehicles nor safe egress from habitable bedrooms along western façade of the building. For these many reasons, the Development Concept is not approvable without significant modification to the scope of the development.

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.

- The site is not currently located within a mapped Sewer Service Area, with the nearest sanitary sewer infrastructure located over 3,100 feet (0.60 miles) to the south. The Developer has not obtained a “Will Serve Letter” from the Township of Middletown Sewerage Authority (TOMSA), which operates the sewer within this service area, likely because the site is not located within the sewer service area. The Developer cannot proceed with this Development Concept until they secure a Site-Specific Amendment to

the Monmouth County Water Quality Management Plan (MCWQMP), which requires approval from TOMSA, Monmouth County, and the NJDEP. NJDEP may not issue the amendment due to the presence of Rank 3 habitat onsite and non-compliance with the Township's Planning and Development Regulations. As it stands, the site cannot be developed with high-density multi-family housing because these amendments and approvals have not been obtained.

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 Development fails to demonstrate compliance with Monmouth County Standards for site access. Realistic access to sidewalks and mass transit is limited, which will lead to a reliance on motor vehicles and increased trip generation from the site. This is also an issue because even if all 70 dwelling units are 1-bedroom, the Development Concept is deficient of the RSIS requirement by fifty-five (55) spaces. At best, the site driveway is proposed to operate at LOS 'E', which is at capacity and with significant delay. As a result, drivers are more likely to take risks, which when compounded with sight distance limitations along the site frontage, will likely lead to higher occurrences of crashes and collisions at the site driveway. The concept proposes tree clearing in excess of what is permitted by Township Regulations and does not provide adequate open nor recreational space on the site. A Flood Hazard Area Verification has not been obtained to verify the site is not in a Flood zone or impacted by Riparian zones. For these many reasons, the site is not suitable without significant modification to the Development Concept.

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 Red Hill Road Site is located outside of the sanitary sewer service area, which the Township of Middletown Sewerage Authority (TOMSA) operates within. The Developer cannot develop the site with high density multi-family housing, without approval from TOMSA, Monmouth County and the NJDEP to amend the current Monmouth County Water Quality Management Plan and include the property lot in TOMSA's current service area. NJDEP may not issue the amendment due to reasons discussed later in this report. **It should be noted that the Developer has obtained a "Will Serve Letter" from TOMSA for the West Nut Swamp Road Site, but has not obtained one for the Red Hill Road Site, likely because the site is not in the sewer service area.**

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 sanitary sewer infrastructure available along the Red Hill Road property frontage. Furthermore, TOMSA has indicated the nearest sanitary sewer gravity main is located approximately 3,100 ft. (0.60 miles) 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. There are no other existing sanitary sewer gravity mains along Red Hill Road from the development site to Cypress Neck Road. Per the Development Concept, the first floor elevation for the 70 dwelling unit apartment building is proposed at elevation 200 whereas the existing grade along Red Hill Road varies from elevation 223 to 230.

Should sanitary sewer infrastructure become available within the Red Hill Road right-of-way, a Pump Station and force main will be required to pump sewage 23-30 ft. uphill from the bottom of the site to the Red Hill Road right-of-way.

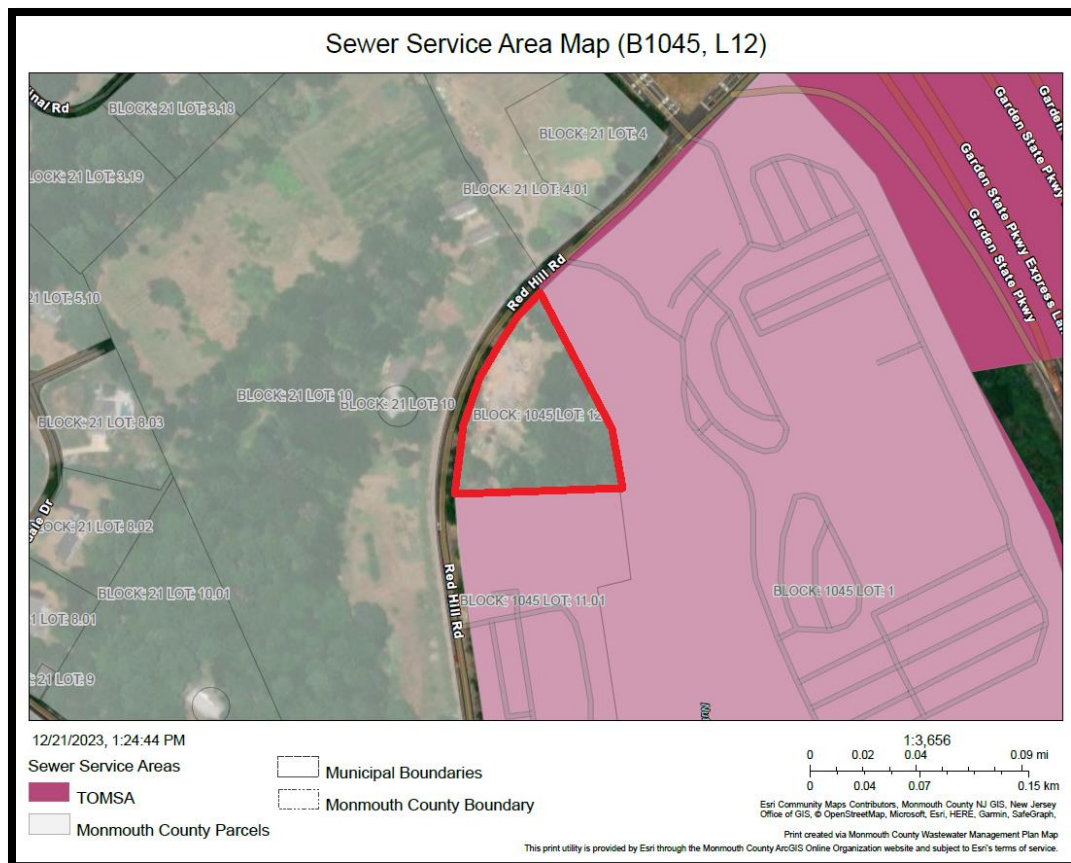


Figure 1: Wastewater Management Plan Viewer (Red Hill Road Site)

3. Regulatory Approvals Required



i. Site-Specific Amendment to the Monmouth County Water Quality Management Plan (MCWQMP)

As noted, to develop the site with high density multi-family housing, a developer will need to obtain approval from TOMSA, Monmouth County and the NJDEP to amend the current Monmouth County Water Quality Management Plan and include the property lot in TOMSA's current service area.

In accordance with the New Jersey Water Quality Management Planning rule at N.J.A.C. 7:15-3.3(b), site specific amendments are limited to proposed alterations to the eligible SSA needed to address a specific project or activity. An application for amendment must be made to both the NJDEP and to the Monmouth County Planning Board Amendment Review Committee (ARC), concurrently.

- Pursuant to N.J.A.C. 7:15-4.4, NJDEP shall determine areas eligible for sewer service in accordance with several provisions, including but not limited to the following:
 - Pursuant to N.J.A.C. 7:15-4.4(e)1, the Department shall consider Areas mapped as endangered or threatened wildlife species habitat as identified on the Department's Landscape Maps of Habitat for Endangered, Threatened or Other Priority Wildlife as Rank 3, 4 and 5.

According to the Environmental Resource Inventory prepared by Princeton Hydro for the site, dated September 2024, "Per the Landscape Project, approximately 90% of the Site was classified as either Rank 1 or 3 T&E species habitat. Rank 3 habitats were identified throughout the majority of the Site with the exceptions being the extreme northwest and southeast portions. The Site's Rank 3 habitats were comprised of wetlands and/or riparian corridors and by their proximity to an observed occurrence of Black-crowned Night Heron (*Nycticorax nycticorax*), a threatened species in New Jersey." The PH report also indicates the site may also contain habitat for the Red-headed Woodpecker (*Melanerpes erythrocephalus*). These findings will require further investigation by the NJDEP and could hinder the approval of a site-specific amendment.

- Pursuant to N.J.A.C. 7:15-4.4(h)1 and 2, the Department shall consider the land uses allowed in adopted zoning ordinances and future land uses shown in adopted municipal or county master plans and other local land use objectives.

As noted within the “Site Layout and Design” section of this report, the proposed Development Concept conflicts with numerous of the Chapter 540 “Planning and Development Regulations” of the Township of Middletown Code, which could prevent a site specific amendment.

ii. Treatment Works Approval

Should the Developer obtain a site-specific amendment to the MCWQMP, 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 unit, based upon the project flow criteria set forth in NJAC 7:14A-23.3, assuming that each dwelling unit consisted of 1 up to 3-bedrooms, the anticipated sewage flow for the development concept would be approximately 10,500 gpd up to 21,000 gpd.

SUMMARY & CONCLUSIONS : The Red Hill Road site is not currently located within a mapped Sewer Service Area, with the nearest sanitary sewer infrastructure located over 3,100 feet (0.60 miles) to the south, along Cypress Neck Road near its intersection with Crawfords Corner Road (C.R. 52). The Developer has not obtained a “Will Serve Letter” from the Township of Middletown Sewerage Authority (TOMSA), which operates the sewer service area, likely because the site is not located in the sewer service area. The Developer cannot proceed without securing a Site-Specific Amendment to the Monmouth County Water Quality Management Plan (MCWQMP), which requires approval from TOMSA, Monmouth County, and the NJDEP. NJDEP may not issue the amendment due to the presence of Rank 3 habitat onsite and non-compliance with the Township’s Planning and Development Regulations. As it stands, the site cannot be developed with high-density multi-family housing until these amendments and approvals are obtained.

C. Availability of Public Potable Water for Connection

1. New Jersey American Water Infrastructure

Based on discussions with and our review of GIS mapping provided by New Jersey American Water (NJAW), it is our understanding that a 12” AC water main exists within the Red Hill Road right-of-way across the property frontage.

While the Developer has secured a “Will Serve Letter” from NJAW for the West Nut Swamp Road site, they have not obtained one for the Red Hill Road site. As part of any

water service application, NJAW will likely evaluate the condition of the asbestos-cement (AC) main to determine if replacement is necessary. Due to the health concerns associated with asbestos-containing materials, the removal of the AC water main can be both costly and time-consuming.

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 (70 apartment units proposed), a Safe Drinking Water Permit Certification would be required from NJDEP.

Based upon the water demand criteria set forth in the Residential Site Improvement Standards (RSIS) NJAC 5:21-5.2, assuming that each dwelling unit consisted of 1- up to 3-bedrooms, the water demand required from a public water supply system for the Development Concept would be 6,650 gpd up to 15,050 gpd.

However, the water demand for the Development Concept may be considerably higher should the building be proposed and/or required to be Fire Suppressed to comply with Building Code requirements, as these estimates do not take into account any required water demand for Fire Protection. This will need to be addressed should the Developer further the Development Concept to a fully engineered site plan.

SUMMARY & CONCLUSIONS: The site is located within the mapped water franchise area of New Jersey American Water (NJAW). Water service is available along the property frontage, via a 12" asbestos cement (AC) water main, located along the Eastern side of Red Hill Road. However, the applicant has not obtained a Will Serve Letter from NJAW for the subject property. Additionally, the Developer has not indicated the number of anticipated bedrooms within each unit, which will be required by NJAW to determine the anticipated water demand for the Concept Development, including any additional demand for Fire Suppression. NJAW will ultimately review and may require upgrades to the existing asbestos cement (AC) water main after assessing its condition and the demand generated by the project.

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 4" plastic gas main within the Red Hill Road right-of-way, on the opposite side of the road from the subject site.

Based upon this information, it is presumed that gas service is available to the site.

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 and meter along 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 within the Red Hill Road right-of-way adjacent to the site frontage.

Based upon this information, it is presumed that gas service is available to the site.

SUMMARY & CONCLUSIONS: Natural Gas (NJNG) and Overhead Electric (JCP&L) infrastructure is available within the Red Hill Road right-of-way. 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

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 development footprint from 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 Red Hill Road Site can be found in Table 1.

Table 1 Steep Slope Analysis – Red Hill Road Site

STEEP SLOPES ANALYSIS			
BLOCK 1045, LOT 12			
STEEP SLOPES RANGE	AREA (S.F.)	AREA (A.C.)	PERCENTAGE OF LOT AREA (%)
10-15%	17,110	0.39	15.2%
15-25%	31,834	0.73	28.3%
>25%	35,681	0.82	31.7%
TOTAL > 10%	84,625	1.94	75.2%

- 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 15.2% of the Red Hill Road Site consists of slopes between 10-15%.

We estimate that the proposed development will disturb approximately 39% 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 60% of the Red Hill Road Site is slopes greater than 15%.

We estimate that the proposed development will disturb approximately 61% of these areas onsite. If the Development Concept progresses to a fully engineered site plan, which includes stormwater management, grading and other site improvements, we anticipate this disturbance will increase.

- In accordance with §540-624, areas of steep slopes greater than 25% are considered Class I Critical Areas.
 - Approximately 31.7% of the Red Hill Road Site are slopes >25%.

We estimate that the proposed development will disturb approximately 68% of these areas onsite. If the Development Concept progresses to a fully engineered site plan, which includes stormwater management, grading and other site improvements, we anticipate this disturbance will increase.

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. It should be noted that this report estimates a larger percentage of steep slopes >25% relative to the PH report, as this report has utilized an overall limit of disturbance for the development, inclusive of the area between the building and the driveway, between the building and the parking area, as well as the curb islands within the parking area. The results otherwise, are generally consistent.

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 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

The Developer has obtained Freshwater Wetlands Letter of Interpretation: Presence/Absence, File No.: 1331-23-0003.1, Activity Number: FWW23001, from NJDEP dated May 25, 2023. The LOI indicates that freshwater wetlands and waters are not

present on the site. In addition, it indicates that no part of the above reference property occurs within a transition area or buffer.

3. Flood Hazard Areas and Riparian Zones

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). The northern terminus of the Nut Swamp Brook is mapped in the vicinity of the southern property line.

We have also reviewed the best available FEMA PFIRM and/or FIRM mapping. Although the LOI obtained by the Developer indicates that there are no state open waters onsite, the LOI does state that “any surface water features on the site or adjacent to the site may possess flood hazard areas and/or riparian zones and development within these areas may be subject to the Flood Hazard Area (FHA) Control Act Rules at N.J.A.C. 7:13.” At a minimum, the Developer would need to obtain an FHA Verification and obtain any required FHA Permits as part of the furtherance of any concept development to a fully engineered site design.

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 75% of the property is situated on slopes greater than 10%. We estimate the proposed Development Concept will disturb over 56% of the steep slopes greater than 10%, 39% of slopes between 10-15%, 52% of Class II Critical Areas (15-25% slope) and 68% of Class I Critical Areas (>25%) onsite. Many other recent Planning Board approval 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 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. To both reduce the overall footprint of steep slopes disturbance and maintain the same proposed dwelling unit count, this would require the building height to be increased in terms of both feet and stories, which will exacerbate the visual impact and availability of air light and open space to neighboring properties.

These disturbance estimates are likely to increase as the site progresses to a fully engineered site and grading design. Disturbance of steep slopes and vegetation removal typically accelerate erosion from stormwater runoff, leading to sedimentation in downstream water bodies, degradation of water quality, and loss of aquatic life support. The Nut Swamp Brook,

located immediately downstream, is likely to be affected by the proposed disturbance of steep slopes.

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. 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 56% 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 52% of Class II Critical Areas (15-25% slope) and 68% 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”.**

ii. 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 it appears ±35 ft. is proposed. **The Development Concept does not comply. To achieve compliance, the building would need to be shifted 15 ft. further into the site and at least an additional 15 ft. wide strip of trees would need to be cleared at the rear of the proposed parking area. This**



would further worsen the lot/tree clearing, which already surpasses the 20% maximum permitted by §540-651A.

- A five (5) story apartment building is proposed which exceeds the maximum 2-1/2 story permitted. In addition, the height of the structure may exceed the maximum 35 ft. permitted. **The Development Concept exceeds the maximum allowed number of stories, and it lacks sufficient information to determine the building's height in feet. Surpassing height restrictions would affect availability of adequate air, light and open space to neighboring properties.**
- A maximum Building Coverage of 8% is permitted whereas it appears $\pm 26\%$ and $\pm 22.2\%$ is proposed based on Tax Map and Deed Plotting, respectively. **The Development Concept does not comply. Building Coverage directly contributes to the rate and volume of Stormwater Runoff generated by a site. As noted in the PH report, this can potentially lead to downstream issues such as stream bank erosion, stream migration and stability issues, and flooding.**
- A maximum Lot Coverage (Impervious Coverage) of 15% is permitted whereas it appears $\pm 57\%$ and $\pm 48.5\%$ is proposed based on Tax Map and Deed Plotting, respectively. **The Development Concept does not comply. In addition, as it does not outline pedestrian walkways connecting the building to the parking area and to the public right-of-way, the extent of non-compliance is exacerbated. 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.**

iii. Earthwork and Grading

- In accordance with §540-532S, each property owner is privileged to make a reasonable use of his property even though the flow of surface waters is altered thereby and causes some harm to others. However, unreasonably harmful interference with the flow of waters shall be prohibited. **The proposed parking area is situated upon an existing overland drainage feature. Installing it at the indicated grades will block natural runoff from the property to the north, leading to and impoundment of stormwater runoff that negatively impacts the neighboring property. No measures have been proposed to address this issue.**



- Structural retaining walls are not permitted to exceed three (3) feet in height within a required setback area in accordance with §540-616I(1). **The proposed site driveway and the northern side of the proposed building are located in areas where existing site slopes are in the range of 15-25% and are proposed to be setback approximately 15ft. and 25 ft. from their respective side lot lines, where a 25 ft. side yard setback is required in the R-45 zone. Notably, no areas of open space for recreation have been provided onsite for the building residents, In order for these areas to be utilized for same, retaining walls would be required and may likely exceed 3 ft. permitted, requiring relief.**

iv. Access and Circulation

- 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 lacks sidewalks connecting the planned seventy-one (71) space parking area to the building, or linking the building and parking area to the public right-of-way. Adding such infrastructure would increase the Lot Coverage (Impervious Coverage), which already surpasses the maximum 15% allowed in the R-45 zone. The PH report outlines potential negative downstream impacts from stormwater runoff due to land development and impervious surfaces.**
- No part of any driveway may be located within five feet of a side property line for single- and/or two-family dwellings and within 20 feet of a side property line for all other uses, in accordance with §540-612E. The proposed main site driveway is proposed 15 ft. from the southern side property line, whereas 20 ft. is required. **The limited space between the proposed driveway and the side property line, along with the existing steep slopes, will hinder sufficient grading, potentially affecting neighboring properties. As noted in the PH report, disturbances to steep slopes can destabilize a slope and lead to changes in topography, erosion, soil loss, and degradation of water quality of downstream and neighboring properties.**

v. Landscape Buffering

- As discussed later in this report, due to Monmouth County sight distance restrictions for the proposed site driveway, it is very unlikely that the Developer would be able to maintain any existing nor propose any new buffer landscaping along the Red Hill Road site frontage. In addition, the site driveway is proposed



within ± 15 ft. of the southern property line and the building is proposed within ± 25 ft. of the north side property line. **§540-606 of the Township code requires a 50-foot 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.**

vi. 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 $\pm 32,500$ s.f. which equates to approximately 34.2% and 28.9% of the Lot Area by Tax Map and Deed Plotting, respectively. This is concerning as the PH report indicates the many valuable benefits that trees provide to the ecosystem. This tree clearing percentage will likely increase for the following reasons:**
 - The Monmouth County Road Plan requires an 80 ft. right-of-way for Red Hill Road (CR52). Right-of-way takings along the site frontage will likely be required by Monmouth County to achieve the required 40 ft. halfwidth. The Lot area will be reduced as a result, thereby increasing the percentage of clearing proposed.
 - The approximated tree clearing is based solely upon the limits of the proposed building and parking area. The area of tree clearing will be significantly higher once proposed site grading is considered.
 - Based upon our review of NearMap aerial imagery (Figure 2), a significant amount of tree clearing took place onsite around 2020. If the property owner cleared these trees without the necessary regulatory approvals pursuant to §540-534, the overall tree clearing percentage would increase to the range of 55-65 % as a result of this unlawful activity.
 - The analysis is based upon a review of Aerial Imagery and a site visit by this office. The limits of existing trees could expand based on an actual physical tree survey.

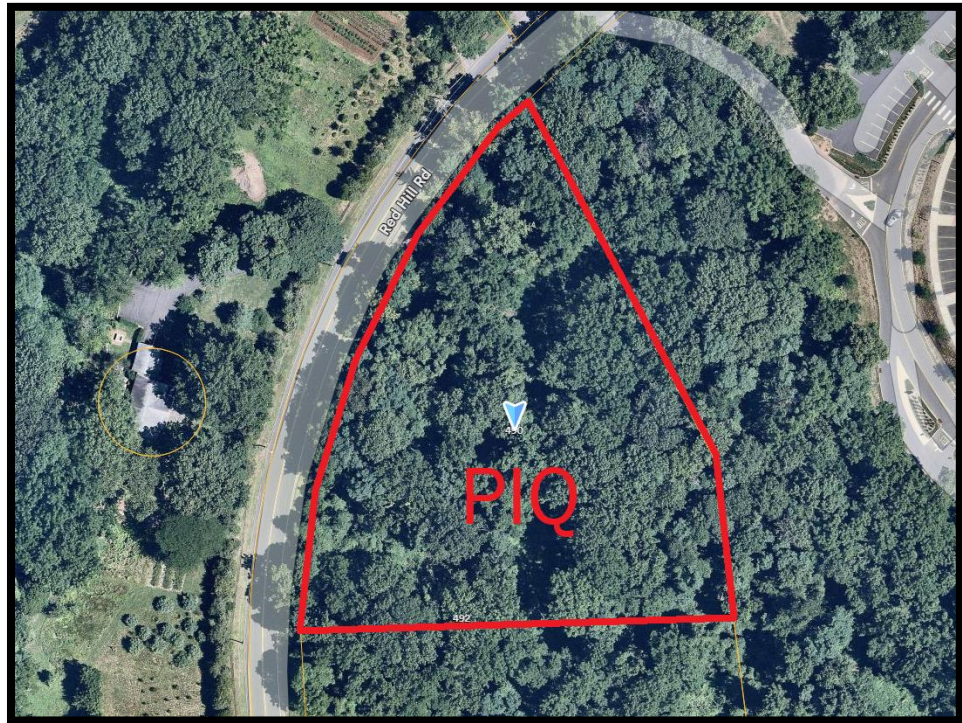


Figure 2: NearMap aerial imagery dated July 13, 2019 showing the site prior to 2020 tree clearing.

SUMMARY & CONCLUSIONS: 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 56% of slopes over 10% and disturbing significant percentages of Class I and II Critical areas. Additionally, the project fails to adhere to R-45 zone bulk standards, including front yard setbacks, building height, building coverage and lot coverage. The concept lacks required sidewalks, which will further exacerbate the exceedance of lot coverage, and may also lack adequate perimeter buffering. 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 a five (5) story apartment building, two (2) stories of which are proposed to be above grade plane in reference to the Red Hill Road site frontage, with all five (5) stories proposed to be above grade plane in reference to the proposed parking area. With the proposed layout, the front façade of the first three (3) stories are to be built into the existing site slope, below grade. Per the International Fire

Code (IFC) 2021, the proposed building is classified as Use Group Residential Group R-2 as it is an Apartment Building which will contain sleeping units and more than two dwelling units where the occupants are permanent in nature.

In accordance with Section 1031.2 of the IFC, Basements and sleeping rooms below the fourth story above grade plane shall not have fewer than one emergency escape and rescue opening, which is defined as “an operable exterior window, door or other similar device that provides for a means of escape and access for rescue in the event of an emergency”.

The Development Concept does not include any architectural floor plans. Since the first three (3) stories of the structure's front (western) façade are built into the existing site slopes, below adjacent grade relative to Red Hill Road, operable exterior windows or doors cannot be placed along this side to comply with IFC 2021. Consequently, it would be virtually impossible to construct habitable bedrooms or sleeping rooms on the entire western side of the building for these three stories. This limitation significantly reduces the number of dwelling units and habitable bedrooms that can be accommodated within the building.

SUMMARY & CONCLUSIONS: The Development Concept features a five-story apartment building, with the first three stories set into the existing steep slopes below grade relative to Red Hill Road. Classified as R-2 use group under the International Fire Code (IFC) 2021, the design does not include architectural plans and lacks operable exterior windows or doors on the western façade, preventing compliance with emergency escape requirements. As a result, this configuration impedes the construction of habitable bedrooms on that side, significantly limiting the number of dwelling units and habitable space available within the building. The Developer is unlikely to build 70-dwelling units without significant modification to the building and site layout.

3. Site Access – Conformance with Monmouth County Regulations

The site is situated on the Eastern side of Red Hill Road (CR 52). Access to the site falls under the jurisdiction of the Monmouth County Planning Board, who review developments in accordance with the “County of Monmouth Development Regulations, Volume II, Design Standards”.

i. Required Sight Distance

- In accordance with Section 5.2-3.1H-1, “Intersection Sight Distance”:

- Proposed driveway access to a county road shall be located to maximize sight distance along the county road. New driveways shall be located to provide an unobstructed line of sight as established by the following horizontal and vertical measurements. The location of the sight line horizontally is measured from a point 15' behind the edge of pavement of the county road on the center of the driveway to a point equal to a distance of ten times the posted speed limit at the center of the lane on the county road approaching the intersection. The required distance along the county road may be adjusted, if it is demonstrated that the actual travel speed (85th percentile speed) on the county road varies significantly from the posted speed limit. The location of the sight line vertically is measured at a height of 3.5' above the finished grade of the driveway (driver's eye) and at a height of 4.0' above the grade of the county road (approaching vehicle).

The Site fronts along a horizontal curve of Red Hill Road with a posted regulatory speed of 40 mph and an advisory curve speed of 35 mph. As noted, the actual traveled speed (85th percentile speed) may be required to be utilized if it varies significantly from the posted speed. The anticipated required sight distance lines for the proposed site driveway in accordance with Monmouth County standards for vehicle speeds ranging from 35 to 50 mph, are illustrated in Exhibit 3.

It can be seen in Exhibit 3 and Figure 3 that there is a significant amount of existing and/or proposed vegetation along the site frontage which would obstruct sight lines for vehicles traveling in the southbound direction to the site. It is unlikely that the County would allow for the installation of new and/or the maintenance of existing buffer landscaping in these areas. Additionally, the sight lines depicted are measured from the existing edge of pavement at the proposed sight driveway. The County will likely require shoulder widening along the site frontage, which as a result, these sight lines would encroach further on the proposed site development.

The Township Code §540-606A and §540-606B requires a minimum 50 ft. wide landscape buffer on the perimeter of all tracts zoned for Multifamily residential development. Although the site is not zoned for the intended use, the Developer is seeking approval to develop it for that purpose. To establish a 50-foot buffer along the property frontage while maintaining adequate sight lines for the safety of motorists, the building

and parking area would need to be shifted further into the site. This would result in additional disturbance of steep slopes and the removal of trees onsite. Alternatively, the footprint of the building could be reduced, which would decrease the number of proposed dwelling units.



Figure 3: Sight Distance limitations along the Red Hill Road frontage looking south (Photo taken by T&M on May 29, 2024)

ii. Appropriate Locations for New Driveways

- In accordance with Section 5.2-3.1I, “Spacing of New Driveways”:
 - Unless mitigating site conditions and design constraints are identified by the applicant’s design professional to the satisfaction of the county engineer, no portion of a driveway shall be located within 10’ of a side property line. The 10’ distance shall be measured at the point of the widest portion of the driveway at the edge of pavement of the county road. Driveway apron flares and corner radii are considered as portions of the driveway. **The proposed driveway apron flares for the Development Concept are located within ± 3 ft. of the southern side property line. This does not comply with the County’s requirements and cannot be rectified**



without making significant changes to the scope and layout of the development.

- For undivided county roads, access to a site shall align with existing or proposed roads or driveways located on the opposite side of the county road. If the county engineer determines that design constraints or special circumstances exist that prohibit such driveways and/or roads to be aligned then the new driveway may be offset from the existing or proposed road driveway on the opposite side of the county road by not less than 250' feet as measured between the centerlines of the roads or driveways. **The proposed driveway does not align with the existing residential driveway which services the property immediately on the opposite of Red Hill Road (Block 21, Lot 10, Holmdel Township). Although the site driveway is located approximately 300 ft. to the south of the centerline of the residential driveway, the location presents sight distance issues. For the driveway to be shifted to the North to provide adequate sight distance, it would likely encroach with the required 250 ft. offset.**

iii. Appropriate Profiles for New Driveways

- In accordance with Section 5.2-3.1J-2, "Profile of a Driveway Approach to a County Road":
 - The grade of a driveway approach to a county road generally, shall be no greater than 3% for a minimum distance of 25' from the edge of pavement of the intersecting county road. Based on site design constraints identified by the applicant's design professional and accepted by the county engineer, the maximum grade of the driveway approach may be exceeded. However, in no instance shall a driveway approach grade to a road be more than 7%. **The proposed driveway is situated in an area of significant steep slopes. Within the first 25' of the Red Hill Road edge of pavement, the existing slopes range from 10-12%, and 15-25% thereafter. To comply with County requirements, earthwork cuts will likely be necessary, which could involve further grading and removal of trees adjacent to the driveway, or may require the installation of proposed retaining walls to protect these areas. This could either further exacerbate the proposed tree clearing or proposed Lot Coverage (Impervious Coverage), both of which are already proposed to exceed Township standards.**



The required grading and/or retaining walls might also occupy the space needed to construct a sidewalk along the site driveway, from the Red Hill Road right-of-way into the site. As detailed later in this report, a lack of pedestrian access from the site to the public right-of-way will lead to a reliance on motor vehicles for transportation, increasing trip generation for the site.

iv. Left Turn Storage Lanes for New Driveways

- In accordance with Section 5.2-3.1J-8, “Left Turn Storage Lanes”:
 - A one-way or two-way left turn lane may be required on a county road at the intersection of a new driveway based on but not limited to one or more of the following (among others):
 - The 85th percentile speed of vehicles traveling on the county road in proximity of the new driveway is greater than 40 miles per hour. **The posted regulatory speed limit for Red Hill Road is 40 mph. The County will likely require additional analysis to assess whether the 85th percentile speed (the actual traveling speed) exceeds the regulatory speed, in deciding whether a Left Turn Storage Lane is necessary. It is important to note that such a lane has not been proposed.**
 - Traffic safety concerns including but not limited to existing roadway geometry, conflicting traffic movements and proximity of existing driveways or road access. **As the proposed site driveway is located along a horizontal curve with sight line limitations, a dedicated Left Turn Storage Lane would likely be required by the County. As noted, a Left Turn Lane is not proposed, which poses a safety concern for the general motoring public. The ability of the Developer to install same may not be possible, as right-of-way is limited along the western side of Red Hill Road and the Owner of the Farm Assessed Property (Block 21, Lot 10, Holmdel Township) may be unwilling to provide adequate dedication of same.**

v. By-Pass Areas for New Driveways

- In accordance with Section 5.2-3.1J-9, “By-Pass Areas”:

- Where the left turning movements into the subject property from the county road are not significant enough to warrant a formal left turn lane, the county engineer may require a traffic by-pass to allow through traffic to bypass a vehicle waiting to make a left turn into the development. This may require the acquisition of additional right-of-way, which is the responsibility of the developer. Traffic volumes and posted speed limits will be taken into consideration in determining the need for a by-pass area. Generally, a by-pass area will not be required on county roads where the posted speed limit is less than 40 MPH, where through traffic volumes are low or moderate and where the proposed development is projected to generate fewer than 15 left turns from the county road during the peak hour. **Should the County determine a formal Left Turn Storage Lane is not required, widening of the Red Hill Road to provide a By-Pass Area along the southbound lane would be required as the posted speed limit is 40 mph, whereas none has been provided on the development concept.**

vi. Roadway Widening

- In accordance with Section 5.3-1, "County Road Width":
 - The minimum width of a county road that is not classified as a scenic county road, from edge of pavement to edge of pavement, is 40'. The minimum half-width of a county road that abuts a development shall be 20' which generally will consist of a 12' wide through lane and an 8' wide shoulder. The 20' half-width shall be measured from the painted centerline of the road not from the centerline of the road right-of-way unless otherwise directed by the county engineer. **Red Hill Road (C.R. 52) is not listed as a "scenic county road" in the Monmouth County Scenic Roadway Plan (adopted 2001). Based on the Development Concept Plan, it appears that a 12 ft. lane and variable 1-2 ft. shoulder exists. The Developer will likely be required to widen the northbound halfwidth of the roadway along the property frontage to provide additional 6-7 ft. of shoulder widening. Widening is not proposed, so the Development Concept does not comply.**

If widening were to be proposed to comply, this would further exacerbate sight distance along the sight frontage, as sight points are measured from the edge of roadway at the center of proposed driveways. This would either further exacerbate the non-compliance with the 50 ft. landscape buffer along the frontage, or would require the development to be shifted further into the site thus further exacerbating

tree clearing, or the scale of the Development Concept and number of units would have to be reduced.

SUMMARY & CONCLUSIONS: The Development Concept is subject to the Monmouth County Planning Board's regulations, which emphasize the need for safe access and proper sight distances for new driveways. The site's driveway configuration does not meet sight distance requirements due to existing and/or proposed vegetation obstructing sight lines along the site frontage. Compliance with setback regulations would require significant modifications to the plan, including slope grading and/or retaining walls. Additionally, the proposal fails to align with existing driveways and does not provide a left-turn storage lane into the site, nor by-pass areas. To adequately address these issues, substantial revisions to the Development Concept are required to ensure compliance, which would likely reduce the scale and yield of the Development Concept. Right-of-way acquisitions may also be needed, which the Developer may not be able to obtain.

4. Site Circulation

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). **T&M has prepared a Circulation Exhibit for the Middletown Township Fire Truck Design Vehicle (Exhibit 4) to assess adequacy of the current site layout for emergency vehicles. As can be seen, the Design Vehicle cannot freely circulate the site without exceeding the bounds of the proposed circulation drive aisles, particularly where the main site driveway transitions to the lower parking area, and where the main site driveway transitions to Red Hill Road. In both locations, as the Design Vehicle egresses the lower parking area and also the site driveway, the Design Vehicle departs the proposed limits of the driveway aisles, which is an unsafe condition.**

As previously noted, the existing site topography is significantly sloped along the proposed main site driveway from Red Hill Road down to the lower parking area, ranging from 15-25%. §540-624J states that the center-line grade of all proposed driveways shall not be greater than 10% slope. Furthermore, 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".

Without an exception from the Fire Code Official, significant earthwork fill would be needed to raise the grade of the lower parking area to reduce the driveway slope to below the 10% threshold. This could entail extensive grading beyond the current

proposed parking area and/or the installation of retaining walls to mitigate the slope. The Developer would be unable to maintain the same building footprint and overall dwelling unit count without raising the height of the building, both in terms of elevation and the number of stories relative to the existing grade along Red Hill Road, which would further impact the visual aesthetics for neighboring properties.

SUMMARY & CONCLUSIONS: The Development Concept does not allow for safe circulation of the Middletown Township Design Fire Truck, especially at transitions between the main driveway and lower parking area, posing safety concerns. The site's existing steep slopes, ranging from 15-25% in the vicinity of the proposed driveway, exceed the allowable 10% for driveways per Township regulations and the International Fire Code, which will likely necessitate significant earthwork, disturbance and/or the removal of trees to comply and could reduce scale of the development. Any proposed fill could raise the building's height relative to Red Hill Road, ultimately impacting the visual aesthetics of the surrounding area.

5. Parking

It is our understanding that 70 total residential apartment dwelling units are proposed. As noted, the Development Concept does not provide any breakdown of the anticipated number of bedrooms within each unit, which makes it difficult to opine as to the adequacy of the parking layout for the proposed development concept. However, based upon the parking requirements set forth in the Residential Site Improvement Standards at NJAC 5:21-4.14, assuming that each dwelling unit consisted solely of 1-, 2- or 3-bedrooms, the parking requirement for the mid-rise development concept would be 126, 140 and 147 parking spaces, respectively. **The current Development Concept includes only seventy-one (71) parking spaces. Even if all 70 units were 1-bedroom, there would still be a deficit of fifty-five (55) spaces—over 43% below the RSIS requirement. If all units were 3-bedroom, the deficit would increase to seventy-six (76) spaces, which is more than 51% below the required amount. Therefore, the proposed development is significantly under-parked.**

SUMMARY & CONCLUSIONS: The proposed Development Concept lacks a breakdown of the anticipated number of bedrooms, complicating the assessment of parking adequacy. However, even based on the conservative estimate that all 70 units are 1-bedroom, there would still be a deficit of fifty-five (55) spaces—over 43% below the RSIS requirement. Consequently, the development is significantly under-parked and requires reevaluation to meet minimum RSIS standards, particularly given the lack of proximity to mass transit.

6. Traffic Impact

i. 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.**

ii. Underestimation of Site Generated Trips

- The ITE Land Use: 220 Multifamily housing (low-Rise) designation provides estimates of Vehicle Trips based upon the number of Dwelling Units as the independent variable, which has been utilized in the Developer's Traffic Impact Analysis. However, Trip Estimates can also be generated utilizing the number of residents as the independent variable. The "Additional Data" section for this ITE Land Use designation indicates that for the three sites for which both the number of residents and the number of occupied dwelling units were available in the study, there were an average of 2.72 residents per occupied dwelling unit. **As previously mentioned, the proposed Development Concept does not specify the number of bedrooms or expected residents for each dwelling unit. Assuming an average of 2.72 residents per occupied unit, the 70 proposed dwelling units would accommodate approximately 190 residents. A comparison of site-generated trips based on 190 residents and 70 dwelling units as the independent variable is presented in Table 2 below. It shows that the anticipated AM and PM peak hour trips would be approximately 20-45% higher with 190 residents. Therefore, the analysis and findings should be based on the number of residents as the independent variable.**

Table 2: ITE Trip Generation Comparison – 190 Residents vs. 70 Dwelling Units

490 RED HILL ROAD									
L.U. CODE	LAND USE	AMOUNT	UNIT	AM PEAK HOUR			PM PEAK HOUR		
				IN	OUT	TOTAL	IN	OUT	TOTAL
220	Multifamily Housing (Low-Rise)	70	Units	13	40	53	40	24	64
220	Multifamily Housing (Low-Rise)	190	Residents	11	53	64	58	29	87
NET INCREASE IN TRIPS:				-2	13	11	18	5	23
PERCENT INCREASE:				-15%	33%	21%	45%	21%	36%

Note: Trip generation based on regression formulas published in the ITE Trip Generation Manual, 11th Edition.



iii. 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 must 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 0.60 miles away from the site, at the intersection of Crawfords Corner Road and Round Hill Road, which is approximately a 13-minute walk. (Exhibit 6A)
 - The walking distance from the Site to Bell Works is more than 1.5 miles away, with a walking time of approximately 32-minutes. While bicycling may reduce this travel time, the Roadway network of Red Hill Road, 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 6B)
 - The Middletown Station of NJ Transit's North Jersey Coast Line is located more than 2.8 miles from the Site. This is over a 1-hour walk and 15-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 6C)
 - The closest Academy Commuter bus stop is located more than 5.4 miles from the site on Half Mile Road in Red Bank. This is over a 1 hour and 45-minute walk and 28-minute bicycle ride. (Exhibit 6D)
 - 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

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).)



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 49-minute walk. (Exhibit 6E)
- The closest that could be found along the Route 35 corridor is at the intersection of New Monmouth Road in Middletown, which is 3.3 miles and a 1 hour and 10-minute walk. (Exhibit 6F)

iv. Underestimation of Trip Generation from West Nut Swamp Site Development

- The Traffic Impact Analysis indicates that adjacent development traffic from the proposed residential development located at 1114 West Nut Swamp Road (“West Nut Swamp Road Site”) has been added to the future “base” traffic volumes to establish the future “no-build volumes”. **Similar to the Red Hill Road site, the West Nut Swamp Road site does not offer a breakdown of the number of bedrooms or residents proposed for the Townhouse and Apartment units. The total number of bedrooms and residents should be provided for the West Nut Swamp Road site, and the analysis should use this information as the independent variable for trip generation.**

Additionally, for the proposed 115 townhouse units, the Developer’s Traffic Engineer has used the ITE Land Use designation 215 “Single-Family Attached Housing.” 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.

v. 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.**

vi. Level of Service at Proposed Site Driveway

- The Traffic Impact Analysis indicates that the proposed Site Driveway will operate at a Level of Service (LOS) “E” during the weekday morning and evening peak hours. **LOS is a term used to qualitatively describe the operating conditions of a roadway and intersection based on factors such as speed, travel time, maneuverability, delay, and safety. For intersections, this is generally an indication of vehicle delay both entering and existing the site. LOS “E” generally describes operation at full capacity, which is highly volatile because there are virtually no usable gaps to maneuver within the traffic stream.**
 - The LOS ‘E’ compounded with the proposed location of the site driveway along a horizontal curve geometry with driveway sight distance limitations, increases the risk of safety crashes at this location.
 - Furthermore, utilizing the number of residents (bedroom count) as the independent variable for calculating site-generated trips for both the Red Hill Road and West Nut Swamp Road sites in the Traffic Impact Analysis would likely increase the average delay per vehicle and potentially worsen the Level of Service for the site driveway. The limited time gap for vehicles making a left turn out of the driveway during the weekday AM and PM peak hours could lead to even more close calls and collisions. Additionally, the Developer has not conducted a Manual on Uniform Traffic Control Devices (MUTCD) warrant analysis to evaluate if any signalization is warranted.
 - The report does indicate that “the driveway has been analyzed assuming full-movement operation, however, the driveway configuration will be assessed for adequate sight distance and is subject to Monmouth County review and approval.” **Should the County restrict turning movements of the site driveway to right-in and right-out turning movements, this would invalidate the site driveway trip distribution utilized in the report – as it would concentrate traffic in different directions than utilized in the report.**

SUMMARY & CONCLUSIONS: The Developer’s traffic engineer performed manual traffic volume counts, but the "No Build" baseline may be underestimated since these were taken at the end of the school year when many public and private schools may operate on reduced schedules. The Traffic Impact Analysis likely undercounts site-generated trips by relying on the number of dwelling units instead of residents and lacks a breakdown of anticipated bedroom counts. Limited access to sidewalks and mass transit is expected to

increase reliance on motor vehicles, thereby increasing site trips. Additionally, the analysis for the nearby West Nut Swamp Road development also lacks details regarding bedroom counts and anticipated residents and potentially utilizes an ITE Land Use Designation which may result in an underestimation of site trips. The report also fails to evaluate the impact on several surrounding intersections, potentially leading to unsupported conclusions. At best, the Developer's Traffic Engineer expects the proposed site driveway is expected to operate at Level of Service E, indicating significant congestion and delay particularly for left turns exiting the site, which is worsened by sight distance issues which will likely increase the likelihood of safety risks, crashes and collisions along the Red Hill Road site frontage. If more appropriate inputs were utilized in the analysis, driveway delay would likely be worsened, which would further increase the likelihood of these incidents.

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, for the following reasons:

- At a minimum, we estimate the proposed Development Concept will result in a total land disturbance of more than one acre (± 1.37 acres), an increase of more than $\frac{1}{4}$ acre of regulated impervious surface (± 1.25 acres), and an increase of more than $\frac{1}{4}$ acre of regulated motor vehicle surface (± 0.67 acres). As such, the project is classified as a "Major Development" 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 no Stormwater Management Infrastructure measures are currently depicted on the proposed Development Concept.**

ii. Limiting Soil Conditions Based on USDA Soil Survey Mapping

As can be seen from Exhibit 5, USDA Soil Survey Mapping shows the front portion of the site, where the building is proposed, is situated on Collington sandy loam (CokB) and the rear portion of the site, where the parking areas is proposed, is situated on Colts Neck Sandy Loam (CosD2).



- Colts Neck Sandy Loam (CosD2) is described as Hydrologic Soil Group B, well drained, with depth to water table approximately 48" and depth to restrictive petroferric at 48" -72". **Petroferric 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 variance 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 no Stormwater Management Infrastructure measures are depicted on the proposed Development Concept, and it is unlikely that they will be able to comply without significant modifications to the site layout, due to the mapped presence of high Estimated Seasonal High Water Table (ESHWT), restrictive soils horizons and steep slope constraints onsite.

- For the Development Concept to implement an aboveground stormwater management basin (stormwater BMP) onsite, this would necessitate further clearing of the existing wooded areas onsite. **As noted, the proposed Development Concept already exceeds the maximum tree clearing permitted by Township ordinance.**
- For the Development Concept to implement an underground stormwater management basin (stormwater BMP) onsite, it would need to be located beneath the proposed parking area. This is problematic for the following reasons:
 - Chapter 9 of the NJ Stormwater Best Management Practices Manual (BMP Manual), 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 about 48 inches deep, meeting this requirement leaves little to no space for an Underground Stormwater Management BMP. To achieve adequate separation, the parking area would need to be substantially raised, which could lead to increased land disturbance and tree clearing or require the installation of retaining walls to maintain existing limits.**

- 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 without the Developer obtaining a variance (as described earlier), or performing significant excavation and replacement of these restrictive soil horizons. The latter would result in further increased construction truck traffic from the site.**
- NJAC 7:8-5.2 requires pre-treatment for all underground SWM basins which receive runoff from motor vehicle surfaces, in the form of Manufactured Treatment Devices (MTD)s or other aboveground BMPs.
 - The Development Concept provides little remaining space in the vicinity of the parking area to implement other above ground BMPs, without expanding the proposed site disturbance and tree clearing. **As previously noted, the Development Concept already exceeds the Township's maximum permitted tree clearing and steep slopes limitations.**
 - While pervious pavement is a permissible BMP for both pre-treatment and to satisfy the water quantity, water quality, and groundwater recharge requirements, we note the following:
 - The BMP manual does not recommend the use of same for areas of high traffic, such as circulation driveways within a parking area, which limits their placement to parking stalls. **Many of the proposed parking stalls are located in areas with steep slopes and existing vegetation. According to the PH report, disturbing these areas could lead to erosion, generating sediment and debris that may hinder the function of porous pavement.**
 - Porous Pavement is limited to a maximum slope of 5%. **The proposed parking area is located on steep slopes, and implementing porous pavement could necessitate significant land disturbance, grading, and tree removal beyond the currently indicated limits, exacerbating the already non-conforming condition. Alternatively, it may require the installation of retaining walls, which should generally not be constructed in close proximity to such BMPs.**
 - Relying largely on porous pavement for stormwater quantity control is not advisable and would result in a large maintenance burden on the

Property Owner and/or HOA if the units are to be fee simple. **Failure of such systems due to lack of maintenance would result in a negative impact to downstream water courses, environmentally sensitive areas and properties.**

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.**
- Should any aboveground basin be proposed, it would most likely require retaining walls to minimize site disturbance and tree clearing. **Retaining walls may be negatively impacted by a GI infiltration BMP, water pressure resulting from stormwater runoff infiltrated by a GI infiltration BMP can have negative impacts on Retaining Walls. This may impact the scope and scale of the proposed Development Concept.**
- 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.**

SUMMARY & CONCLUSIONS: The Development Concept does not demonstrate compliance with Township's and NJDEP stormwater management regulations. The layout does not provide adequate room for aboveground stormwater management BMPs, without further exceeding permissible tree clearing and disturbance to steep slopes. The implementation of underground stormwater management BMPs may not be feasible without significant modification to the site, due to the mapped presence of ESHWT at 48" below grade. Furthermore, the presence of mapped restrictive soil horizons jeopardizes implementation of GI BMP, requiring either variances from NJDEP or significant soil excavation and

replacement. Overall, substantial modifications to the Development Concept are necessary to address these compliance issues, to ensure both effective stormwater management, and to mitigate potential environmental impacts to downstream areas.

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 56% of slopes over 10% and disturbing significant percentages of Class I and II Critical areas. **It does not appear that any attempt has been made to minimize these disturbances.**
 - The project fails to adhere to R-45 zone bulk standards, including front yard setbacks, building height, building coverage and lot coverage. The concept lacks required sidewalks, which will further exacerbate the exceedance of lot coverage, and may also lack adequate perimeter buffering. **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.**
 - The Development Concept does not include architectural plans and lacks operable exterior windows or doors on the first three stories on the western façade, preventing compliance with IFC 2021 emergency escape requirements. As a result, this configuration impedes the construction of habitable bedrooms on that side,



significantly limiting the number of dwelling units and habitable space available within the building. **Overall, we question the yield of dwelling units and bedrooms that can be accommodated within the Building Layout.**

- The Development Concept is subject to the Monmouth County Planning Board's regulations, which emphasize the need for safe access and proper sight distances for new driveways. **To adequately address many of these issues, substantial revisions to the Development Concept are required to ensure compliance, which would likely reduce the scale and yield of the Development Concept. Right-of-way acquisitions may also be needed, which the Developer may not be able to obtain.**
- The Development Concept fails to ensure adequate circulation for the Middletown Township Design Fire Truck, particularly at the transitions between the driveway and lower parking area, raising safety concerns. Additionally, the steep slopes of 15-25% near the proposed driveway exceed the allowable 10% for driveways, necessitating substantial earthwork and potential tree removal, which could alter the scope and scale of the development.
- The proposed Development Concept lacks a breakdown of the anticipated number of bedrooms. **However, even the most conservative estimates demonstrate the development is significantly under-parked and requires reevaluation to meet minimum RSIS standards, particularly given the lack of proximity to mass transit.**
- The Site Driveway is proposed to operate at a LOS 'E', which compounded by sight distance limitations along the sight frontage, increases safety risks. This condition may be worsened, as the "No Build" baseline traffic volumes, site generated trips and trips generated by the West Nut Swamp Road Site may be underestimated by the Developer's Traffic Engineer. The report also did not evaluate the traffic impact to other intersections in the vicinity of the site.
- The Development Concept does not demonstrate compliance with Township's and NJDEP stormwater management regulations. The plans do not provide adequate space for above ground BMPs nor delineate the location of any underground BMPs. Implementation of underground GI BMPs may not be feasible given depth to ESHWT and restrictive soils based on USDA Soil Mapping., without significant modification to the Development Concept.

CONCLUSION: The Concept Development fails to comply with many provisions of the Township of Middletown Development Regulations pertaining to steep slopes, critical

areas, stormwater management, many of which may lead to adverse impacts to downstream and neighboring areas. The Development fails to demonstrate compliance with Monmouth County Standards for site access, and trip generation from the site, which may be currently underestimated, and will likely lead to higher occurrences of crashes and collisions. The concept does not provide adequate circulation for Fire Emergency Vehicles nor safe egress from habitable bedrooms along western façade of the building. For these many reasons, the Development Concept is not approvable without significant modification to the scope of the development.

- 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 subject property is located outside of the mapped Sewer Service Area operated by the Township of Middletown Sewerage Authority (TOMSA). **The applicant has not obtained a “Will Serve” letter from TOMSA, likely for this reason.**
 - Based on discussions with and review of GIS mapping provide by TOMSA, there is no public sanitary sewer infrastructure available along the Red Hill Road property frontage. **The nearest sanitary sewer gravity main is located approximately 3,100 ft. south of the site within Cypress Neck Road, near the intersection with Crawfords Corner Road (C.R. 52).**
 - In accordance with the New Jersey Water Quality Management Planning rule at N.J.A.C. 7:15, the Property Owner must obtain approval from the Monmouth County Planning Board Amendment Review Committee (ARC) and the NJDEP to amend the current Monmouth County Water Quality Management Plan (MCWQMP), concurrently.
 - The NJDEP shall consider Areas mapped as endangered or threatened wildlife species habitat as identified on the Department's Landscape Maps of Habitat for Endangered, Threatened or Other Priority Wildlife as Rank 3, 4 and 5. **PH has indicated the mapping shows Rank 3 habitats onsite associated with the Black-crowned Night Heron (*Nycticorax nycticorax*) and may also contain habitat for the Red-headed Woodpecker**

(*Melanerpes erythrocephalus*). This finding will require further investigation by the NJDEP and could hinder the approval of a site-specific amendment.

- The NJDEP, in determination of whether areas are eligible for sewer service, shall consider the land uses allowed in adopted zoning ordinances and future land uses shown in adopted municipal or county master plans and other local land use objectives. **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 56% of slopes over 10% and disturbing significant percentages of Class I and II Critical areas. It also exceeds maximum permitted Building Coverage and Lot Coverage, which would likely be exacerbated as the site is furthered to an engineered site design. These deficiencies could hinder the approval of a site specific amendment by NJDEP.**

○ **Public Water**

- NJAW public water infrastructure is available along the property frontage. **However, the Developer has not provided a “Will Serve Letter” from New Jersey American Water for the proposed Development Concept.**
- NJAW will ultimately review and may require upgrades to the existing Asbestos Cement (AC) water main after assessing its condition and the potable and fire suppression demand generated by the project.

CONCLUSION: The site is not currently located within a mapped Sewer Service Area, with the nearest sanitary sewer infrastructure located over 3,100 feet (0.60 miles) to the south. The Developer has not obtained a “Will Serve Letter” from the Township of Middletown Sewerage Authority (TOMSA), which operates the sewer service area, likely because the site is not located in the sewer service area. To proceed, the Developer must secure a Site-Specific Amendment to the Monmouth County Water Quality Management Plan (MCWQMP), which requires approval from TOMSA, Monmouth County, and the NJDEP. NJDEP may not issue the amendment due to the presence of Rank 3 habitat onsite and non-compliance with the Township’s Planning and Development Regulations. As it stands, the site cannot be developed with high-density multi-family housing until these amendments and approvals are obtained.

- 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 site access as currently proposed with a Level of Service ‘E’ is an unsafe condition given the location along a horizontal curve geometry. The vehicle delay may be worsened if the Traffic Analysis more appropriately utilized the number of bedrooms/residents as the independent variable for ITE Trip generation estimates as opposed to utilizing the number of dwelling units proposed. Notably, the Development Concept did not provide a bedroom count per each dwelling unit. As vehicle delay is worsened, the likelihood of near misses and collisions at the site driveway increases.**
 - “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 0.6 miles, which is then an additional 1 mile walk to Bell Works. The Middletown Train Station is more than 2.8 miles from the Site. The Academy Commuter bus stop in Red Bank is more than 5.4 miles and the closest NJ Transit bus stops are located more than 2.5 miles (as the crow flies) from the Site, respectively.**
 - “From a site planning perspective, there is an appropriate amount of open space proposed on the site, which is clear evidence of the site not being overdeveloped.” **§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 ±32,500 s.f. which equates to approximately 28.9% of the Lot Area. This is a conservative estimate, which likely will be greater after potential County ROW takings and as site grading and other site disturbances are taken into consideration beyond the limits of the proposed building and parking area. In addition, no areas of open space for recreation of the site residents have been designated on the site.**

- “The site is not within a flood zone.” **Although the property is not within a mapped FEMA Flood Zone, that does not replace a Flood Hazard Verification from NJDEP. The LOI obtained by the property owner specifically states that “any surface water features on the site or adjacent to the site may possess flood hazard areas and/or riparian zones and development within these areas may be subject to the Flood Hazard Area (FHA) Control Act Rules at N.J.A.C. 7:13.” NHD mapping depicts the northern terminus of the Nut Swamp Brook in the vicinity of the southern property line which may have an associated Flood Hazard Area (FHA) and Riparian Zone. To our knowledge, the Developer has not obtained an FHA Verification from the NJDEP.**

CONCLUSION: The Development fails to demonstrate compliance with Monmouth County Standards for site access. Realistic access to sidewalks and mass transit is limited, which will lead to a reliance on motor vehicles and increased trip generation from the site. This will likely lead to higher occurrences of crashes and collisions at the site driveway. The concept proposes tree clearing in excess of what is permitted by Township Regulations and does not provide adequate open nor recreational space on the site. A Flood Hazard Area Verification has not been obtained to verify the site is not in a Flood zone or impacted by Riparian zones. For these many reasons, the site is not suitable without significant modification to the Development Concept.

H. Conclusion

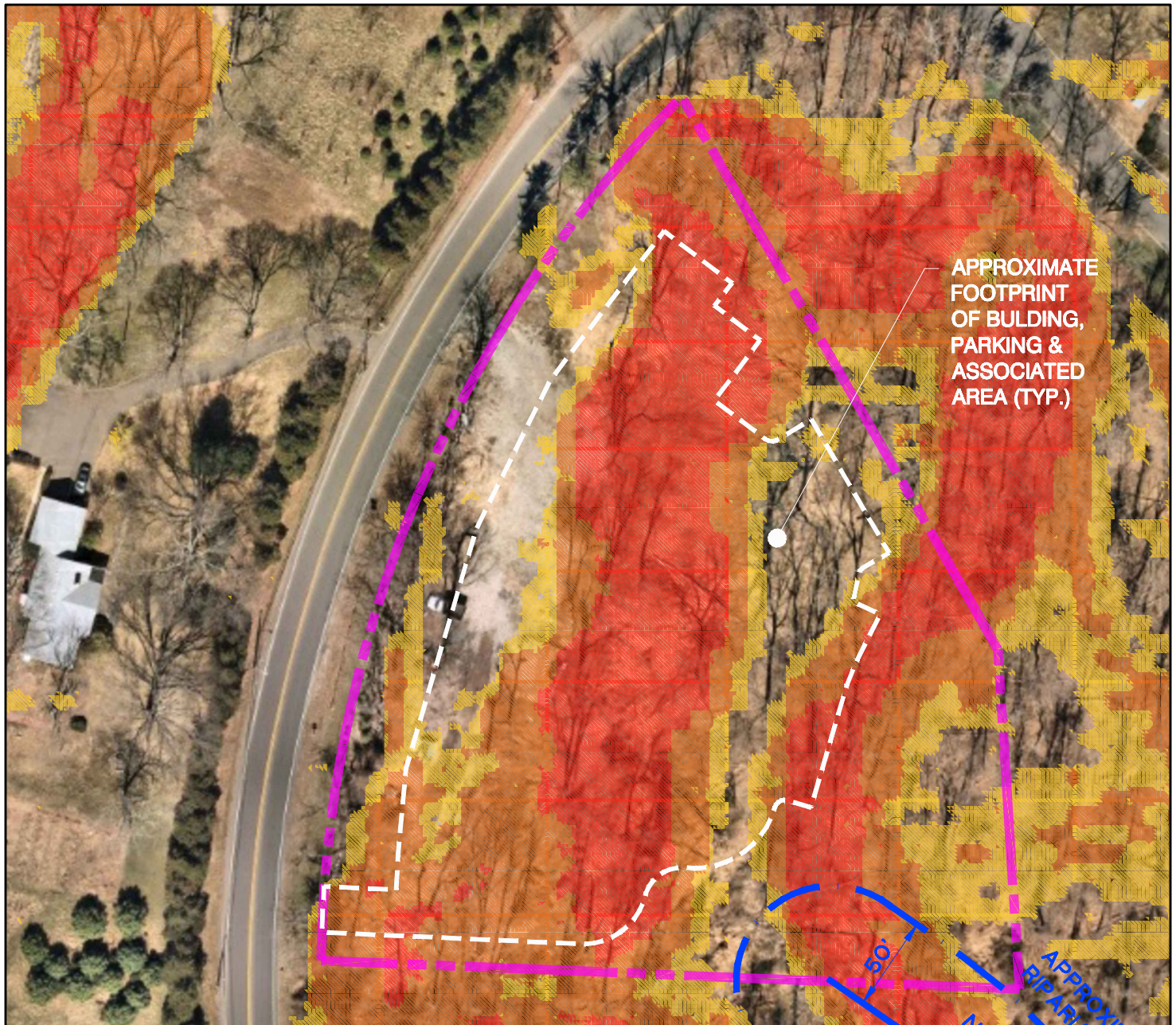
Although the site is **Available**, the site is **Not Approvable**, **Not Developable**, and **Not Suitable** for development of high density multifamily housing without significant modification to the scope of the Development Concept, including a reduction in the number of dwelling units proposed.

EXHIBITS 1 - 6

Exhibit No.	Description
Exhibit '1'	Sheet No. 1 of 1: Steep Slopes Exhibit – “Red Hill Road Site”
Exhibit '2'	Sheet No. 1 of 1: Proposed Tree Clearing Exhibit – “Red Hill Road Site”
Exhibit '3'	Sheet No. 1 of 1: Monmouth County Sight Distance Requirements for Site Driveway Exhibit – “Red Hill Road Site”
Exhibit '4'	Sheet No. 1 of 3: Middletown Township Design Fire Truck Circulation Exhibit #1
	Sheet No. 2 of 3: Middletown Township Design Fire Truck Circulation Exhibit #2
	Sheet No. 3 of 3: Middletown Township Design Fire Truck Turning Template
Exhibit '5'	USDA Soil Mapping Exhibit – “Red Hill Road Site”
Exhibit '6'	6A - Walking Distance to Sidewalk
	6B - Walking Distance to Bell Works
	6C - Walking Distance to Middletown Train Station
	6D - Walking Distance to Academy Bus (Lincroft/Red Bank)
	6E - Walking Distance to NJ Transit Bus (New Monmouth Road & Rt. 35, Middletown, NJ)
	6F - 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"=80'

STEEP SLOPES EXHIBIT

"RED HILL ROAD SITE"

BLOCK 1045, LOT 12

MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



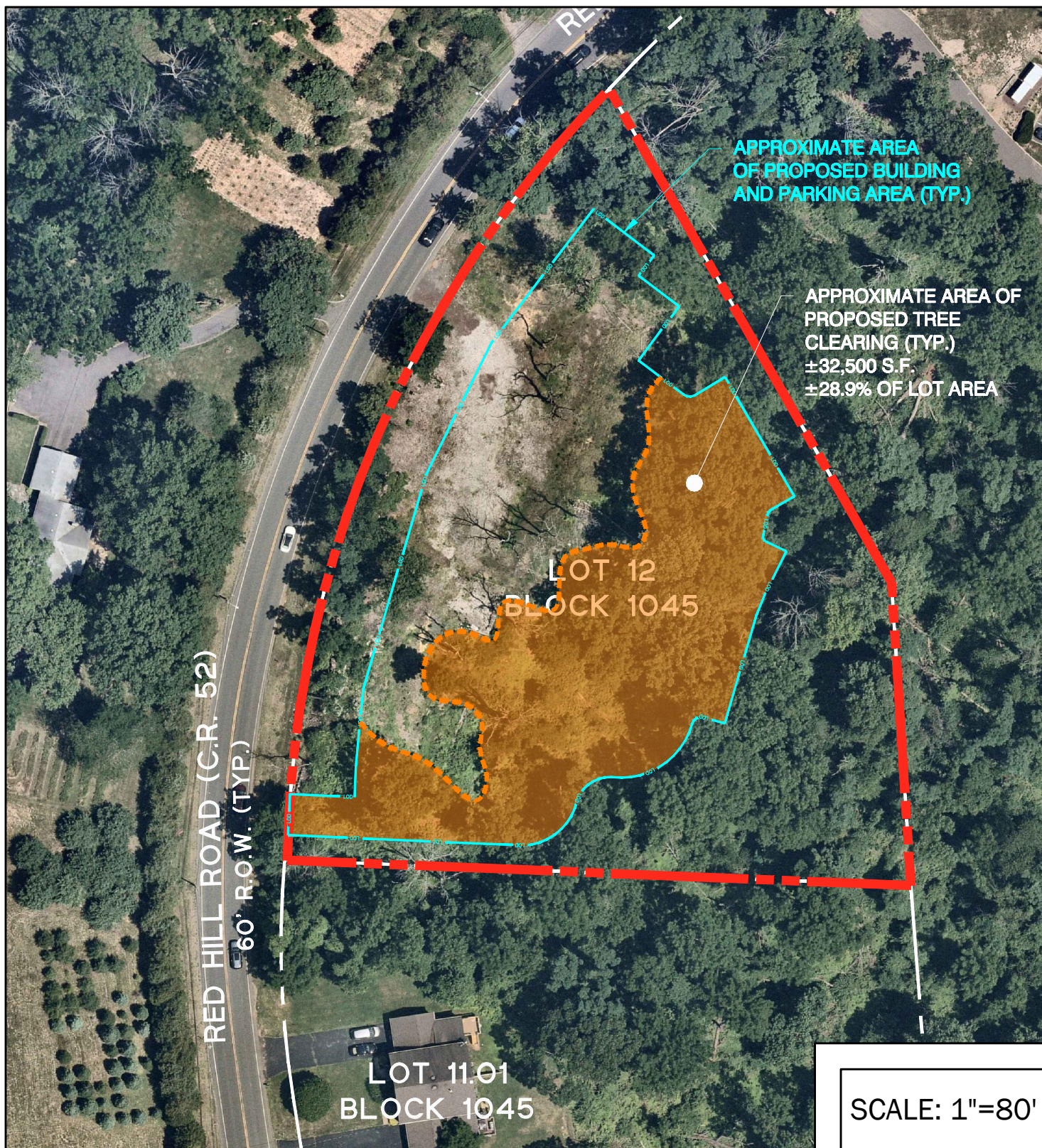
YOUR GOALS. OUR MISSION.

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 24CA27967500



EXHIBIT 2



SCALE: 1"=80'

PROPOSED TREE CLEARING EXHIBIT
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



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AND LAND SURVEYORS
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EXHIBIT 3



**MONMOUTH COUNTY SIGHT DISTANCE
REQUIREMENTS FOR SITE DRIVEWAY
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ**



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EXHIBIT 4



SECTION

SCALE: 1"=80'

MIDDLETOWN TOWNSHIP DESIGN FIRE TRUCK
CIRCULATION EXHIBIT #1
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



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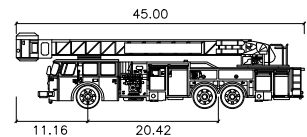
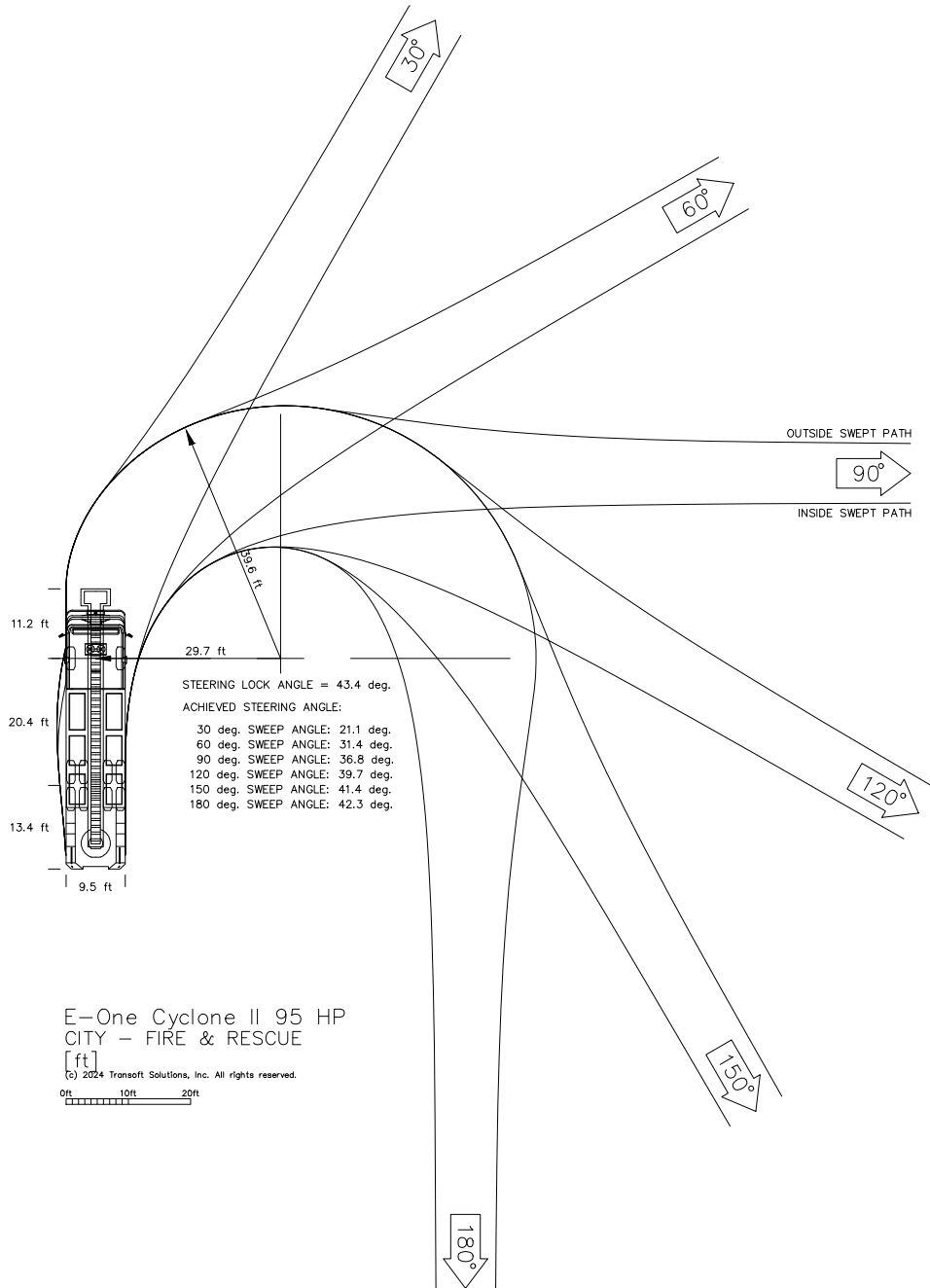
SCALE: 1"=80'

MIDDLETOWN TOWNSHIP DESIGN FIRE TRUCK
CIRCULATION EXHIBIT #2
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



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E-One Cyclone II 95 HP

	feet
Width	: 9.50
Track	: 9.35
Lock to Lock Time	: 6.0
Steering Angle	: 43.4

SCALE: 1"=30'

MIDDLETOWN TOWNSHIP DESIGN FIRE TRUCK
TURNING TEMPLATE
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ

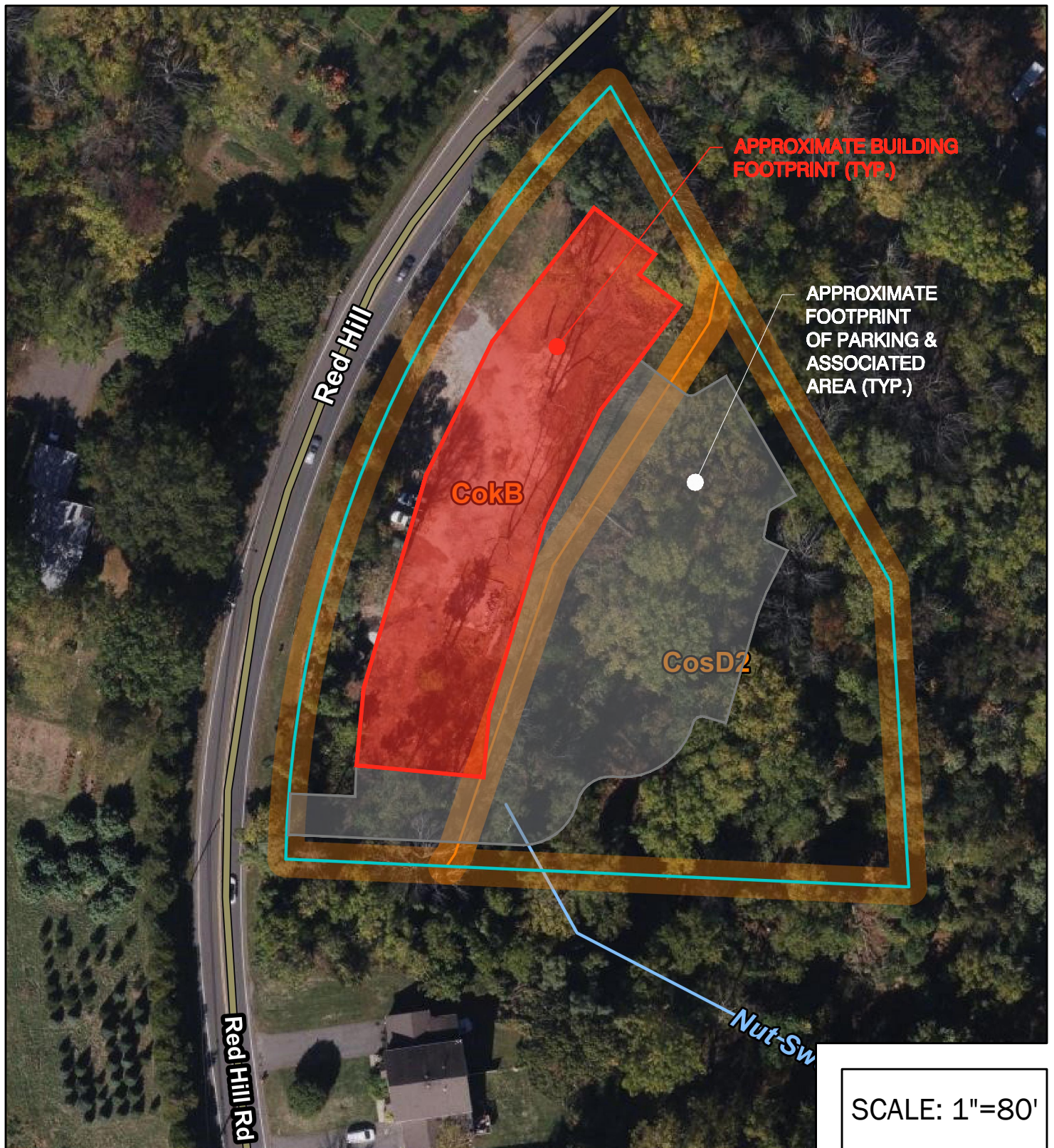


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FAX 732-473-3408

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EXHIBIT 5



SCALE: 1"=80'

USDA SOIL MAPPING EXHIBIT
"RED HILL ROAD SITE"
BLOCK 1045, LOT 12
MIDDLETOWN TOWNSHIP, MONMOUTH COUNTY, NJ



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EXHIBIT 6

EXHIBIT 6A

Walking Distance to Sidewalk

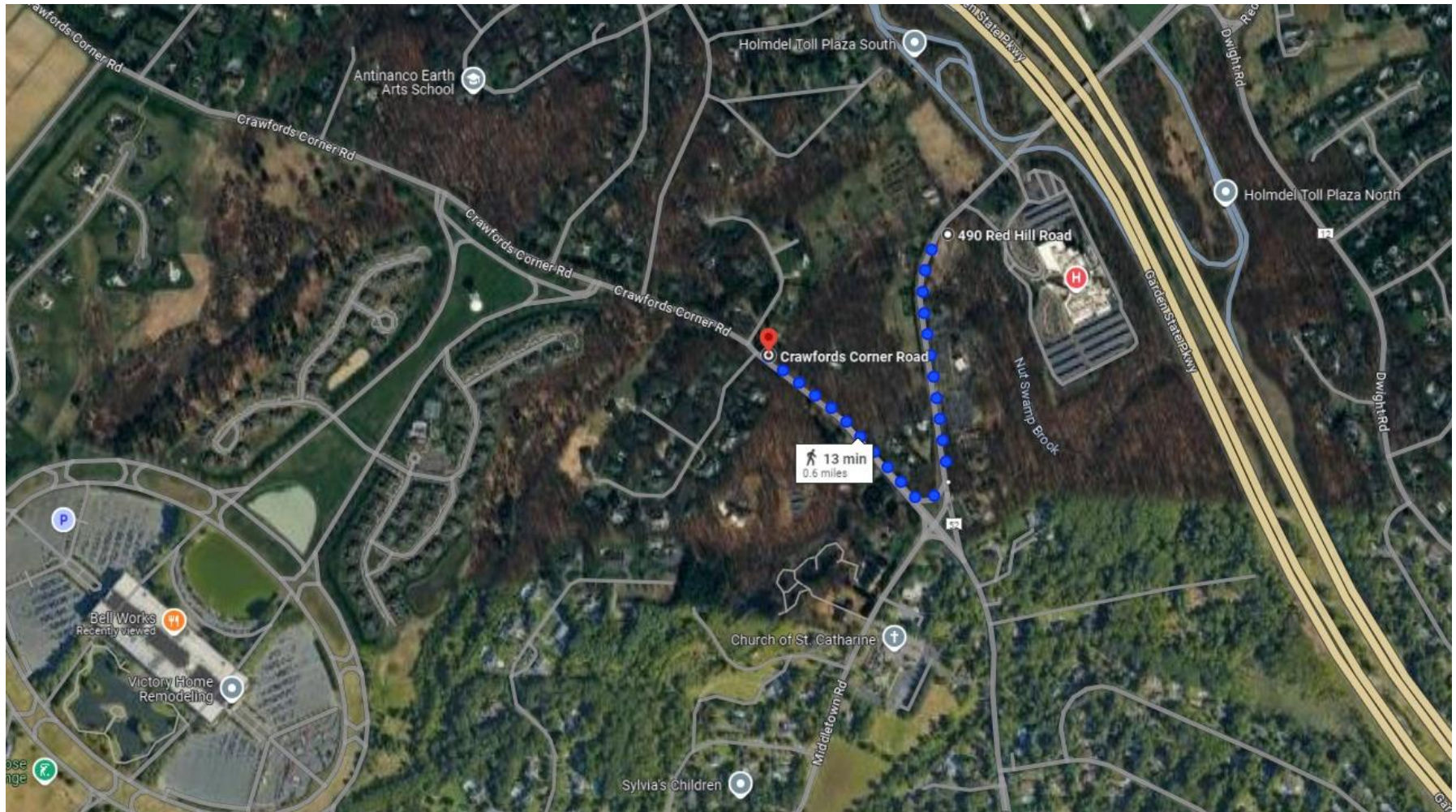


EXHIBIT 6B

Walking Distance to Bell Works

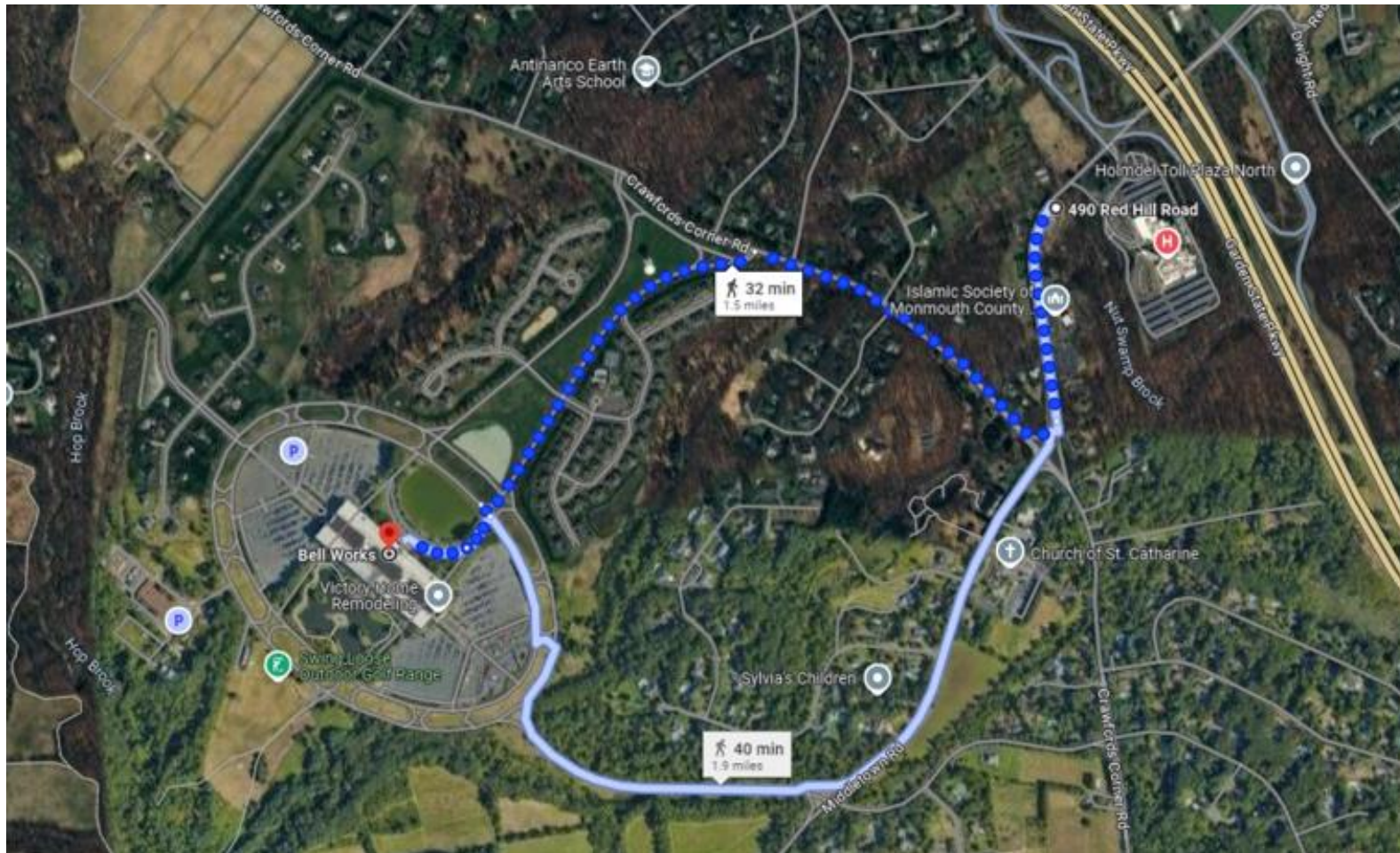


EXHIBIT 6C

Walking Distance to Middletown Train Station

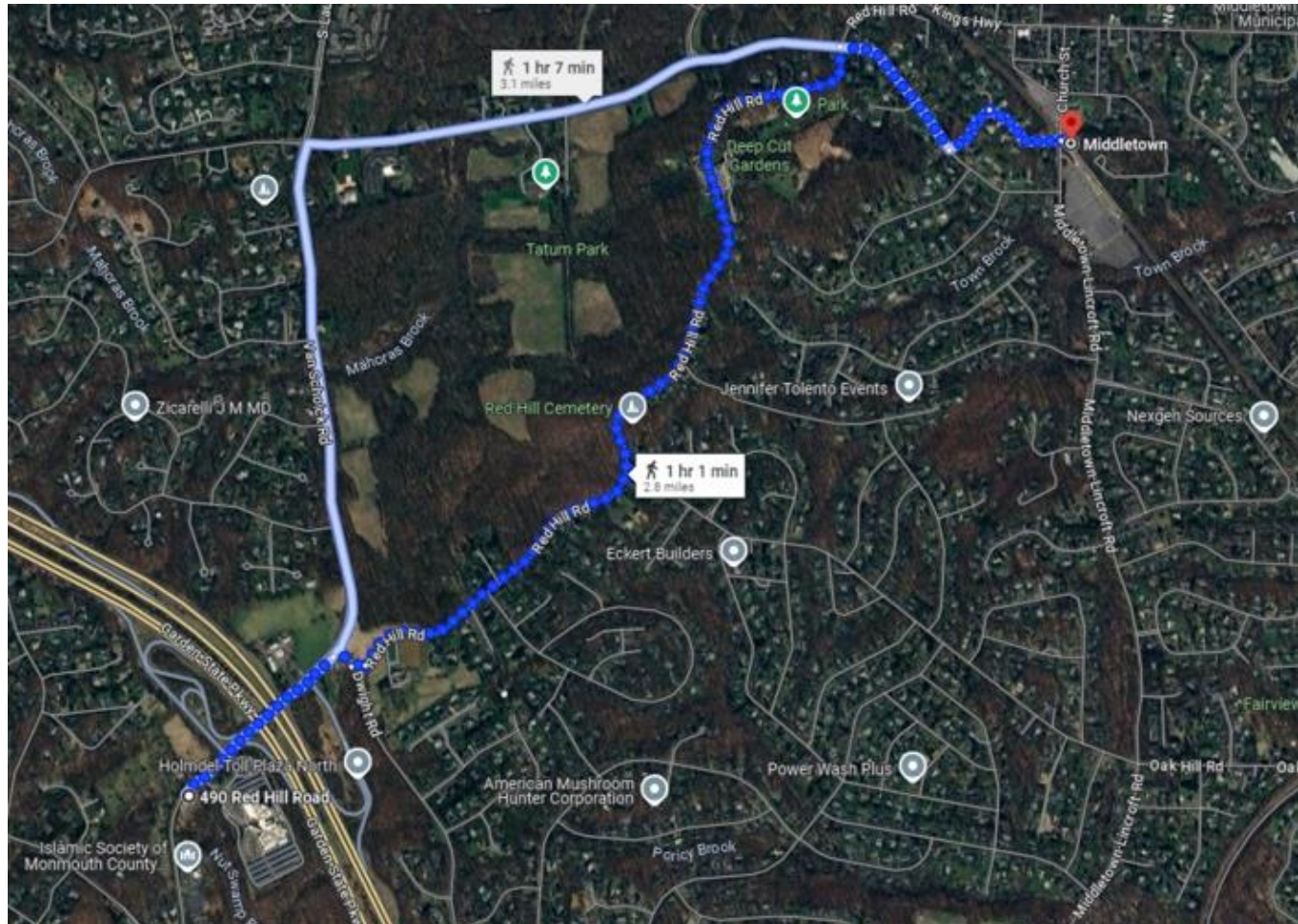


EXHIBIT 6D

Walking Distance to Academy Bus (Lincroft/Red Bank)

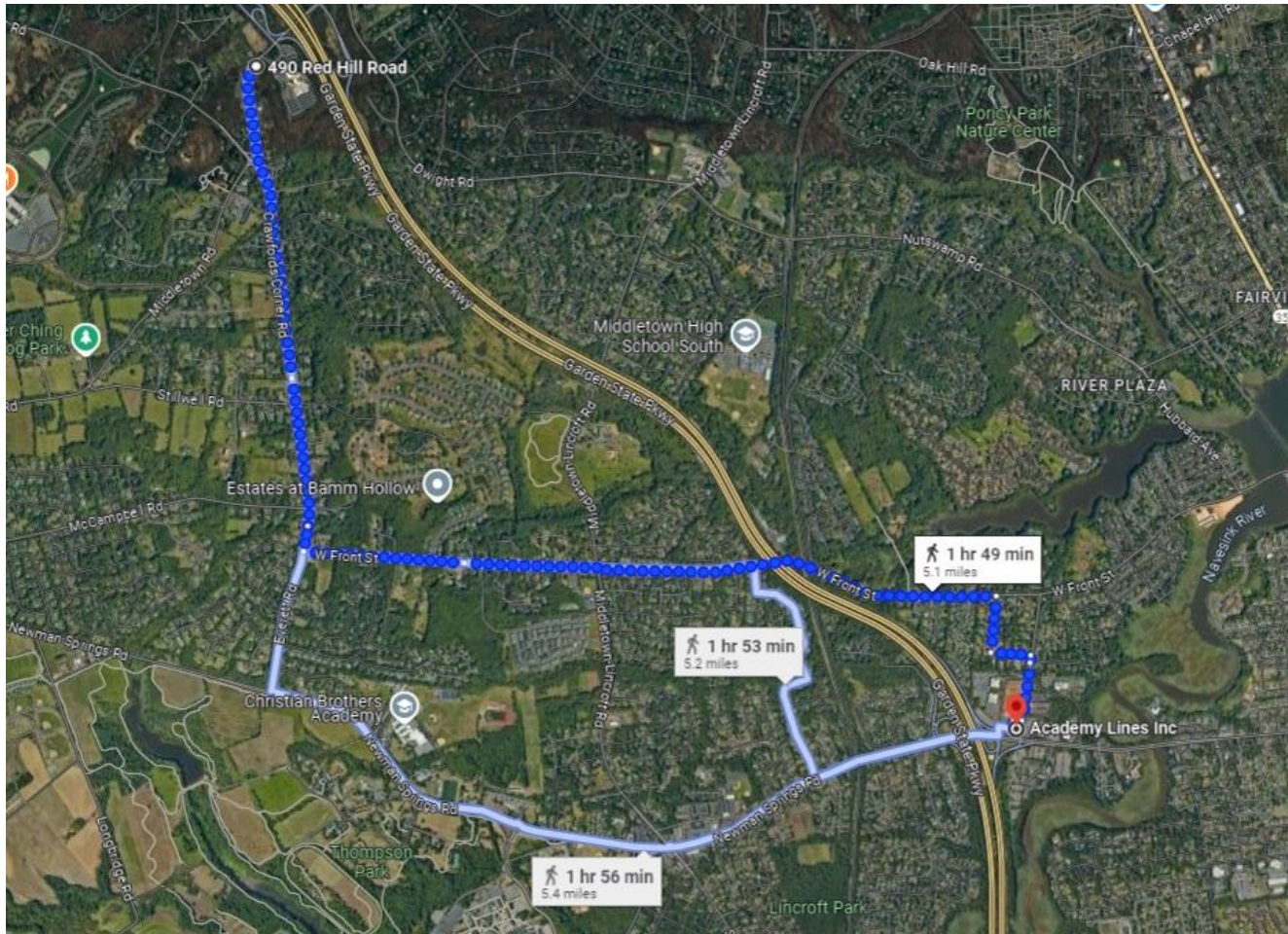


EXHIBIT 6E

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

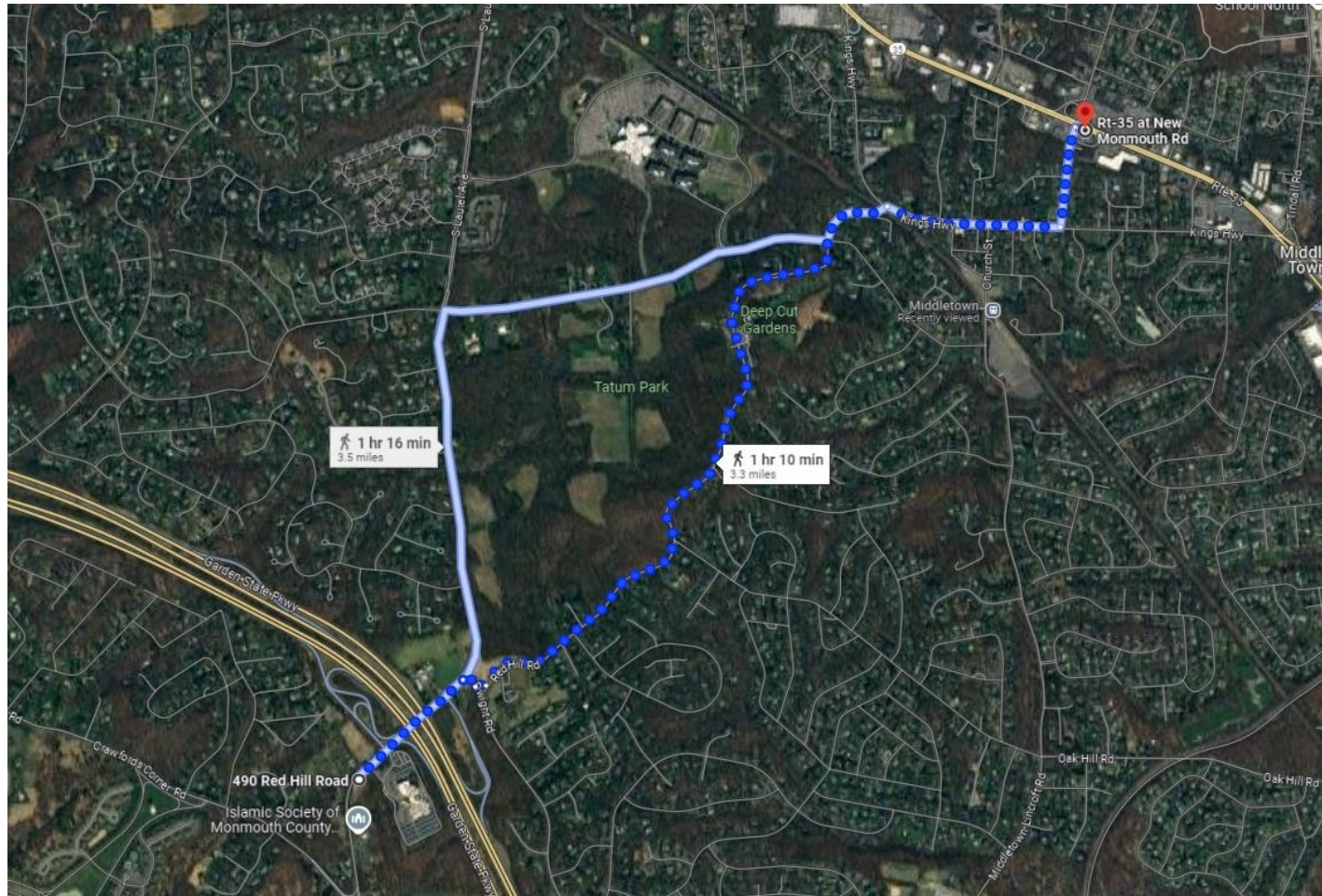
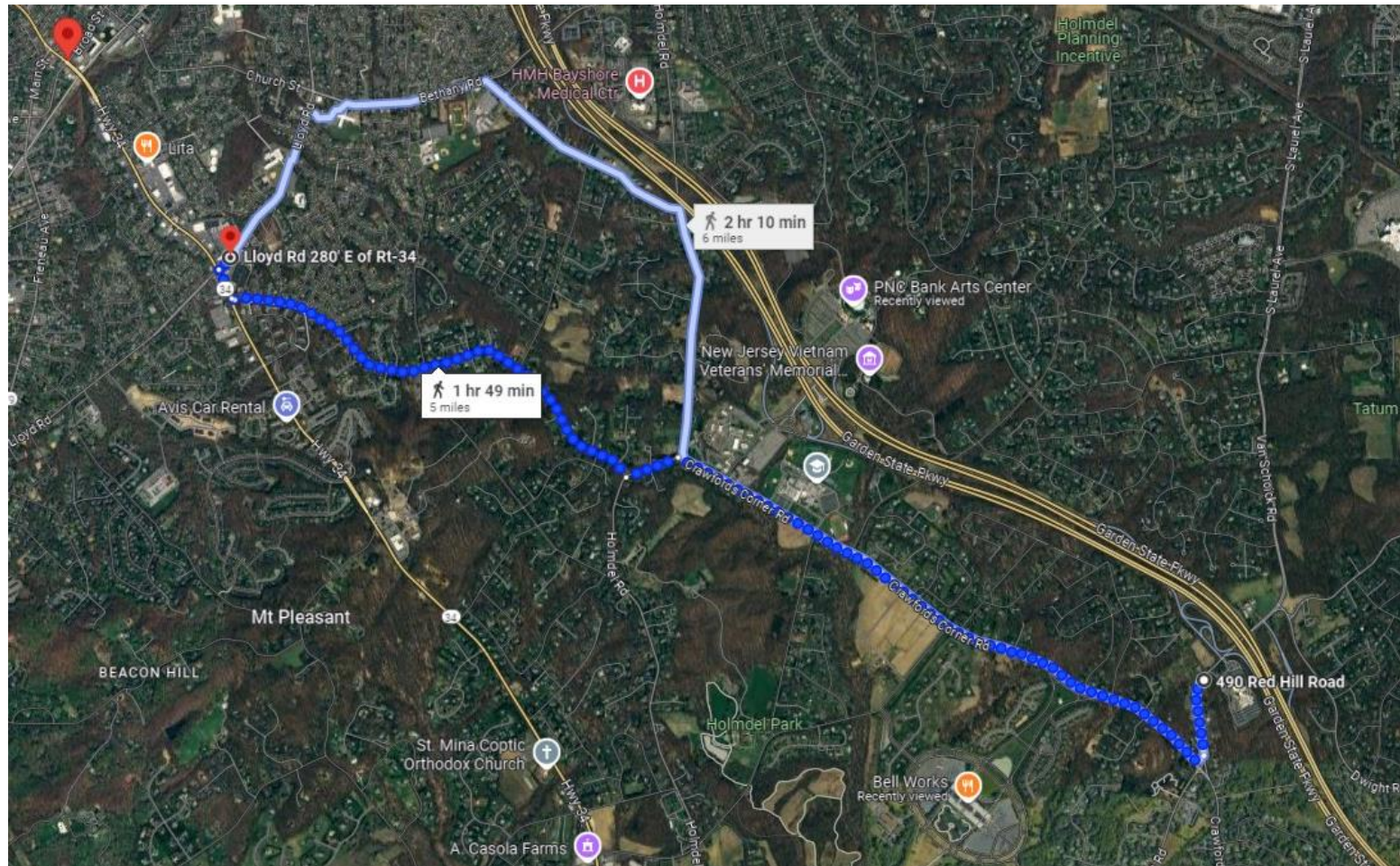


EXHIBIT 6F

Walking Distance to NJ Transit Bus (Lloyd Road & 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 potential 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 (Figure 4), 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 4: 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 (Figure 5). 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 5: 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

ITE Trip Generation

Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

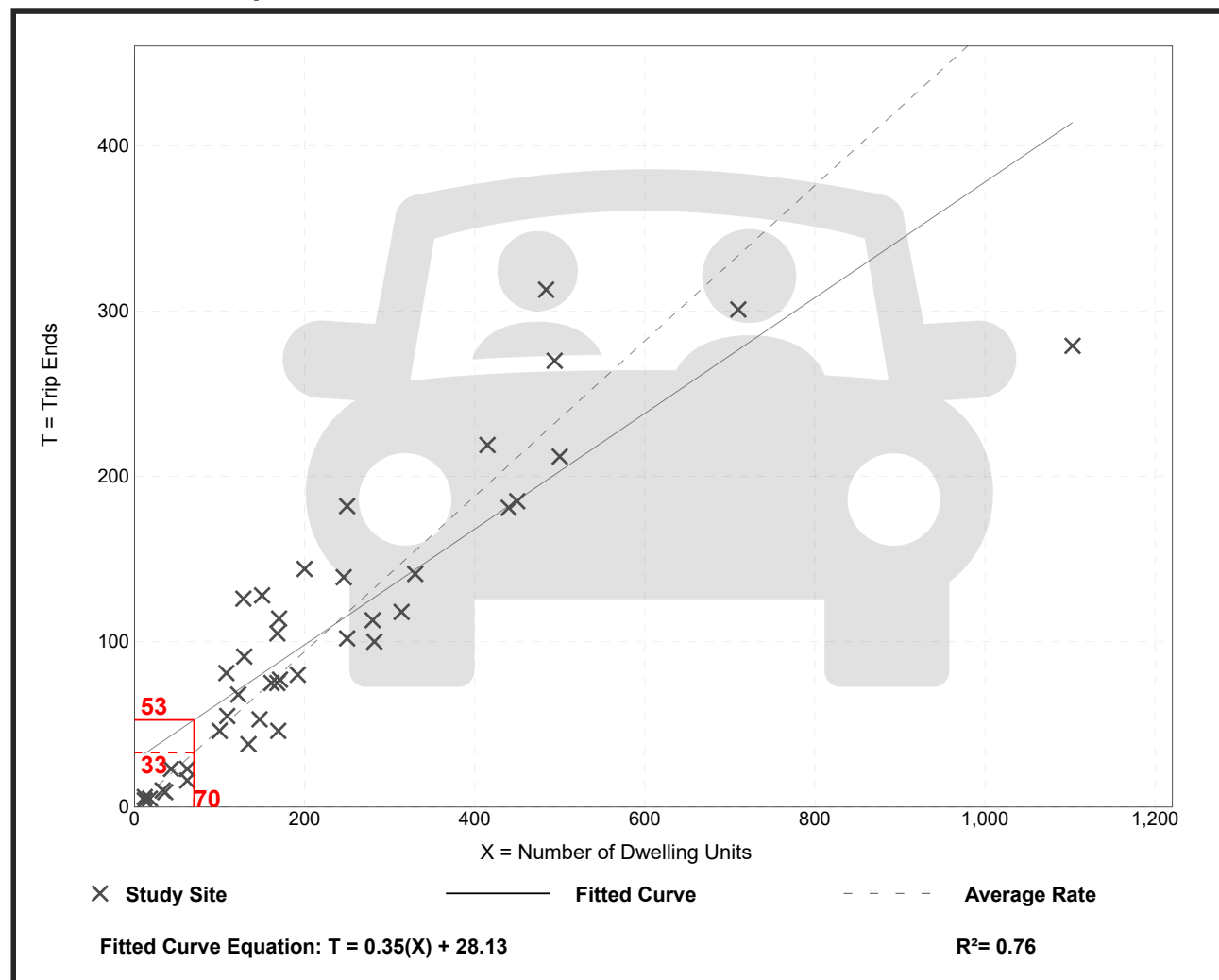
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 40
Avg. Num. of Dwelling Units: 234
Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.47	0.25 - 0.98	0.16

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

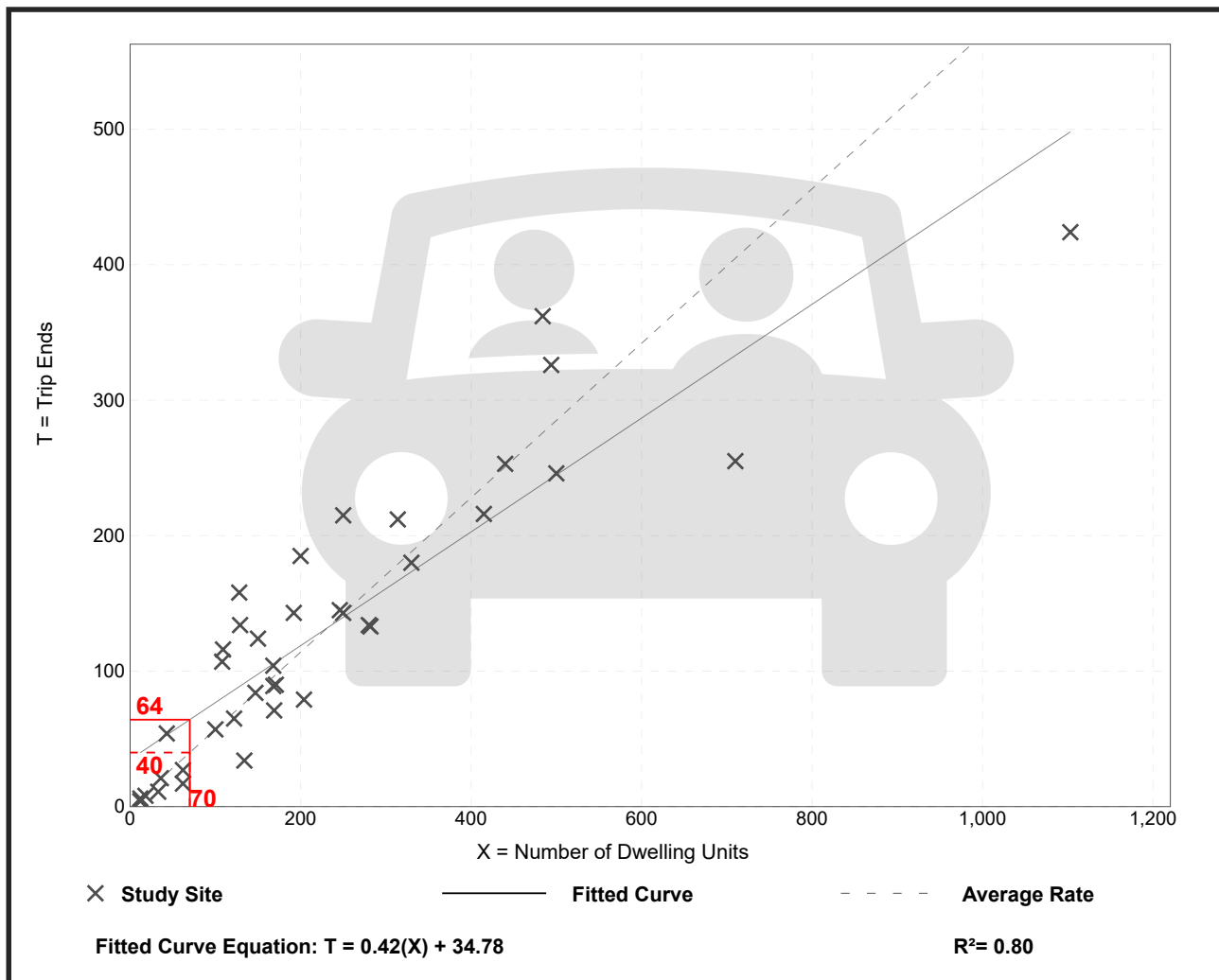
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 38
Avg. Num. of Dwelling Units: 231
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.25 - 1.26	0.20

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

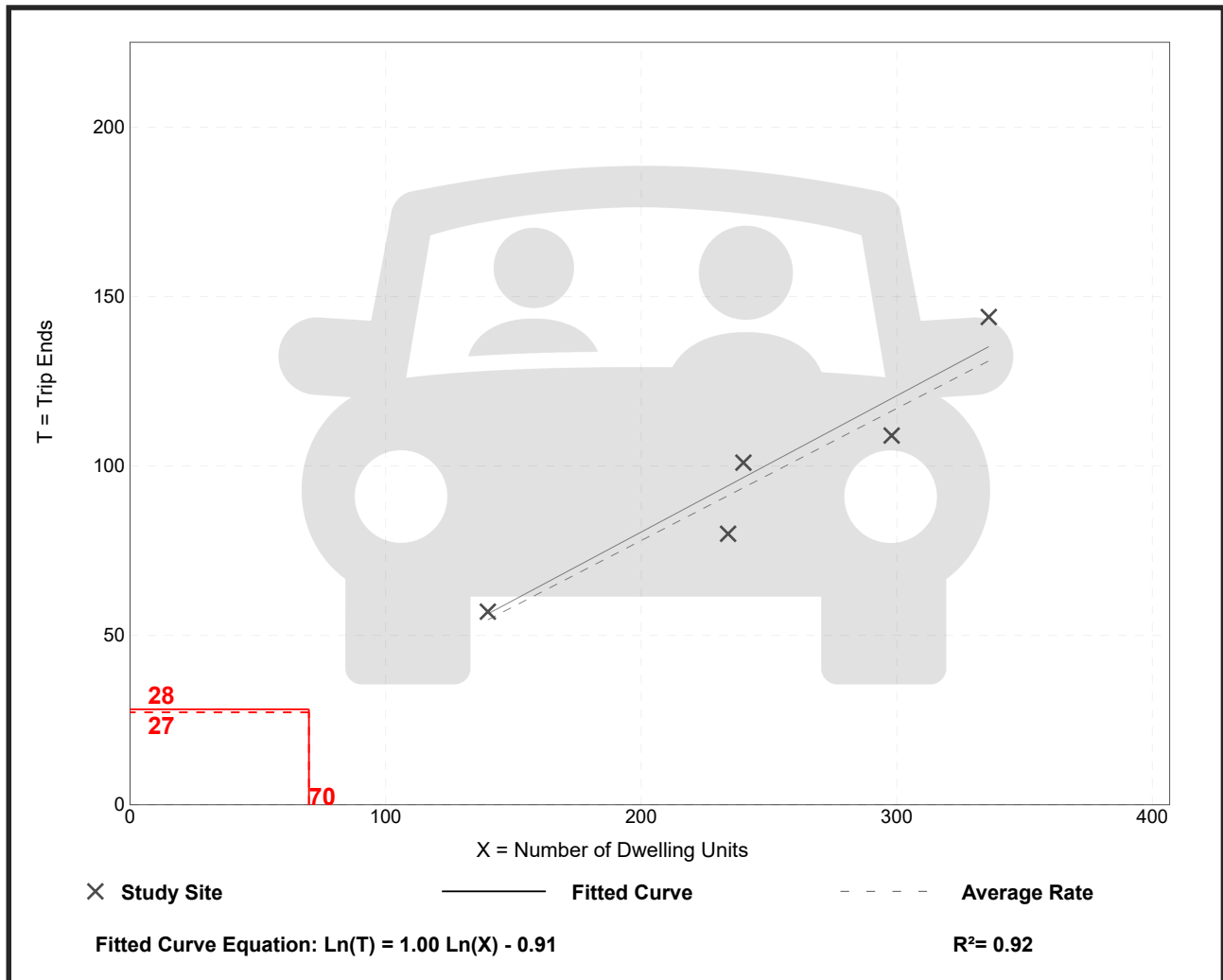
Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.34 - 0.43	0.04

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

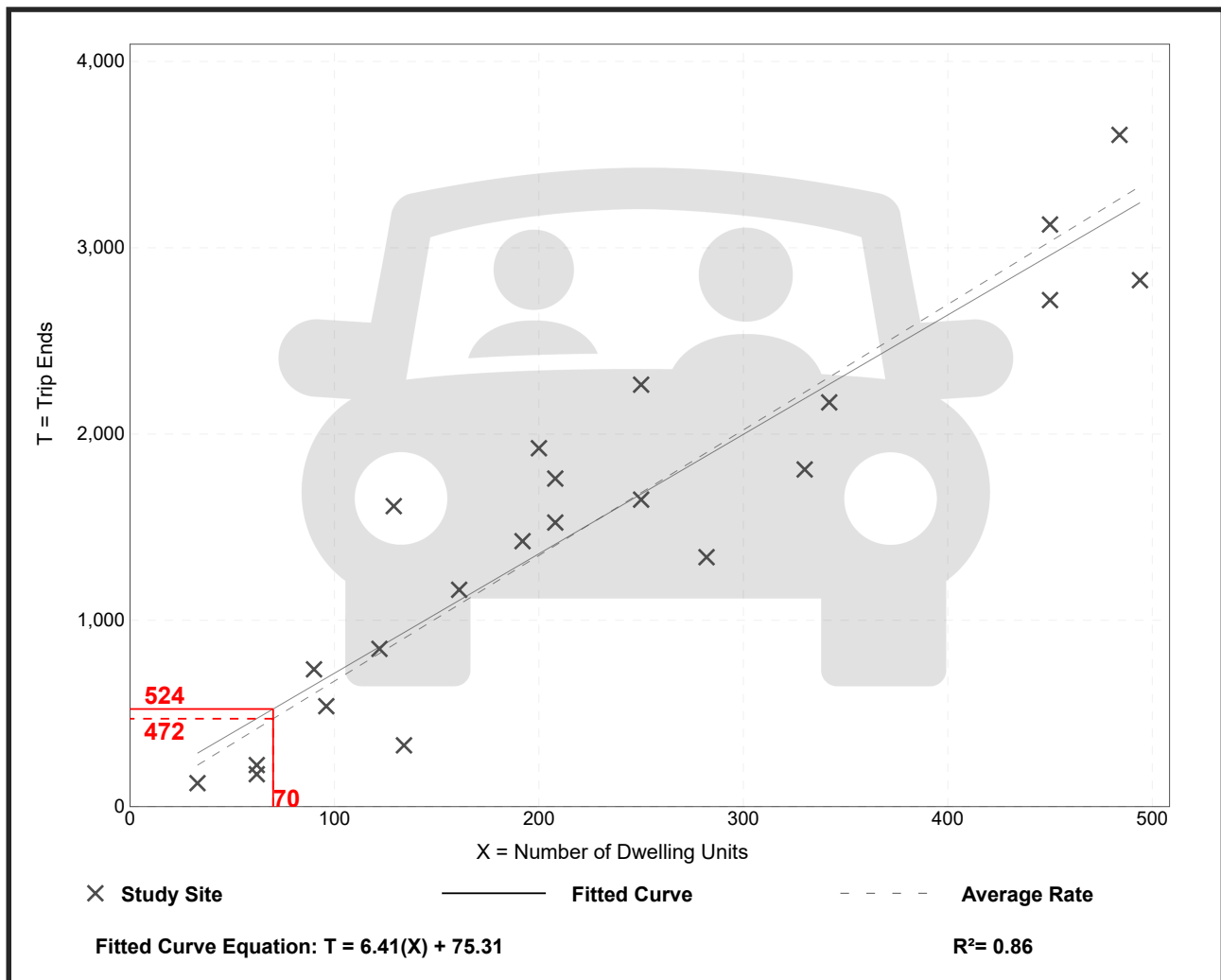
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 229
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

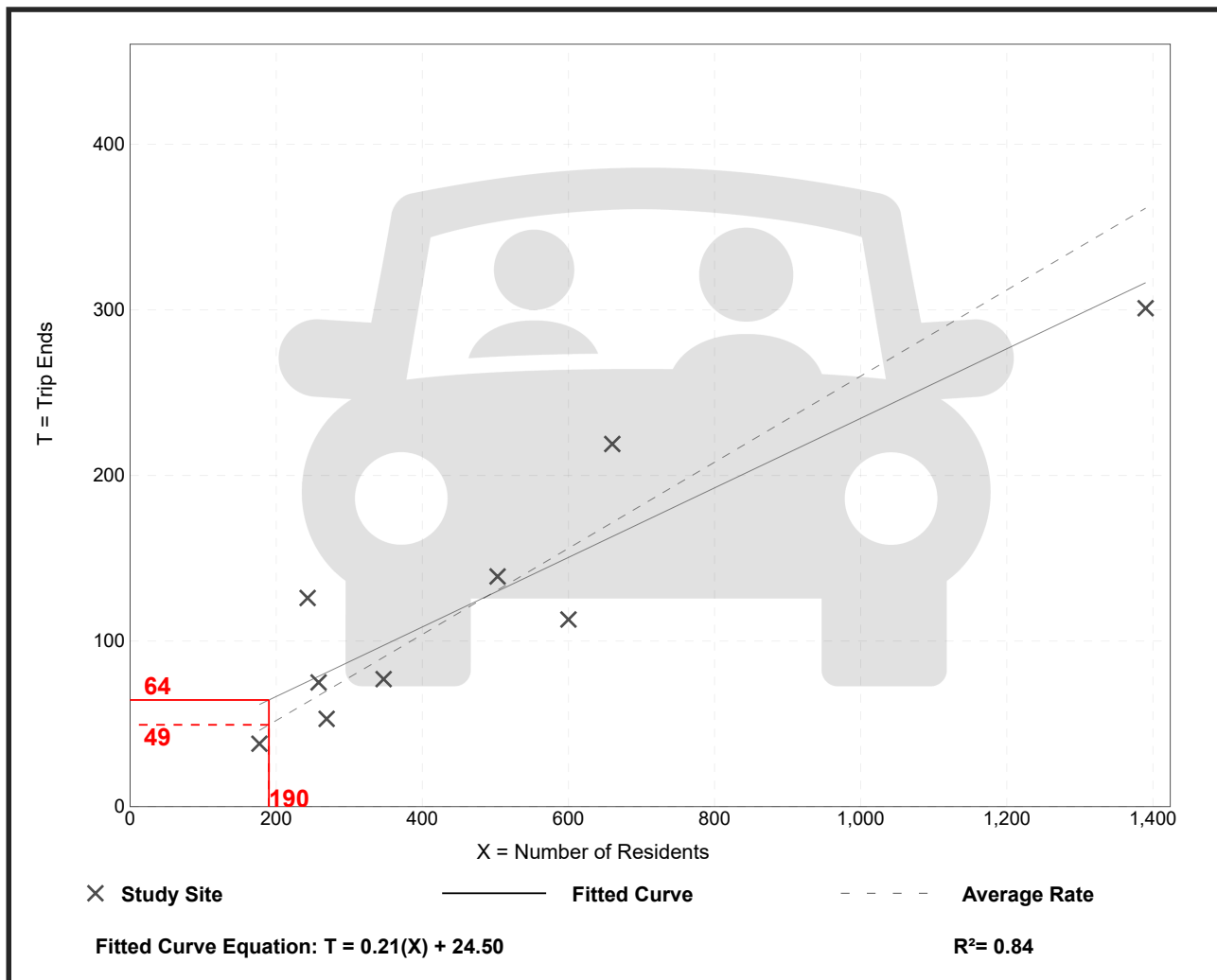
Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Residents: 494
Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.26	0.19 - 0.52	0.08

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

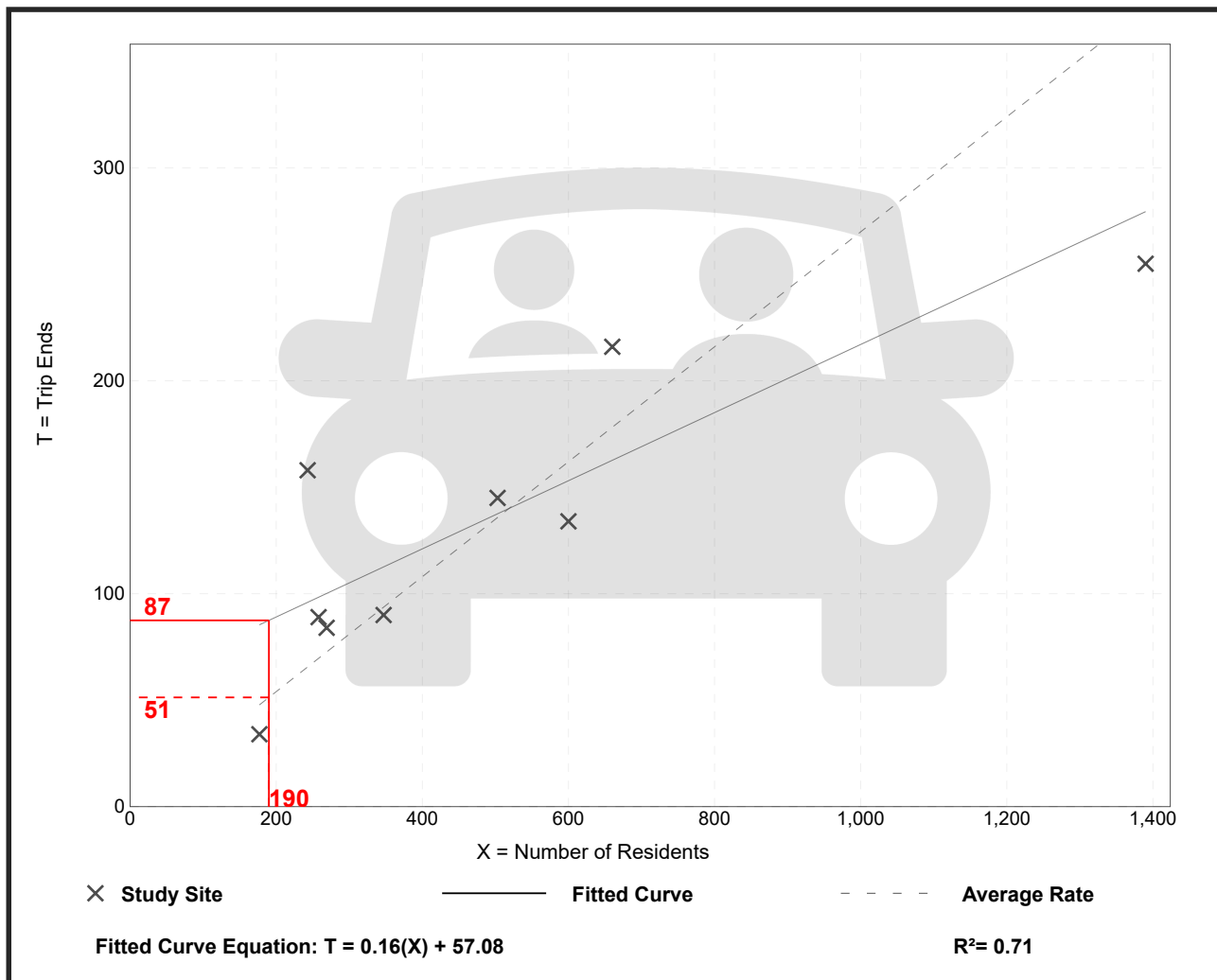
Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 9
Avg. Num. of Residents: 494
Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.27	0.18 - 0.65	0.11

Data Plot and Equation



Land Use: 215

Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077



APPENDIX C

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.