

# BERNARDS TOWNSHIP ENVIRONMENTAL COMMISSION

Regular Meeting of **February 27, 2023** - 7 pm

Municipal Building, Warren Craft Room

1 Collyer Lane, Basking Ridge, NJ

## Meeting Agenda

1. Call to Order
2. Open Public Meeting Statement
3. Flag Salute
4. Roll Call
5. Approval of EC meeting minutes regular – [January 23, 2023; Re-Org 2023](#)
6. Reports and Miscellaneous Correspondence
  - a. [Allen Road Email](#)

### Discussion

#### Subcommittee Reports

- i. Applications Review: John Crane, John Valeri, Todd Edelstein
- ii. ANJEC email monitoring / important educational webinars: Todd Edelstein
- iii. Native Pollinator Group: Sarah Wolfson
  1. Small pollinator garden on township owned property
- iv. Community Outreach / Education: Nancy Cook
- v. Guerilla Gardening: Sarah Wolfson
- vi. Tree Protection: John Valeri

### 7. Old Business

- a. Status on Current Projects:

### 8. New Business

#### a. Applications

- i. [Fellowship Village, Inc. Add't Info – PB 22-005 – 33 & 55 Allen Rd](#) – Construction of two-story structure to house staff on Lot 9 (Conditional use, prelim/final site plan.) Additional information was submitted and reviewed.
- ii. [Reale – ZB 23-001 – 71 Long Road](#) - Construction of new dwelling.
- iii. [Light -Add't Info – ZB 22-028 – Victoria Dr](#) – Variance for exceeding max imperious coverage allowed.
- iv. [Signature Acquisitions LLC Replacement Docs – ZB 22-028 – 150 Allen Rd](#) – Prelim/final site plan, D4-F.A.R., bulk variances to raze existing building & construct two (2) mixed used buildings

### 9. Comments by Public

### 10. Comments by Members

### 11. Adjournment

Ellen Houlihan, Secretary



Please call (908) 204 - 3000 seventy-two (72) hours in advance if accommodations are required, including Assistive listening devices (ALD).



## ***Bernards Township Environmental Commission***



### **BERNARDS TOWNSHIP ENVIRONMENTAL COMMISSION MINUTES – January 23, 2023**

#### **CALL TO ORDER**

Chairperson Alice Smyk called the meeting to order at 7:33 pm in the Warren Craft Room, Bernards Township Municipal Building in accordance with the Open Public Meeting Act of 1975.

#### **ROLL CALL**

**Present:** Nancy Cook, John Crane, Todd Edelstein, Alice Smyk , John Valeri Jr., Sarah Wolfson

**Absent:** Jennifer Asay, Elizabeth Cirri, Nicholas Cuozzo

**Also Present:** Kaitlin Cartoccio, Recording Secretary

#### **APPROVAL OF MEETING MINUTES**

Motion to approve the November 28, 2023, minutes made by John Crane, second by John Valeri Jr. All in favor, motion carried.

#### **REPORTS & MISCELLANEOUS CORRESPONDENCE**

##### **A. ANJEC 2023**

John Crane reminded the group that ANJEC is a lobbyist group. Nancy Cook said the group should try one more year, try for a grant or scholarship. If it's in the budget, we should do it. Todd Edelstein commented it has good information for new members. ANJEC changed their dues amounts for a certain number of members. Several members questioned where the dues money goes.

Motion by Nancy Cook, second by Todd Edelstein.

John Crane – No

John Valeri Jr. – Abstain

Nancy Cook- Yes

Todd Edelstein - Yes

Alice Smyk - Yes

Sarah Wolfson - Yes





## ***Bernards Township Environmental Commission***



### **B. Highlands Film**

Need more details. Nancy Cook will reach out.

### **C. Pollinator Group**

Discussion around participating in the Native Plant Sale for 2023. Lots of manpower required. Reach out to Jennifer Asay to partner with Girl Scouts. Maybe partner with Bernardsville.

## **DISCUSSION**

### **A. 2023 EC Meeting Dates**

Discussion regarding a December meeting. Perhaps a date should be held until confirmed or if there's any applications. Possibly December 11<sup>th</sup>. September 25<sup>th</sup> is Yom Kippur, can the meeting be moved?

### **B. Review BTEC General Application Comments**

No comments.

### **C. Supporting Plant Sale**

No further comments.

## **SUBCOMMITTEE REPORTS**

### **A. Applications**

None

### **B. ANJEC -**

Virtual webinar about electric vehicles 7 pm. Todd can send info out if you want to watch. Todd also mentioned he's been watching the news - whales being beached possibly due to wind power.

### **C. Pollinator**

Lots of webinars.

### **D. Community Outreach**

None

### **E. Guerilla Gardening**

Nothing new, but what is the budget? Everyone should look for locations for guerilla gardening.



## ***Bernards Township Environmental Commission***



### **OLD BUSINESS**

#### **A. Status on Current Projects**

Discussion on lantern fly project. Think ahead about Charter Day. - rainwater, composting. Sarah Wolfson suggested contacting the watershed ambassador.

### **NEW BUSINESS**

#### **A. Applications**

None

### **COMMENTS BY THE PUBLIC**

None

### **COMMENTS BY MEMBERS**

Alice Smyk mentioned the Jack Gray correspondence. Todd Edelstein brought up farm Agricultural Advisory Board. There's a possible want for farmers markets. John Crane mentioned the Sewage Authority has been having issue with illegal sump pumps. Perhaps we should add a comment about sump pumps to master comments.

### **ADJOURNMENT**

Meeting was adjourned at 8:40 pm. Motion by Todd Edelstein, second by Jon Valeri All in favor, motion carried.

Respectfully submitted,  
Kaitlin Cartoccio, Meeting Secretary



## ***Bernards Township Environmental Commission***



### **BERNARDS TOWNSHIP ENVIRONMENTAL COMMISSION REORGANIZATION MEETING MINUTES**

**January 23, 2023 – 7pm**

#### **CALL TO ORDER**

Recording Secretary Kaitlin Cartoccio called the meeting to order at 7:02 pm in the Warren Craft Room, Bernards Township Municipal Building in accordance with the Open Public Meeting Act of 1975.

#### **FLAG SALUTE**

All those assembled saluted the flag.

#### **ROLL CALL**

**Present:** Nancy Cook, John Crane, Todd Edelstein, Alice Smyk, John Valeri Jr., Sarah Wolfson

**Absent:** Elizabeth Cirri, Nicholas Cuzzo, Jennifer Asay

**Also Present:** Kaitlin Cartoccio, Recording Secretary

#### **NOMINATION FOR CHAIRPERSON**

Kaitlin Cartoccio opened the call for nominations for Chairperson. Nancy Cook nominated Alice Smyk. Seconded by Todd Edelstein. All in favor, motion carried.

#### **NOMINATION FOR VICE CHAIRPERSON**

Kaitlin Cartoccio opened the call for nominations for Vice Chairperson. Todd Edelstein nominated Nancy Cook. Seconded by Alice Smyk. All in favor, motion carried.

#### **SUB-COMMITTEE APPOINTMENTS**

**A. Tree Protection Committee – John Valeri Jr.**

**B. ANJEC Monitoring/Webinars – Todd Edelstein**

**C. Native Pollinator Group – Sarah Wolfson**

**D. Community Outreach/Education – Nancy Cook**

**E. Guerilla Gardening – Sarah Wolfson**



## ***Bernards Township Environmental Commission***



**F. Applications** – John Crane, John Valeri Jr., Todd Edelstein

### **COMMENTS BY MEMBERS**

There was a question regarding appointment to Agricultural Board.

### **ADJOURNMENT**

Meeting was adjourned at 7:31 pm. Motion by John Valeri Jr., second by Nancy Cook. All in favor, motion carried.

Respectfully submitted,  
Kaitlin Cartoccio, Meeting Secretary

## Ellen Houlihan

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**From:** Neha Mehta <nehamehta0384@gmail.com>  
**Sent:** Monday, January 23, 2023 3:26 PM  
**To:** Ellen Houlihan  
**Subject:** Allen Road Manufacturing Plant Environmental Concerns

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

Dear Environmental Committee:

My family and I are residents of Bernard's township and live on Somerville Road. We are concerned about the proposed manufacturing plant on Allen Road.

My concerns are multifold.

1. threatens wood turtles habitat
2. removal of mature trees that protect the wetlands
3. air, water, and noise pollution

First, it will pose a threat to wood turtles. There are several wood turtles that roam around our property. Historically, the wood turtle was a fairly common species within suitable habitat in New Jersey. However, by the 1970s, the wood turtle was placed on the highly threatened and endangered species list in New Jersey in 1979. Since the late 1970s, biologists have monitored and surveyed wood turtle sites in New Jersey, providing valuable data regarding the life history, reproduction, and habitat use of these turtles in the state. There is, however, a continuing need to examine the productivity and juvenile survival of wood turtles, which may be threatened by disturbance such as manufacturing on Allen Road. The level of noise pollution that would be a result of a manufacturing plant would cause a huge disturbance in their habitat, and potentially cause them to lose some of their existing habitat, which could further lead to their decline.

In addition, removing 400-600 mature trees and increasing the paved area allowance from 15% to 21% doesn't sound like much, however, directly below the property is a DEP wetland, and it's capacity to handle rain torrents decreases as impermeable area increases above it, which increases runoff and erosion. These wetlands ensure that local houses do not get flooded.

These are just a few of my concerns that I put together.

I hope to hear from you soon.

Best,

Neha Patel

Email: [nehamehta0384@gmail.com](mailto:nehamehta0384@gmail.com)

Phone: 908-872-4643

Address: 207 Somerville Road, Basking Ridge, NJ 07920

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Neha

ADD'L DOCS

**TOWNSHIP OF BERNARDS**  
**PLANNING BOARD**  
**APPLICATION STATUS FORM**

Application No: PB22-005 Block: 9301 Lot: 33 Zone: R-2

Applicant: FELLOWSHIP VILLAGE INC.

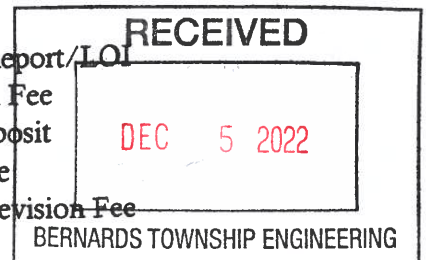
Address of Property: 33 + 55 ALLEN RD

Description: CONSTRUCTION OF TWO STORY STRUCTURE  
TO HOUSE STAFF ON LOT 9 (CONDITIONAL USE,  
PRELIM/FINAL SITE PLAN)

**APPLICATION CHECKLIST**

- ☒ Original + 3 copies of Application
- ☐ Remaining 17 copies of Application
- ☒ W-9
- ☒ Site Inspection Form (A)
- ☒ Ownership Form (B)
- ☒ Property Owners List (C) (2)
- ☒ Tax Certification (D) (2)
- ☐ Public Notice (E)
- ☒ Outside Agencies Form (F)
- ☒ Tree Removal Form (G)

- ☒ Contributions Form (H)
- ☒ Engineering Plan/Plot Plan
- ☒ Architectural Plan
- ☒ Survey
- ☐ Wetlands Report/LOI
- ☒ Application Fee
- ☒ Escrow Deposit
- ☐ Imaging Fee
- ☐ Tax Map Revision Fee
- ☒ Checklist



**SCHEDULING**

10.14.22 Original Submission Date  
11.28.22 Completeness Deadline (45 days)  
\_\_\_\_ Incomplete Date  
\_\_\_\_ Resubmission Date  
\_\_\_\_ Date Complete  
\_\_\_\_ Time to Act (45/95/120 days)

**HEARING**

\_\_\_\_ Notice to Property Owners  
\_\_\_\_ Date of Publication  
\_\_\_\_ Completeness Hearing  
2/7/23 Public Hearing  
\_\_\_\_ Carried to Date  
\_\_\_\_ Decision - Approved/Denied  
\_\_\_\_ Resolution Memorialized  
\_\_\_\_ Resolution Published

**DISTRIBUTION**

10.17.22 Environmental Commission  
\_\_\_\_ Fire Official  
\_\_\_\_ LCFAS  
\_\_\_\_ Police

**NOTES**

November 22, 2022

**VIA HAND DELIVERY & E-MAIL**

Township of Bernards Planning Board  
Attn: David Schley, P.P., AICP, Township Planner  
Municipal Building  
277 South Maple Avenue  
Basking Ridge, New Jersey 07920

**Re: Response Letter re: 10/28/22 Completeness Review Memorandum**  
Fellowship Village, Inc. ("Applicant") (f/k/a Fellowship Senior Living, Inc.)  
*Application for Preliminary and Final Site Plan and Conditional Use Approval*  
("Application") (PB22-005)  
Block 9301, Lot 33 and Block 9401, Lot 9

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Dear Mr. Schley:

This office represents Fellowship Village, Inc. (f/k/a Fellowship Senior Living, Inc.), the Applicant in the above-captioned application for Preliminary and Final Site Plan and Conditional Use Approval (the "Application"). This letter is written in response to your Completeness Review Memorandum, dated October 28, 2022 (the "Completeness Memorandum") and in anticipation of the Planning Board's consideration of the completeness of this application on November 22, 2022.

Applicant presents the following responses for consideration:

1. A draft public notice is enclosed for review.
2. A revised preliminary site plan checklist and a final checklist are enclosed for review.
3. A check for \$150 is enclosed in payment of the Document Imaging Fee.
4. A revised List of Exceptions and Submission Waivers is enclosed and reflects the following:
  - a. The Steep Slopes Plan will be revised to reflect 10 contours as required by ordinance. No relief will be sought from the Steep Slopes regulations.
  - b. Relief was previously granted related to the number of existing loading spaces. No new loading spaces are proposed. To the extent the previously granted relief must be modified, Applicant requests such relief.
  - c. Relief is requested from the Lighting regulations, as indicated.

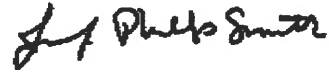
- d. Applicant will revise its plans and stormwater statement in accordance with those requirements for a major development.
  - e. Applicant proposes to make an in lieu contribution to the tree fund, and wishes to address the actual tree count and replacement calculations under plan review.
5. Locations of existing structures within 200' of the site are shown in the aerial submitted as part of the Site Plans. To the extent underground utilities, existing contours and other specific items are not visible on the aerial, Applicant requests a partial waiver from item #15 on the preliminary checklist. ***Submission Waiver Sought.***
  6. Prior to final determination of completeness, Applicant will provide a determination prepared by a qualified consultant/expert. Applicant requests a partial waiver from item #16 on the preliminary checklist, to the extent that a formal absence determination from the Department of Environmental Protection would otherwise be required. ***Submission Waiver Sought.***
  7. The revised steep slope map will be provided.
  8. The submitted Site Plans will be revised to incorporate the additional tree information.
  9. Tree protection details will be provided.
  10. Applicant will provide general soil information prior to a site plan hearing. To the extent soil borings are required by the checklist, Applicant requests a waiver from item #38. ***Submission Waiver Sought.***
  11. The survey for Lot 33 will be provided.
  12. Applicant continues to request a submission waiver from items #48 and 49, related to the Environmental Impact Assessment. ***Submission Waiver Sought.***
  13. Fire water service, fire hydrants and fire department connections are currently indicated on the Utility Plan. The Applicant will submit a Fire Service Plan reflecting these items as well as fire truck vehicle circulation.



GIBBONS P.C.

Applicant and its professionals look forward to addressing any further questions or comments that the Board or its professional may have relative to a determination of completeness on November 22, 2022.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer Phillips Smith". The signature is fluid and cursive, with the first name "Jennifer" being more prominent.

Jennifer Phillips Smith  
Director

cc: Brian Lawrence (via e-mail)  
Bill Schramm, AIA (via e-mail)  
Daniel J. Dougherty, PE, PP (via e-mail)  
Cyndi Kiefer, Board Secretary, (via e-mail)

## **NOTICE OF PUBLIC HEARING ON APPLICATION**

**PLEASE TAKE NOTICE THAT** the Planning Board of the Township of Bernards (the "Board") will hold a hearing on \_\_\_\_\_, 20\_\_, at 7:30 PM at the Municipal Building, located at 1 Collyer Lane, Basking Ridge, New Jersey 07920 for the purposes of reviewing and taking action upon the application of Fellowship Village Inc. (previously known as Fellowship Senior Living, Inc.) ("Applicant"), for preliminary and final site plan and conditional use approval (the "Application") for the development of certain property having a street address of 55 Allen Road and 33 Allen Road (aka 8000 Fellowship Road), known on the tax maps as Block 9401, Lot 9 and Block 9301, Lot 33 (the "Property"). The Applicant, Fellowship Village, is a Continuing Care Retirement Community (CCRC) currently operating at the Property. The Property, consisting of approximately 75.4-acres, is located within the R-2 residential zoning district, where Fellowship Village is a permitted conditional use. The existing Fellowship Village campus is limited to Block 9301, Lot 33, but Applicant is looking to expand the campus to include Block 9401, Lot 9.

The prior use was a one story framed single-family residential dwelling Applicant proposes to construct a new, two-story structure with a total floor area of approximately 3,402 square feet to serve as a staff residence building. The proposed improvements also include a 180 square foot deck, a driveway from Fellowship Road, a sidewalk, and eight (8) parking spaces, with one ADA parking stall. Applicant does not request any bulk variances as part of the Application, and the Application complies with the applicable conditional use requirements. Applicant seeks design exceptions related to lighting (for a maximum of 5 fc, where only 0.9 fc are permitted) and loading (where 6 spaces are required and 1 was previously approved), as deemed necessary. Applicant also seeks to make a payment to the Tree Replacement Fund pursuant to § 21-45.5.

In connection with this Application, Applicant seeks any variances, deviations, design exceptions/waivers, submission waivers, interpretations, modifications of other prior imposed conditions, and other approvals reflected on the filed plans (as same may be further amended from time to time without further notice) and as may be determined to be necessary during the review and processing of the Application.

When the Application is called, interested parties may appear at the hearing or any adjournment thereof either in person or by attorney, ask questions, and present evidence and offer statements or documentation that may be relevant to the Application. The hearing may be continued without further notice on such additional or other dates as the Board may determine.

The Application, maps, plans and related supporting materials are on file with the Board Secretary at 277 South Maple Avenue, Basking Ridge, New Jersey 07920. Any individual seeking to review copies of such application materials should contact the Board Secretary, Cyndi Kiefer, at 908-204-3026, Monday through Friday, 8:30AM to 4:30PM or such other hours set by the Township.

**Fellowship Village Inc., f/k/a  
Fellowship Senior Living, Inc.**  
By: Jennifer Phillips Smith, Esq.  
GIBBONS P.C.  
141 W. Front Street, Suite 240  
Red Bank, New Jersey 07701  
(732) 704-5801

## **APPENDIX B, ARTICLE III**

### **Checklist**

#### **Application for Preliminary Approval of a Major Subdivision or Site Plan (See Article VII for Details)**

**\*Important: Each item must be marked Submitted, Not Applicable or Waiver Requested\***

| <b>No.</b> | <b>Item</b>   | <b>Submitted</b> | <b>Not Applicable</b> | <b>Waiver Requested</b> |
|------------|---|------------------|-----------------------|-------------------------|
| 1          | A completed application form and checklist(s). If the application involves a wireless telecommunications tower and/or antennas, all items listed on the Wireless Telecommunications Facilities Checklist must be also be submitted.   | X                |                       |                         |
| 2          | A certificate from the tax collector indicating that taxes are paid.  | X                |                       |                         |
| 3          | All required application and escrow deposit fees.   | X                |                       |                         |
| 4          | Names and addresses of property owners within 200' of the subject property, as disclosed by current tax records and identified by block & lot numbers.  | X                |                       |                         |
| 5          | Title block indicating:   | X                |                       |                         |
|            | a. Name of development and street location.   | X                |                       |                         |
|            | b. Name and address of applicant, owner and authorized agent, if any.   | X                |                       |                         |
|            | c. Name and address of professional(s) preparing plans including signature, date, license number and seal.  | X                |                       |                         |
|            | d. Tax map block and lot numbers.   | X                |                       |                         |
|            | e. Date of plan preparation and revision box with date of each revision.  | X                |                       |                         |
|            | f. Development application number.  | X                |                       |                         |
|            | g. Written and graphic scale.   | X                |                       |                         |
| 6          | Signature of applicant and, if applicant is not owner, signed consent of the owner.   | X                |                       |                         |
| 7          | Name and address of the attorney representing parties, if any, and the name of each client represented.   | X                |                       |                         |
| 8          | Signature blocks as required by the Map Filing Law.   | X                |                       |                         |
| 9          | North arrow giving reference meridian.  | X                |                       |                         |
| 10         | Copies of any protective covenants or deed restrictions applying to the subject property, including a statement as to whether such covenants or deeds are of record. A copy or abstract of the deed or deeds or other instruments by which title is derived with the names of all owners must also be provided.   | X                |                       |                         |
| 11         | A key map showing the entire tract and its relation to the surrounding areas, including all roads, zone boundaries and municipal boundaries within one-half (1/2) mile of the subject property at a scale of one (1) inch equals not more than two thousand (2,000) feet.   | X                |                       |                         |
| 12         | A zoning schedule indicating the zone(s) within which the property is located and required, existing & proposed conditions relative to lot area, width, frontage, yard setbacks, lot coverage, height, floor area, floor area ratio, density, open space, parking, loading, signs, etc.   | X                |                       |                         |
| 13         | A list of required and obtained regulatory approvals and permits.   | X                |                       |                         |
| 14         | A list of requested variances and exceptions.   | X                |                       |                         |
| 15         | The location and dimensions of existing & proposed property lines, existing streets, streets shown on the Township's official map or master plan, structures (indicating the use of each structure and whether existing structures will remain or be removed), building setbacks, rights-of-way, easements, parking & loading areas, driveways, railroads, bridges, culverts, drain pipes, gas transmission lines, overhead utilities, historic sites/structures, wooded areas, watercourses, flood plains, wetlands or other environmentally sensitive areas on and within 200' of the subject property. |                  |                       | X                       |
| 16         | A wetlands delineation or wetlands absence determination prepared by a qualified consultant and verified by a letter of interpretation from the New Jersey Department of Environmental Protection, if required pursuant to § 21-14.1.a.   |                  |                       | X                       |

| No. | Item  | Submitted | Not Applicable | Waiver Requested |
|-----|---|-----------|----------------|------------------|
| 17  | Plans & profiles of proposed utility layouts, including water supply, sewage disposal, stormwater drainage, gas, telephone and electricity, showing feasible connections to existing or proposed systems. Plans for individual on-site water supply and/or sewage disposal systems shall be accompanied by the necessary local, county and/or state agency approvals. If service will be provided by an existing utility company, a letter from that company stating that service will be available before occupancy is required. | X         |                |                  |
| 18  | The locations of percolation tests on each existing/proposed lot and a copy of the written approval of the tests and locations from the Bernards Township Health Department, if sewage disposal is to be handled by individual septic system(s). For each lot, the applicant shall submit test locations and written approvals from the Health Department for both a primary and secondary septic disposal field. The applicant must show on the development plan the locations and dimensions of both septic disposal fields.    |           | X              |                  |
| 19  | All means of vehicular and pedestrian access to the site from public streets, including locations and dimensions of driveways and curbcuts and any traffic signs, signals, channelization, acceleration and deceleration lanes or other traffic control devices.  | X         |                |                  |
| 20  | Site identification sign and street sign locations and details.   | X         |                |                  |
| 21  | Existing & proposed topographic contour intervals based on U.S.C. & G.S. datum on and within 200' of the subject property as follows:<br>- up to 3% grade = 1' intervals                      - over 3% grade = 2' intervals  | X         |                |                  |
| 22  | A steep slope map in accordance with § 21-14.2.b, if the property contains any existing slopes of 15% or greater.   | X         |                |                  |
| 23  | Spot and finished elevations at all property corners.   | X         |                |                  |
| 24  | A landscaping plan showing shade trees, screening, buffering, existing vegetation and limits of clearing, a planting schedule, details of plantings, landscape treatments and other amenities, etc. (see § 21-54.4 for detailed requirements).  | X         |                |                  |
| 25  | A tree identification plan and an application for tree removal permit including the following (see § 21-45.3 for detailed requirements):  | X         |                |                  |
|     | a. Location of existing tree canopy and labeling of the canopy areas to be removed and to be preserved.   | X         |                |                  |
|     | b. Location of individual trees with a DBH equal to or greater than six inches identified by size and species within the limit of disturbance and 30 feet beyond the limit of disturbance, labeled to be removed or to be preserved.  | X         |                |                  |
|     | c. Location of individual trees with a DBH equal to or greater than ten inches identified by size and species within the property boundaries, labeled to be removed or to be preserved.   | X         |                |                  |
|     | d. Tree protection details.   | X         |                |                  |
|     | e. A list of all trees to be removed and, if replacement trees are required, a schedule in accordance with the table in § 21-45.1 indicating the number of replacement trees required and the number of replacement trees proposed.   | X         |                |                  |
| 26  | A lighting plan in accordance with Section 21-41, including the location, type, height, graphic details and specifications of all existing & proposed lighting. The plan shall show the proposed illumination in footcandle values throughout the site and shall identify the average maintained horizontal illumination in vehicular areas and in sidewalk areas.  | X         |                |                  |
| 27  | A soil erosion and sediment control plan, if required pursuant to Section 21-27.  | X         |                |                  |
| 28  | A solid waste management plan and a recycling plan, including locations and details of outdoor refuse and recycling storage areas and means of screening, in accordance with Sections 21-40 and 21-40A.   | X         |                |                  |

| No. | Item  | Submitted | Not Applicable | Waiver Requested |
|-----|---|-----------|----------------|------------------|
| 29  | Plans and profiles of proposed driveways.   | X         |                |                  |
| 30  | Plans, typical cross-sections, centerline profiles, tentative grades, curb radii and details of all streets on the site or off the site which are proposed to be improved, including curbing, sidewalks and drainage structures.  |           | X              |                  |
| 31  | Construction details in accordance with Township standards.   | X         |                |                  |
| 32  | Existing & proposed easements or land reserved for or dedicated to public use, utility use or for the common use of property owners in the development, including a statement of the limits and purpose of the easement rights or dedicated land.   |           | X              |                  |
| 33  | Existing & proposed sight triangles.  |           | X              |                  |
| 34  | Development staging plans.  |           | X              |                  |
| 35  | Existing & proposed block and lot numbers.  |           | X              |                  |
| 36  | The area in square feet and to the nearest tenth of an acre of all existing and proposed lots.  | X         |                |                  |
| 37  | A sketch of the proposed or possible layout or disposition of remaining lands, if any.  |           | X              |                  |
| 38  | General soil information including soil logs.   |           |                | X                |
| 39  | Source and date of the current property survey and a copy of the survey showing all existing tract boundary or lot lines with lengths of courses to hundredths of a foot and bearings to half minutes, the error of closure not to exceed one (1) to ten thousand (10,000). The tract boundary or lot lines shall be clearly delineated. All bearings shall be in the New Jersey Plane Coordinate System, with coordinates shown on at least three (3) corners.               | X         |                |                  |
| 40  | Appropriate certification blocks as required by the Map Filing Law  |           | X              |                  |
| 41  | Monumentation as specified by the Map Filing Law.   |           | X              |                  |
| 42  | Metes and bounds description showing dimensions, bearings, curve data, length of tangents, radii, arcs, chords and central angles for all centerlines and rights-of-way and centerline curves on streets.   |           | X              |                  |
| 43  | Plans and computations for any storm drainage systems, including locations, details and specifications of all storm sewer lines, catch basins, inlets, manholes, culverts, headwalls, dry wells, ground water recharge basins, detention basins, etc. and existing and proposed drainage area maps.   |           | X              |                  |
| 44  | When a stream is proposed for alteration, improvement or relocation or when a drainage structure or fill is proposed over, under, in or along a running stream, intermittent stream, swale or drainageway, evidence of approval or of the request for approval, required modifications or lack of jurisdiction over the improvement by the New Jersey Department of Environmental Protection shall accompany the application (see § 21-54.4 for additional required details). |           | X              |                  |
| 45  | When ditches, streams or watercourses are to be altered, improved or relocated, the method of stabilizing slopes and measures to control erosion and siltation, as well as typical ditch sections and profiles, shall be shown.   |           | X              |                  |
| 46  | For a site plan, preliminary elevations and plans of all buildings and structures, showing windows, doors, architectural treatment, roof treatment, roof appurtenances and screening, floor elevations and proposed methods of energy conservation and the locations, dimension and legend(s) of all proposed signs. For a subdivision, the approximate basement and first floor elevation for each house.  | X         |                |                  |
| 47  | A list of names and addresses of all stockholders or individual partners owning at least 10% of its stock of any class or at least 10% of the interest in the partnership, as the case may be.  | X         |                |                  |

| No. | Item   | Submitted | Not Applicable | Waiver Requested |
|-----|--|-----------|----------------|------------------|
| 48  | A Project Report, which may be submitted separately or as part of the Environmental Impact Assessment, including the following (see § 21-54.6 for details). Where individual maps or exhibits are submitted separately to satisfy other checklist requirements, they may be referenced in the Project Report.  |           |                | X                |
|     | a. Project Description and Statistics Report.  |           |                |                  |
|     | b. Land Classification Map and Report.   |           |                |                  |
|     | c. Natural Features Report.  |           |                |                  |
|     | d. Open Space Plan and Report.   |           |                |                  |
|     | e. Land Coverage and Drainage Plan and Report.   |           |                |                  |
|     | f. Soil Erosion and Sedimentation Control Plan and Report.   |           |                |                  |
|     | g. Sewer and Water Plan and Report.  |           |                |                  |
|     | h. Circulation Plan and Traffic Report.  |           |                |                  |
|     | i. Utilities Plan and Report.  |           |                |                  |
|     | j. Development Schedule Plan.  |           |                |                  |
|     | k. Variances and Exceptions Report.  |           |                |                  |
|     | l. Easements and Covenants Report.   |           |                |                  |
| 49  | An Environmental Impact Assessment, including the following (see § 21-54.6.m for details).   |           |                | X                |
|     | a. Plan and description of the development plan.   |           |                |                  |
|     | b. Inventory of existing natural resources.  |           |                |                  |
|     | c. Assessment of environmental impacts.  |           |                |                  |
|     | d. Unavoidable adverse environmental impacts.  |           |                |                  |
|     | e. Steps to minimize environmental damage.   |           |                |                  |
|     | f. Alternatives.   |           |                |                  |
|     | g. Details and matters to be evaluated:  |           |                |                  |
|     | (1) Sewerage facilities.   |           |                |                  |
|     | (2) Water supply.  |           |                |                  |
|     | (3) Storm water.   |           |                |                  |
|     | (4) Stream encroachments.  |           |                |                  |
|     | (5) Floodplains.   |           |                |                  |
|     | (6) Solid waste disposal.  |           |                |                  |
|     | (7) Air pollution.   |           |                |                  |
|     | (8) Traffic.   |           |                |                  |
|     | (9) Social/economic factors.   |           |                |                  |
|     | (10) Aesthetics.   |           |                |                  |
|     | (11) Licenses, permits, etc.   |           |                |                  |
|     | (12) A copy of the development plan and application form.  |           |                |                  |
| 50  | Delineations of existing and proposed stream buffer conservation areas and stream buffer management plans, if required pursuant to Section 21-14.4.b.  |           | X              |                  |
| 51  | Contribution Disclosure Statement, if required pursuant to Section 21-7A.  | X         |                |                  |
| 52  | A plan showing all the details required in the procedures of Table 401-A, entitled Maximum Permitted Lot Yield & Minimum Improvable Lot Area Standards, Residential Development, R-1 Through R-7 Zones.  |           | X              |                  |
| 53  | For each proposed dwelling, cross sections shall be provided from the center of the road to the rear of the house in existing and proposed conditions; cross sections shall be provided perpendicular to the road through the center of the dwelling to a point 50' to the rear of the dwelling; the cross section shall be provided at a scale of 1" = 10' horizontal and 1" = 10' vertical.            | X         |                |                  |
| 54  | A fire service plan, showing on a separate plan sheet(s) information relating to fire safety and emergency response, including: existing and proposed water lines, fire department connections, hydrants and cisterns; widths and turning radii of streets, driveways, parking aisles, emergency access roads and fire lanes; public building entrances; parking spaces; and stormwater drainage basins. | X         |                |                  |

### **APPENDIX C, ARTICLE III**

#### **Checklist**

#### **Application for Final Approval of a Major Subdivision or Site Plan**

#### **(See Article VII for Details)**

**\*Important: Each item must be marked Submitted, Not Applicable or Waiver Requested\***

| <b>No.</b> | <b>Item</b>  | <b>Submitted</b> | <b>Not Applicable</b> | <b>Waiver Requested</b> |
|------------|--|------------------|-----------------------|-------------------------|
| 1          | All items required for preliminary approval as set forth in § 21-54.4, unless previously waived by the Board.  |                  |                       | X                       |
| 2          | All additional items required by the Board as a condition of preliminary approval.   |                  | X                     |                         |
| 3          | A certificate from the tax collector indicating that taxes are paid.   | X                |                       |                         |
| 4          | All required application and escrow deposit fees.  | X                |                       |                         |
| 5          | Final detailed architectural renderings of each building and sign, including front, side and rear elevations.  | X                |                       |                         |
| 6          | Final cross-sections, profiles and established grades of all streets, aisles, lanes and driveways and construction documents for all public improvements.  |                  | X                     |                         |
| 7          | Final plans and profiles of all storm sewers.  | X                |                       |                         |
| 8          | Final plans and profiles of all sanitary sewers.   | X                |                       |                         |
| 9          | Final plans and profiles of all water mains.   | X                |                       |                         |
| 10         | All dimensions of the exterior boundaries of any subdivision, balanced and closed to a precision of one to 10,000, and the dimensions of all lot lines to within one to 20,000. All dimensions, angles and bearings must be tied to at least two permanent monuments not less than 300 feet apart and all information shall be indicated on the plat. At least one corner of the subdivision shall be tied to U.S.C. and G.S. benchmarks with data on the plat as to how the bearings were determined. |                  | X                     |                         |
| 11         | Proposed street names.   |                  | X                     |                         |
| 12         | A Final Application Comparison Report, including:  |                  |                       | X                       |
|            | a. The number and type of dwelling units.  |                  |                       |                         |
|            | b. The amount of nonresidential floor space.   |                  |                       |                         |
|            | c. The type of community facilities and/or structures.   |                  |                       |                         |
|            | d. The amount of open space to be preserved.   |                  |                       |                         |
|            | e. The nature and cost of public improvements.   |                  |                       |                         |
|            | f. The anticipated value of residential and nonresidential construction.   |                  |                       |                         |
|            | g. Finalized landscaping and tree removal information pursuant to Sections 21-43 through 21-45.  |                  |                       |                         |
|            | h. A comparison to the preliminary development approval, indicating the nature and reasons for any changes to the preliminary approval.  |                  |                       |                         |

| No. | Item   | Submitted | Not Applicable | Waiver Requested |
|-----|--|-----------|----------------|------------------|
| 13  | Organization documents, including:   |           | X              |                  |
|     | a. Articles of incorporation, by-laws and membership rules/regulations for any homeowner's association, condominium association or other organization to maintain the common open space or community facilities.   |           | X              |                  |
|     | b. A copy of the master deed detailing the rights and privileges of individual owners of common property.  |           | X              |                  |
|     | c. A copy of all materials submitted to the Department of Community Affairs as required by the New Jersey Planned Real Estate Development Full Disclosure Act Regulations and evidence of the status of acceptance of and/or approval by the Department of Community Affairs.    |           | X              |                  |
|     | d. Covenants or easements restricting the use of the common open space or elements.  |           | X              |                  |
|     | e. Covenants or agreements requiring homeowners or residents to pay the organization for the maintenance of the common open space and/or community facilities. This shall include a proposed schedule of membership fees for at least the first three years of operation.        |           | X              |                  |
| 14  | All easements or covenants affecting any land in the development.  | X         |                |                  |
| 15  | All maintenance agreements under which private roads and other facilities will be maintained, refuse collected and other supplementary services provided, if there is to be no homeowners' association, condominium association, open space organization or similar arrangement. |           | X              |                  |
| 16  | An offer of dedication including all legal requirements for valid dedication to the Township or, where appropriate, to another governmental body of roads or other improvements intended for public ownership.   |           | X              |                  |





**Fellowship Village, Inc.  
(f/k/a Fellowship Senior Living, Inc.)  
Block 9301, Lot 33; Block 9401, Lot 9**

**List of Requested Exceptions and Submission Waivers**

November 22, 2022

**§ 21-39.2. Loading Requirements**

No loading space is proposed as part of this application. In 2016, the Planning Board granted a design exception to allow one (1) loading space to serve the facility, whereas Ordinance section 21-39.2(a) required a total of five (5) based on the total square footage of floor area. Due to the additional square footage proposed in Applicant's 2021 Planning Board application, six (6) spaces would have been required. Applicant therefore requested and the Board granted an exception to allow one (1) space, whereas six (6) were required. In 2016 and in 2021, the Board found that the Applicant did not need all of the required loading / unloading spaces, and actually only needed one (1) space for safe and efficient loading and unloading. The additional square footage proposed in this application does not increase the total number of required loading spaces. *The Applicant requests that the Board determine that the same remains true in connection with this pending Application, but to the extent that the Board determines that Applicant requires a further design exception from this section, Applicant hereby requests same.*

**§ 21-41.3 Nonresidential Lighting Intensity**

Applicant's proposed lighting plan has a maximum intensity of 5.0 fc, where the maximum permitted is 0.9 fc.

**§ 21-45 Tree Removal and Protection**

In lieu of planting replacement trees, Applicant requests that the Board permit Applicant to make a contribution to Township Tree Fund as established by Code § 21-45.5.

**Submission Waivers**

As part of its application for development, the Applicant seeks waivers or partial waivers from the following checklist items:

**Preliminary Site Plan Checklist**

- **#15** - Location of existing structures, parking areas, driveways, topographic contours, etc. within 200' of the property (Preliminary Site Plan Checklist Item No. 15).
  - o *All structures on the property are depicted in the Site Plans. In addition, Applicant submitted an aerial of the property herewith showing locations of existing structures, parking areas, driveways,*

*topographic contours, etc. within 200' of the property; however, certain structures (such as culverts) are not visible on the aerial.*

- **#16** - A wetlands determination or absence determination prepared by a qualified consultant and verified by a Letter of Interpretation (LOI) issued by NJDEP (Preliminary Site Plan Checklist Item No. 16).
  - o *Applicant will submit a certification from Applicant's environmental consultant concerning the absence of wetlands in the area of proposed disturbance, but requests a waiver to the extent an LOI would otherwise be required.*
- **#38** – General soil information including soil logs
  - o *Applicant will provide general soil information, but requests a waiver from providing soil logs. No soil borings have been performed.*
- **#48 & 49** - A Project Report/Environmental Impact Statement
  - o *Applicant's proposal consists of a modest residential project (staff residence with 3,402 square feet of floor area) on a small development parcel (2.87 acres), with no impact to regulated environmental elements/conditions. Applicant is replacing an existing residential structure.*

#### **Final Site Plan Checklist**

- **#1** - All checklist items required for preliminary approval as set forth in Code § 21-54.4, unless previously waived by the Board
  - o *As set forth directly above, Applicant is requesting relief from Preliminary Site Plan Checklist Items Nos. 15, 16, 38 48, and 49.*
- **#12** - Final Application Comparison Report
  - o *Applicant is seeking preliminary and final major site plan approval simultaneously in connection with this Application.*

# ***DRAINAGE STATEMENT***

*For*

## **Fellowship Senior Living**

### **Proposed Staff Residences**

**Block 9301, Lot 33  
Block 9401, Lot 9  
8000 Fellowship Road  
Bernards Township, Somerset County, New Jersey**

**Prepared by:**



**1904 Main Street  
Lake Como, NJ 07719  
(732) 974-0198**

A handwritten signature in blue ink, appearing to read 'D.J. Dougherty', is written over a horizontal line.

**Daniel J. Dougherty PE, PP  
NJ Professional Engineer License #41690**

**February 2023  
DEC # 4309-99-001**

## TABLE OF CONTENTS

| <u>Section</u>         | <u>Page</u> |
|------------------------|-------------|
| Drainage Summary ..... | 2           |

## **I. Drainage Summary**

This Drainage Statement has been prepared to define and demonstrate compliance of the proposed stormwater drainage conditions that would occur as a result of the redevelopment of Block 9401, Lot 9, as shown on the Township of Bernards Tax Map Sheet No. 94, located in the Township of Bernards, Somerset County, New Jersey.

The Applicant currently owns and operates Fellowship Senior Living located on Block 9301, Lot 33 at 8000 Fellowship Road. The Applicant has acquired adjacent Block 94.01 Lot 9 (AKA 55 Allen Road) and wishes to redevelop this site to construct a Staff Residence to house up to seven (7) staff members of the senior living facility.

Under the existing conditions the site consisted of a single-family home with driveway access to Allen Road. The existing residential home represents an impervious coverage of 1,669 SF and a gravel driveway of 3,792 SF. Runoff from the existing property flows via sheet flow to Allen Road and also toward Fellowship Drive on Lot 33

The proposed project consists of demolishing the existing home and constructing a 3,402 SF two-story residence building. Additional improvements include a parking area providing eight (8) parking stalls, driveway, sidewalks, lighting and landscaping.

Under proposed conditions, improvements include the staff residence building, asphalt parking, and an asphalt driveway with access to Fellowship Road. New impervious surfaces of 8,134 SF are proposed, resulting in a net increase in impervious of 2,673 SF (0.06 Ac.). A total area of disturbance of 18,570 SF (0.426 Ac.) is proposed.

### ***Minor Project Interpretation***

Section § 21-42 - *Drainage* of the Township ordinance establishes the minimum stormwater management requirements for development projects. As the proposed project creates less than ¼ acre increase of impervious surfaces and disturbs less than one (1) acre of land, it qualifies as a "Minor Project" under the Township Ordinance.

Per § 21-42.11 – *Stormwater Management Requirements for a Minor Development*, the a minor project must implement an infiltration measure with a capacity of three inches of runoff for each square foot of new impervious area. Therefore, a total volume of 668 CF of infiltration storage is required for this project (2,673 SF x 3”). To meet this requirement, the project proposes an infiltration system consisting of two (2) type B-Inlets and 54 LF of 48” diameter perforated HDPE, providing 678 CF of infiltration storage. The system is oriented such that overflow will travel to the existing storm water collection system within Fellowship Drive, in a stable and controlled manner.

Soil test pit log is included in the appendix and resulted in no observation of seasonal high water table.

Soil erosion and sediment control measures are proposed on the project site plans, and the project is subject to approval by the Somerset-Union Soil Conservation District via Soil Erosion and Sediment Control Plan Certification.

The above elements confirm that the proposed project meets the applicable requirements set forth by the Township Ordinance § 21-42 – *Drainage*.

### ***Major Project Interpretation***

Per comments received during the Township Site Plan Application Completeness Review, we understand that the proposed improvements may be interpreted as a Major Project due to a recently completed application on a separate portion of the Fellowship Senior Living site.

After review of this previous application (engineering performed by Marathon Engineering), we find that the drainage improvements and discharge are at a separate hydrologic location from the proposed improvements and occur independently. Therefore, we submit a request for interpretation as a Minor project as discussed above.

## **SOIL TEST PIT LOG**



# SOIL PROFILE PIT LOG

Soil Profile Pit: SPP-1

Page 1 of 1

| Project: Proposed Staff Residence Building                            |  |                         |                      |   |        |                 |                         |                |      | Project No.: 4309-08-001EC  |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|---|--|-------------------------|----------------------|---|--------|-----------------|-------------------------|----------------|------|---|-----------------------|-------------------|--------------------|--------------|------------|----------------|-------------|------|----------|----------|------------|-----|-------------|
| Location: 8500 Fellowship Road, Barnards, Somerset County, New Jersey |  |                         |                      |   |        |                 |                         |                |      | Client: Fellowship Senior Living  |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
| Surface Elevation (ft): 243.0   |  | Date Started: 2/10/23   |                      | Groundwater Data                          |        | Depth (ft): 5.4 |                         | KL (ft): 237.6 |      | Groundwater Comments  |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
| Termination Depth (ft): 10.8  |  | Date Completed: 2/10/23 |                      | Sogage                                    |        | NE              |                         | -              |      | Seepage encountered at a depth of 65 inches due to apparent perched condition |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
| Excavation / Test Method: Visual Observation                          |  | Logged by: U. Khan      |                      | Contractor: Neighbors Property Management |        | Groundwater     |                         | NE             |      | -   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|   |  | Rig Type: Bobcat E60    |                      | Moisture                                  |        | NE              |                         | -              |      | -   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
| DEPTH (in)  | COLOR                                      | SOIL TEXTURE            | COARSE FRAGMENTS (%) |   |        |                 | STRUCTURE               |                |      | WATER CONTENT   | CONSISTENCY           |                   |                    | BOUNDARY     |            | ROOTS          | MOTTLING    |      |          | SAMPLING |            |     | LAB RESULTS |
|   |  |                         | GRAVEL               | COBBLES                                   | STONES | BOULDERS        | Shape                   | Grade          | Size |   | Resistance to Rupture | Stickiness        | Plasticity         | Distinctness | Topography |                | Quantity    | Size | Contrast | Type     | Depth (in) | No. |             |
| 0-8   | Topsoil<br>Dark Reddish Brown<br>(5YR 3/2) | LOAM                    | 5                    | 0   | 0      | 0               | GRANULAR/<br>SPHEROIDAL | WEAK           | FINE | MOIST   | FRIABLE               | NONSTICKY         | NONPLASTIC         | ABRUPT <1"   | SMOOTH     | MNY (>20% MAX) | VERY COARSE | NONE |          |          |            |     |             |
| 8-23  | Reddish Brown<br>(5YR 4/3)                 | SILT LOAM               | 5                    | 0   | 0      | 0               | SUBANGULAR<br>BLOCKY    | WEAK           | FINE | MOIST   | FRIABLE               | SLIGHTLY STICKY   | SLIGHTLY PLASTIC   | CLEAR <2.5"  | WAVY       | NONE           |             | NONE | BAG TUBE | 20       | S-1<br>T-1 |     |             |
| 23-65   | Reddish Brown<br>(5YR 4/3)                 | SILTY CLAY              | 5                    | 0   | 0      | 0               | SUBANGULAR<br>BLOCKY    | WEAK           | FINE | MOIST   | FRIABLE               | MODERATELY STICKY | MODERATELY PLASTIC | CLEAR <2.5"  | SMOOTH     | FEW (5% MAX)   | MEDIUM      | NONE | BAG TUBE | 30       | S-2<br>T-2 |     |             |
| 65-129  | Dark Reddish Brown<br>(2.5YR 3/4)          | VERY FLAGGY LOAM        | 40                   | 30  | 10     | 0               | SUBANGULAR<br>BLOCKY    | WEAK           | FINE | MOIST   | FRIABLE               | SLIGHTLY STICKY   | SLIGHTLY PLASTIC   |              |            | NONE           |             | NONE | BAG      | 72       | S-3        |     |             |
|   |  |                         |                      |   |        |                 |                         |                |      |   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|   |  |                         |                      |   |        |                 |                         |                |      |   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|   |  |                         |                      |   |        |                 |                         |                |      |   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|   |  |                         |                      |   |        |                 |                         |                |      |   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |
|   |  |                         |                      |   |        |                 |                         |                |      |   |                       |                   |                    |              |            |                |             |      |          |          |            |     |             |

Additional Remarks: Weathered rock encountered at 65 inches below the ground surface. Soil profile pit SPP-1 encountered refusal at approximately 10.8 feet below the ground surface on apparent bedrock.





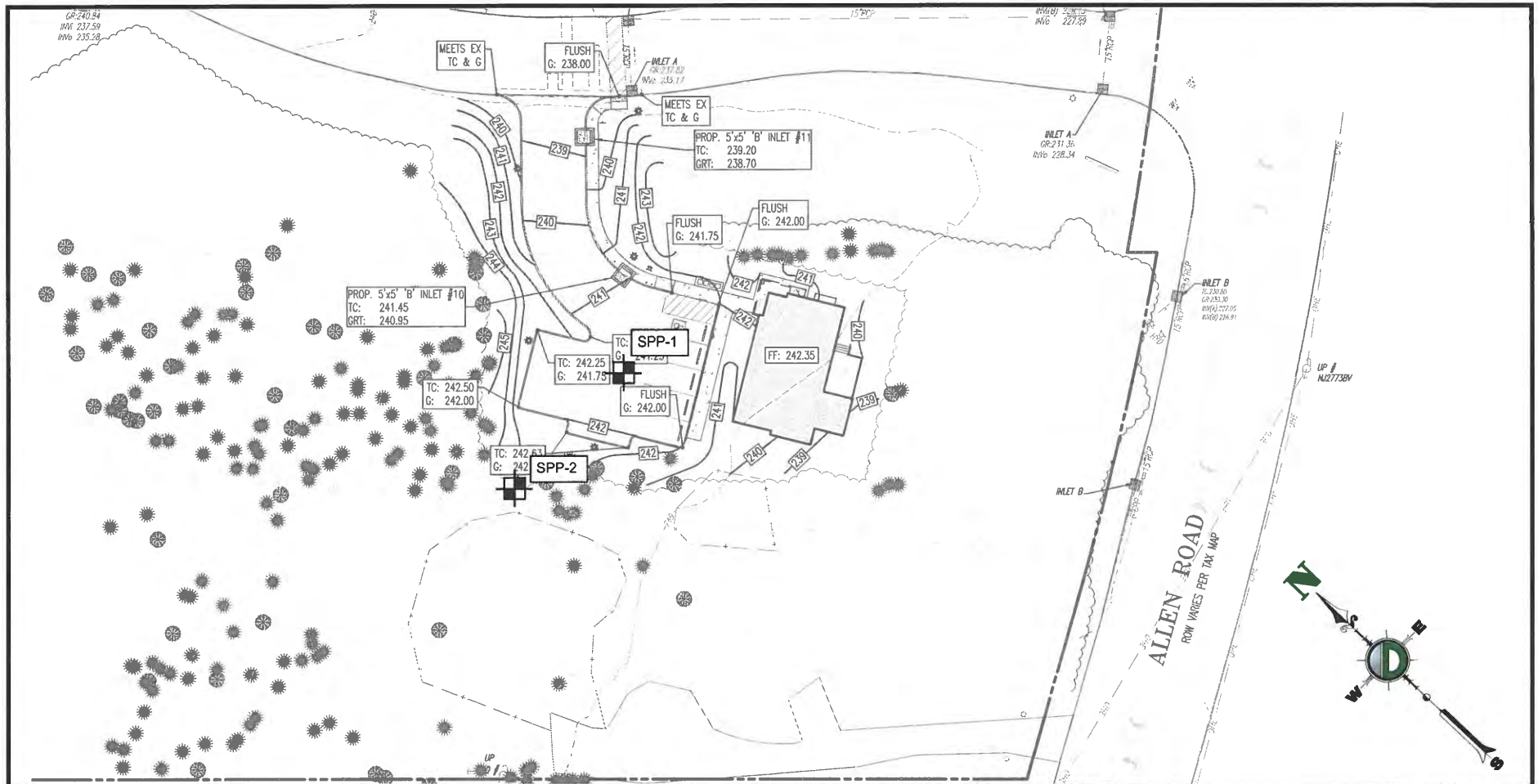
# SOIL PROFILE PIT LOG

Soil Profile Pit: **SPP-2**

Page 1 of 1

| Project: Proposal Staff Residence Building                            |                                      |   |                      |                    |        |            |                   |           |        | Project No.: 4309-28-001EC       |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
|---|--------------------------------------|---|----------------------|--------------------|--------|------------|-------------------|-----------|--------|----------------------------------|-----------------------|-----------------|------------------|--------------|------------|-----------------------------|----------|------|----------|----------|------------|---------|-------------|
| Location: 8600 Fellowship Road, Barnards, Somerset County, New Jersey |                                      |   |                      |                    |        |            |                   |           |        | Client: Fellowship Senior Living |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| Surface Elevation (ft): 243.0   |                                      | Date Started: 2/10/23                     |                      | Crescentwater Data |        | Depth (ft) |                   | E.L. (ft) |        | Crescentwater Comments           |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| Termination Depth (ft): 11.9  |                                      | Date Completed: 2/10/23                   |                      | SWM                |        | U. Khan    |                   | NE        |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| Proposed Location:  |                                      | Logged by: U. Khan                        |                      | SWM                |        | NE         |                   | NE        |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| Excavation / Test Method: Visual Observation                          |                                      | Contractor: Neighbors Property Management |                      | SWM                |        | NE         |                   | NE        |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| Rig Type: Bobcat E60  |                                      | SWM                                       |                      | NE                 |        | NE         |                   | NE        |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
| DEPTH (ft)  | COLOR                                | SOIL TEXTURE                              | COARSE FRAGMENTS (%) |                    |        |            | STRUCTURE         |           |        | WATER CONTENT                    | CONSISTENCY           |                 |                  | BOUNDARY     |            | ROOTS                       | MOTTLING |      |          | SAMPLING |            |         | LAB RESULTS |
|   |                                      |   | GRAVEL               | COBBLES            | STONES | BOULDERS   | Shape             | Grade     | Size   |                                  | Resistance to Rupture | Stickiness      | Plasticity       | Distinctness | Topography |                             | Quantity | Size | Contrast | Type     | Depth (in) | No.     |             |
| 0-0   | Topsoil Dark Reddish Brown (5YR 3/2) | SILT LOAM                                 | 10                   | 0                  | 0      | 0          | SUBANGULAR BLOCKY | MODERATE  | FINE   | MOIST                            | FRIABLE               | SLIGHTLY STICKY | SLIGHTLY PLASTIC | CLEAR <2.5"  | WAVY       | MIN (0-20% MAX) VERY COARSE | NONE     |      |          | BAG      | 5          | S-1     |             |
| 0-33  | Reddish Brown (5YR 4/2)              | VERY FLAGGY SILT LOAM                     | 20                   | 30                 | 0      | 0          | SUBANGULAR BLOCKY | WEAK      | FINE   | MOIST                            | FRIABLE               | SLIGHTLY STICKY | SLIGHTLY PLASTIC | GRADUAL <5"  | WAVY       | FEW (5% MAX) FINE           | NONE     |      |          | BAG TUBE | 24         | S-2 T-1 |             |
| 33-46   | Reddish Brown (5YR 4/2)              | VERY FLAGGY SILTY CLAY                    | 20                   | 30                 | 0      | 0          | SUBANGULAR BLOCKY | MODERATE  | MEDIUM | MOIST                            | FRIABLE               | SLIGHTLY STICKY | SLIGHTLY PLASTIC | CLEAR <2.5"  | WAVY       | FEW (5% MAX) FINE           | NONE     |      |          | BAG      | 50         | S-3     |             |
| 46-83   | Dark Reddish Brown (2.5YR 3/4)       | VERY FLAGGY LOAM                          | 50                   | 30                 | 5      | 0          | PLATY             | WEAK      | FINE   | MOIST                            | FRIABLE               | SLIGHTLY STICKY | SLIGHTLY PLASTIC | CLEAR <2.5"  | IRREGULAR  | NONE                        | NONE     |      |          | BAG      | 70         | S-4     |             |
| 83-143  | Dark Reddish Brown (2.5YR 3/4)       | VERY FLAGGY LOAM                          | 35                   | 35                 | 15     | 5          | PLATY             | WEAK      | FINE   | MOIST                            | FRIABLE               | SLIGHTLY STICKY | SLIGHTLY PLASTIC |              |            | NONE                        | NONE     |      |          | BAG      | 120        | S-5     |             |
|   |                                      |   |                      |                    |        |            |                   |           |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
|   |                                      |   |                      |                    |        |            |                   |           |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
|   |                                      |   |                      |                    |        |            |                   |           |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |
|   |                                      |   |                      |                    |        |            |                   |           |        |                                  |                       |                 |                  |              |            |                             |          |      |          |          |            |         |             |

Additional Remarks: Highly weathered rock encountered at 46 inches below the ground surface. Soil profile pit SPP-2 encountered refusal at approximately 11.9 feet below the ground surface on apparent bedrock.



SCALE: N.T.S.

JOB No:  
4309-99-001EC

SHEET No:

1

OF 1

DRAWN BY:  
UK

DESIGNED BY:  
FVC

DATE:  
02/10/2023

TITLE:

## TEST LOCATION PLAN

PROJECT: **Fellowship Senior Living**  
**Proposed Staff Residences**  
**Block 9301, Lot 33; Block 9401, Lot 9**  
8000 Fellowship Road  
Township of Bernards  
Somerset County, New Jersey

Rev. # 0

DEC Client Code: 4309

## LEGEND:



SPP-X  
APPROXIMATE LOCATION OF SOIL  
PROFILE PIT

### NOTES:

1. THIS PLAN IS NOT FOR CONSTRUCTION AND WAS PREPARED TO ILLUSTRATE TEST LOCATIONS ONLY AND MAY NOT REFLECT THE MOST CURRENT REVISION OF THE BASE PLAN.
2. THIS PLAN HAS BEEN PREPARED BASED ON A DECEMBER 12, 2022 GRADING PLAN PREPARED BY DYNAMIC ENGINEERING CONSULTANTS, PC.



245 Main Street - Suite 110  
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*Specializing in the Assessment and Management  
of the Ecological Resources*

315 Mountain View Drive  
Kunkletown, Pennsylvania 18058

Phone: (610) 681-6030

Fax: (610) 681-6031

November 25, 2022

Mr. Daniel Dougherty  
Dynamic Engineering Consultants  
1904 Main Street  
Lake Como, New Jersey 07719

**RE:   *PROGRESS REPORT:   Jurisdictional Wetlands Evaluation***

***Allen Road - Fellowship Road South Property  
Block 9401 - Lot 9  
Bernards Township, Somerset County, New Jersey***

Dear Mr. Dougherty:

Pursuant to your request, I have conducted a field evaluation of the subject property to determine if any portion of the referenced property satisfies required criteria for designation as jurisdictional wetlands (wetlands), waters (SOW) and/or wetland transition areas (WTA) as regulated by the New Jersey Freshwater Wetlands Protection Act (FWWPA). Said field evaluation was conducted on November 23, 2022

***Jurisdictional Wetlands and WTA pursuant to FWWPA:***

The jurisdictional wetlands evaluation was conducted utilizing the wetlands determination methodology required by the New Jersey Department of Environmental Protection (NJDEP) in accordance with the New Jersey Freshwater Wetlands Protection Act (NJAC 7:7A).

NJ-GeoWeb mapping which includes mapping of regulated streams and potential regulated wetlands does not include any streams or wetlands on, adjacent to or in the general vicinity of the property.

EASTERN STATES  
ENVIRONMENTAL ASSOCIATES  
INC.

Page 2.

Field evaluation determined that no portion of the property satisfies criteria required for designation as wetlands or SOW. With the exception of a small manipulated area in the southern-central region, the property is primarily unmanipulated and wooded.

Vegetation species occurring throughout the property consist predominantly of Eastern Red Cedar (FacU), Black Cherry (FacU), Norway Maple (NL), Black Cherry (FacU), Red Maple (Fac), Sassafras (FacU), Bush Honeysuckle (Fac), Multiflora Rose (Fac), Raspberry (Fac), Japanese Honeysuckle (Fac) and Violet (Fac). Said vegetation species composition does not consist predominantly of hydrophytic species.

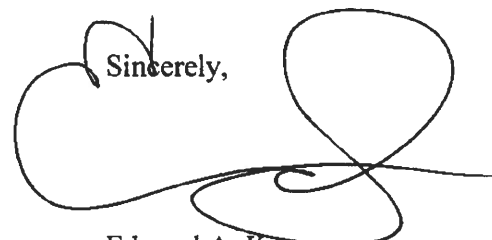
Soil samples taken throughout the property were not indicative of hydric soils. Said soil samples consisted primarily of silt loams which produced Munsell Soil Color Chart readings with Hues of 5YR and 7.5YR; Values of 4; and Chromas ranging from 4 to 6 with no apparent mottling or indications of redox.

No evidence of long-term wetland hydrology was determined to occur throughout the property.

Based upon the habitat characteristics and drainage associations, it is anticipated that any wetlands in the general region of the property would be classified as intermediate resource value thereby requiring a wetland transition area (WTA) distance of 50 feet. Field evaluation determined that any wetlands which occur within the general region of the property are located a distance in excess of 150 feet from the property. Accordingly, it is determined that no portion of the property is encompassed within a WTA associated with a vicinity wetland.

Please do not hesitate to contact me directly should you have any questions concerning the aforementioned evaluation and resulting determinations.

Sincerely,

A handwritten signature in black ink, appearing to read 'Edward A. Kuc', with a large, stylized loop at the end.

Edward A. Kuc  
Principal Ecologist

EAK/jmd



*Specializing in the Assessment and Management  
of the Ecological Resources*

315 Mountain View Drive  
Kunkletown, Pennsylvania 18058  
Phone: (610) 681-6030  
Fax: (610) 681-6031

---

## **PROFESSIONAL CREDENTIALS**

### **EDWARD A. KUC, PRINCIPAL ECOLOGIST**

Edward A. Kuc is a Natural Resource Ecologist by profession with areas of expertise including aquatic and terrestrial ecosystems, wildlife (mammalian, avian, reptilian, amphibian), endangered wildlife, fisheries and freshwater wetlands. Edward A. Kuc has conducted extensive research of these natural resources and has provided numerous Natural Resource Protection, Management and Mitigation Plans for federal, state and municipal environmental regulatory agencies as well as private enterprise.

Edward A. Kuc serves as Principal Environmental Specialist for Eastern States Environmental Associates, Inc (ESEA). Responsibilities include the coordination, implementation and supervision of the various ecological inventory, assessment, management and mitigation projects undertaken by ESEA for private and public clientele. Edward A. Kuc is extensively involved with regulatory compliance matters and serves as the chief representative of ESEA clients with regard to federal, state and municipal environmental permit applications. Edward A. Kuc has represented various municipalities along with the State of New Jersey concerning Land Diversion Plan Proposals.

Prior to joining ESEA, Edward A. Kuc served as Supervisory Ecologist of a large environmental consulting organization based in the State of New Jersey. Edward A. Kuc's responsibilities included the implementation and supervision of the natural resource inventories, impact assessment, management and mitigation programs conducted by the organization. Edward A. Kuc was likewise responsible for the coordination and review of associated environmental documents and reports prepared by the organization.

Edward A. Kuc has served in the capacity of Environmental Specialist for the New Jersey Department of Environmental Protection (NJDEP). Edward A. Kuc was responsible for the inventory, evaluation and habitat availability assessment for various wildlife species monitored and managed by the NJDEP. Edward A. Kuc was also responsible for the collection and analysis of biological information pertaining to fishery population inventories, population reproduction, trout waters classification, fishery population introduction and population

**EASTERN STATES  
ENVIRONMENTAL ASSOCIATES  
INC.**

Page 2.

establishment, anadromous species migration and stream encroachment reviews. Edward A. Kuc was responsible for providing guidance to the design and implementation of various natural habitat management and mitigation programs. Edward A. Kuc continued to be of service to the Division's Black Bear Research and Management Project through the Wildlife Conservation Corps Program.

Edward A. Kuc served as a Research Biologist for the U.S.D.A. Forest Service in Clearwater National Forest, Idaho, where he was responsible for various fish and wildlife research and management programs. Edward A. Kuc was responsible for habitat evaluations and population analysis of various large-game and non-game wildlife species and was responsible for the determination of wildlife species population dynamics and distribution among seasonal ranges. Edward A. Kuc was responsible for the analysis of stream condition, riparian habitat quality, sport fishing population and salmonid spawning area potential. Edward A. Kuc was responsible for the design and implementation of various stream and riparian habitat enhancement projects. Edward A. Kuc was responsible for the comparative evaluation of fish and wildlife species population densities for impact evaluation of various land use activities. Edward A. Kuc was also responsible for the design and implementation of various natural habitat restoration, enhancement and creation projects.

Edward A. Kuc possesses a Bachelor of Science Degree in Natural Resource Management from Rutgers University - Cook College. Edward A. Kuc is affiliated with many professional organizations including The Wildlife Society, The American Fisheries Society, Society of Wetland Scientists, The Audubon Society, Association of Urban Wildlife Managers, The National Wildlife Federation and The Nature Conservancy. Edward A. Kuc is certified as a Professional Wetland Scientist by the Society of Wetland Scientists. Edward A. Kuc has served as the President of the New Jersey Chapter of the Wildlife Society. Edward A. Kuc has authored numerous technical reports and articles and has conducted many presentations and seminars pertaining to various Natural Resource related topics.

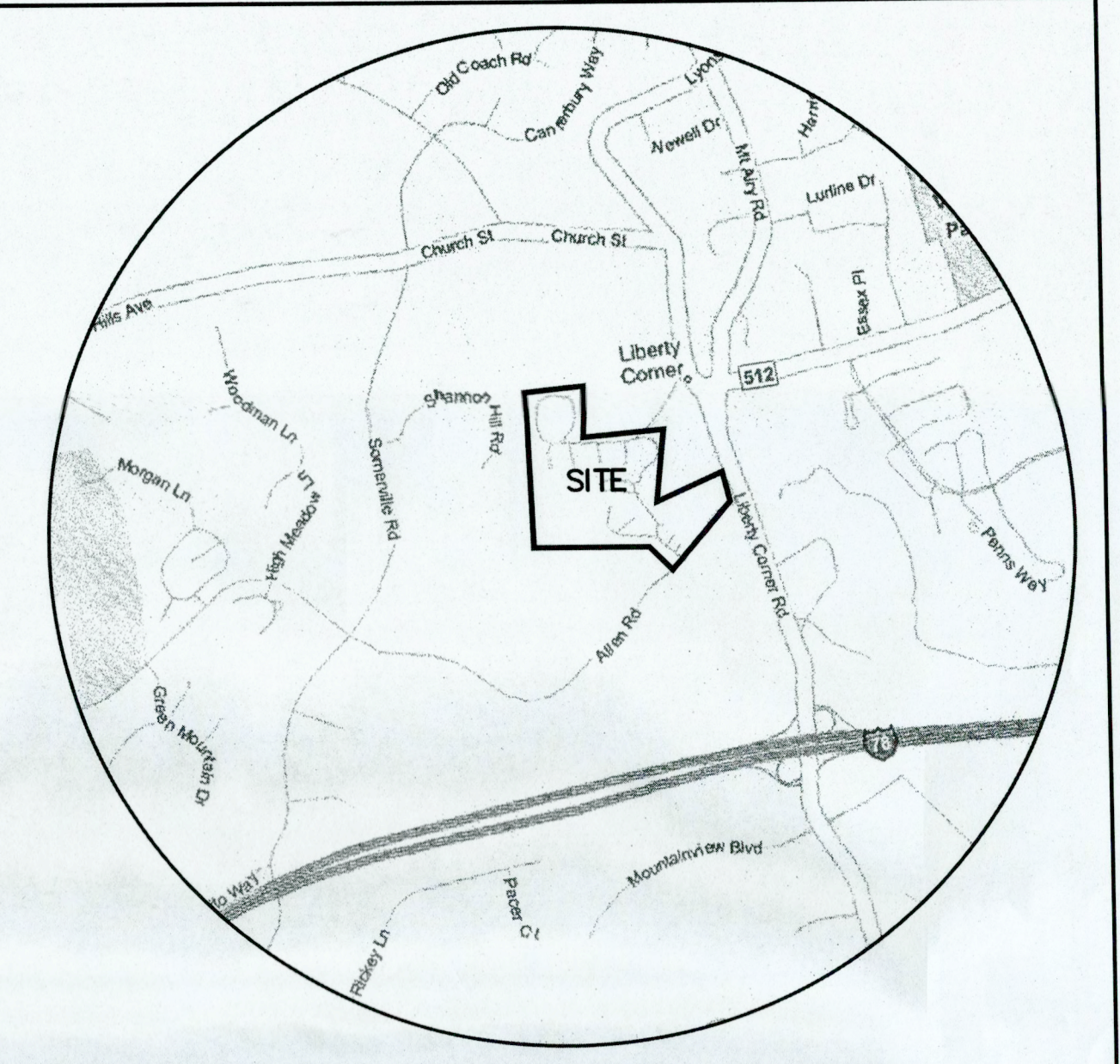
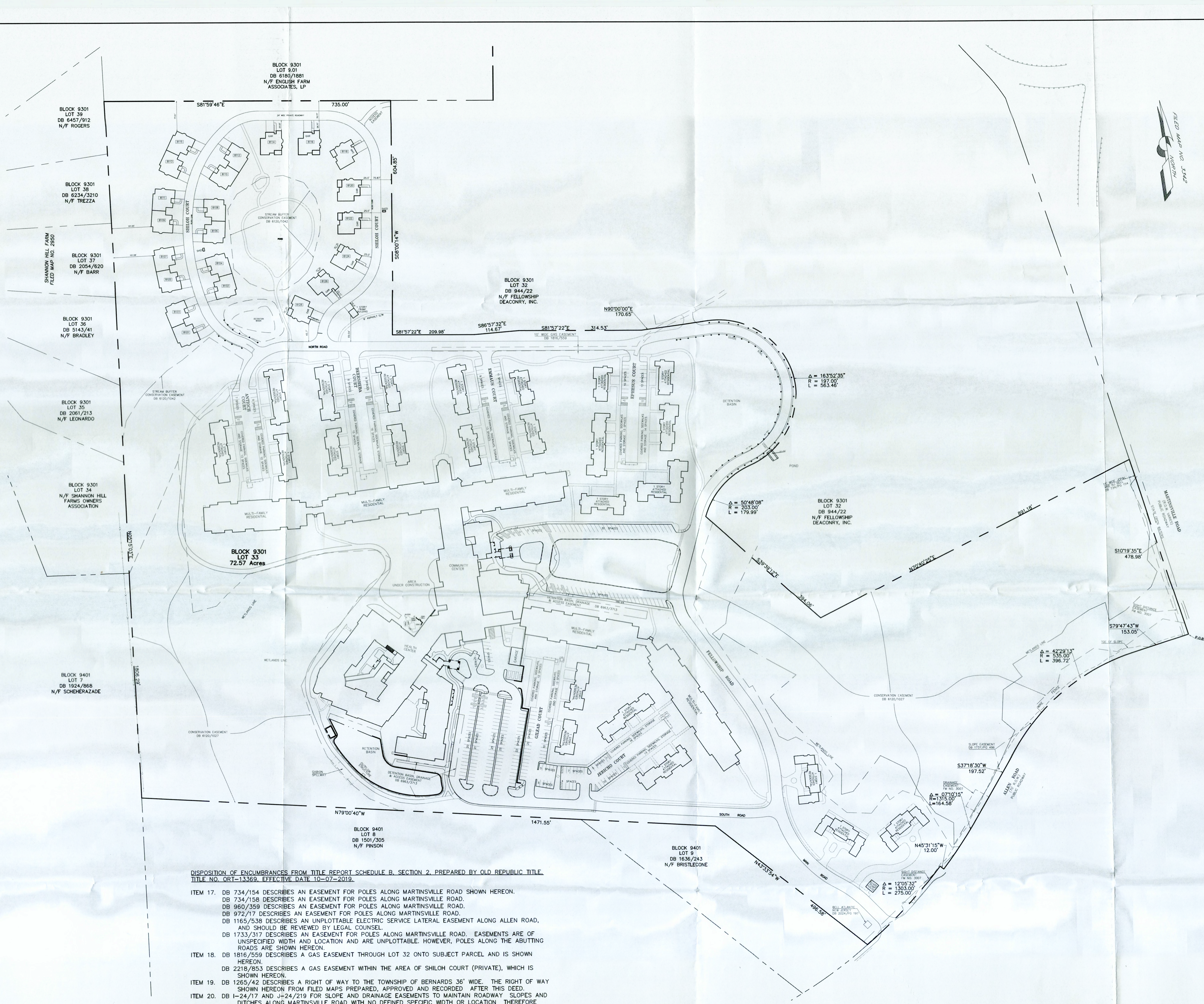
**EASTERN STATES  
ENVIRONMENTAL ASSOCIATES  
INC.**

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**ASSOCIATES AND TECHNICAL STAFF:**

The Associates and Technical Staff of Eastern States Environmental Associates, Inc. consist of a select group of environmental specialists. This select group of Associates and Staff Biologists include highly experienced and recognized individuals in various specialties of environmental related consultation. The educational background of these individuals ranges from Bachelor to Doctorate degrees in environmental sciences.





- Property Description
- All that certain lot, parcel or tract of land situate and lying in the township of Bernards, County of Somerset, State of New Jersey, and being more particularly described as follows:
- Being known and designated as Lot 43.01 in Block 175 as shown on a map entitled, "Final Subdivision Map, Fellowship Village" filed as Filed Map No. 3342 of the Somerset County Clerk's Office and being more particularly described as follows:
- Beginning at the intersection of the westerly line of Martinsville Road as shown on said Filed Map No. 3342 with the northerly line of Allen Road, thence;
1. Along said northerly line South 79° 47' 43" West 153.05'; thence;
  2. Continuing along said northerly line along a curve to the left having a radius of 535.00', an arc length of 396.72', a central angle of 42° 29' 13"; thence;
  3. Continuing along said northerly line South 37° 18' 30" West 197.52'; thence;
  4. Along a curve to the right having a radius of 1315.00', an arc length of 164.58', a central angle of 07° 10' 15"; thence;
  5. North 45° 31' 15" West 12.00'; thence;
  6. Along a curve to the right having a radius of 1303.00', an arc length of 275.00', a central angle of 12° 05' 32" to the easterly line of Lot 9, Block 9401; thence;
  7. Along said easterly line North 43° 33' 54" West 496.58'; thence;
  8. North 79° 00' 40" West 1471.55' to the easterly line of Lot 7, Block 9401; thence;
  9. Along said easterly line and along a portion of the easterly line of Shamon Hill Farm, a subdivision recorded as Filed Map No. 2950 North 05° 15' 03" East 1806.29'; thence;
  10. Along the southerly line of Lot 9, Block 9301 South 81° 59' 46" East 735.00'; thence;
  11. Along the westerly and southerly lines of Lot 32, Block 9301 being Lot 42.01, Block 175 as shown on said Filed Map No. 3342, the following 9 courses South 08° 00' 14" West 604.85'; thence;
  12. South 81° 57' 22" East 209.98'; thence;
  13. South 86° 57' 32" East 114.67'; thence;
  14. South 81° 57' 22" East 314.53'; thence;
  15. North 90° 00' 00" East 170.65'; thence;
  16. Along a curve to the right having a radius of 197.00', an arc length of 563.46', a central angle of 163° 52' 35"; thence;
  17. Along a curve to the left having a radius of 203.00', an arc length of 179.99', a central angle of 50° 48' 08"; thence;
  18. South 39° 39' 12" East 394.06'; thence;
  19. North 70° 40' 25" East 891.18' to the westerly line of the aforementioned Martinsville Road; thence;
  20. Along said westerly line South 10° 19' 35" East 478.98' to the POINT OF BEGINNING of the herein described tract containing 72.57 acres more or less.

DISPOSITION OF ENCUMBRANCES FROM TITLE REPORT SCHEDULE B, SECTION 2, PREPARED BY OLD REPUBLIC TITLE, TITLE NO. ORT-13369, EFFECTIVE DATE 10-07-2019.

- ITEM 17. DB 734/154 DESCRIBES AN EASEMENT FOR POLES ALONG MARTINSVILLE ROAD SHOWN HEREON.  
DB 734/158 DESCRIBES AN EASEMENT FOR POLES ALONG MARTINSVILLE ROAD.  
DB 960/359 DESCRIBES AN EASEMENT FOR POLES ALONG MARTINSVILLE ROAD.  
DB 972/17 DESCRIBES AN EASEMENT FOR POLES ALONG MARTINSVILLE ROAD.  
DB 1165/538 DESCRIBES AN UNPLOTTABLE ELECTRIC SERVICE LATERAL EASEMENT ALONG ALLEN ROAD, AND SHOULD BE REVIEWED BY LEGAL COUNSEL.  
DB 1733/317 DESCRIBES AN EASEMENT FOR POLES ALONG MARTINSVILLE ROAD. EASEMENTS ARE OF UNSPECIFIED WIDTH AND LOCATION AND ARE UNPLOTTABLE. HOWEVER, POLES ALONG THE ABUTTING ROADS ARE SHOWN HEREON.
- ITEM 18. DB 1816/559 DESCRIBES A GAS EASEMENT THROUGH LOT 32 ONTO SUBJECT PARCEL AND IS SHOWN HEREON.  
DB 2218/853 DESCRIBES A GAS EASEMENT WITHIN THE AREA OF SHILOH COURT (PRIVATE), WHICH IS SHOWN HEREON.
- ITEM 19. DB 1265/42 DESCRIBES A RIGHT OF WAY TO THE TOWNSHIP OF BERNARDS 36' WIDE. THE RIGHT OF WAY SHOWN HEREON FROM FILED MAPS PREPARED, APPROVED AND RECORDED AFTER THIS DEED.
- ITEM 20. DB I-24/17 AND J-24/219 FOR SLOPE AND DRAINAGE EASEMENTS TO MAINTAIN ROADWAY SLOPES AND DITCHES ALONG MARTINSVILLE ROAD WITH NO DEFINED SPECIFIC WIDTH OR LOCATION THEREFORE UNPLOTTABLE.  
DB 1737/496 SLOPE EASEMENT ALONG ALLEN ROAD SHOWN HEREON.
- ITEM 21. DB 1959/343 CONTAINS AGREEMENTS FOR DETENTION BASIN ACCESS AND MAINTENANCE. LOCATION IS UNDEFINED AND THEREFORE UNPLOTTABLE, MAINTENANCE AGREEMENT SHOULD BE REVIEWED BY LEGAL COUNSEL.
- ITEM 22. DB 2024/197 EASEMENT FOR BELL ATLANTIC CABINET SHOWN HEREON.
- ITEM 23. DB 2176/501 DESCRIBES AN EASEMENT FOR THE USE OF FELLOWSHIP DRIVE, SHOWN HEREON, FOR ACCESS TO OTHER PARCELS AND PHASES OF THE SITE AND SHOULD BE REVIEWED BY LEGAL COUNSEL.
- ITEM 24. DB 6120/1027 DESCRIBE CONSERVATION EASEMENTS SHOWN HEREON.
- ITEM 25. DB 6120/1042 DESCRIBES STREAM BUFFER CONSERVATION EASEMENTS SHOWN HEREON.
- ITEM 18. PARCEL SUBJECT TO WATER COURSES, SHOWN HEREON, AND RIGHTS SHOULD BE REVIEWED BY LEGAL COUNSEL.
- ITEM 27. DB 6963/3713 DETENTION BASIN, DRAINAGE & ACCESS EASEMENT AND RESTRICTION, EASEMENTS ARE SHOWN HEREON. RESTRICTIONS SHOULD BE REVIEWED BY LEGAL COUNSEL.
- ITEM 28. DB 2264/895 DESCRIBES A TEMPORARY CONSTRUCTION EASEMENT WHICH AUTOMATICALLY TERMINATED

NOTES

1. BOUNDARY, WETLANDS AND STATE OPEN WATERS INFORMATION SHOWN HEREON FROM FILED MAP NO. 3342, "FELLOWSHIP VILLAGE".
2. NO CORNER MARKERS SET PER CONTRACTUAL AGREEMENT.
3. PROPERTY HAS DIRECT VEHICULAR ACCESS TO ALLAN ROAD, PUBLIC RIGHT OF WAY.
4. PROPERTY RUNS ALONG MARTINSVILLE ROAD WITH NO VEHICULAR ACCESS OBSERVED.
5. A PORTION OF THE PARCEL DESCRIBED HEREON LIES WITHIN THE FLOOD HAZARD AREA "ZONE AE" AND FLOOD AREA "ZONE X" IN ACCORDANCE WITH THE DOCUMENT ENTITLED "FLOOD INSURANCE RATE MAP, SOMERSET COUNTY, NEW JERSEY, PANEL NO. 3404280064E, EFFECTIVE DATE 9-28-07".
6. SUBJECT PROPERTY RECENTLY HAD BUILDING AND PARKING LOT CONSTRUCTION. IMPROVEMENTS ARE SHOWN HEREON.

PARKING SUMMARY  
320 OPEN  
56 GARAGES (28X2)  
162 COVERED  
28 HANDICAP  
566 TOTAL

CERTIFICATION

TO FELLOWSHIP SENIOR LIVING, INC., THE BANK OF NEW YORK MELLON, OLD REPUBLIC NATIONAL TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 3, 4, 8, 9, 13, 16, 17, OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON 11-14-19.

ALTA/NSPS LAND TITLE SURVEY  
FELLOWSHIP VILLAGE  
BLOCK 9301 - LOT 33  
BERNARDS TOWNSHIP, SOMERSET COUNTY, N.J.

KENNEDY KENNON P.L.L.C. KSS KENNON SURVEYING SERVICES, INC.  
5 POWDER HORN DRIVE, SUITE 4  
P.O. BOX 4477



# PRELIMINARY AND FINAL SITE PLAN

## FOR FELLOWSHIP SENIOR LIVING PROPOSED STAFF RESIDENCES

BLOCK 9301, LOT 33; BLOCK 9401, LOT 9; TAX MAP SHEET #94 - LATEST REV. DATED 12-04-2007  
8000 FELLOWSHIP ROAD  
TOWNSHIP OF BERNARDS  
SOMERSET COUNTY, NEW JERSEY

### 200' PROPERTY OWNERS LIST

Block-Lot: 11201-8  
HBB PROPERTY LLC C/O ALLEN RD LLC  
PO BOX 74  
LIBERTY CORNER NJ 07938  
RE: 50 ALLEN RD

Block-Lot: 9401-9  
FELLOWSHIP SENIOR LIVING, INC.  
8000 FELLOWSHIP RD  
BASKING RIDGE NJ 07920  
RE: 55 ALLEN RD

Block-Lot: 11201-9  
JLJ PROPERTY INVESTMENTS LLC  
2051 SE 3RD ST UNIT 508  
DEERFIELD BEACH FL 33441  
RE: 701 MARTINSVILLE RD

Block-Lot: 9204-2  
BERNARDS TWP SEWERAGE AUTHORITY  
MARTINSVILLE RD; BOX 247  
LIBERTY CORNER NJ 07938  
RE: 726 MARTINSVILLE RD

Block-Lot: 9301-35  
LEONARDO, RAFAEL C & MILAGROS B  
100 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 100 SHANNON HILL RD

Block-Lot: 9301-34  
SHANNON HILL FARMS HOMEOWNERS ASSOC  
.00000  
RE: 102 SHANNON HILL RD

Block-Lot: 9301-32  
FELLOWSHIP DEACONRY INC  
PO BOX 204  
LIBERTY CORNER NJ 07938  
RE: 3575 VALLEY RD

Block-Lot: 9301-9.01  
ENGLISH FARM ASSOCIATES, LP  
PO BOX 183  
LIBERTY CORNER NJ 07938  
RE: 3613 VALLEY RD

Block-Lot: 9401-8  
PINSON, ELLEN  
658 HOYDEN HILL RD  
FAIRFIELD CT 06824  
RE: 99 ALLEN RD

Block-Lot: 9204-1  
BRISTLECON INC  
PO BOX 328  
LIBERTY CORNER NJ 07938  
RE: 706 MARTINSVILLE RD

Block-Lot: 9204-2-CELL1  
BERNARDS TWP SEWERAGE AUTHORITY  
MARTINSVILLE RD; BOX 247  
LIBERTY CORNER NJ 07938  
RE: 726 MARTINSVILLE RD

Block-Lot: 9204-2-CELL2  
BERNARDS TWP SEWERAGE AUTHORITY  
MARTINSVILLE RD; BOX 247  
LIBERTY CORNER NJ 07938  
RE: 726 MARTINSVILLE RD

Block-Lot: 9401-7-Q0005  
SCHEHERAZADE ENTERPRISES INC  
15 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 15 SHANNON HILL RD

Block-Lot: 9301-9.01-Q0012  
ENGLISH FARM ASSOCIATES, LP  
PO BOX 183  
LIBERTY CORNER NJ 07938  
RE: CHURCH ST

Block-Lot: 9401-7  
SCHEHERAZADE ENTERPRISES INC  
15 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 15 SHANNON HILL RD

Block-Lot: 9301-36  
BRADLEY, KENNETH O & ANDERSON, LYNN E  
92 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 92 SHANNON HILL RD

Block-Lot: 9301-38  
GALLUSHA, CHRISTOPHER M & ALYSON E  
80 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 80 SHANNON HILL RD

Block-Lot: 9301-37  
BARR, LARRY & JUNE  
86 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 86 SHANNON HILL RD

Block-Lot: 9301-39  
BUWEN, JAMES & LEIGH  
76 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 76 SHANNON HILL RD

Block-Lot: 9301-40  
KLIPPEL, JON & CROWE, MARGARET F  
70 SHANNON HILL RD  
BASKING RIDGE NJ 07920  
RE: 70 SHANNON HILL RD

Block-Lot: 9401-8-Q0036  
PINSON, ELLEN  
658 HOYDEN HILL RD  
FAIRFIELD CT 06824  
RE: 99 ALLEN RD

Block-Lot: 11201-8  
HBB PROPERTY LLC C/O ALLEN RD LLC  
PO BOX 74  
LIBERTY CORNER NJ 07938  
RE: 50 ALLEN RD

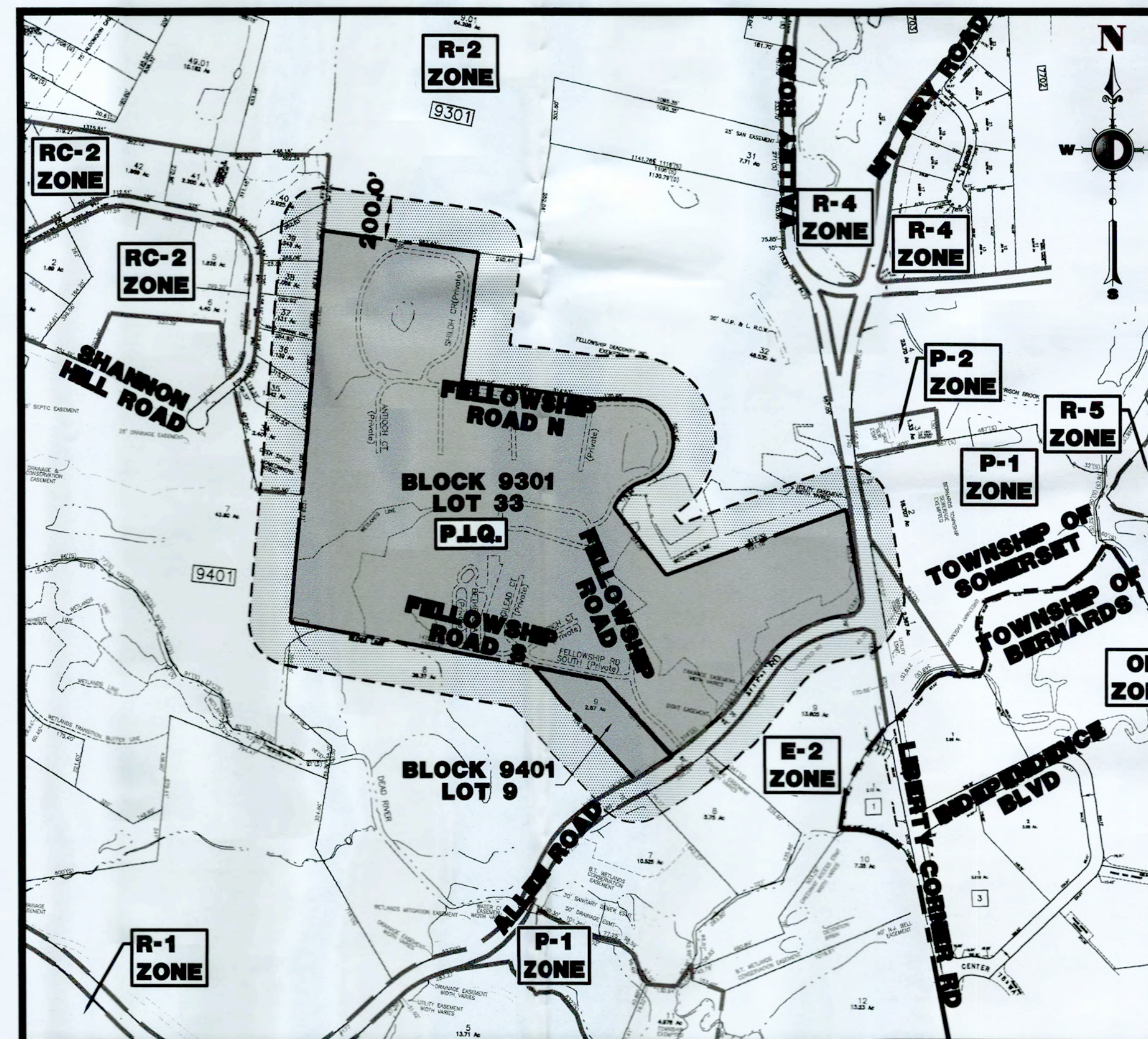
Block-Lot: 11201-7  
BASKING RIDGE MAR PROPERTY LLC  
60 ALLEN RD & DELTA HOTELS  
BASKING RIDGE NJ 07920  
RE: 80 ALLEN RD

Block-Lot: 11201-9  
JLJ PROPERTY INVESTMENTS LLC  
2051 SE 3RD ST UNIT 508  
DEERFIELD BEACH FL 33441  
RE: 701 MARTINSVILLE RD

Block-Lot: 9301-33  
FELLOWSHIP SENIOR LIVING INC  
8000 FELLOWSHIP RD  
BASKING RIDGE NJ 07920  
RE: 33 ALLEN RD

Block-Lot: 9401-8  
PINSON, ELLEN  
658 HOYDEN HILL RD  
FAIRFIELD CT 06824  
RE: 99 ALLEN RD

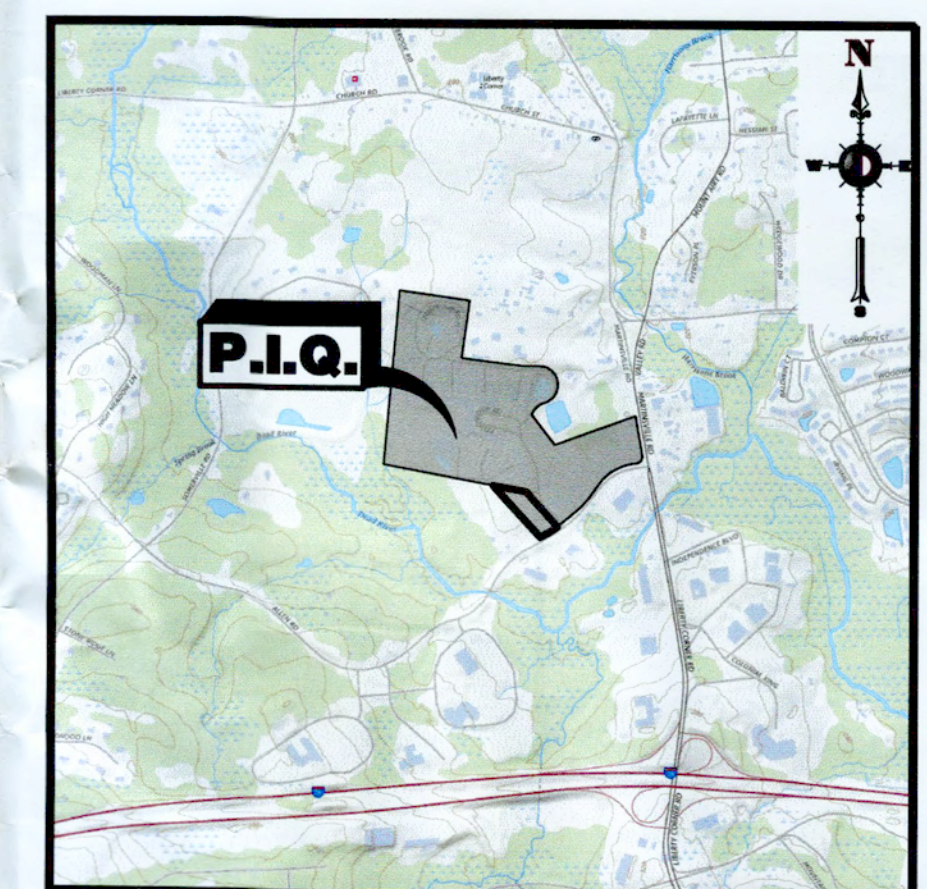
Block-Lot: 9401-7-Q0005  
PINSON, ELLEN  
658 HOYDEN HILL RD  
FAIRFIELD CT 06824  
RE: 99 ALLEN RD



### AREA MAP

1" = 500'

PREPARED BY  
**DYNAMIC ENGINEERING CONSULTANTS, P.C.**  
1904 MAIN STREET  
LAKE COMO, NJ 07719  
WWW.DYNAMICEC.COM



### KEY MAP

1" = 2000'

### DRAWING INDEX

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| CONSTRUCTION DETAILS                                | 13 of 14 |
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THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

|   |   |
|---|---|
| <b>DYNAMIC ENGINEERING</b><br>LAND DEVELOPMENT CONSULTING • PERMITTING • GEOTECHNICAL • ENVIRONMENTAL • SURVEY • PLANNING & ZONING<br>Lake Como, New Jersey T: 732.974.0198   Chester, New Jersey T: 908.879.7229   Newark, New Jersey T: 973.753.7200   Toms River, New Jersey T: 732.478.0000<br>Allen, Texas T: 972.534.2100   Austin, Texas T: 512.444.2444   Houston, Texas T: 281.289.4400   Del Rio, Texas T: 512.512.8500<br>Newtown, Pennsylvania T: 267.665.0276   Philadelphia, Pennsylvania T: 215.253.4888   Bethlehem, Pennsylvania T: 610.598.4400 |   |
| TITLE: <b>COVER SHEET</b>   |   |
| PROJECT: <b>FELLOWSHIP SENIOR LIVING<br/>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 33; BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY   | JOB No: 4309-99-001<br>DATE: 09/10/2022<br>SCALE: (H) AS SHOWN<br>SHEET No: <b>1</b><br>OF 14<br>Rev. # 1 |
| DRAWN BY: LG<br>DESIGNED BY: AF<br>CHECKED BY: DJD<br>CHECKED BY: —   | PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41690   |
| <b>DANIEL J. DOUGHERTY</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41690   | <b>JOHN A. PALUS</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41975                             |
| <b>811 PROTECT YOURSELF</b><br>ALL EXISTING UTILITIES MUST BE LOCATED AND DEPTH DETERMINED PRIOR TO ANY CONSTRUCTION. CALL 811 BEFORE YOU DIG.<br>FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM  |   |



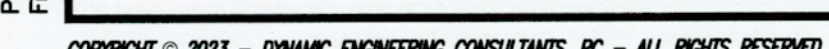


Product: 02/09/23 - 11:47 AM, By: mdelvechio, - bernards\dwg\Site Plans\040999001\SA1.dwg, ----> 02 AERIAL MAP  
File: \\despc\local\despc\projects\4309 fellowship senior living\99-001

|   |                             |
|---|-----------------------------|
| GRAPHIC SCALE<br>-200 0 100 200 400 600<br>(IN FEET)<br>1 INCH = 200 FT.  |                             |
| THE AERIAL IMAGE DEPICTED ON THIS PLAN IS BASED UPON AERIAL PHOTOGRAPHY OF THE STATE OF NEW JERSEY CAPTURED BETWEEN MARCH AND MAY, 2015. THE NEW JERSEY 2015 HIGH RESOLUTION ORTHOPHOTOGRAPHY PROJECT WAS FURNISHED BY THE NJ OFFICE OF INFORMATION TECHNOLOGY. THE CONDITIONS OF THE SITE AND SURROUNDING AREAS MAY HAVE CHANGED SINCE THE DATE OF AERIAL PHOTOGRAPHY AND THEREFORE THIS PLAN MAY NOT ACCURATELY REFLECT ALL CURRENT EXISTING CONDITIONS.  |                             |
| THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION  |                             |
| <b>DYNAMIC ENGINEERING</b><br>LAND DEVELOPMENT CONSULTING • PERMITTING • GEOTECHNICAL • ENVIRONMENTAL • SURVEY • PLANNING & ZONING<br>Office conveniently located in:<br>Lake Como, New Jersey T: 732.974.0198   Chester, New Jersey T: 908.879.9229   Newark, New Jersey T: 973.755.7200   Torrance, New Jersey T: 732.678.0000<br>Allen, Texas T: 972.534.7100   Austin, Texas T: 512.444.2444   Houston, Texas T: 281.389.9400   Delray Beach, Florida T: 561.201.8570<br>Newtown, Pennsylvania T: 267.485.0276   Philadelphia, Pennsylvania T: 215.253.4888   Bethlehem, Pennsylvania T: 412.998.4400 |                             |
| TITLE: <b>AERIAL MAP</b>  |                             |
| PROJECT: <b>FELLOWSHIP SENIOR LIVING<br/>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 33; BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY   |                             |
| JOB No: 4309-99-001   | DATE: 09/10/2022            |
| DRAWN BY: LG  | SCALE: (H) 1"=200'<br>(V) - |
| DESIGNED BY: AF   | SHEET No: 2                 |
| CHECKED BY: DJD   | OF 14                       |
| CHECKED BY: -   | Rev. # 1                    |
| <b>DANIEL J. DOUGHERTY</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41690   |                             |
| <b>JOHN A. PALUS</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41975   |                             |
| <b>811 PROTECT YOURSELF</b><br>ALL STATES REQUIRE NOTIFICATION OF<br>UNDERGROUND UTILITIES PRIOR TO ANY<br>EXCAVATION TO AVOID THE SAFETY<br>DANGER OF HITS TO ANY LINES<br>FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:<br>WWW.CALL811.COM   |                             |

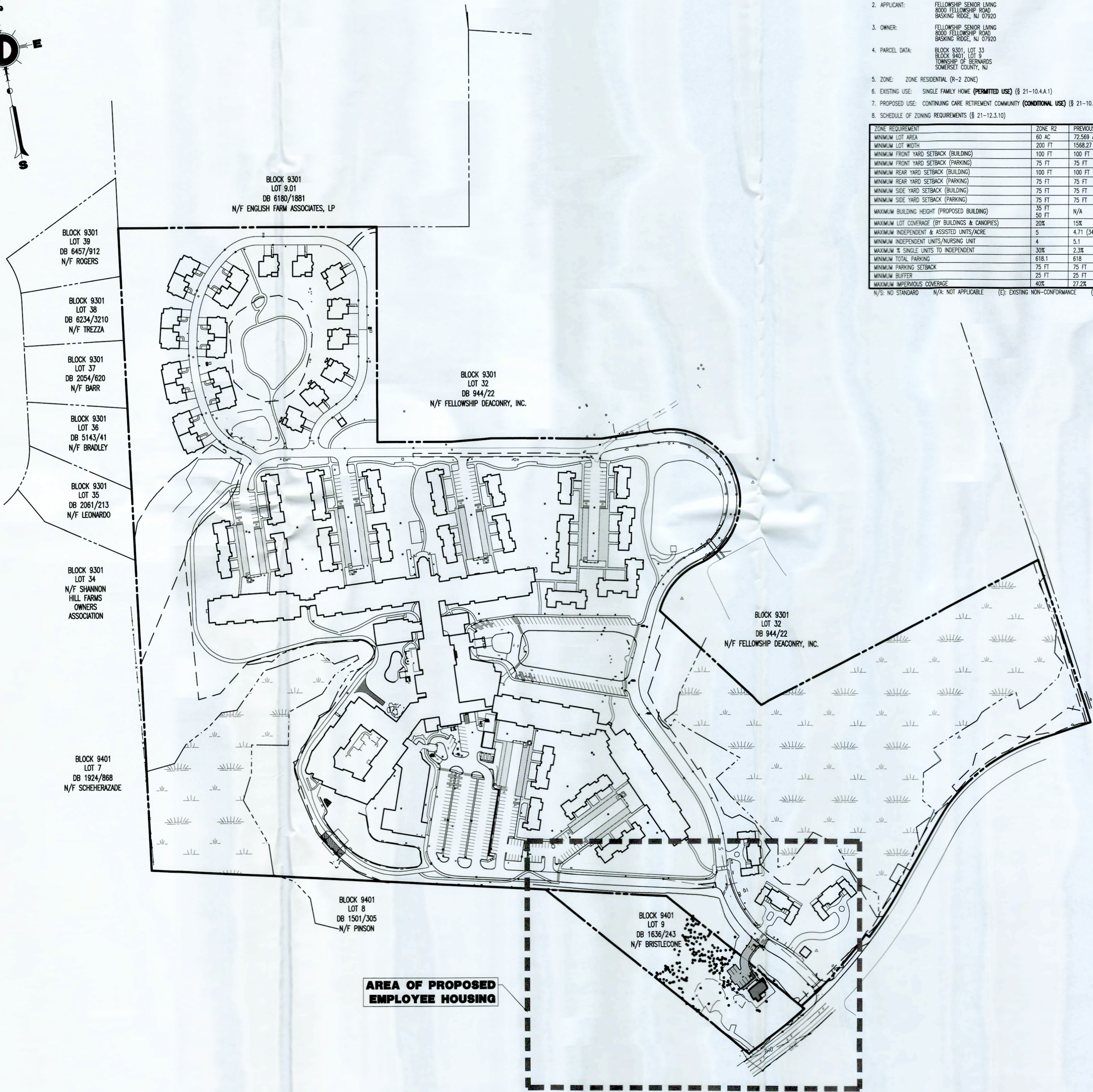
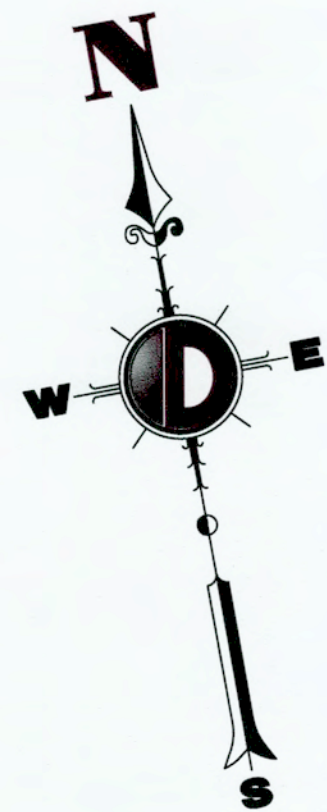


lotted: 02/09/23 - 11:47 AM, By: mdelvecchio, - Product Ver: 24.2s (LMS Tech)  
 file: \\decpc.local\decfolders\Data\decpc projects\4309 fellowship senior living\99-001 bernards\Dwg\Site Plans\DA30999001SS1.dwg, ----> 03 STEEP SLOPES PLAN



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|--|--|--|--|--|--|--|--|--|--|
| <b>THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION</b>  |  |  |  |  |  |  |  |  |  |
|  |  | <h1 style="margin: 0;">DYNAMIC<br/>ENGINEERING</h1>  |  |  |  |  |  |  |  |
|  |  | <b>LAND DEVELOPMENT CONSULTING    •    PERMITTING    •    GEOTECHNICAL    •    ENVIRONMENTAL    •    SURVEY    •    PLANNING &amp; ZONING</b>  |  |  |  |  |  |  |  |
|  |  | <small>Office conveniently located in:</small><br>Lake Como, New Jersey 1.732.974.0198    Chester, New Jersey 1.908.979.9222    Network, New Jersey 1.973.755.7000    Toms River, New Jersey 1.732.678.0000<br>Allen, Texas 1.972.934.7010    Austin, Texas 1.512.446.2444    Houston, Texas 1.281.799.6400    Delton Beach, Florida 1.561.927.8570<br>Newtown, Pennsylvania 1.709.485.2740    Philadelphia, Pennsylvania 1.215.253.4688    Bethlehem, Pennsylvania 1.610.959.4400<br><a href="http://www.dynamicco.com">www.dynamicco.com</a> |  |  |  |  |  |  |  |
| <b>TITLE:</b>  |  | <h2 style="margin: 0;">STEEP SLOPES PLAN</h2>  |  |  |  |  |  |  |  |
| <b>PROJECT:</b> <b>FELLOWSHIP SENIOR LIVING</b><br><b>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 35, BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY |  | <b>JOB NO:</b> 4309-99-001   |  | <b>DATE:</b> 08 / 10 / 2022  |  |  |  |  |  |
|  |  | <b>DRAWN BY:</b> KNG   |  | <b>SCALE:</b> (1" = 30' (N)  |  |  |  |  |  |
|  |  | <b>DESIGNED BY:</b> AF   |  | <b>SHEET (N)</b>   |  |  |  |  |  |
| <b>DANIEL J. DOUGHTERY</b><br>   |  | <b>CHECKED BY:</b> DJD   |  | <div style="font-size: 48px; font-weight: bold; margin: 0;">3</div>  |  |  |  |  |  |
|  |  | <b>CHECKED BY:</b> —   |  |  |  |  |  |  |  |
|  |  | <b>JOHN A. PALUS</b><br>   |  |  |  |  |  |  |  |
| <b>PROFESSIONAL ENGINEER</b><br>NEW JERSEY LICENSE No. 41690   |  | <b>PROFESSIONAL ENGINEER</b><br>NEW JERSEY LICENSE No. 41975   |  | <div style="text-align: center;"> <br/> <b>PROTECT YOURSELF</b><br/> <small>ALL STATE REQUIRE NOTIFICATION OF EXISTING UTILITIES, OR ANY PERSON PERMITTED TO EXCAVATE THE EARTH'S SURFACE HEREIN IN ANY STATE</small><br/> <br/> <small>Call before you dig</small> </div> |  |  |  |  |  |
| FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:<br><a href="http://WWW.CALL811.COM">WWW.CALL811.COM</a>   |  | <b>Rev. #</b> 1  |  |  |  |  |  |  |  |





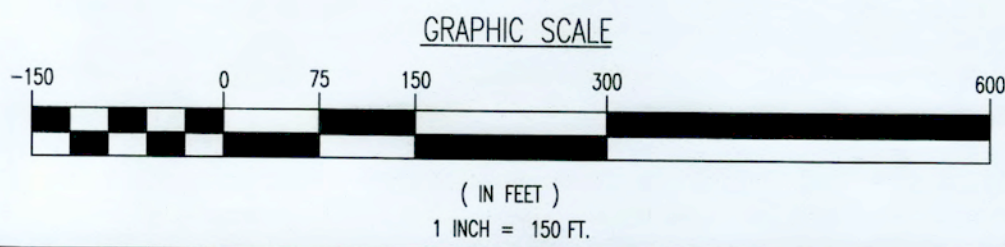
### GENERAL NOTES

- THIS PLAN HAS BEEN PREPARED BASED ON REFERENCES INCLUDING:  
BOUNDARY & TOPOGRAPHIC SURVEY  
KONIG SURVEYING SERVICES, INC.  
5 POWDER HORN DRIVE, SUITE 4, P.O. BOX 4477  
WARREN, NEW JERSEY 07058  
SURVEYOR FILE NO: 27944900
- APPLICANT: FELLOWSHIP SENIOR LIVING  
8000 FELLOWSHIP ROAD  
BASKING RIDGE, NJ 07000
- OWNER: FELLOWSHIP SENIOR LIVING  
8000 FELLOWSHIP ROAD  
BASKING RIDGE, NJ 07000
- PARCEL DATA: BLOCK 9301, LOT 33  
BLOCK 9401, LOT 9  
TOWNSHIP OF BERNARDS  
SOMERSET COUNTY, NJ
- ZONE: ZONE RESIDENTIAL (R-2 ZONE)
- EXISTING USE: SINGLE FAMILY HOME (PERMITTED USE) (§ 21-10.4A.1)
- PROPOSED USE: CONTINUING CARE RETIREMENT COMMUNITY (CONDITIONAL USE) (§ 21-10.4A.3)
- SCHEDULE OF ZONING REQUIREMENTS (§ 21-12.3.10)

| ZONE REQUIREMENT                               | ZONE R2 | PREVIOUSLY APPROVED | PROPOSED         |
|--|---------|---------------------|------------------|
| MINIMUM LOT AREA                               | 60 AC   | 72,569 AC           | 75,441 AC        |
| MINIMUM LOT WIDTH                              | 200 FT  | 1568.27 FT          | 1773 FT          |
| MINIMUM FRONT YARD SETBACK (BUILDING)          | 100 FT  | 100 FT              | 102 FT           |
| MINIMUM FRONT YARD SETBACK (PARKING)           | 75 FT   | 75 FT               | 159.7 FT         |
| MINIMUM REAR YARD SETBACK (BUILDING)           | 100 FT  | 100 FT              | 352.6 FT         |
| MINIMUM REAR YARD SETBACK (PARKING)            | 75 FT   | 75 FT               | 276.2 FT         |
| MINIMUM SIDE YARD SETBACK (BUILDING)           | 75 FT   | 75 FT               | 128.9 FT         |
| MINIMUM SIDE YARD SETBACK (PARKING)            | 75 FT   | 75 FT               | 130.1 FT         |
| MAXIMUM BUILDING HEIGHT (PROPOSED BUILDING)    | 35 FT   | N/A                 | 31.4 FT          |
| MAXIMUM LOT COVERAGE (BY BUILDINGS & CANOPIES) | 50 FT   | N/A                 | 14.5%            |
| MAXIMUM INDEPENDENT & ASSISTED UNITS/ACRE      | 20%     | 15%                 | 4.53 (342 UNITS) |
| MINIMUM INDEPENDENT UNITS/NURSING UNIT         | 5       | 4.71 (342 UNITS)    | 4.53 (342 UNITS) |
| MAXIMUM % SINGLE UNITS TO INDEPENDENT          | 4       | 5.1                 | 5.1              |
| MINIMUM TOTAL PARKING                          | 30%     | 2.3%                | 2.3%             |
| MINIMUM PARKING SETBACK                        | 618.1   | 618                 | 626              |
| MINIMUM BUFFER                                 | 75 FT   | 75 FT               | 75 FT            |
| MAXIMUM IMPERVIOUS COVERAGE                    | 25 FT   | 25 FT               | 25 FT            |
|  | 40%     | 27.2%               | 26.4%            |

N/S: NO STANDARD N/A: NOT APPLICABLE (E): EXISTING NON-CONFORMANCE (V): VARIANCE

- PARKING REQUIREMENTS  
A. SUFFICIENT OFF-STREET PARKING SHALL BE REQUIRED TO MEET THE NEEDS OF THE RESIDENTS, EMPLOYEES AND GUESTS IN ACCORDANCE WITH THE FOLLOWING MINIMUM REQUIREMENTS: INDEPENDENT-LIVING UNITS: 1.0 PER DWELLING UNIT; ASSISTED-LIVING UNITS: 0.35 PER DWELLING UNIT; LONG-TERM CARE, SUB-ACUTE AND MEMORY-CARE UNITS: .35 PER DWELLING UNIT; STAFF: ONE OFF-STREET PARKING SPACE PER FULL TIME STAFF, PLUS ONE FOR EVERY TWO PART-TIME STAFF, ON THE MAXIMUM SHIFT; VISITORS: AN ADDITIONAL 10% ABOVE THE TOTAL REQUIRED PARKING. (§ 21-12.3.1.12)  
B. PARKING CALCULATION:  
INDEPENDENT LIVING: (256 UNITS)\*(1 PARKING SPACE/UNIT) = 256 SPACES  
ASSISTED LIVING: (86 UNITS)\*(0.35 PARKING SPACES/UNIT) = 30.1 SPACES  
LONG-TERM CARE/NURSING: (67 UNITS)\*(0.35 PARKING SPACES/UNIT) = 23.5 SPACES  
STAFF (FULL TIME, MAX SHIFT): (165 EMP)\*(1 PARKING SPACE/EMP) = 165 SPACES  
STAFF (PART-TIME): (20 EMP)\*(0.5 PARKING SPACES/EMP) = 10 SPACES  
VISITOR PARKING: (485 SPACES)\*(0.10) = 48.5 SPACES  
AUDITORIUM PARKING: (240 SEATS)\*(1 SPACE/3 SEATS) = 80 SPACES  
TOTAL REQUIRED: = 613.1 SPACES  
PREVIOUSLY APPROVED PARKING: = 618 SPACES  
TOTAL PROPOSED: = 626 SPACES (COMPLIES)  
TOTAL REQUIRED LOADING SPACES = 6 SPACES  
TOTAL EXISTING/PROPOSED LOADING SPACES = 1 SPACE  
HANDICAP PARKING SUMMARY:  
TOTAL PARKING PROPOSED = 626 SPACES  
HANDICAP PARKING REQUIRED (10.02) = 13 SPACES  
HANDICAP PARKING PREVIOUSLY APPROVED = 26 SPACES  
HANDICAP PARKING PROPOSED = 27 SPACES (COMPLIES)
- THE APPLICANT REQUESTS ANY AND ALL SUBMISSION WAIVERS THAT ARE NOT SPECIFICALLY IDENTIFIED HEREIN. TESTIMONY WILL BE SUPPLIED AT THE PUBLIC HEARING TO SUPPORT SAID SUBMISSION WAIVERS.
- PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE SURE THAT ALL REQUIRED PERMITS AND APPROVALS HAVE BEEN OBTAINED. NO CONSTRUCTION OR FABRICATION SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED AND THOROUGHLY REVIEWED ALL PLANS AND OTHER DOCUMENTS BY ALL OF THE PERMITTING AUTHORITIES.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE REQUIREMENTS AND STANDARDS OF THE LOCAL GOVERNING AUTHORITY.
- THE SOILS REPORT AND RECOMMENDATIONS SET FORTH THEREIN ARE A PART OF THE REQUIRED CONSTRUCTION DOCUMENTS AND IN CASE OF CONFLICT SHALL TAKE PRECEDENCE UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS. THE CONTRACTOR SHALL NOTIFY THE ENGINEER CONSTRUCTION MANAGER OF ANY DISCREPANCY BETWEEN SOILS REPORT & PLANS.
- SITE CLEARING SHALL INCLUDE THE LOCATION AND REMOVAL OF ALL UNDERGROUND TANKS, PIPES, VALVES, ETC.
- THE PROPERTY SURVEY SHALL BE CONSIDERED A PART OF THESE PLANS.
- ALL DIMENSIONS SHOWN ON THE PLANS SHALL BE FIELD VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER IF ANY DISCREPANCIES EXIST PRIOR TO PROCEEDING WITH CONSTRUCTION FOR NECESSARY PLAN CHANGES. NO EXTRA COMPENSATION SHALL BE PAID TO THE CONTRACTOR FOR WORK HAVING TO BE REDONE DUE TO DIMENSIONS OR GRADES SHOWN INCORRECTLY ON THESE PLANS IF SUCH NOTIFICATION HAS NOT BEEN GIVEN.
- SOLID WASTE TO BE DISPOSED OF BY CONTRACTOR IN ACCORDANCE WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS.
- ALL EXCAVATED UNSUITABLE MATERIAL MUST BE TRANSPORTED TO AN APPROVED DISPOSAL LOCATION.
- CONTRACTOR IS RESPONSIBLE FOR ALL SHORING REQUIRED DURING EXCAVATION AND SHALL BE PERFORMED IN ACCORDANCE WITH CURRENT OSHA STANDARDS, AS WELL AS ADDITIONAL PROVISIONS TO ASSURE STABILITY OF CONTIGUOUS STRUCTURES, AS FIELD CONDITIONS DICTATE.
- ALL CONTRACTORS MUST CARRY STATUTORY WORKERS COMPENSATION, EMPLOYERS LIABILITY INSURANCE AND APPROPRIATE LIMITS OF COMMERCIAL GENERAL LIABILITY INSURANCE. COI ALL CONTRACTORS MUST HAVE THEIR COI POLICIES ENDORSED TO NAME DYNAMIC ENGINEERING CONSULTANTS, P.C. ITS SUBCONTRACTORS AS ADDITIONAL INSURED AND TO PROVIDE CONSTRUCTION WORKER COMPENSATION TO INSURE THE HOLD HARMLESS AND WAIVER AS EVIDENCE OF THE REQUIRED INSURANCE PRIOR TO COMMENCEMENT OF WORK AND UPON RENEWAL OF EACH POLICY DURING THE ENTIRE PERIOD OF CONSTRUCTION. IN ADDITION, ALL CONTRACTORS WILL, TO THE FULLEST EXTENT PERMITTED BY LAW, INDEMNIFY AND HOLD HARMLESS DYNAMIC ENGINEERING CONSULTANTS, P.C. AND ITS SUBCONTRACTORS FROM AND AGAINST ANY DAMAGES, LIABILITIES OR COSTS, INCLUDING REASONABLE ATTORNEY'S FEES AND DEFENSE COSTS, ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE PROJECT, INCLUDING ALL CLAIMS BY EMPLOYEES OF THE CONTRACTORS.
- NEITHER THE PROFESSIONAL ACTIVITIES OF DYNAMIC ENGINEERING CONSULTANTS, P.C., NOR THE PRESENCE OF DYNAMIC ENGINEERING CONSULTANTS, P.C. OR ITS EMPLOYEES AND SUBCONTRACTANTS AT A CONSTRUCTION/PROJECT SITE, SHALL RELIEVE THE GENERAL CONTRACTOR OF ITS OBLIGATIONS, DUTIES AND RESPONSIBILITIES INCLUDING, BUT NOT LIMITED TO, CONSTRUCTION MEANS, METHODS, SEQUENCE, TECHNIQUES OR PROCEDURES NECESSARY FOR PERFORMING, SUPERINTENDING AND COORDINATING THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND ANY HEALTH OR SAFETY PRECAUTIONS REQUIRED BY ANY REGULATORY AGENCIES. DYNAMIC ENGINEERING CONSULTANTS, P.C. AND ITS PERSONNEL HAVE NO AUTHORITY TO EXERCISE ANY CONTROL OVER ANY CONSTRUCTION CONTRACTOR OR ITS EMPLOYEES IN CONNECTION WITH THEIR WORK OR ANY HEALTH OR SAFETY PROGRAMS OR PROCEDURES. THE GENERAL CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR JOBSITE SAFETY. DYNAMIC ENGINEERING CONSULTANTS, P.C. SHALL BE INCUMBED BY THE GENERAL CONTRACTOR AND SHALL BE MADE ADDITIONAL INSURED UNDER THE GENERAL CONTRACTOR'S POLICIES OF GENERAL LIABILITY INSURANCE.
- DYNAMIC ENGINEERING CONSULTANTS, P.C. SHALL REVIEW AND APPROVE OR TAKE OTHER APPROPRIATE ACTION ON THE CONTRACTOR SUBMITTALS, SUCH AS SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND OTHER DATA WHICH THE CONTRACTOR IS REQUIRED TO SUBMIT, BUT ONLY FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH THE DESIGN OBJECTS AND THE INFORMATION SHOWN IN THE CONSTRUCTION MEANS OR METHODS. COORDINATION OF THE WORK WITH OTHER TRADES OR CONSTRUCTION SAFETY PRECAUTIONS, ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. DYNAMIC ENGINEERING'S REVIEW SHALL BE CONDUCTED WITH REASONABLE PROMPTNESS WHILE ALLOWING SUFFICIENT TIME TO PERMIT ADEQUATE REVIEW. REVIEW OF A SPECIFIC ITEM SHALL NOT INDICATE THAT DYNAMIC ENGINEERING CONSULTANTS, P.C. HAS REVIEWED THE ENTIRE ASSEMBLY OF WHICH THE ITEM IS A COMPONENT. DYNAMIC ENGINEERING CONSULTANTS, P.C. SHALL NOT BE RESPONSIBLE FOR ANY DEVIATIONS FROM THE CONSTRUCTION DOCUMENTS NOT BROUGHT TO THE ATTENTION OF DYNAMIC ENGINEERING CONSULTANTS, P.C. IN WRITING BY THE CONTRACTOR. DYNAMIC ENGINEERING CONSULTANTS, P.C. SHALL NOT BE REQUIRED TO REVIEW PARTIAL SUBMISSIONS OR THOSE FOR WHICH SUBMISSIONS OF CORRELATED ITEMS HAVE NOT BEEN RECEIVED.
- IN AN EFFORT TO RESOLVE ANY CONFLICTS THAT ARISE DURING THE DESIGN AND CONSTRUCTION OF THE PROJECT OR FOLLOWING THE COMPLETION OF THE PROJECT, DYNAMIC ENGINEERING CONSULTANTS, P.C. AND THE CONTRACTOR MUST AGREE THAT ALL DISPUTES BETWEEN THEM ARISING OUT OF OR RELATING TO THIS AGREEMENT OR THE PROJECT SHALL BE SUBMITTED TO NONBINDING MEDIATION UNLESS THE PARTIES MUTUALLY AGREE OTHERWISE.
- THE CONTRACTOR MUST INCLUDE A MEDIATION PROVISION IN ALL AGREEMENTS WITH INDEPENDENT SUBCONTRACTORS AND CONSULTANTS RETAINED FOR THE PROJECT AND TO REQUIRE ALL INDEPENDENT CONTRACTORS AND CONSULTANTS ALSO TO INCLUDE A SIMILAR MEDIATION PROVISION IN ALL AGREEMENTS WITH THEIR SUBCONTRACTORS, SUBCONSULTANTS, SUPPLIERS AND FABRICATORS, THEREBY PROVIDING FOR MEDIATION AS THE PRIMARY METHOD FOR DISPUTE RESOLUTION BETWEEN THE PARTIES TO ALL SUCH AGREEMENTS.
- IF THE CONTRACTOR DEViates FROM THE PLANS AND SPECIFICATIONS, INCLUDING THE NOTES CONTAINED THEREON, WITHOUT FIRST OBTAINING PRIOR WRITTEN AUTHORIZATION FOR SUCH DEVIATIONS FROM THE OWNER AND ENGINEER, IT SHALL BE RESPONSIBLE FOR THE PAYMENT OF ALL COSTS TO CORRECT ANY WORK DONE. ALL FINES OR PENALTIES ASSESSED WITH RESPECT HERETO AND ALL COMPENSATORY OR PUNITIVE DAMAGES RESULTING THEREFROM AND IT SHALL INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ALL SUCH COSTS TO CORRECT ANY SUCH WORK AND FROM ALL SUCH FINES AND PENALTIES, COMPENSATION AND PUNITIVE DAMAGES AND COSTS OF ANY NATURE RESULTING THEREFROM.
- ALL TRAFFIC SIGNS AND STRIPPING SHALL FOLLOW THE REQUIREMENTS SPECIFIED IN THE MANUAL ON "UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
- THE BUILDING SETBACK DIMENSIONS ILLUSTRATED AND LISTED ON THE SITE PLAN DRAWINGS ARE MEASURED FROM THE OUTSIDE SURFACE OF BUILDING WALLS. THESE SETBACK DIMENSIONS DO NOT ACCOUNT FOR ROOF OVERHANGS, ORNAMENTAL ELEMENTS, SIGNAGE OR OTHER EXTERIOR EXTENSIONS UNLESS SPECIFICALLY NOTED.
- CONTRACTOR ACKNOWLEDGES HE HAS READ AND UNDERSTOOD THE DESIGN PHASE SOIL PERMEABILITY AND GROUNDWATER TEST RESULTS IN THE STORMWATER MANAGEMENT REPORT AND THAT THE CONTRACTOR'S RESPONSIBILITIES INCLUDE NECESSARY PROVISIONS TO ACHIEVE THE DESIGN PERMEABILITY IN THE FIELD.
- CONTRACTOR TO BE ADVISED THAT THE ENGINEER WAS NOT PROVIDED WITH FINAL FLOOR PLAN DRAWINGS FOR THE BUILDING AT THE TIME OF SITE PLAN DESIGN. AS A RESULT, ENTRANCE DOOR LOCATIONS AS DEPICTED HEREON MAY NOT BE FINAL AND MUST BE CONFIRMED WITH THE ARCHITECTURAL PLANS PRIOR TO CONSTRUCTION. THE HANDICAP ACCESSIBLE PARKING SPACES AND THE ASSOCIATED RAMPS AND ACCESSIBLE ROUTE MUST COMPLY WITH NAC 5.2.2.7 AND THE HANDICAP PARKING SPACES MUST BE LOCATED AS THE NEAREST SPACES TO THE ENTRANCE. CONTRACTOR TO NOTIFY OWNER AND ENGINEER IMMEDIATELY OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.



THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

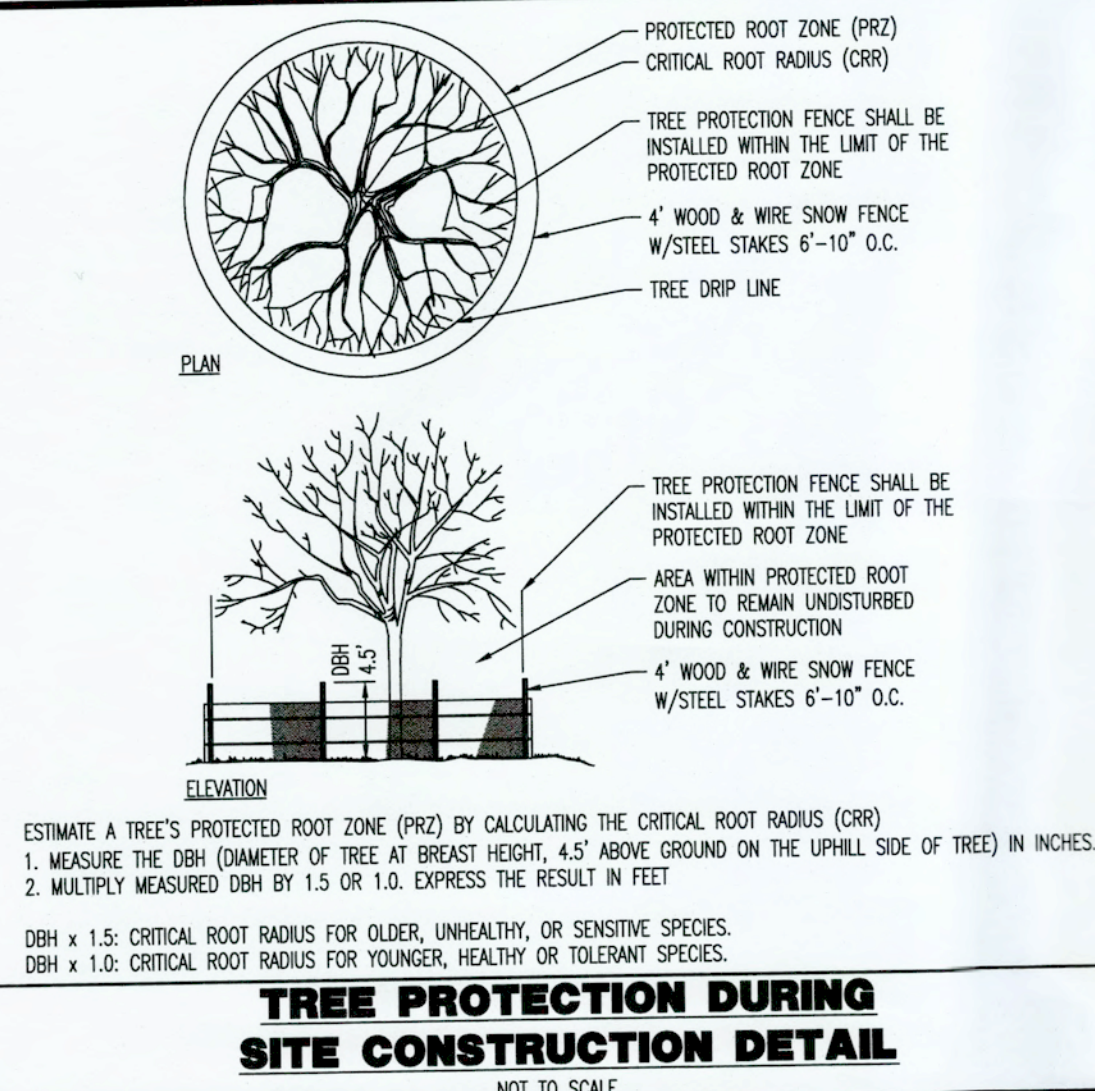
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| TITLE: <b>OVERALL SITE PLAN</b>   |  |   |  |
| PROJECT: <b>FELLOWSHIP SENIOR LIVING</b><br><b>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 33, BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY   |  | JOB No: 4309-99-001<br>DATE: 09/10/2022<br>DRAWN BY: MFZ<br>DESIGNED BY: AF<br>CHECKED BY: DJD<br>CHECKED BY: — |  |
| DANIEL J. DOUGHERTY<br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41690  |  | JOHN A. PALUS<br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41975  |  |
| 811 PROTECT YOURSELF<br>ALL EXISTING UTILITIES MUST BE LOCATED PRIOR TO ANY EXCAVATION OR DRILLING OPERATIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN THE NECESSARY INFORMATION FROM THE UTILITY COMPANIES TO AVOID DAMAGE TO ANY EXISTING UTILITIES. CALL 811 PRIOR TO ANY EXCAVATION OR DRILLING OPERATIONS.  |  | OF 14<br>Rev. # 1   |  |



02/09/23 - 11:47 AM, Bp. mdeveschio, Product Ver. 24.2a (JMS Tech) - 05 DEMOLITION AND TREE REMOVAL PLAN - 09-001 bernarae\dwg\Site Plans\030999001\SR1.dwg

## DEMOLITION NOTES

- ALL DEMOLITION ACTIVITIES ARE TO BE PERFORMED IN STRICT ADHERENCE TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.
  - PROCEED WITH DEMOLITION IN A SYSTEMATIC MANNER, FROM THE TOP OF THE STRUCTURE(S) TO THE GROUND.
  - COMPLETE DEMOLITION WORK ABOVE EACH FLOOR OR TIER BEFORE DISTURBING ANY OF THE SUPPORTING MEMBERS OF THE LOWER LEVELS.
  - DEMOLISH CONCRETE AND MASONRY IN SMALL SECTIONS.
  - REMOVE STRUCTURAL FRAMING MEMBERS AND LOWER THEM TO THE GROUND BY MEANS OF HOISTS, DERRICKS OR OTHER SUITABLE METHODS.
  - BREAK UP CONCRETE SLABS-ON-GRADE, UNLESS OTHERWISE DIRECTED BY OWNER.
  - LOCATE DEMOLITION EQUIPMENT THROUGHOUT THE STRUCTURE AND REMOVE MATERIALS SO AS TO NOT IMPOSE EXCESSIVE LOADS ON SUPPORTING WALLS, FLOORS OR FRAMING.
  - PROVIDE INTERIOR AND EXTERIOR SHORING, BRACING AND SUPPORTS TO PREVENT MOVEMENT, SETTLEMENT OR COLLAPSE OF STRUCTURES TO BE DEMOLISHED (AND ADJACENT FACILITIES, IF APPLICABLE).
  - DEMOLISH AND REMOVE ALL FOUNDATION WALLS, FOOTINGS AND OTHER MATERIALS WITHIN THE AREA OF THE DESIGNATED FUTURE BUILDING. ALL OTHER FOUNDATION SYSTEMS, INCLUDING BASEMENTS, SHALL BE DEMOLISHED TO A DEPTH OF NOT LESS THAN ONE FOOT BELOW PROPOSED PAVEMENT OR BREAK BASEMENT FLOOR SLABS. SEAL ALL OPEN UTILITY LINES WITH CONCRETE. CONTRACTOR TO REVIEW STRUCTURE PRIOR TO DEMOLITION TO DETERMINE IF BASEMENT, CRAWL SPACE OR ANY SUB-STRUCTURE EXISTS. ANY SUB-STRUCTURE, INCLUDING BASEMENTS SHALL BE REMOVED IN ITS ENTIRETY OR AS DIRECTED BY OWNER.
  - ERECT AND MAINTAIN COVERED PASSAGeways IN ORDER TO PROVIDE SAFE PASSAGE FOR PERSONS AROUND THE AREA OF DEMOLITION. CONDUCT ALL DEMOLITION OPERATIONS IN A MANNER THAT WILL PREVENT DAMAGE AND PERSONAL INJURY TO STRUCTURES, ADJACENT BUILDINGS AND ALL PERSONS.
  - REFRAIN FROM USING ANY EXPLOSIVES WITHOUT PRIOR WRITTEN CONSENT OF OWNER AND APPLICABLE GOVERNMENTAL AUTHORITIES.
  - CONDUCT DEMOLITION SERVICES IN SUCH A MANNER TO ENSURE MINIMUM INTERFERENCE WITH ROADS, STREETS, WALKS AND OTHER ADJACENT FACILITIES. DO NOT CLOSE OR OBSTRUCT STREETS, WALKS, OR OTHER OCCUPIED FACILITIES WITHOUT PRIOR WRITTEN PERMISSION OF OWNER AND ANY APPLICABLE GOVERNMENTAL AUTHORITIES. PROVIDE ALTERNATE ROUTES AROUND CLOSED OR OBSTRUCTED TRAFFIC WAYS, IF REQUIRED BY APPLICABLE GOVERNMENTAL REGULATIONS.
  - USE WATERING, TEMPORARY ENCLOSURES AND OTHER SUITABLE METHODS, AS NECESSARY TO LIMIT THE AMOUNT OF DUST AND DIRT RISING AND SCATTERING IN THE AIR. CLEAN ADJACENT STRUCTURES AND IMPROVEMENTS OF ALL DUST AND DEBRIS CAUSED BY THE DEMOLITION OPERATIONS. RETURN ALL ADJACENT AREAS TO THE CONDITIONS EXISTING PRIOR TO THE START OF WORK.
  - ACCOMPLISH AND PERFORM THE DEMOLITION IN SUCH A MANNER AS TO PREVENT THE UNAUTHORIZED ENTRY OF PERSONS AT ANY TIME.
  - COMPLETELY FILL BELOW GRADE AREAS AND VOIDS RESULTING FROM THE DEMOLITION OF STRUCTURES AND FOUNDATIONS WITH SOIL MATERIALS IN ACCORDANCE WITH THE GEOTECHNICAL REPORT. CONSISTING OF STONE, GRAVEL AND SAND, FREE FROM DEBRIS, TRASH, FROZEN MATERIALS, ROOTS AND OTHER ORGANIC MATTER. STONES USED WILL NOT BE LARGER THAN 6 INCHES IN DIMENSION. MATERIAL FROM DEMOLITION MAY NOT BE USED AS FILL. PRIOR TO PLACEMENT OF FILL MATERIALS, UNDERTAKE ALL NECESSARY ACTION IN ORDER TO ENSURE THAT AREAS TO BE FILLED ARE FREE OF STANDING WATER, FROST, FROZEN MATERIAL, TRASH, DEBRIS. PLACE FILL MATERIALS IN HORIZONTAL LAYERS NOT EXCEEDING 6 INCHES IN LOOSE DEPTH AND COMPACT EACH LAYER AT PLACEMENT TO 95% OPTIMUM DENSITY. GRADE THE SURFACE TO MEET ADJACENT CONTOURS AND TO PROVIDE SURFACE DRAINAGE.
  - REMOVE FROM THE DESIGNATED SITE, AT THE EARLIEST POSSIBLE TIME, ALL DEBRIS, RUBBISH, SALVAGEABLE ITEMS, HAZARDOUS AND COMBUSTIBLE SERVICES. REMOVED MATERIALS MAY NOT BE STORED, SOLD OR BURNED ON THE SITE. REMOVAL OF HAZARDOUS AND COMBUSTIBLE MATERIALS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH THE PROCEDURES AS AUTHORIZED BY THE FIRE DEPARTMENT OR OTHER APPROPRIATE REGULATORY AGENCIES AND AUTHORITIES.
  - DISCONNECT, SHUT OFF AND SEAL IN CONCRETE ALL UTILITIES SERVING THE STRUCTURE(S) TO BE DEMOLISHED BEFORE THE COMMENCEMENT OF THE DESIGNATED DEMOLITION. MARK FOR POSITION ALL UTILITY DRAINAGE AND SANITARY LINES AND PROTECT ALL ACTIVE LINES. CLEARLY IDENTIFY BEFORE THE COMMENCEMENT OF DEMOLITION SERVICES THE REQUIRED INTERRUPTION OF ACTIVE SYSTEMS THAT MAY AFFECT OTHER PARTIES, AND NOTIFY ALL APPLICABLE UTILITY COMPANIES TO ENSURE THE CONTINUATION OF SERVICE.
  - THIS DEMOLITION PLAN IS INTENDED TO IDENTIFY THOSE EXISTING CONDITIONS WHICH ARE TO BE REMOVED. IT IS NOT INTENDED TO PROVIDE DIRECTION OTHER THAN THAT ALL PROCEDURES ARE TO BE IN ACCORDANCE WITH STATE, FEDERAL, LOCAL, AND JURISDICTIONAL REQUIREMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS NECESSARY.
- NOTES**
  - IN ACCORDANCE WITH STATE LAW, THE CONTRACTOR SHALL BE REQUIRED TO CALL THE BOARD OF PUBLIC UTILITIES ONE CALL DAMAGE PROTECTION SYSTEM OR UTILITY MARK OUT IN ADVANCE OF ANY EXCAVATION.
  - CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING SITE IMPROVEMENTS AND UTILITIES. ALL DISCREPANCIES SHALL BE IDENTIFIED TO THE ENGINEER IN WRITING.
  - ALL EXISTING UTILITIES TO BE ABANDONED SHALL BE DISCONNECTED AND CAPPED AT THE MAIN FOR WATER, AT THE CLEAN-OUT FOR SEWER AND THE SHUT-OFF VALVE OR MAIN FOR GAS IN ACCORDANCE WITH MUNICIPAL AND LOCAL UTILITY REQUIREMENTS.
  - ALL EXISTING DEBRIS SHALL BE REMOVED BY CONTRACTOR IN ACCORDANCE WITH MUNICIPAL AND LOCAL UTILITY COMPANY REQUIREMENTS.

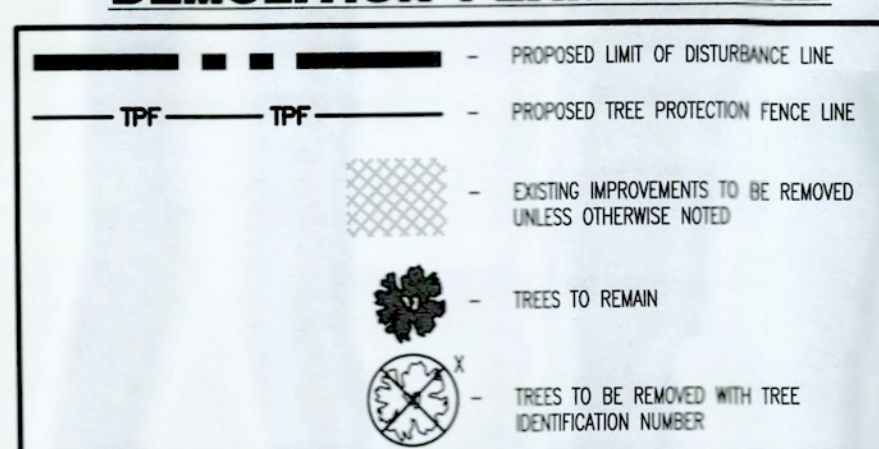


## TREE REPLACEMENT CALCULATIONS

| DBH          | # OF TREES REMOVED | REPLACEMENT REQUIRED | # OF REPLACEMENT TREES REQUIRED (2.5" CALIPER) | PROPOSED QUALIFYING REPLACEMENT PLANTINGS | REMAINING REPLACEMENT REQUIREMENT |
|--------------|--------------------|----------------------|--|---|-----------------------------------|
| 0" - 6"      | 13                 | 1                    | 13   |   |                                   |
| 6.01" - 12"  | 13                 | 2                    | 26   |   |                                   |
| 12.01" - 18" | 5                  | 3                    | 15   |   |                                   |
| 18.01" - 24" | 4                  | 4                    | 16   |   |                                   |
| TOTAL        | 35                 | -                    | 70   | 8   | 62*                               |

\*APPLICANT PROPOSES TO ADDRESS TREE REPLACEMENT DEFICIENCY VIA IN-LIEU CONTRIBUTION OF \$300/TREE (62 X \$300 = \$18,600), PER ORDINANCE.

## DEMOLITION PLAN LEGEND



**LIMIT OF DISTURBANCE  
(18,570 SF)  
(0.426 AC.)**

**PROP. TREE PROTECTION FENCE**

**PROP. TREE PROTECTION FENCE**

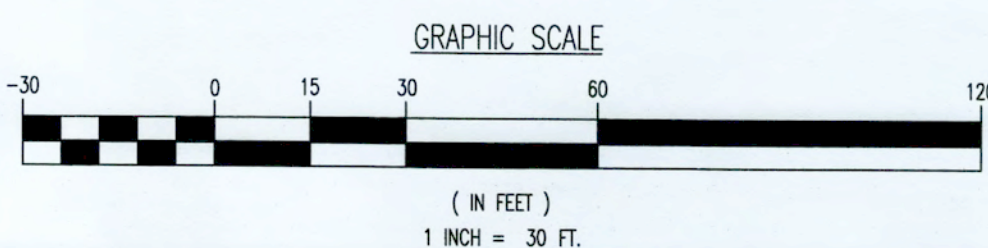
**PROP. SILT FENCE**

**PROP. TREE PROTECTION FENCE**

EX. WELL TO BE CAPPED & ABANDONED PER LOCAL AND NJDEP REGULATIONS

EX. SEPTIC TANK/SYSTEM TO BE REMOVED PER LOCAL AND NJDEP REGULATIONS

LIMIT OF DISTURBANCE 4950 SF



| TREE IDENTIFICATION SUMMARY |              |              |
|-----------------------------|--------------|--------------|
| TREE #                      | DBH (INCHES) | TYPE         |
| 1                           | 10           | POPLAR       |
| 2                           | 20           | PINE         |
| 3                           | 6            | ASH          |
| 4                           | 6            | PINE         |
| 5                           | 6            | PINE         |
| 6                           | 24           | MAPLE        |
| 7                           | 5            | ASH          |
| 8                           | 10           | BLACK WALNUT |
| 9                           | 18           | PINE         |
| 10                          | 18           | PINE         |
| 11                          | 16           | BLACK WALNUT |
| 12                          | 24           | MAPLE        |
| 13                          | 24           | MAPLE        |
| 14                          | 5            | PINE         |
| 15                          | 5            | ASH          |
| 16                          | 10           | PINE         |
| 17                          | 12           | PINE         |
| 18                          | 6            | PINE         |
| 19                          | 7            | PINE         |
| 20                          | 6            | PINE         |
| 21                          | 10           | PINE         |
| 22                          | 15           | PINE         |
| 23                          | 12           | PINE         |
| 24                          | 10           | PINE         |
| 25                          | 6            | PINE         |
| 26                          | 10           | PINE         |
| 27                          | 6            | ASH          |
| 28                          | 12           | PINE         |
| 29                          | 10           | PINE         |
| 30                          | 4            | MAPLE        |
| 31                          | 10           | MAPLE        |
| 32                          | 16           | MAPLE        |
| 33                          | 6            | CHERRY       |
| 34                          | 6            | PINE         |
| 35                          | 10           | CHERRY       |

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**DEMOLITION AND TREE REMOVAL PLAN**

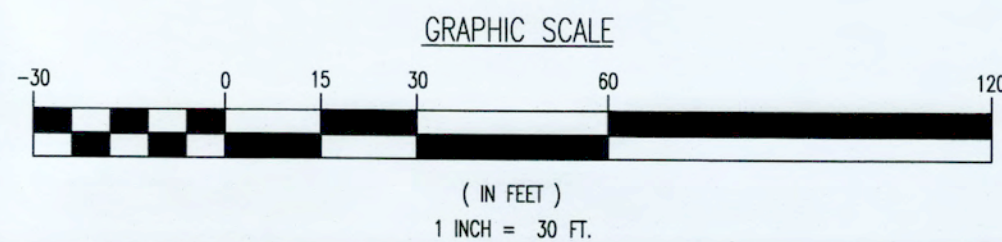
PROJECT: **FELLOWSHIP SENIOR LIVING PROPOSED STAFF RESIDENCES**  
BLOCK 9301, LOT 33; BLOCK 9401, LOT 9  
8000 FELLOWSHIP ROAD  
BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

JOB No: 4309-99-001  
DATE: 09/10/2022  
DRAWN BY: GMC  
SCALE: (H) 1"=30' (V)  
DESIGNED BY: AF  
SHEET No: 5 OF 14  
CHECKED BY: DJD  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41690  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41975

**DANIEL J. DOUGHERTY**  
**JOHN A. PALUS**

**PROTECT YOURSELF**  
ALL STATE REQUIREMENTS OF EXISTING CONDITIONS, AS APPLICABLE, SHALL BE MAINTAINED OR RESTORED TO ORIGINAL CONDITION OR BETTER.  
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: [www.nj.gov](http://www.nj.gov)







Product: 02/09/23 - 11:48 AM By: mdelvecchio, File: \\dccc-local\decoders\data\decproj\l... Product Ver: 24.2a (LMS Tech) Fellowship senior living\99-001 terrara\dwg\Site Plans\DA3099001SKG.dwg, --> 07 GRADING PLAN



### GRADING NOTES

- SITE GRADING SHALL BE PERFORMED IN ACCORDANCE WITH THESE PLANS AND SPECIFICATIONS AND THE RECOMMENDATIONS SET FORTH IN THE SOILS REPORT REFERENCED IN THIS PLAN SET. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ALL SOFT, YIELDING, OR UNSUITABLE MATERIALS AND REPLACING WITH SUITABLE MATERIALS AS SPECIFIED IN THE SOILS REPORT. ALL EXCAVATED OR FILLED AREAS SHALL BE COMPACTED TO 90% OF MODIFIED PROCTOR MAXIMUM DENSITY PER ASTM D 1557. MOISTURE CONTENT AT TIME OF PLACEMENT SHALL NOT EXCEED 2% ABOVE NOR 3% BELOW OPTIMUM. CONTRACTORS SHALL SUBMIT A COMPARISON REPORT PREPARED BY A QUALIFIED SOILS ENGINEER, REGISTERED WITHIN THE STATE WHERE THE WORK IS PERFORMED, VERIFYING THAT ALL FILLED AREAS AND SUBGRADE AREAS WITHIN THE BUILDING AND AREA AND AREAS TO BE PAVED HAVE BEEN COMPACTED IN ACCORDANCE WITH THESE PLANS AND SPECS AND THE RECOMMENDATIONS SET FORTH IN THE SOILS REPORT.
- CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION AND UTILITY INVERT ELEVATIONS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR TO ENSURE 0.75% MIN. SLOPE AGAINST ALL ISLAND, GUTTERS, CURBS AND 1.0% ON ALL CONCRETE SURFACES, AND 1-1/2% MIN. ON ASPHALT TO PREVENT PONDING. ANY DISCREPANCIES THAT MAY AFFECT THE PUBLIC SAFETY OR PROJECT COSTS, MUST BE IDENTIFIED TO THE ENGINEER IN WRITING IMMEDIATELY. PROCEEDING WITH CONSTRUCTION WITH DESIGN DISCREPANCIES IS DONE SO AT THE CONTRACTOR'S OWN RISK.
- PROPOSED TOP OF CURB ELEVATIONS ARE GENERALLY 6" ABOVE EXISTING LOCAL ASPHALT GRADE UNLESS OTHERWISE NOTED. FIELD ADJUST TO CREATE A MIN. OF 0.75% GUTTER GRADE ALONG CURB FACE. ENGINEER TO APPROVE FINAL CURBING CUT SHEETS PRIOR TO INSTALLATION.
- SUBBASE MATERIAL FOR SIDEWALKS, CURB, OR ASPHALT SHALL BE FREE OF ORGANICS AND OTHER UNSUITABLE MATERIALS. SHOULD SUBBASE BE DEEMED UNSUITABLE, SUBBASE IS TO BE REMOVED AND FILLED WITH APPROVED FILL MATERIAL COMPACTED TO 95% OPTIMUM DENSITY (AS DETERMINED BY MODIFIED PROCTOR METHOD).
- REFER TO SITE PLAN FOR ADDITIONAL NOTES.
- IN CASE OF DISCREPANCIES BETWEEN PLANS, THE SITE PLAN WILL SUPERCEDE IN ALL CASES. CONTRACTOR MUST NOTIFY ENGINEER OF RECORD OF ANY CONFLICT IMMEDIATELY.
- MAXIMUM CROSS SLOPE OF 2% ON ALL SIDEWALKS.
- CONTRACTOR TO ENSURE A MAXIMUM OF 2% SLOPE IN ALL DIRECTIONS IN ADA PARKING SPACES AND ADA ACCESS AISLES. CONTRACTOR TO ENSURE A MAXIMUM OF 5% RUNNING SLOPE AND 2% CROSS SLOPE ALONG ALL OTHER PORTIONS OF ACCESSIBLE ROUTE. WITH THE EXCEPTION OF RAMPS AND CURB RAMPS. CONTRACTOR SHALL CLARIFY ANY QUESTIONS CONCERNING CONSTRUCTION IN ADA AREAS WITH THE ENGINEER PRIOR TO THE START OF CONSTRUCTION.
- THE OWNER SHALL RETAIN DYNAMIC EARTH, LLC (908-878-7085) OR ALTERNATE QUALIFIED GEOTECHNICAL ENGINEER TO TEST SOIL PERMEABILITY AND PROVIDE CONSTRUCTION PHASE INSPECTIONS OF THE BASIN BOTTOM SOILS AND ANY FILL MATERIALS WITHIN ANY PROPOSED INFILTRATION OR RETENTION BASIN TO COMPARE RESULTS TO DESIGN CRITERIA.
- CONTRACTOR IS TO REMOVE EXISTING UNSUITABLE OR OVERLY COMPACT SOIL OR ROCK AS NEEDED TO ACHIEVE REQUIRED PERMEABILITY AS DIRECTED BY THE OWNERS GEOTECHNICAL ENGINEER, AND NEW FILL, IF NEEDED, SHALL HAVE AN IN PLACE PERMEABILITY GREATER THAN OR EQUAL TO THE DESIGN CRITERIA.
- CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE OWNER'S GEOTECHNICAL ENGINEER PRIOR TO ONSET OF CONSTRUCTION TO SUBMIT AND CONFIRM THE CONTRACTOR'S PROPOSED MEANS AND MATERIALS AND TO SCHEDULE INSPECTIONS FOR BOTTOM OF BASIN, REMOVAL OF UNSUITABLE SOIL, FILL PLACEMENT, AND FINAL BASIN PERMEABILITY TESTING.
- THE CONTRACTOR IS RESPONSIBLE FOR AS-BUILT PLANS AND GRADE CONTROL UNLESS DEFINED OTHERWISE ELSEWHERE IN THE CONTRACT DOCUMENTS.

### ADA NOTES

ALL SLOPES INDICATED ARE ACTUAL. CONTRACTOR TO REFER TO LATEST ADA GUIDELINES AND NJ BARRIER FREE SUBCODE (NJAC 5:23-7) FOR SLOPE LIMITS. AT THE TIME OF PLAN DESIGN, THE SLOPE LIMITS ARE AS FOLLOWS:

#### SIDEWALKS / ACCESSIBLE ROUTES

- RUNNING SLOPE: 1:20 (5%) MAX. (4.5% MAX. FOR NEW CONSTRUCTION)
- CROSS SLOPE: 1:48 (2.08%) MAX. (1.5% MAX. FOR NEW CONSTRUCTION)
- INTERSECTION SLOPE: 1:48 (2.08%) MAX. IN ALL DIRECTIONS (1.5% MAX. FOR NEW CONSTRUCTION)
- CHANGE IN LEVELS: 1/4" MAX. HEIGHT OR 1/2" MAX. HEIGHT WITH BEVELED EDGE BEVELED EDGE SLOPE OF 1:2 (50%) MAX.
- GAPS: 1/2" MAX. WIDTH ELONGATED OPENINGS SHALL BE PLACED SO LONG DIMENSION IS PERPENDICULAR TO PATH OF TRAVEL

#### CURB RAMPS

- SLOPE: 1:12 (8.3%) MAX. (7.4% MAX. FOR NEW CONSTRUCTION)
- SIDE FLARE SLOPE: 1:10 (10%) MAX. (WHERE PEDS CROSS RAMP)
- BOTTOM LANDING: 48" MIN. LENGTH; WIDTH TO MATCH CURB RAMP: 1:48 MAX. (2.08%) IN ALL DIRECTIONS (1.5% MAX. FOR NEW CONSTRUCTION)
- TOP LANDING: 36" MIN. LENGTH; WIDTH TO MATCH CURB RAMP: 1:48 MAX. (2.08%) CROSS SLOPE (1.5% MAX. FOR NEW CONSTRUCTION) AND 1:20 (5%) RUNNING SLOPE (4.5% MAX. FOR NEW CONSTRUCTION)

#### ACCESSIBILITY PARKING STALLS

- SPACE AND ACCESS AISLE SLOPE: 1:48 MAX. (2.08%) IN ALL DIRECTIONS (1.5% MAX. FOR NEW CONSTRUCTION)

#### CROSSWALKS

- RUNNING SLOPE: 1:20 (5%) MAX. (4.5% MAX. FOR NEW CONSTRUCTION)
- CROSS SLOPE: 1:48 (2.08%) MAX. (1.5% MAX. FOR NEW CONSTRUCTION)
- CHANGE IN LEVELS: 1/4" MAX. HEIGHT OR 1/2" MAX. HEIGHT WITH BEVELED EDGE BEVELED EDGE SLOPE OF 1:2 (50%) MAX.
- GAPS: 1/2" MAX. WIDTH ELONGATED OPENINGS SHALL BE PLACED SO LONG DIMENSION IS PERPENDICULAR TO PATH OF TRAVEL

#### RAMPS

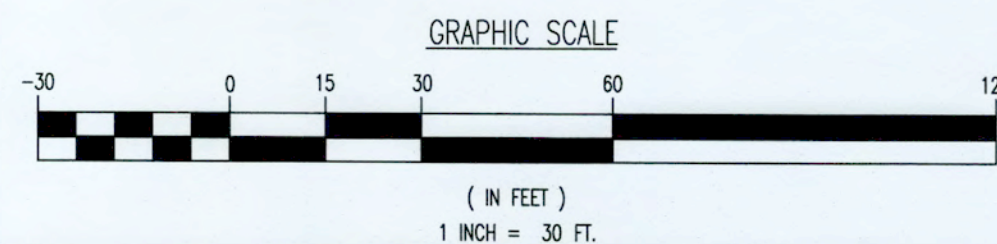
- SLOPE: 1:12 (8.3%) MAX. (7.4% MAX. FOR NEW CONSTRUCTION)
- EXISTING RAMPS: SLOPE: 1:10 (10%) MAX. FOR RISE OF 6"; 1:8 (12.5%) MAX. FOR MAX. RISE OF 3"
- MAX. RISE: 30"
- MIN. CLEAR WIDTH: 36"
- MIN. LANDING CLEAR LENGTH: 60"
- MAX. CROSS SLOPE: 1:48 (2.08%) (1.5% MAX. FOR NEW CONSTRUCTION)

### GRADING/UTILITY GRAPHIC LEGEND

PROPERTY LINE (PARCEL IN QUESTION)  
OFF-SITE PROPERTY LINES

EXIST. CABLE LINE  
PROP. CABLE LINE  
EXIST. ELECTRIC LINE  
PROP. ELECTRIC LINE  
EXIST. FIBER OPTIC LINE  
PROP. FIBER OPTIC LINE  
EXIST. GAS LINE  
PROP. GAS LINE  
EXIST. OVERHEAD WIRES  
PROP. OVERHEAD WIRES  
EXIST. TELEPHONE LINE  
PROP. TELEPHONE LINE  
EXIST. CABLE TV BOX  
PROP. CABLE TV BOX  
EXIST. WATER VALVE  
PROP. WATER VALVE  
EXIST. STORM CLEANOUT  
PROP. STORM CLEANOUT  
EXIST. SANITARY CLEANOUT  
PROP. SANITARY CLEANOUT  
EXIST. AREA LIGHT  
PROP. AREA LIGHT  
EXIST. OUTLET CONTROL STRUCTURE  
PROP. OUTLET CONTROL STRUCTURE  
EXIST. DRAINAGE MANHOLE  
PROP. DRAINAGE MANHOLE  
EXIST. SANITARY SEWER MANHOLE  
PROP. SANITARY SEWER MANHOLE  
EXIST. 'A' INLET  
PROP. 'A' INLET  
EXIST. 'B' INLET  
PROP. 'B' INLET  
EXIST. 'E' INLET  
PROP. 'E' INLET  
EXIST. YARD INLET  
PROP. YARD INLET  
EXIST. FLARED END SECTION  
PROP. FLARED END SECTION  
EXIST. UTILITY POLE  
PROP. UTILITY POLE  
EXIST. MONITORING WELL  
APPROX. TEST PIT LOCATION  
EXIST. FIRE HYDRANT  
EXIST. GAS VALVE  
EXIST. ELECTRIC METER  
EXIST. ELECTRIC BOX  
EXIST. CLEAN OUT  
EXIST. WELL  
EXIST. WATER SHUT OFF VALVE  
EXIST. TELEPHONE BOX  
EXIST. CABLE TV BOX  
PROP. HEADWALL

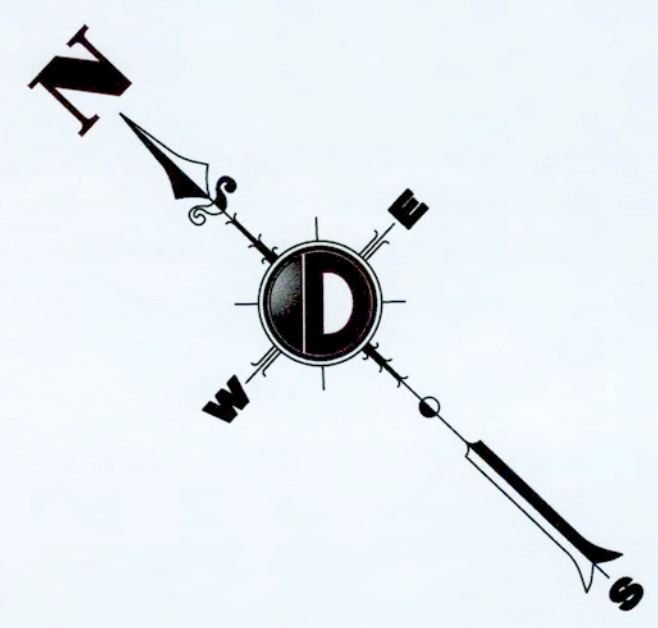
EXIST. UNDERGROUND ELEC./TELE. SERVICE (NO. & SIZE OF CONDUITS NOT DEFINED)  
PROP. UNDERGROUND ELEC./TELE. SERVICE (NO. & SIZE OF CONDUITS NOT DEFINED)  
EXIST. SANITARY SEWER LINE  
PROP. SANITARY SEWER LINE  
EXIST. STORM DRAIN LINE  
PROP. STORM DRAIN LINE  
EXIST. MINOR CONTOUR & ELEVATION  
PROP. MINOR CONTOUR & ELEVATION  
EXIST. MAJOR CONTOUR & ELEVATION  
PROP. MAJOR CONTOUR & ELEVATION  
EXIST. FINISH GRADE CONTOUR & ELEVATION  
PROP. FINISH GRADE CONTOUR & ELEVATION  
EXIST. HIGH SIDE OF EXTENDED CURB & (2) FINISHED GRADE @ LOW SIDE OF EXTENDED CURB  
PROP. HIGH SIDE OF EXTENDED CURB & (2) FINISHED GRADE @ LOW SIDE OF EXTENDED CURB  
EXIST. SPOT ELEVATIONS  
EXIST. GUTTER ELEV.  
EXIST. TOP OF CURB ELEV.  
EXIST. FINISH FLOOR ELEV.  
EXIST. GARAGE FLOOR ELEV.  
PROP. GRADE SPOT ELEV.  
PROP. TOP OF CURB & FINISHED GRADE ELEV.  
PROP. FINISHED FLOOR ELEV.  
PROP. TOP OF WALL & FINISHED GRADE @ LOW SIDE OF WALL (ACTUAL BOTTOM OF WALL FOOTING TO BE ESTABLISHED BY WALL DESIGNER)  
PROP. TOP OF EXTENDED CURB (2) FINISHED GRADE @ HIGH SIDE OF EXTENDED CURB & (2) FINISHED GRADE @ LOW SIDE OF EXTENDED CURB  
EXIST. DIRECTION OF DRAINAGE FLOW ARROW



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|  |   |
|--|---|
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| TITLE: <b>GRADING PLAN</b>   |   |
| PROJECT: <b>FELLOWSHIP SENIOR LIVING<br/>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 33; BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY  | JOB NO: 4309-99-001<br>DATE: 09/10/2022<br>SCALE: (H) 1"=30'<br>(V)<br>SHEET NO: 7<br>OF 14 |
| DRAWN BY: MFZ<br>DESIGNED BY: AF<br>CHECKED BY: DJD<br>CHECKED BY: —   | Rev. # 1  |
| <b>DANIEL J. DOUGHERTY</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41690  | <b>JOHN A. PALUS</b><br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41975               |
| ALL STATE BOARD MEMBERS OF<br>EXAMINERS, REVIEWERS, OR AP PRISON<br>PREPARED TO REVIEW THE WORK<br>SERVICE AGREEMENT IN ANY STATE<br>FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:<br>WWW.CALL111.COM   |   |

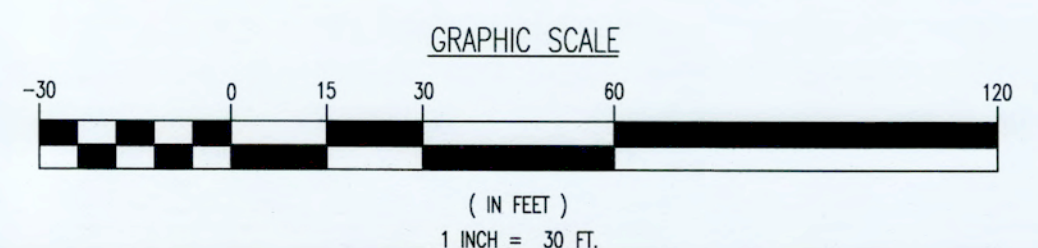













































1. LOCATION OF ALL EXISTING AND PROPOSED SERVICES ARE APPROXIMATE AND MUST BE CONFIRMED INDEPENDENTLY WITH LOCAL UTILITY COMPANIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION. SANITARY SEWER AND ALL OTHER UTILITY SERVICE CONNECTION POINTS SHALL BE CONFIRMED INDEPENDENTLY BY THE CONTRACTOR IN FIELD PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. ALL DISCREPANCIES SHALL BE REPORTED IMMEDIATELY IN WRITING TO THE ENGINEER. CONSTRUCTION SHALL COMMENCE BEGINNING AT THE LOWEST WATER (POINT OF CONNECTION) AND PROGRESS UP GRADIENT. INTERFACE POINTS (CROSSINGS) WITH EXISTING UNDERGROUND UTILITIES SHALL BE FIELD VERIFIED BY TEST PIT PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY UTILITY "ONE-CALL" NUMBER 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER & SEWER DEPARTMENTS TO WALK-OUT THEIR UTILITIES.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT BUILDING UTILITY CONNECTION LOCATIONS. WHERE CONFLICTS EXIST WITH THESE SITE PLANS, ENGINEER IS TO BE NOTIFIED PRIOR TO CONSTRUCTION TO RESOLVE SAME. SERVICE SIZES TO BE DETERMINED BY ARCHITECT.
4. WATER SERVICE MATERIALS SHALL BE SPECIFIED BY THE LOCAL UTILITY COMPANY. CONTRACTOR'S PRICE FOR WATER SERVICE SHALL INCLUDE ALL FEES AND APPURTENANCES REQUIRED BY THE UTILITY TO PROVIDE A COMPLETE WORKING SERVICE.
5. ALL WATER MAIN SHALL BE CEMENT-LINED, CLASS 52 DUCTILE IRON PIPE, UNLESS OTHERWISE DESIGNATED.
6. THE MINIMUM DIAMETER FOR DOMESTIC WATER SERVICE SHALL BE 1 INCH.
7. SEWER MAINS SHALL BE SEPARATED FROM WATER MAINS BY A DISTANCE OF AT LEAST 10 FEET HORIZONTALLY. WHERE THIS IS NOT POSSIBLE, THE PIPES SHALL BE IN SEPARATE TRENCHES WITH THE SEWER MAIN AT LEAST 18 INCHES BELOW THE WATER MAIN. ALL SEWER MAINS SHALL BE SDR-35 PVC PIPE UNLESS OTHERWISE DESIGNATED.
8. ALL SEWER PIPE INSTALLED WITH LESS THAN 3 FEET OF COVER, GREATER THAN 20 FEET OF COVER OR WITHIN 18 INCHES OF A WATER MAIN SHALL BE CONSTRUCTED OF DUCTILE IRON PIPE. ALL DUCTILE IRON SEWER PIPE SHALL BE CEMENT-LINED, CLASS 52 PIPE, FURNISHED WITH SEWER COAT, OR APPROVED EQUIV.
9. WHERE SANITARY SEWER LATERALS ARE GREATER THAN 10' DEEP AT CONNECTION TO THE SEWER MAIN, CONCRETE DEEP LATERAL CONNECTIONS ARE TO BE UTILIZED.
10. THE CONTRACTOR IS RESPONSIBLE FOR THE STABILIZATION OF THE EXISTING SEWER MAIN, STRUCTURES AND APPURTENANCES DURING CONNECTION.
11. LOCATION & LAYOUT OF GAS, ELECTRIC & TELECOMMUNICATION UTILITY LINES AND SERVICES SHOWN ON THESE PLANS ARE SCHEMATIC IN NATURE. ACTUAL LOCATION & LAYOUT OF THESE UTILITIES & SERVICES ARE TO BE PER THE APPROPRIATE UTILITY PROVIDER.
12. ALL SEWER AND WATER FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REGULATORY AUTHORITY'S RULES AND REGULATIONS.
13. ALL PROPOSED UTILITIES TO BE INSTALLED UNDERGROUND UNLESS OTHERWISE NOTED.



- EXISTING WATER SERVICE NOTE:** CONTRACTOR TO LOCATE AND UTILIZE EXISTING WATER SERVICE CONNECTION IF FEASIBLE. OTHERWISE REMOVE EXISTING WATER SERVICE CONNECTION AND INSTALL NEW WATER SERVICE CONNECTION IN ACCORDANCE WITH THE LOCAL GAS COMPANY REQUIREMENTS. TERMINATION AT THE MAIN MUST BE APPROVED BY THE LOCAL GAS COMPANY. CONTRACTOR SHALL OBTAIN ALL REQUIRED STAFF WORKING PERMITS FROM THE LOCAL WATER COMPANY PRIOR TO COMPLETION. IF THE EXISTING WATER SERVICE CAN NOT BE UTILIZED, THE NEW SERVICE IS TO BE COORDINATED AND VERIFIED FOR LOCATION WITH THE LOCAL WATER COMPANY. CONTRACTOR SHALL OBTAIN ALL REQUIRED STAFF WORKING PERMITS FOR REMOVAL OF EXISTING SERVICE AND INSTALLATION OF NEW SERVICE.
- EXISTING GAS SERVICE NOTE:** CONTRACTOR TO LOCATE AND UTILIZE EXISTING GAS SERVICE CONNECTION IF FEASIBLE. OTHERWISE REMOVE EXISTING GAS SERVICE LINE AND CAP AT MAIN IN R.O.W. IN ACCORDANCE WITH THE LOCAL GAS COMPANY REQUIREMENTS. TERMINATION AT THE MAIN MUST BE APPROVED BY THE LOCAL GAS COMPANY PRIOR TO COMPLETION. IF THE EXISTING GAS SERVICE CAN NOT BE UTILIZED, THE NEW SERVICE IS TO BE COORDINATED AND VERIFIED FOR LOCATION WITH THE LOCAL GAS COMPANY. CONTRACTOR SHALL OBTAIN ALL REQUIRED STAFF WORKING PERMITS FOR REMOVAL OF EXISTING SERVICE AND INSTALLATION OF NEW SERVICE.
- SEWER SERVICE NOTE:** CONTRACTOR TO LOCATE AND UTILIZE EXISTING SEWER SERVICE CONNECTION IF OF ADEQUATE SIZE AND INTEGRITY AND ACCEPTABLE TO LOCAL SEWER AUTHORITY. OTHERWISE CONTRACTOR TO REMOVE EXISTING SEWER SERVICE LINE AND CAP AT MAIN IN R.O.W. IN ACCORDANCE WITH THE LOCAL SEWER AUTHORITY REQUIREMENTS. TERMINATION AT THE MAIN MUST BE APPROVED BY THE LOCAL SEWER AUTHORITY PRIOR TO COMPLETION. IF EXISTING SEWER SERVICE CAN NOT BE UTILIZED, THE NEW SERVICE IS TO BE COORDINATED AND VERIFIED FOR LOCATION WITH THE LOCAL SEWER AUTHORITY. CONTRACTOR SHALL OBTAIN ALL REQUIRED STAFF WORKING PERMITS FOR REMOVAL OF EXISTING SERVICE AND INSTALLATION OF NEW SERVICE.

- ## SHRINKAGE NOTES
1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY UTILITY "ONE-CALL" NUMBER 72 HOURS PRIOR TO ANY EXCAVATION ON THIS SITE. CONTRACTOR SHALL ALSO NOTIFY LOCAL WATER & SEWER DEPARTMENTS TO MARK-OUT THEIR UTILITIES.
2. ROOF LEADER COLLECTION PIPING ARE CONCEPTUAL IN NATURE AND ARE NOT FOR CONSTRUCTION. ACTUAL ROOF LEADER COLLECTION PIPING IS TO BE COORDINATED WITH / ARCHITECTURAL PLANS FOR EACH INDIVIDUAL BUILDING. ALL ROOF LEADER COLLECTION PIPING SHALL BE SCHEDULED 40 PACE UNLESS OTHERWISE DESIGNED.
3. MANUFACTURED REINFORCED CONCRETE STORM PIPE TO CONFORM TO ASTM C-76, CLASS III, UNLESS OTHERWISE DESIGNATED. MANUFACTURED REINFORCED CONCRETE ELLIPTICAL STORM PIPE TO CONFORM TO ASTM C-507, CLASS III, UNLESS OTHERWISE DESIGNATED. REINFORCED CONCRETE STORMWATER PIPE TO BE PROVIDED IN PERMANENT AND NON-REMOVABLE CONCRETE PIPE ASSOCIATION INSTALLED GUIDELINES AND WARTOR (OR PREPARED) FLEXIBLE JOINT SEALANTS IN ACCORDANCE WITH ASTM C 990 TO BE UTILIZED TO PROVIDE A SLT-TIGHT JOINT. WHEN SPECIFICALLY INDICATED, REINFORCED CONCRETE STORM PIPE JOINTS SHALL BE WATER-TIGHT AND CONFORM TO ASTM C-443.
4. HDPE DRAINAGE PIPE SHALL HAVE A SMOOTH WALL INTERIOR WITH ANNUAL EXTERIOR CORRUGATIONS AND CONFORM TO ASTM F2306. SOLID PIPE SHALL HAVE GASKETED WATER-TIGHT JOINTS MEETING THE REQUIREMENTS OF ASTM F2306 AND ASTM D3212. PERFORATED PIPE SHALL HAVE GASKETED SLT-TIGHT JOINTS MEETING THE REQUIREMENTS OF ASTM F2306 AND ASTM F477. HDPE PIPE SHALL BE FROM A MANUFACTURER WHO IS AN EASTERN STATES CONJUNCTION (ESC) QUALIFIED MANUFACTURER OF HDPE PIPE AND INSTALLED IN ACCORDANCE WITH PIPE MANUFACTURER RECOMMENDATIONS.
5. HP DRAINAGE PIPE SHALL HAVE A SMOOTH WALL INTERIOR WITH ANNUAL EXTERIOR CORRUGATIONS AND CONFORM TO ASTM F2376 (12"-30" PIPE) AND ASTM F2280 (36"-60" PIPE). HDPE PIPE SHALL HAVE GASKETED WATER-TIGHT JOINTS MEETING THE REQUIREMENTS OF ASTM D3212 AND ASTM F477. FIELD WATERTIGHTNESS: PERFORATED PIPE ASSOCIATION (PAP) PERFORATED PIPE SHALL BE FROM A MANUFACTURER WHO IS AN EASTERN STATES CONJUNCTION (ESC) QUALIFIED MANUFACTURER OF HP STORM PIPE AND INSTALLED IN ACCORDANCE WITH PIPE MANUFACTURER RECOMMENDATIONS.
6. PIPE LENGTHS ON THIS PLAN HAVE BEEN MEASURED AS THE DISTANCE BETWEEN THE CENTER POINT OF THE 2 CONNECTED STRUCTURES. ACTUAL PHYSICAL PIPE LENGTH FOR INSTALLATION IS EXPECTED TO BE LESS AND SHOULD BE ACCOUNTED FOR BY THE CONTRACTOR ACCORDINGLY.



- |   |                            |   |                             |   |                            |
|---|----------------------------|---|-----------------------------|---|----------------------------|
|  | EXIST. GUY WIRE            |  | EXIST. MONITORING WELL      |  | PROP. WATER VALVE          |
|  | EXIST. LIGHT POLE          |  | APPROX. TEST PIT LOCATION   |  | PROP. GAS VALVE            |
|  | EXIST. BUILDING LIGHT      |  | EXIST. FIRE HYDRANT         |  | PROP. STORM CLEANOUT       |
|  | EXIST. SHOE BOX LIGHT      |  | EXIST. WATER VALVE          |  | PROP. SANITARY CLEANOUT    |
|  | EXIST. COBRA LIGHT POLE    |  | EXIST. GAS VALVE            |  | PROP. AREA LIGHT           |
|  | EXIST. TRAFFIC SIGNAL POLE |  | EXIST. GAS METER            |  | PROP. OUTLET CONTROL STR.  |
|  | EXIST. MANHOLE             |  | EXIST. ELECTRIC METER       |  | PROP. DRAINAGE MANHOLE     |
|  | EXIST. "4" INLET           |  | EXIST. ELECTRIC BOX         |  | PROP. SANITARY SEWER MANH. |
|  | EXIST. "8" INLET           |  | EXIST. CLEAN OUT            |  | PROP. "4" INLET            |
|  | EXIST. "12" INLET          |  | EXIST. WELL                 |  | PROP. "8" INLET            |
|  | EXIST. YARD INLET          |  | EXIST. WATER SHUT OFF VALVE |  | PROP. "12" INLET           |
|  | EXIST. FLARED END SECTION  |  | EXIST. TELEPHONE BOX        |  | PROP. YARD INLET           |
|  | EXIST. HEADWALL            |  | EXIST. CABLE TV BOX         |  | PROP. FLARED END SECTION   |
|  | EXIST. UTILITY POLE        |  | PROP. HEADWALL              |   |                            |

- |                         |   |
|-------------------------|---|
| × 8.9                   | EXIST. SPOT ELEVATIONS  |
| × G: 8.90               | EXIST. GUTTER ELEV.   |
| × TC: 8.90              | EXIST. TOP OF CURB ELEV.  |
| × FT: 8.90              | EXIST. FINISH FLOOR ELEV.   |
| × G <sup>2</sup> : 8.90 | EXIST. GARAGE FLOOR ELEV.   |
| G: 000.00               | PROP. GRADE SPOT ELEV.  |
| TC: 000.00              | PROP. TOP OF CURB & FINISHED GRADE ELEV.                                      |
| G: 000.00               |   |
| FF: 000.00              | PROP. FINISHED FLOOR ELEV.  |
| FW: 000.00              | PROP. TOP OF WALL & FINISHED GRADE @ LOW SIDE                                 |
| SL: 000.00              | OF WALL (ACTUAL BOTTOM OF WALL FOOTING TO<br>BE ESTABLISHED BY WALL DESIGNER) |
| TC: 000.00              | PROP. TOP OF EXTENDED CURB (CH) FINISHED GRADE                                |
| GH: 000.00              | @ HIGH SIDE OF EXTENDED CURB & (CL) FINISHED                                  |
| GL: 000.00              | GRADE @ LOW SIDE OF EXTENDED CURB   |

|          |   |  |   |   |  |
|----------|---|--|---|---|--|
| BY       |    | <b>DYNAMIC ENGINEERING</b>   |   | 1904 Street Street<br>Lakeland, FL 34001<br>T: 732.974.0198<br>F: 732.974.3501<br>www.dynamicme.com |  |
|          |   | LAND DEVELOPMENT CONSULTING • PERMITTING • <b>GEO/TECHNICAL</b> • ENVIRONMENTAL • SURVEY • PLANNING & ZONING |   |   |  |
| Date     | Likee Comm. New Jersey: T: 732.974.0198   Chester, New Jersey: T: 908.675.9228   Newark, New Jersey: T: 973.755.7500   Torra River, New Jersey: T: 732.478.0000 |  | Offices conveniently located in:  |   |  |
|          | Allen, Texas: T: 972.324.1200   Austin, Texas: T: 512.444.2446   Houston, Texas: T: 281.789.4400   Delray Beach, Florida: T: 561.991.8570                       |  | Newtown, Pennsylvania: T: 267.685.0276   Philadelphia, Pennsylvania: T: 215.233.4888   Bethlehem, Pennsylvania: T: 610.996.4400 |   |  |
| Rev.     | TITLE: _____  |  |   |   |  |
|          | <h1>UTILITY PLAN</h1>   |  |   |   |  |
| Comments | PROJECT: <b>FELLOWSHIP SENIOR LIVING</b><br><b>PROPOSED STAFF RESIDENCES</b>  |  | JOB No: 4309-99-001   |   | DATE: 09/10/2022   |
|          | BLOCK 9301, LOT 33; BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY   |  | DRAWN BY: GMC<br>DESIGNED BY: AF<br>CHECKED BY: DJD<br>CHECKED BY: _____  |   | SCALE: (H) 1"=30'<br>(V)<br>SHEET No: _____  |
| Date     | <b>DANIEL J. DOUGHERTY</b>  |  | <b>JOHN A. PALUS</b>  |   | <br><b>REGISTERED PROFESSIONAL ENGINEER</b><br>ALL STATE REQUIREMENTS OF<br>ENGINEERING, SURVEYING, OR ANY OTHER<br>DISCIPLINE TO BE EXERCISED BY THE PERSON<br>INDICATED HEREIN TO BE THE SAME INDICATED IN ANY STATE<br>FOR STATE SPECIFIC DESIGN. PHONE NUMBERS VARY.<br>WWW.CALL111.COM |
|          | PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41890   |  | PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE NO. 41975   |   |  |



| <u>LANDSCAPE SCHEDULE</u>  |            |                                |                    |               |                |
|--|------------|--------------------------------|--------------------|---------------|----------------|
| <u>KEY</u>   | <u>QTY</u> | <u>BOTANICAL NAME</u>          | <u>COMMON NAME</u> | <u>SIZE</u>   | <u>REMARKS</u> |
| <u>SHADE TREE(S)</u>   |            |                                |                    |               |                |
| AR   | 8          | ACER RUBRUM                    | RED MAPLE          | 2 1/2-3" CAL. | B+B            |
| <u>EVERGREEN SHRUB(S)</u>  |            |                                |                    |               |                |
| BWVG   | 31         | BUXUS MICROPHYLLA 'WINTER GEM' | WINTER GEM BOXWOOD | 30-36"        | B+B            |
| <u>DECIDUOUS SHRUB(S)</u>  |            |                                |                    |               |                |
| MP   | 23         | MYRICA PENSYLVANIA             | NORTHERN BAYBERRY  | 30-36"        | B+B            |
| NOTE: IF ANY DISCREPANCIES OCCUR BETWEEN AMOUNTS SHOWN IN THE PLAN AND THE PLANT LIST, THE PLAN SHALL DICTATE. |            |                                |                    |               |                |



- [illegible]

12. CLEANUP
- A. UPON THE COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS RESULTING FROM HIS WORK. ALL PAVED AREAS SHALL BE BROOM CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
- B. MAINTAIN TREES, SHRUBS AND OTHER PLANTS BY PRUNING, CULTIVATING AND WEEDING AS REQUIRED FOR HEALTHY GROWTH. RESTORE PLANTING SAVERS TO ORIGINAL CONDITION. REPAIR OR REPLACE ANY SUPPORTS AND TIES AS REQUIRED. REPAIR OR REPLACE ANY DAMAGE TO PLANTING MATERIALS AS REQUIRED. RESTORE OR REPLACE DAMAGED WRAPPINGS. SPRAY WITH INSECTICIDES AS REQUIRED TO KEEP TREES AND SHRUBS FREE OF INSECTS AND DISEASE.
- C. MAINTAIN PLANTS BY WATERING, FERTILIZING, WEEDING, MOWING, TRIMMING, AND OTHER OPERATIONS SUCH AS ROLLING, REGRADING AND REPLANTING AS REQUIRED TO ESTABLISH A SMOOTH, ACCEPTABLE LAWN, FREE OF EROSION OR SARE AND WEEDS.
13. MAINTENANCE (LAINERS BID) COST PER YEAR AFTER INITIAL 90-DAY MAINTENANCE PERIOD.

2. PLANT MATERIAL SHALL BE FURNISHED INSTALLED AS INDICATED, INCLUDING: LABOR, MATERIALS, PLANTS, EQUIPMENT, INCIDENTALS AND CLEAN-UP. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PLANTING AT CORRECT GROUND LEVELS. LAYOUT TO BE APPROVED BY LANDSCAPE ARCHITECT PRIOR TO PLANTING.

3. PLANTS SHALL BE TYPICAL OF THEIR SPECIES AND VARIETY, HAVE NORMAL GROWTH HABITS, WELL DEVELOPED BRANCHES, DENSELY FOLIATED, VIGOROUS ROOT SYSTEMS, AND BE FREE OF DISEASE AND PESTS.

4. CONTRACTOR SHALL REMOVE ANY SOIL OR DRUMMAGE CONTAMINANTS CONSIDERED DETRIMENTAL TO THE GROWTH OF PLANT MATERIAL.

5. ALL PLANT MATERIAL SHALL BE GUARANTEED BY THE CONTRACTOR TO BE IN VIGOROUS GROWING CONDITION. PROVISION SHALL BE MADE FOR A GROWTH GUARANTEE PERIOD OF ONE YEAR AFTER PLANTING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF PLANTS DURING THE GUARANTEE PERIOD.

6. SUCCEEDING PLANTING SCHEDULE ALL REPLACEMENTS SHALL HAVE A GUARANTEE EQUAL TO THAT STATED ABOVE.

7. ALL PLANTS SHALL BE GUARANTEED TO BE IN VIGOROUS GROWING CONDITION. IF PLANT IS NOT POSSIBLE, THE CONTRACTOR SHALL PROVIDE PROTECT STOCK NOT PLANTED. PLANTS SHALL NOT REMAIN UNPLANTED FOR LONGER THAN A THREE DAY PERIOD AFTER DELIVERY, ANY PLANTS NOT INSTALLED PROTECT STOCK WILL BE REJECTED.

8. DURATION OF GUARANTEE PERIOD SHALL BE: HEAD OF ROOTS, AND SIZE OF BALLS SHALL BE IN ACCORDANCE WITH ANSI Z590.1 (REV. 2001) "AMERICAN STANDARD FOR NURSERY STOCK" AS PUBLISHED BY THE AMERICAN NURSERY & LANDSCAPE ASSOCIATION.

9. PLANTS SHALL BE PLANTED AT CORRECT DEPTHS AND TAMPED AS BACK FILLING PROCEEDS. PLANTING MIX TO BE AS SHOWN ON PLANTING DETAILS. LARGE PLANTING AREAS TO INCORPORATE FERTILIZATION AND SOIL CONDITIONS AS STATED IN PLANTING SPECIFICATIONS.

10. ALL PLANTS SHALL BE BOUND WITH WIRE OR ROPE AT ANY TIME SO AS TO DAMAGE THE BARK OR BREAK BRANCHES. PLANTS SHALL BE HANDLED FROM THE BOTTOM OF THE BALL.

11. PLANTING OPERATIONS SHALL BE PERFORMED DURING PERIODS WITHIN THE PLANTING SEASON WHEN WEATHER AND SOIL CONDITIONS ARE SUITABLE AND IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE LANDSCAPE ARCHITECT. PLANTS SHALL BE PLANTED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE LANDSCAPE ARCHITECT.

12. ALL PLANTS PLANTS AND STRAIGHT SHALL BE SUCH THAT A NORMAL OR NATURAL APPEARANCE TO THE CROWN OF THE PLANT WITH THE GROUND SURFACE WILL BE ESTABLISHED. LARGE TREES IN THE CENTER OF AREAS SHALL BE PLANTED FIRST.

13. PLANTING OPERATIONS SHALL BE COMPLETED PRIOR TO PLANTING UTILIZING CLEAN, SHARP TOOLS. IT IS ADVISABLE TO APPROXIMATELY 1/3 OF THE GROWTH OF LARGE TREES (7 CALIPER AND OVER) BY THE REMOVAL OF SUPERFLUOUS BRANCHES, THOSE WHICH CROSS, THOSE WHICH RUN PARALLEL, ETC.

14. MAJOR BRANCHES SHALL BE PRUNED TO MAINTAIN THE NATURAL SHAPE OF THE CROWN OF THE PLANT.

15. EACH TREE AND SHRUB SHALL BE PRUNED IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICE TO PRESERVE NATURAL CHARACTER OF PLANT. PRUNING SHALL BE DONE WITH CLEAN, SHARP SEWING SHALL BE PRUNED TO REMOVE ANY DAMAGED BRANCHES AS A RESULT OF CONSTRUCTION OPERATIONS. ALL EXISTING TREES SHALL BE FERTILIZED WITH A REGULAR GARDEN FERTILIZER (1-5-5) UPON COMPLETION OF WORK. THE ENTIRE LENGTH OF ANY DAMAGED BRANCH SHALL BE CUT OFF AT THE POINT OF DAMAGE TO THE CROWN OF THE PLANT.

16. ALL PLANTS COMPLETELY SATURATE THESE AREAS WITH WATER. ROOTS SHALL NOT BE LEFT EXPOSED FOR MORE THAN ONE (1) DAY. CONTRACTOR IS TO PROTECT ALL EXISTING TREES TO REMAIN BY DIRECTED TREE PROTECTION FENCE AND BRANCHES SHALL BE PROTECTED BY BRANCH PROTECTION NETS TO ENSURE NO COMPACTION OF THE ROOT MASS.

17. NEW PLANTING AREAS AND SOIL SHALL BE ADEQUATELY PREPARED OR WATERED TO ESTABLISH THE PROPOSED PLANTS AND LAWN.

18. ALL PLANTING OPERATIONS SHALL BE COMPLETED PRIOR TO THE END OF THE PLANTING SEASON. PLANTS SHALL BE INSTALLED, INSPECTED AND APPROVED BY THE MUNICIPAL LANDSCAPE ARCHITECT. THE MUNICIPAL ENGINEER AND LANDSCAPE ARCHITECT SHALL TAKE INTO ACCOUNT SEASONAL VARIATIONS IN PLANTING SCHEDULES AND PLANTING METHODS. PLANTS SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE LANDSCAPE ARCHITECT OR SITE PLAN APPROVED BY THE PLANNING BOARD OR ZONING BOARD OF ADJUDICATION SHALL BE INSTALLED DURING THE FOLLOWING PLANTING SEASONS:

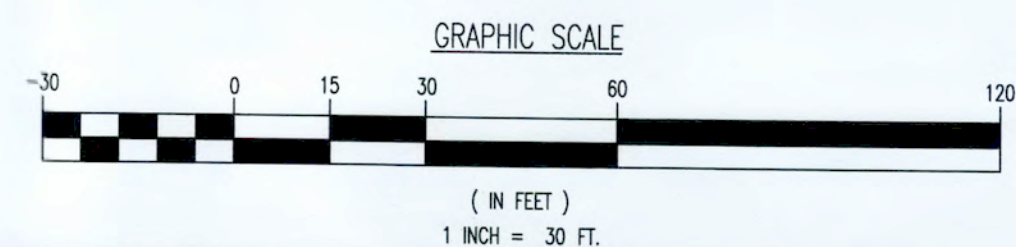
FURTHERMORE, THE FOLLOWING TREE VARIETIES SHALL NOT BE PLANTED DURING THE FALL PLANTING SEASON DUE TO THE HAZARDS ASSOCIATED WITH DIGGING THESE TREES IN THIS SEASON.


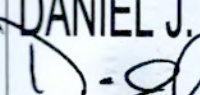
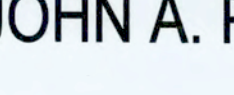



|                         |                         |
|-------------------------|-------------------------|
| ACER RUBRUM             | POPULUS VARIETIES       |
| BETULA VARIETIES        | PRUNUS VARIETIES        |
| CARPINUS VARIETIES      | PYRUS VARIETIES         |
| CRATAEGUS VARIETIES     | QUERCUS VARIETIES       |
| KOELERUTHERA            | SALIX WEEPING VARIETIES |
| LIVIDAMBAR STYACIFLUA   | TEUK TOMENTOSA          |
| LIRIODENDRON TULIPIFERA | ZELKOWA VARIETIES       |

ANY PLANTINGS INSTALLED IN CONFLICT WITH THIS REQUIREMENT MUST RECEIVE THE WRITTEN APPROVAL BY THE MUNICIPAL ENGINEER OR LANDSCAPE ARCHITECT, PRIOR TO PLANTING. FAILURE TO COMPLY WITH THESE REQUIREMENTS WILL REQUIRE THE REMOVAL OF THE PLANTING IN QUESTION. THIS REQUIREMENT DOES NOT APPLY TO SEEDING OR SOODING OR PLANTINGS SPECIFICALLY FOR SOIL STABILIZATION PURPOSES. THE PLANTING ASSOCIATED WITH ANY LOT GIVEN A CERTIFICATE OF OCCUPANCY OUTSIDE THESE PERIODS SHALL BE PROVIDED DURING THE PREVIOUS OR NEXT APPROPRIATE SEASON.



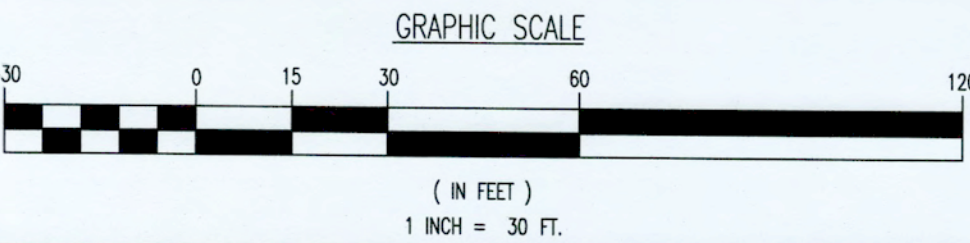
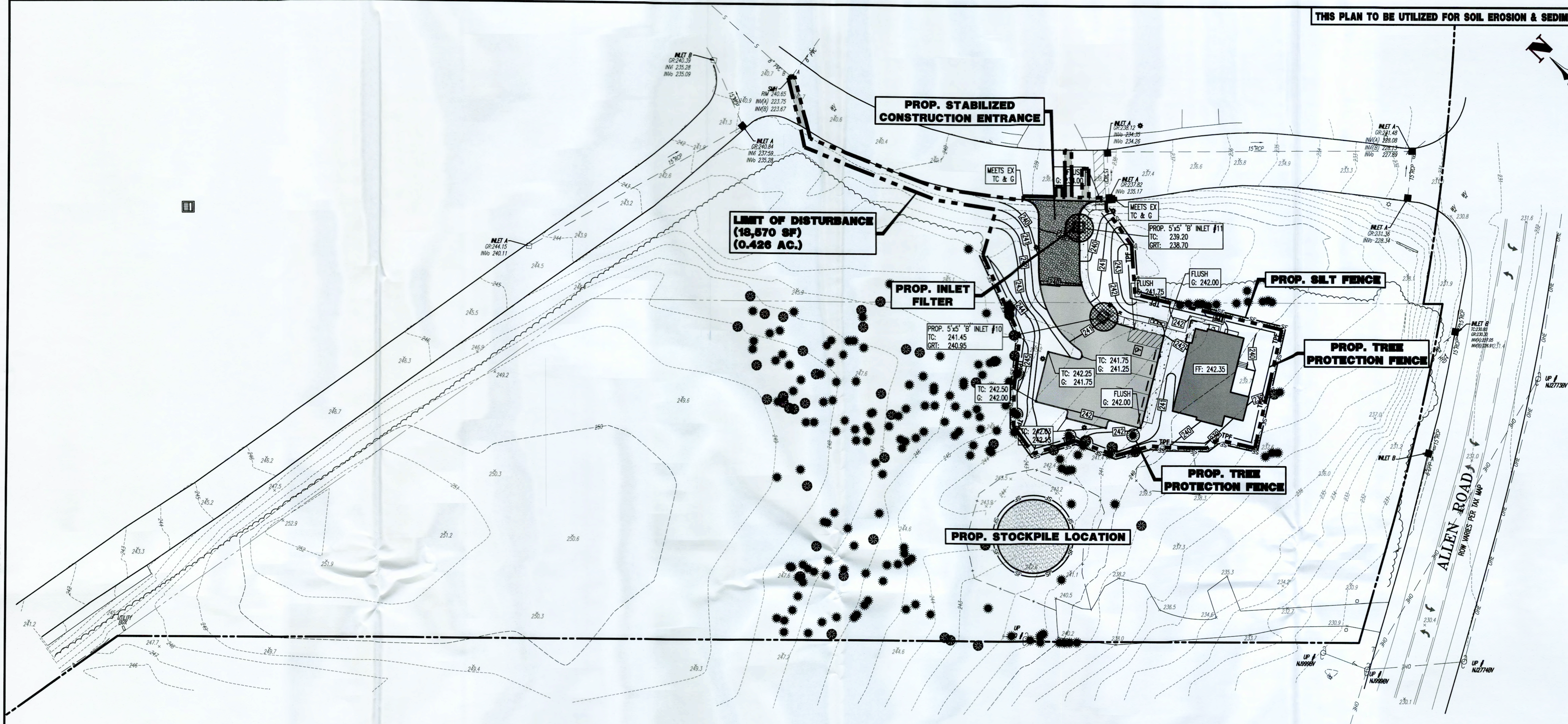
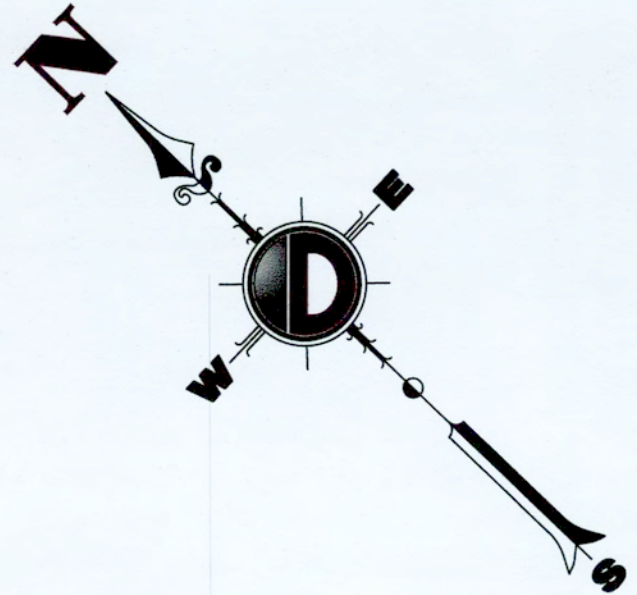
1. THIS LIGHTING PLAN ILLUSTRATES THE MINIMUM LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY OF NORTH AMERICA (IESNA) APPROVED METHODS. ACTUAL SITE ILLUMINATION LEVELS AND PERFORMANCE OF LUMINAIRES MAY VARY DUE TO VARIATIONS IN WEATHER, ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER RELATED VARIABLE FIELD CONDITIONS.
2. ALL EXISTING CONDITIONS LIGHTING LEVELS ARE REPRESENTATIVE OF AN APPROXIMATION UTILIZING LABORATORY DATA FOR SIMILAR FIXTURES AND/OR ACTUAL FIELD MEASUREMENTS TAKEN WITH A LIGHT METER. DUE TO FACTORS SUCH AS FIXTURE MAINTENANCE, EQUIPMENT TOLERANCES, MEASUREMENTS, ETC., ACTUAL LIGHTING LEVELS MAY DIFFER AND THE LIGHTING LEVELS DEPICTED ON THIS PLAN SHOULD BE CONSIDERED AS APPROXIMATE.
3. CONDUITS SHALL BE INSTALLED A MINIMUM OF 2 FEET BEHIND GUIDELINE POSTS.
4. ALL WIRING METHODS AND EQUIPMENT CONSTRUCTION SHALL CONFORM TO THE CURRENT NATIONAL ELECTRICAL CODE.
5. REFER TO ARCHITECTURAL PLANS FOR SITE WIRING DIAGRAM.
6. THIS PLAN IS PREPARED SPECIFICALLY TO ANALYZE THE LIGHTING LEVELS GENERATED BY THE PROPOSED ON-SITE LIGHTING ONLY. EXISTING LIGHT FIXTURES BEYOND THE EXTENTS OF THIS DEVELOPMENT/PROPERTY ARE NOT MODELLED IN THIS DESIGN, AND MAY ALTER ACTUAL LIGHTING LEVELS AT THE PROPERTY LINES.



|  |  |  |                                |
|--|--|--|--------------------------------|
| <b>THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION</b>  |  |  |                                |
|  <b>DYNAMIC<br/>ENGINEERING</b>   |  | <b>1006 Main Street<br/>Lake Como, NJ 07719<br/>P: 732.974.0191<br/>F: 732.974.0192<br/><a href="http://www.dynamicnj.com">www.dynamicnj.com</a></b> |                                |
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|  |  | <b>• ENVIRONMENTAL •</b>   | <b>• SURVEY •</b>              |
|  |  |  | <b>• PLANNING &amp; ZONING</b> |
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| <b>Allen, Texas: P: 973.534.0100   Austin, Texas: P: 973.646.2544   Houston, Texas: P: 281.789.4400   Delray Beach, Florida: P: 561.921.8050</b>                     |  |  |                                |
| <b>Newtown, Pennsylvania: P: 267.685.0274   Philadelphia, Pennsylvania: P: 215.253.4068   Bethlehem, Pennsylvania: P: 610.396.4400</b>                               |  |  |                                |
| <b>TITLE:</b>  |  |  |                                |
| <b>LANDSCAPE AND LIGHTING PLAN</b>   |  |  |                                |
| <b>PROJECT: FELLOWSHIP SENIOR LIVING</b>   |  | <b>JOB NO:</b>   | <b>DATE:</b>                   |
| <b>PROPOSED STAFF RESIDENCES</b>   |  | 4309--99--001  | 09/10/2022                     |
| BLOCK 9301, LOT 33; BLOCK 9401, LOT 9  |  | <b>DRAWN BY:</b>   | <b>SCALE(H)=1"=30'</b>         |
| 8000 FELLOWSHIP ROAD   |  | GMC  | (V)                            |
| BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY   |  | <b>DESIGNED BY:</b>  | <b>SHEET No:</b>               |
|  |  | AF   |                                |
|  |  | <b>CHECKED BY:</b>   |                                |
|  |  | DJD  |                                |
|  |  | <b>CHECKED BY:</b>   |                                |
|  |  |  |                                |
| <b>DANIEL J. DOUGHERTY</b>   |  | <b>JOHN A. PALUS</b>   |                                |
|   |  |   |                                |
| <b>PROFESSIONAL ENGINEER</b>   |  | <b>PROFESSIONAL ENGINEER</b>   |                                |
| NEW JERSEY LICENSE NO. A1960   |  | NEW JERSEY LICENSE NO. A1975   |                                |
|   |  |   |                                |
|  |  | <b>PROTECT YOURSELF</b>  |                                |
|  |  | ALL STATES REQUIRE REGISTRATION OF<br>SOURCES, MATERIALS, OR METHODS<br>PREPARED TO VERIFY THE QUALITY<br>SERVICE PROVIDED BY THE FIRM               |                                |
|  |  |   |                                |
|  |  | FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:<br><a href="http://WWW.CALL11.COM">WWW.CALL11.COM</a>   |                                |
|  |  | <b>Rev. # 1</b>  |                                |



THIS PLAN TO BE UTILIZED FOR SOIL EROSION & SEDIMENT CONTROL PURPOSES ONLY



THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

**DYNAMIC ENGINEERING**  
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Lake Como, New Jersey | Chester, New Jersey | Newark, New Jersey | Torrance, New Jersey | Allentown, Pennsylvania | Philadelphia, Pennsylvania | Bethlehem, Pennsylvania | Allentown, Pennsylvania | Allentown, Pennsylvania

**SOIL EROSION AND SEDIMENT CONTROL PLAN**  
PROJECT: **FELLOWSHIP SENIOR LIVING**  
**PROPOSED STAFF RESIDENCES**  
BLOCK 9301, LOT 33; BLOCK 9401, LOT 9  
8000 FELLOWSHIP ROAD  
BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

DANIEL J. DOUGHERTY  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41989

JOHN A. PALUS  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41975

**10**  
OF 14  
Rev. # 1

JOB No: 4309-99-001  
DATE: 09/10/2022  
DRAWN BY: GMC  
DESIGNED BY: AF  
CHECKED BY: DJD  
CHECKED BY: —

ALL STATE REQUIREMENTS OF  
CONSTRUCTION, EXISTING, OR ANY OTHER  
PERMITS TO OBTAIN THE CITY'S  
SERVICE, ADDRESS & ALL CASES  
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:  
WWW.CALL811.COM

Plotted: 02/09/23 - 11:49 AM By: mdelawiechowski - Product: Ver. 24.2a (LMS Test)  
File: \\depc.local\decoders\data\depc\_projects\4309\_fellowship\_senior\_living\99-001\_bernards\dwg\Site Plans\0430999001SET.dwg -> 10 SOIL EROSION AND SEDIMENT CONTROL PLAN

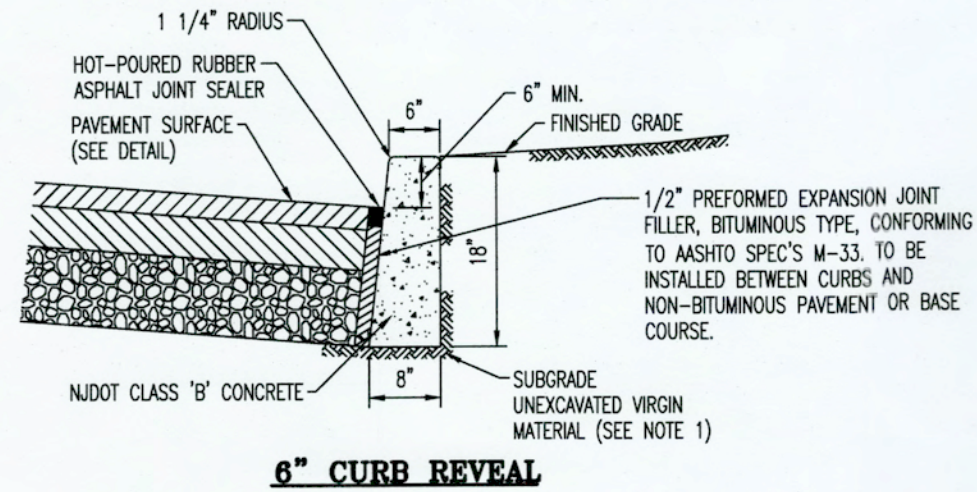


APPLYING THE FULL 0.2 TO 0.4 INCHES OF WATER AFTER SPREADING PELLETIZED MULCH ON THE SEED BED IS EXTREMELY IMPORTANT FOR SUFFICIENT ACTIVATION AND EXPANSION OF THE MULCH TO PROVIDE SOIL COVERAGE.

### TEMPORARY STOCKPILE DETAIL



Product Ver: 24.2a (LMS Tech) Plotted: 02/09/23 - 11:49 AM By: mdevicchio, File: \\despc-local\despc\data\despc projects\4509 fellowshp senior living\98-001 bernards\Draw\Site Plans\0450998001SD1.dwg, -----> 12 CONSTRUCTION DETAILS

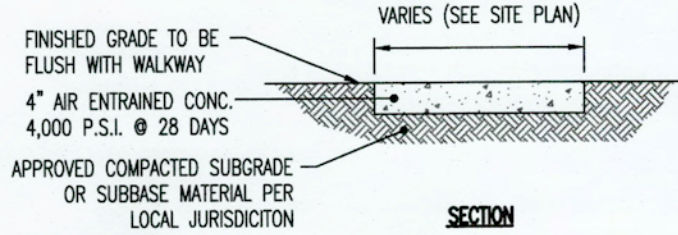
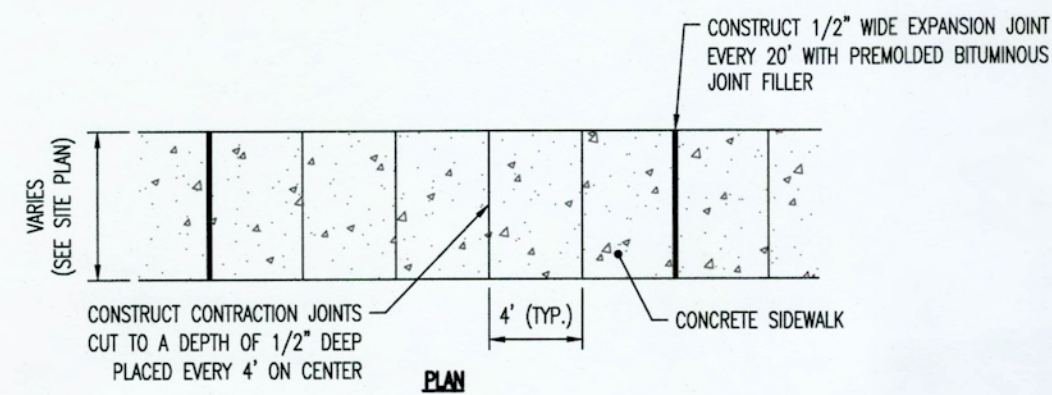


NOTES:

1. ANY EXCAVATION BELOW DESIRED GRADE DUE TO OVER EXCAVATION OR WET SOIL CONDITIONS SHALL BE BACKFILLED WITH 3/4\"
2. TRANSVERSE JOINTS 1/2\"
3. DUMMY JOINTS (FORMED) SHALL BE INSTALLED MIDWAY BETWEEN EXPANSION JOINTS.
4. WIDTH OF JOINT FILLER STRIP EQUAL TO THE THICKNESS OF THE PAVEMENT LESS 1/2\"
5. THESE SPECIFICATIONS ALSO MEET RISIS DESIGN STANDARDS.

CONCRETE CURB DETAIL

NOT TO SCALE

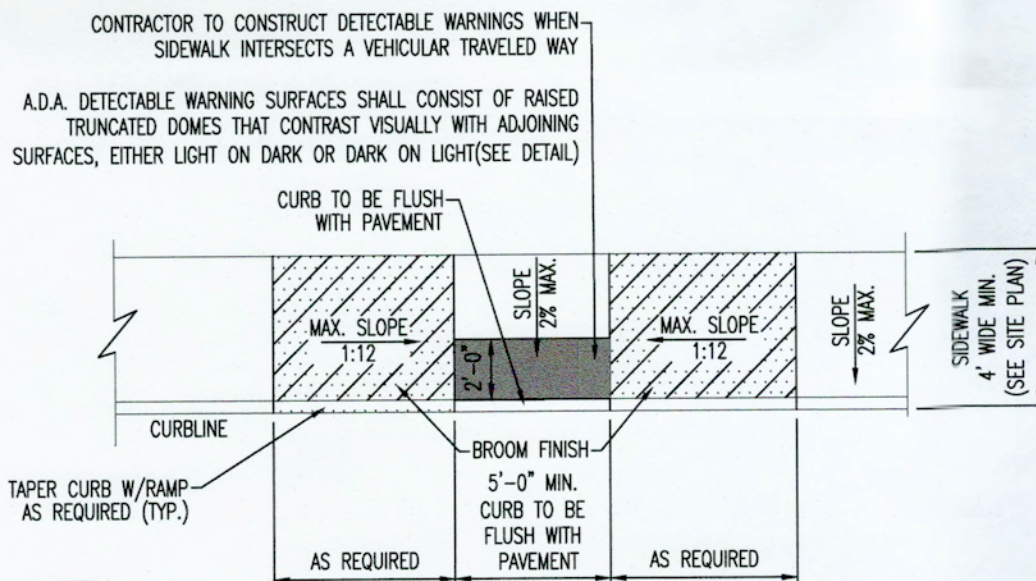


NOTE:

1. MAX. CROSS SLOPE 1/4\"
2. PROVIDE 1/2\"
3. REFER TO SITE PLAN FOR SIDEWALK WIDTH.
4. PROVIDE A BROOM FINISH TO PROVIDE A SLIP RESISTANT WEARING SURFACE IN ACCORDANCE WITH A.D.A. REGULATIONS. FINISH THE EDGES OF THE GROOVES USING AN EDGING TOOL WITH A 1/4\"

SIDEWALK DETAIL

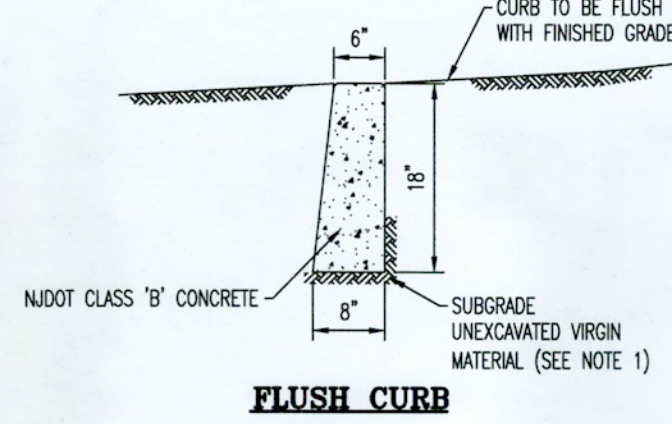
NOT TO SCALE



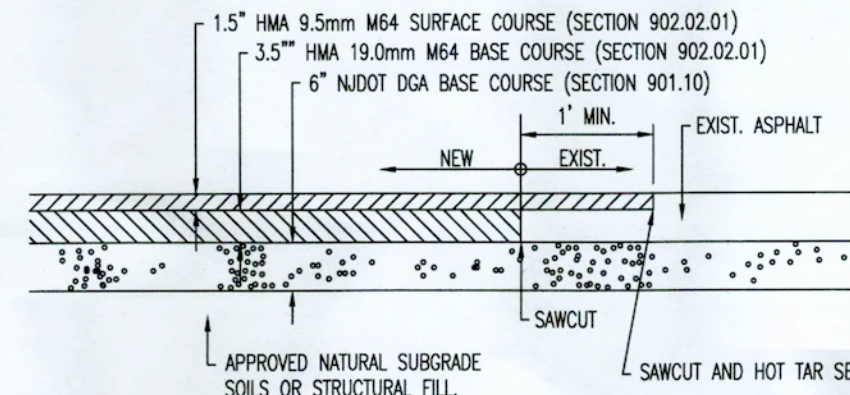
- NOTES:
- 1.) CURB RAMPS MAY NOT EXTEND INTO ANY PORTION OF THE PARKING SPACE OR ASSOCIATED STRIPPED ISLAND.
  - 2.) COUNTER SLOPES OF ADJOINING GUTTERS AND PAVEMENT SHALL NOT BE STEEPER THAN 1:20 WITH A MAX. CROSS SLOPE OF 2%.
  3. A LEVEL LANDING AREA (MAX. SLOPE 2% IN ANY DIRECTION) SHALL BE PROVIDED AT THE TOP OF THE RAMP. THE LANDING CLEAR LENGTH SHALL BE 36\"
  - 4.) CURB RAMPS, PAVEMENT MARKINGS & APPLICABLE SIGNAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST A.D.A. ACCESSIBILITY GUIDELINES.

A.D.A. PARALLEL CURB RAMP DETAIL

NOT TO SCALE



FLUSH CURB

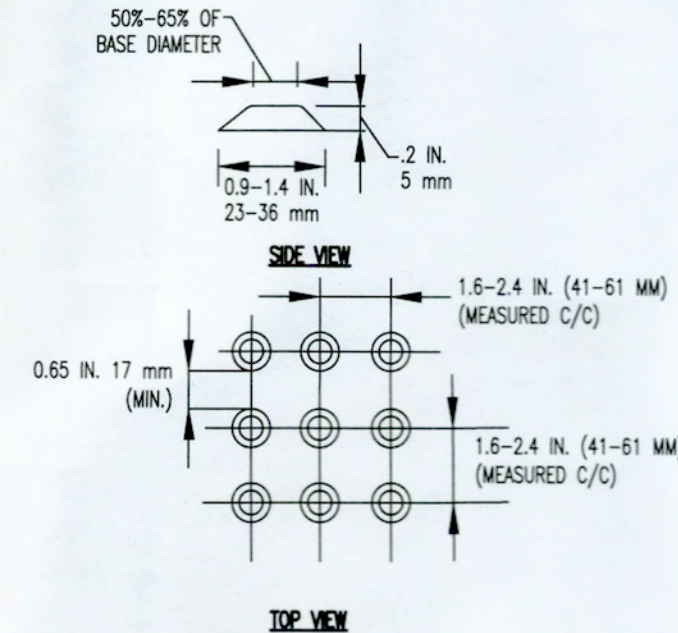


NOTES:

1. ALL PAVEMENT SECTION MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH NEW JERSEY DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2019.
2. OWNER SHALL CONTACT AND ENGAGE DYNAMIC EARTH, LLC. TO INSPECT AND TEST SUBGRADE SOILS. CONTRACTOR SHALL CONTACT DYNAMIC EARTH, LLC. AT (908) 879-7095 (WWW.DYNAMIC-EARTH.COM) AT ONSET OF CONSTRUCTION TO CONFIRM REQUIREMENTS AND COORDINATE INSPECTIONS.
3. SUBGRADE SOILS SHALL BE APPROVED BY DYNAMIC EARTH, LLC. APPROVED NATURAL SOILS SHALL BE COMPACTED AND PROOFROLLED WITH A LOADED TANDUM AXLE TRUCK TO A FIRM AND UNFELLING CONDITION. UNSUITABLE MATERIALS SHALL BE REMOVED AND REPLACED WITH STRUCTURAL FILL OR STABILIZED AS DIRECTED BY DYNAMIC EARTH, LLC. ANY STRUCTURAL FILL AT OR BELOW PAVEMENT SUBGRADE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM-D1557.
4. CONTRACTOR TO REFER TO GEOTECHNICAL REPORT FOR FINAL PAVEMENT SECTION DESCRIPTION.

STANDARD DUTY ASPHALT PAVEMENT DETAIL

NOT TO SCALE

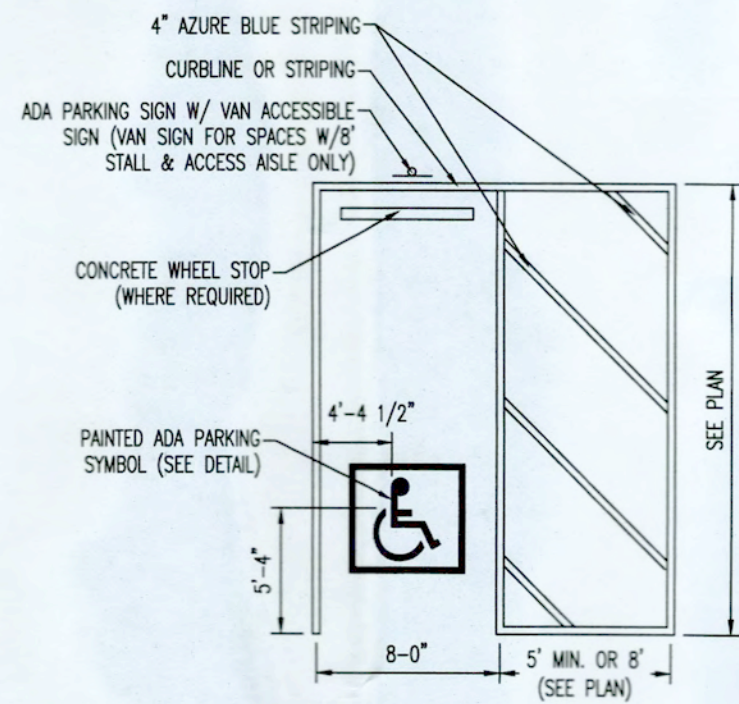


NOTES:

1. DETECTABLE WARNINGS SHALL BE A PRE-MANUFACTURED ARMOUR TILE TACTILE SYSTEM OR APPROVED EQUIVALENT.
2. WARNING SURFACE SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT ON DARK OR DARK ON LIGHT PER LATEST A.D.A. ACCESSIBILITY GUIDELINES.
3. CONTRACTOR TO COORDINATE SPECIFIC SYSTEM AND MATERIALS UTILIZED WITH THE ENGINEER TO ENSURE LOCAL, STATE AND A.D.A. COMPLIANCE PRIOR TO CONSTRUCTION.
4. DETECTABLE WARNING SURFACE SHALL BE IN ACCORDANCE WITH THE LATEST A.D.A. ACCESSIBILITY GUIDELINES.

TRUNCATED DOME PATTERN FOR A.D.A. DETECTABLE WARNING SURFACE

NOT TO SCALE

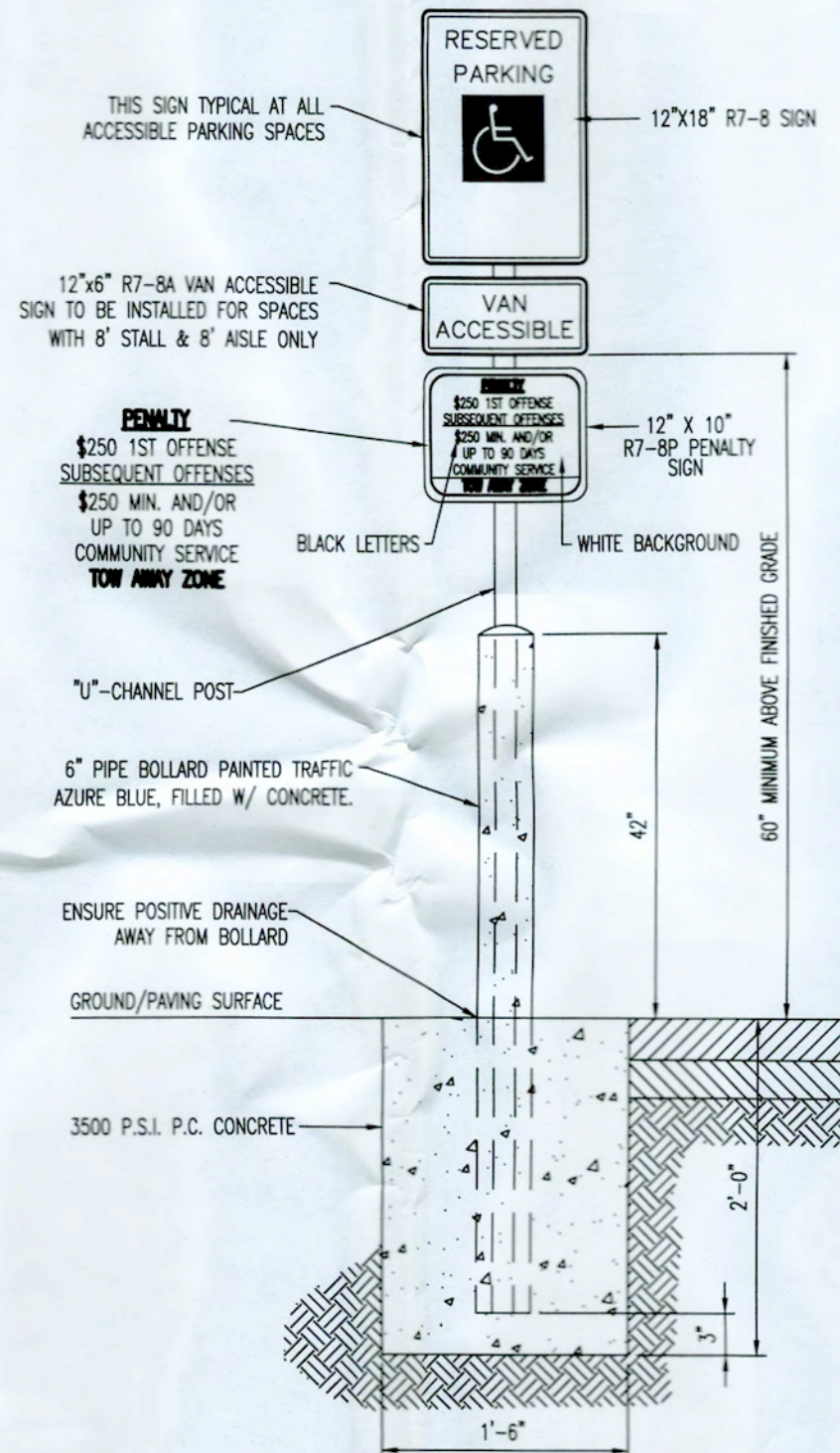


NOTES:

1. PAVEMENT STRIPING FOR ALL ADA PARKING SPACES SHALL BE PAINTED AZURE BLUE.
2. WHERE AN ADA PARKING STALL MEETS A STANDARD PARKING STALL, AN AZURE BLUE AND WHITE PAVEMENT STRIPE SHALL BE PAINTED.
3. ALL PAVEMENT STRIPING, MARKINGS AND SIGNAGE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST ADA ACCESSIBILITY GUIDELINES.

ADA STALL MARKINGS DETAIL

NOT TO SCALE

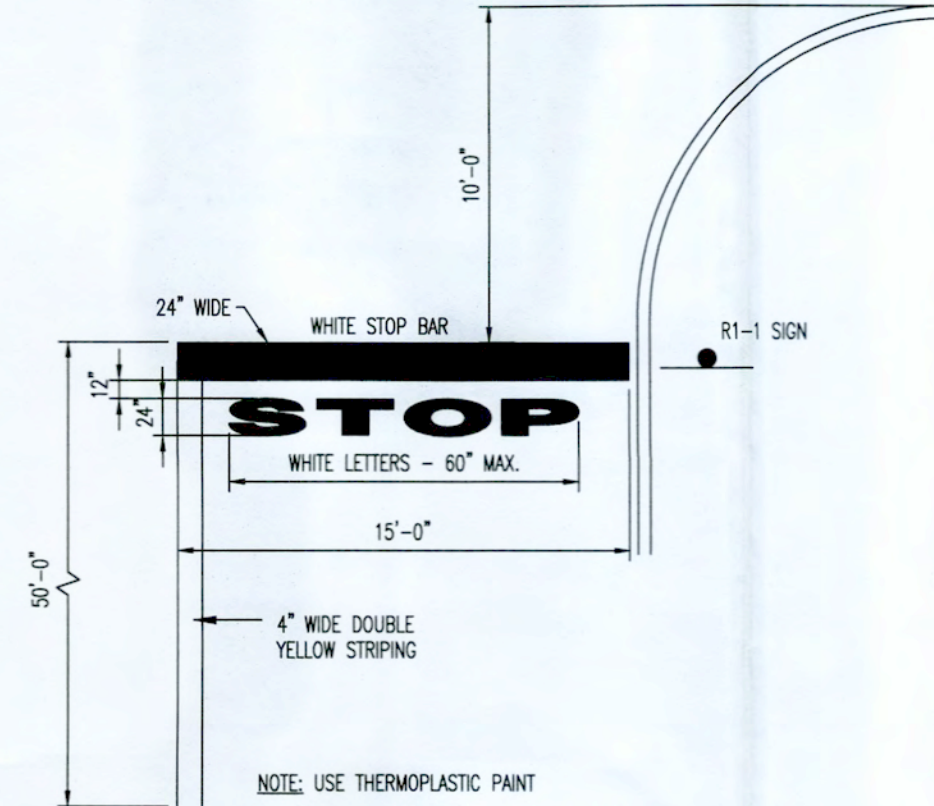


NOTES:

- 1.) IF AT THE TIME OF CONSTRUCTION THE STATE OF NEW JERSEY HAS APPROVED FINES/PENALTIES DIFFERENT THAN THOSE INDICATED ON THIS DETAIL, CONTRACTOR IS TO PROVIDE SIGNAGE INDICATING THE CURRENT FINES/PENALTIES AS APPROVED BY THE STATE OF NEW JERSEY.
- 2.) VAN ACCESSIBLE SIGN SHALL BE 60\"

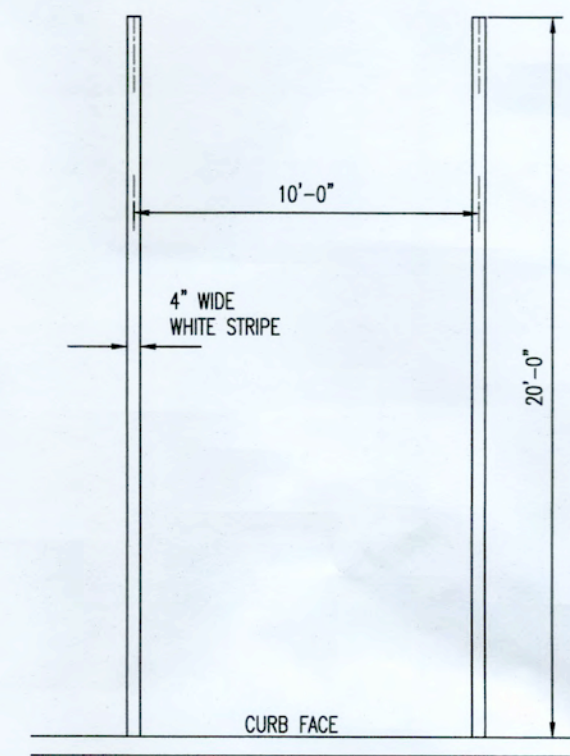
A.D.A. PARKING SIGN ON BOLLARD DETAIL

NOT TO SCALE



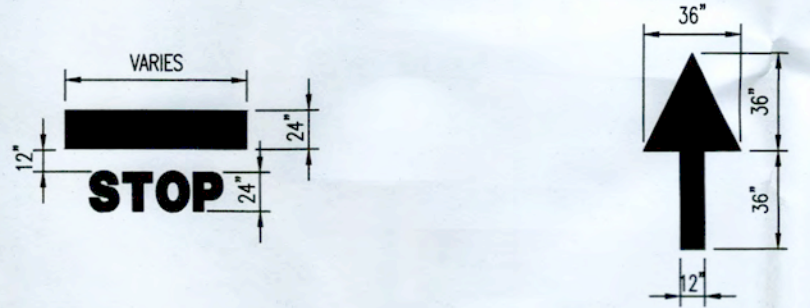
CONTROLLED INTERSECTION STRIPING AND SIGNAGE DETAIL

NOT TO SCALE



PARKING STALL STRIPING DETAIL

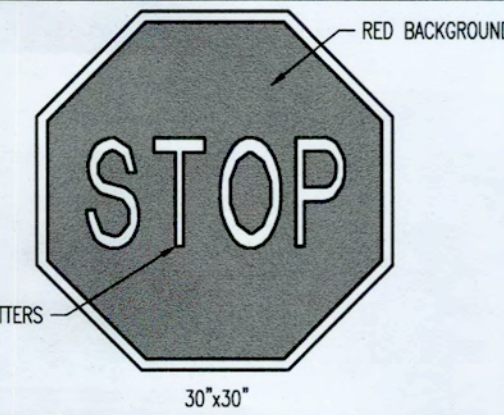
NOT TO SCALE



NOTE: ARROWS AND WORDS CAN BE ARRANGED IN OTHER COMBINATIONS THAN THOSE ILLUSTRATED HERE TO ACHIEVE DESIRED RESULT. ALL PAINT TO BE THERMOPLASTIC.

PAINTED MARKING DETAILS

NOT TO SCALE



R1-1 SIGN DETAIL

NOT TO SCALE

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

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1504 Main Street  
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F: 732.974.3531  
www.dynamiceng.com

Offices currently located in:  
Lake Carmo, New Jersey T: 732.974.0198 | Chester, New Jersey T: 908.879.7229 | Newark, New Jersey T: 973.755.7200 | Toms River, New Jersey T: 732.478.0000  
Allentown, Pennsylvania T: 717.234.2100 | Austin, Texas T: 512.444.5444 | Houston, Texas T: 281.789.4400 | Delray Beach, Florida T: 561.971.8570  
Newtown, Pennsylvania T: 267.485.0276 | Philadelphia, Pennsylvania T: 215.253.4868 | Bethlehem, Pennsylvania T: 610.258.4402

**CONSTRUCTION DETAILS**

PROJECT: **FELLOWSHIP SENIOR LIVING PROPOSED STAFF RESIDENCES**  
BLOCK 9301, LOT 33; BLOCK 9401, LOT 9  
8000 FELLOWSHIP ROAD  
BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY

JOB No: 4309-99-001  
DATE: 09/10/2022  
SCALE: (H) NOT TO (V) SCALE  
SHEET No: 12 OF 14

DRAWN BY: GMC  
DESIGNED BY: AF  
CHECKED BY: DJD  
CHECKED BY: —

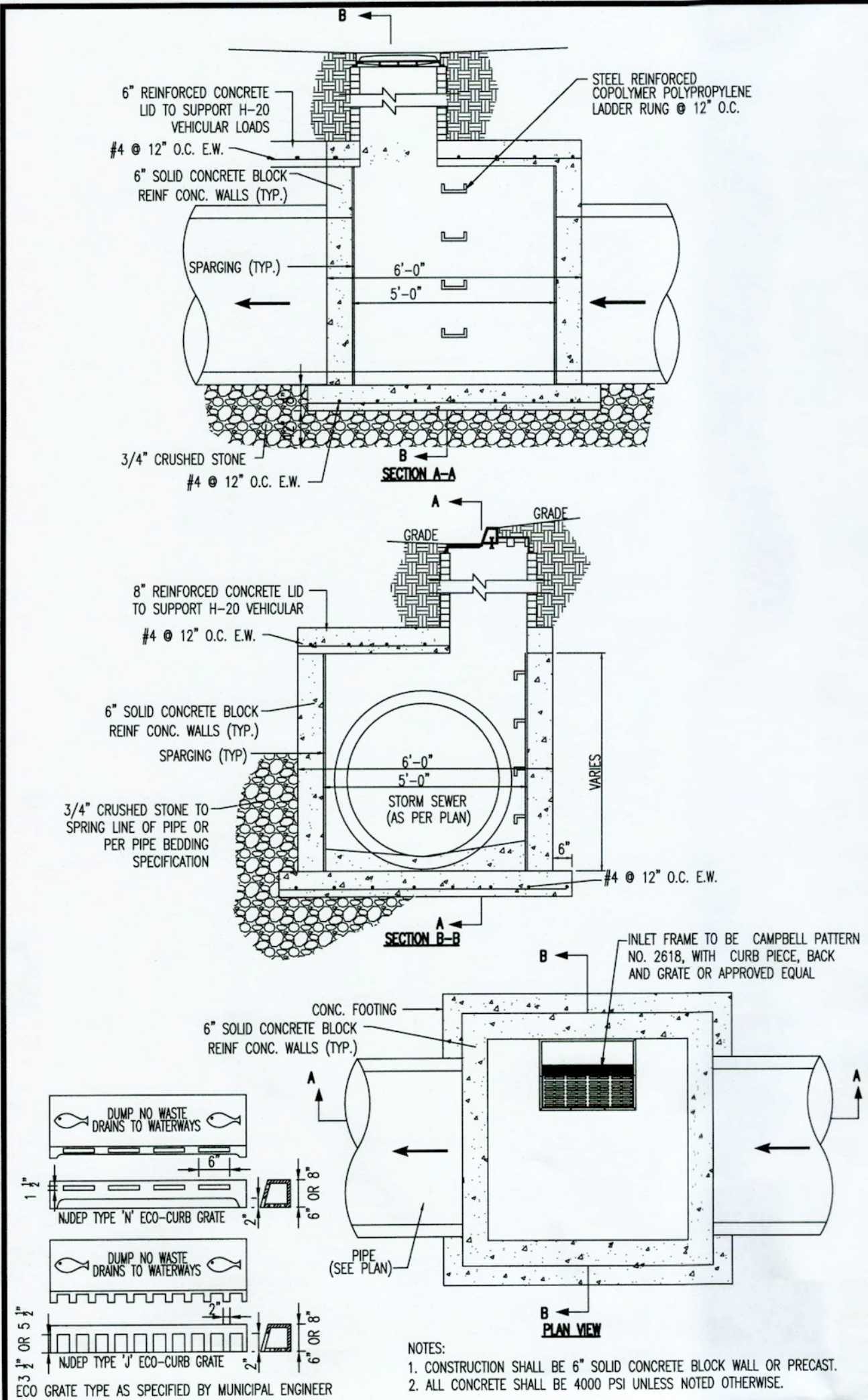
DANIEL J. DOUGHERTY  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41975

JOHN A. PALUS  
PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE No. 41975

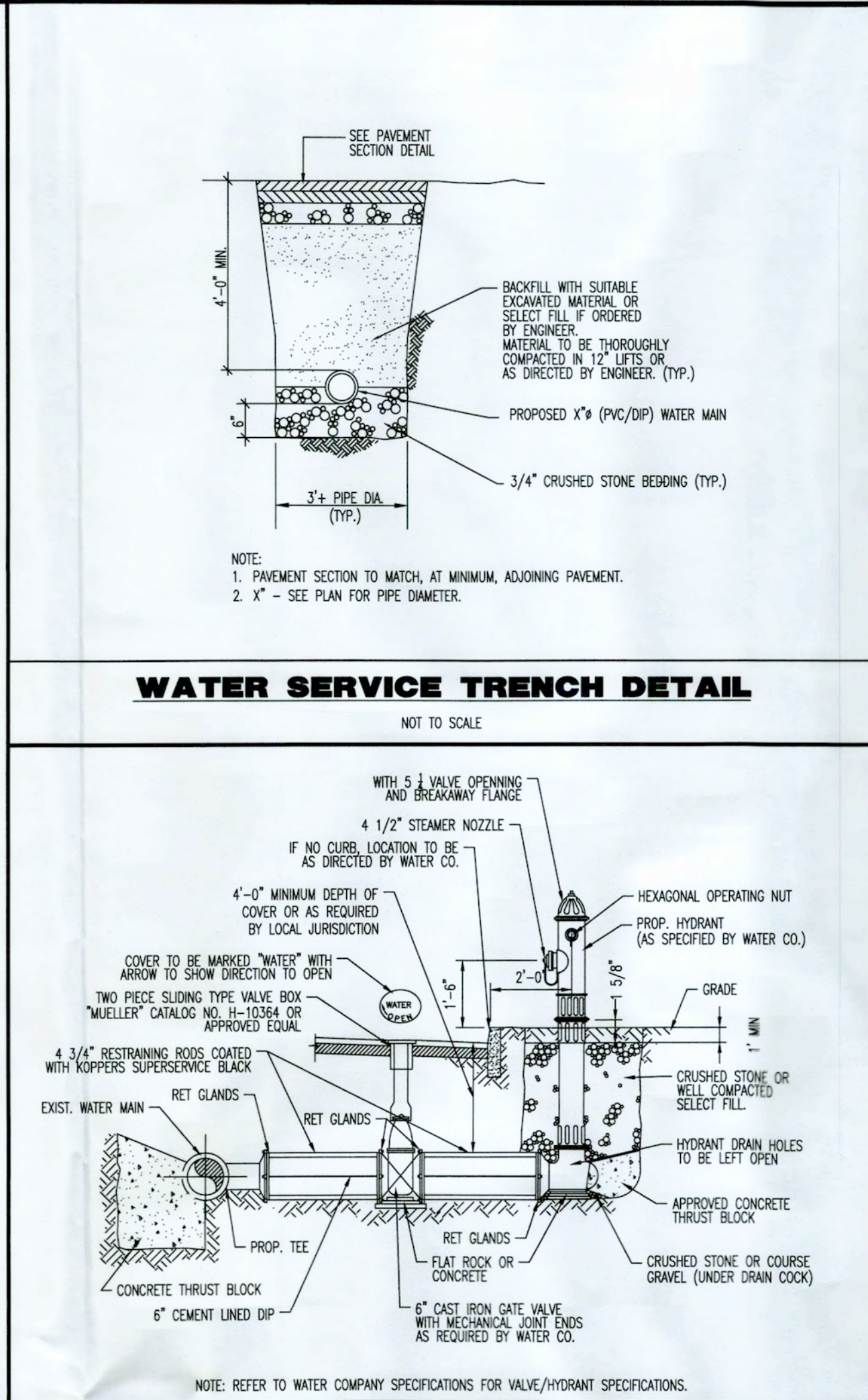
811 PROTECT YOURSELF  
ALL EXISTING UTILITIES MUST BE LOCATED PRIOR TO ANY EXCAVATION. CALL 811 TO LOCATE UTILITIES. FOR STATE SPECIFICATIONS, VISIT: WWW.CALL811.COM

Rev. # 1

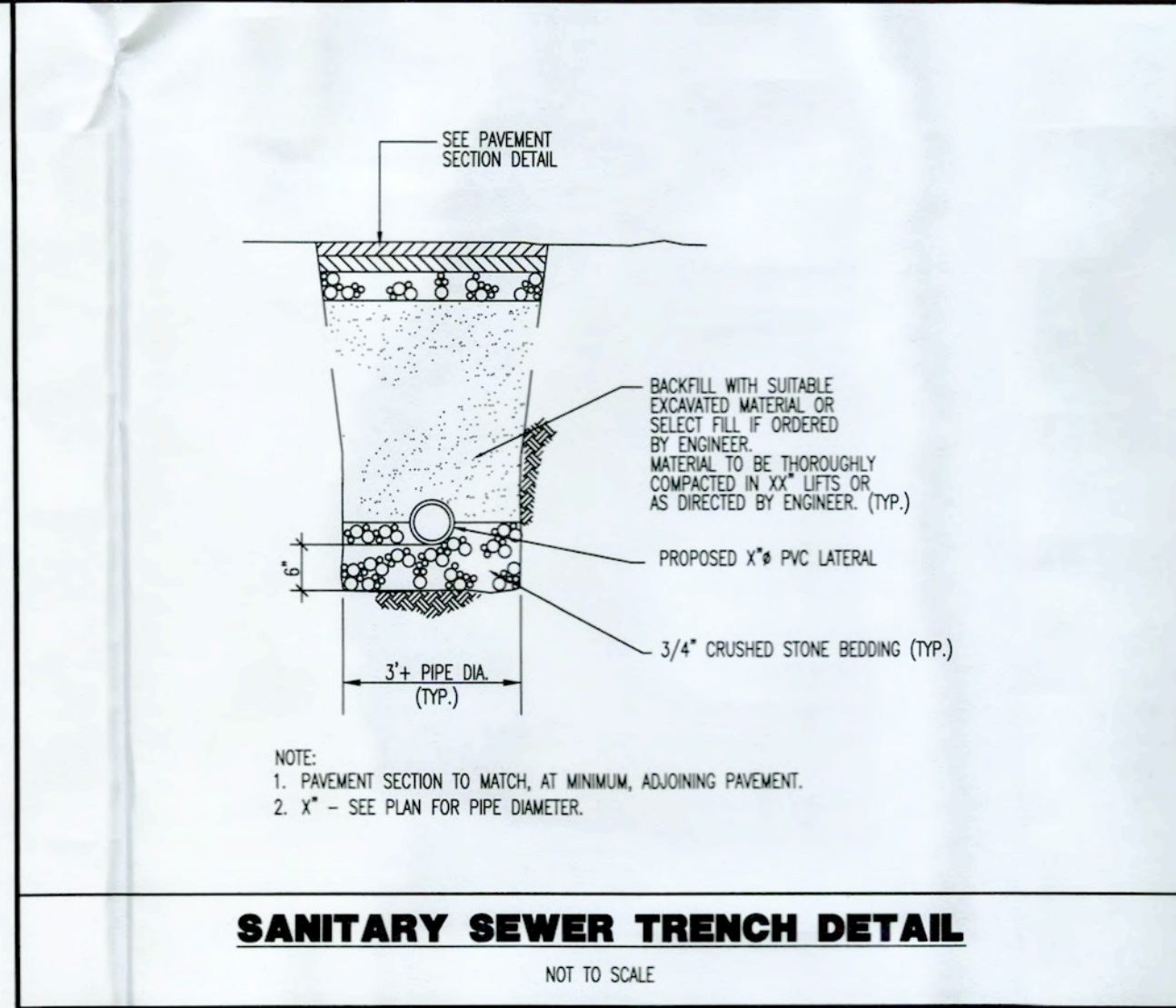




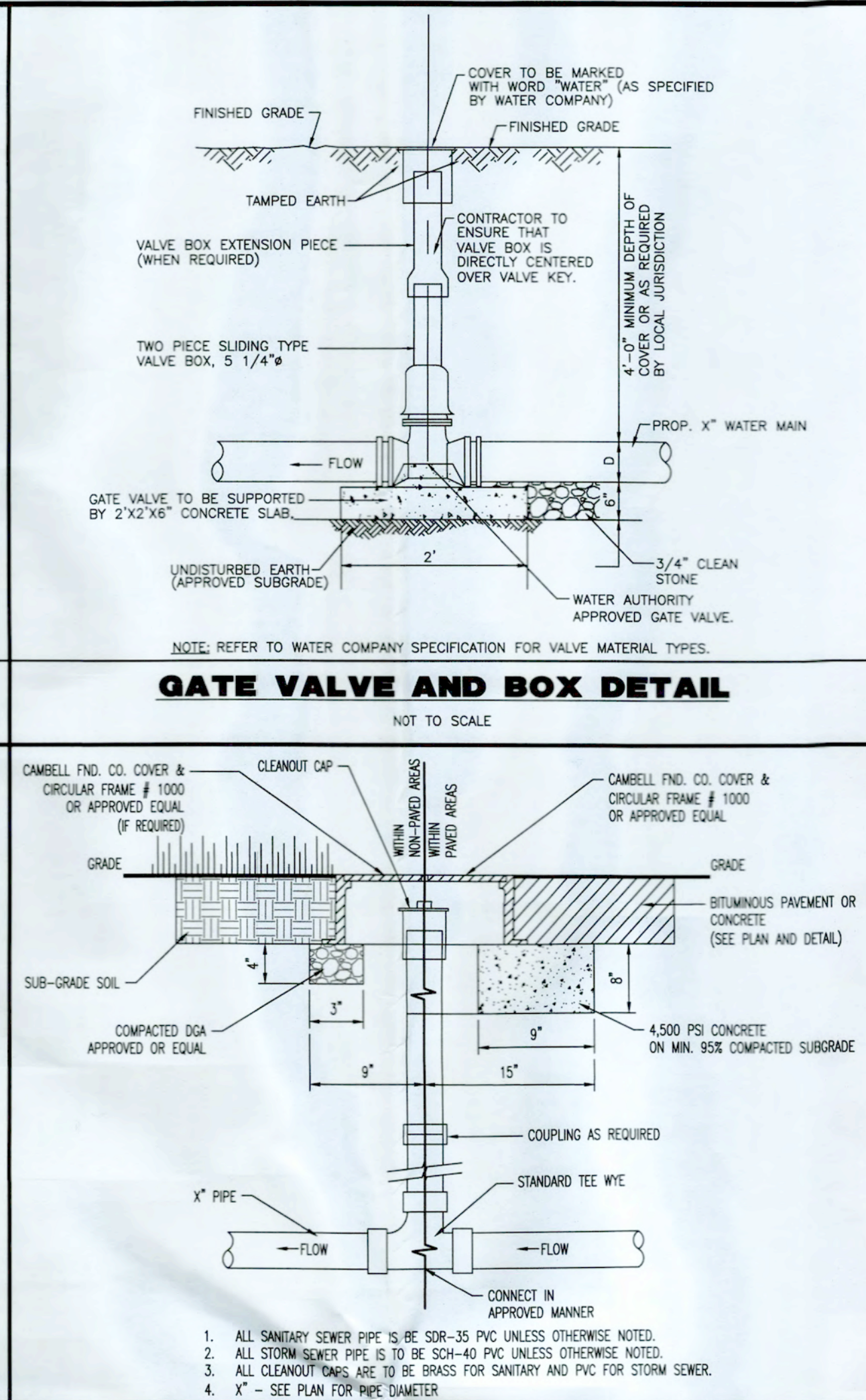
**5' X 5' TYPE 'B' INLET DETAIL**  
NOT TO SCALE



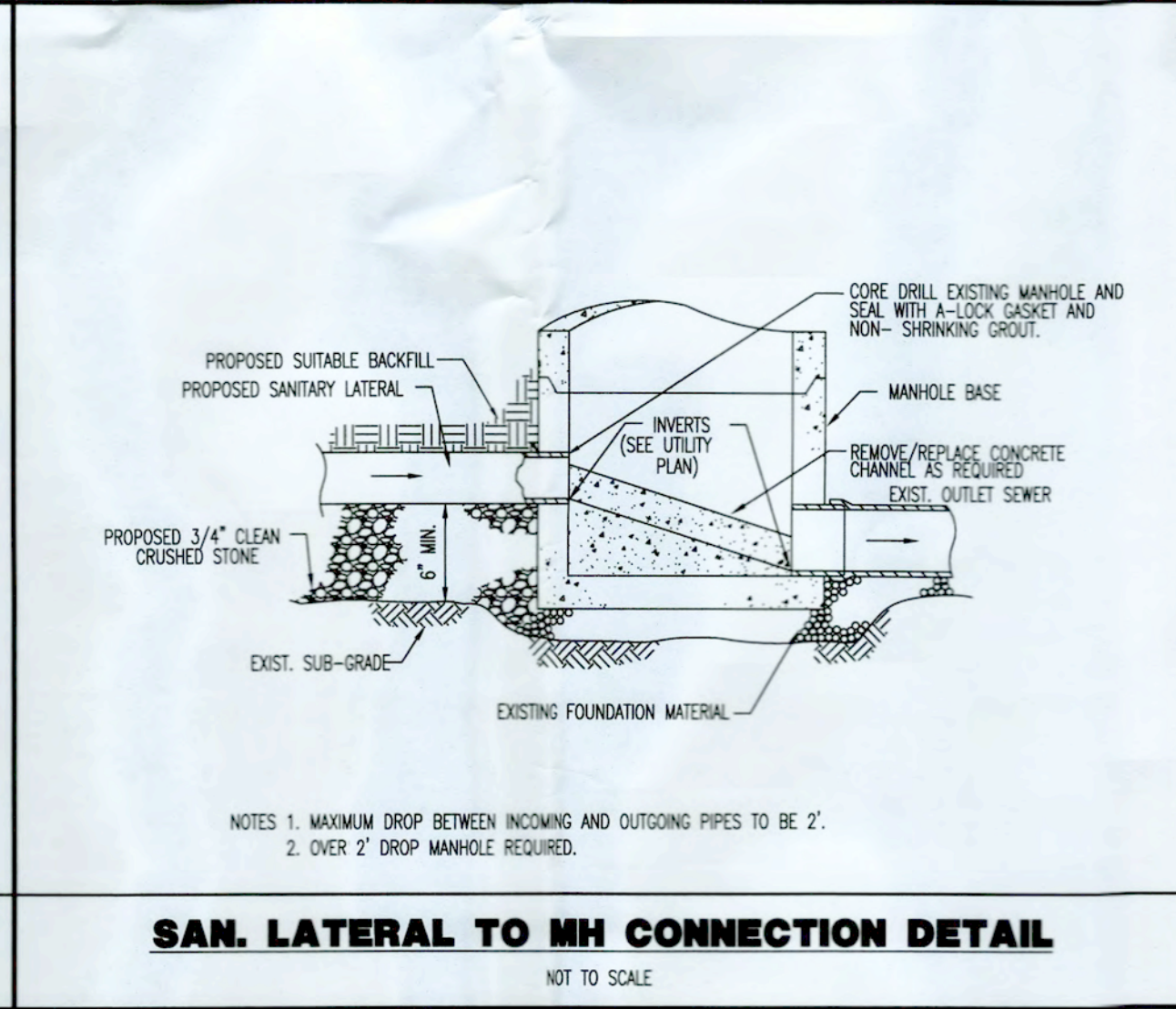
**TYPICAL HYDRANT & VALVE INSTALLATION**  
NOT TO SCALE



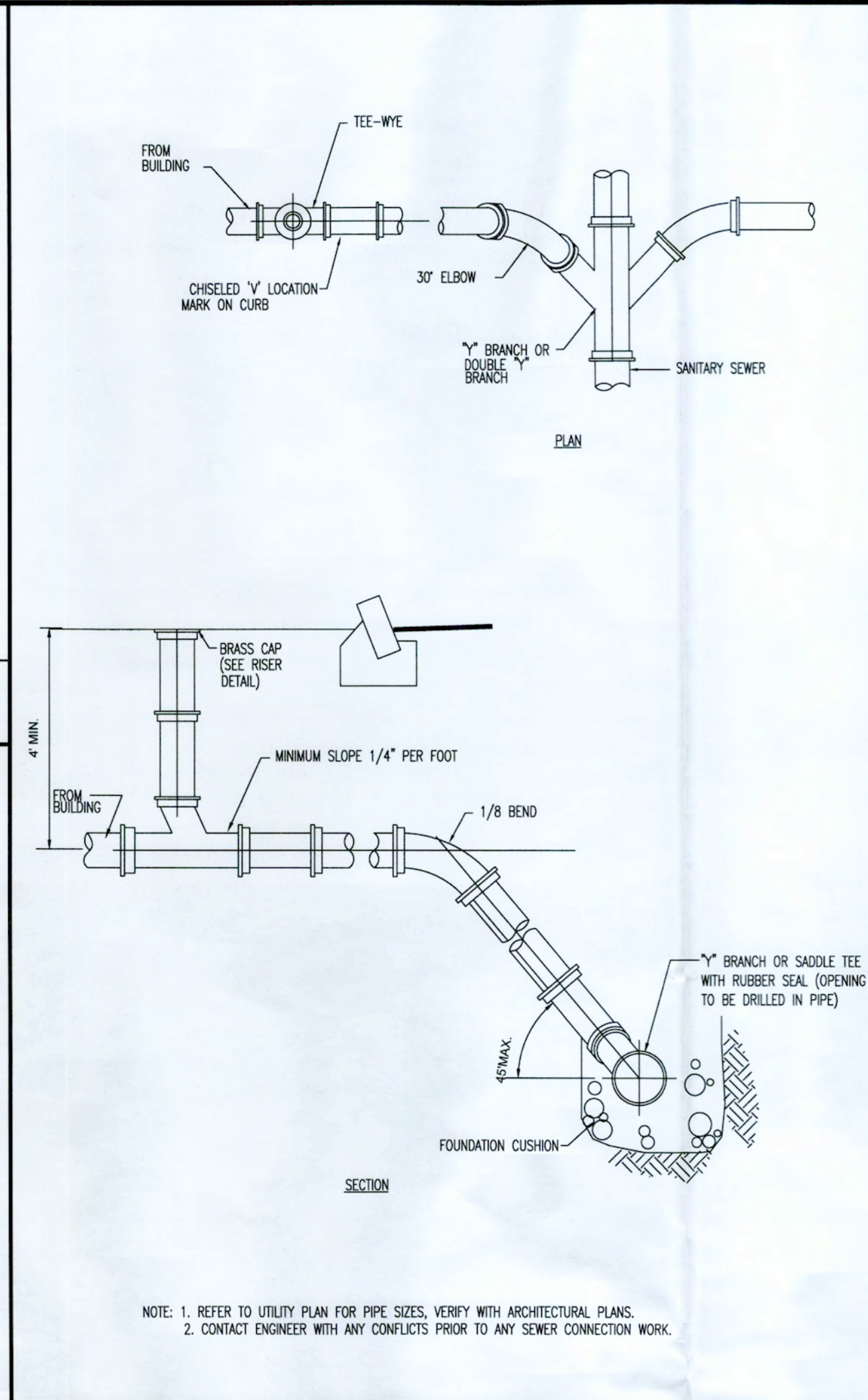
**SANITARY SEWER TRENCH DETAIL**  
NOT TO SCALE



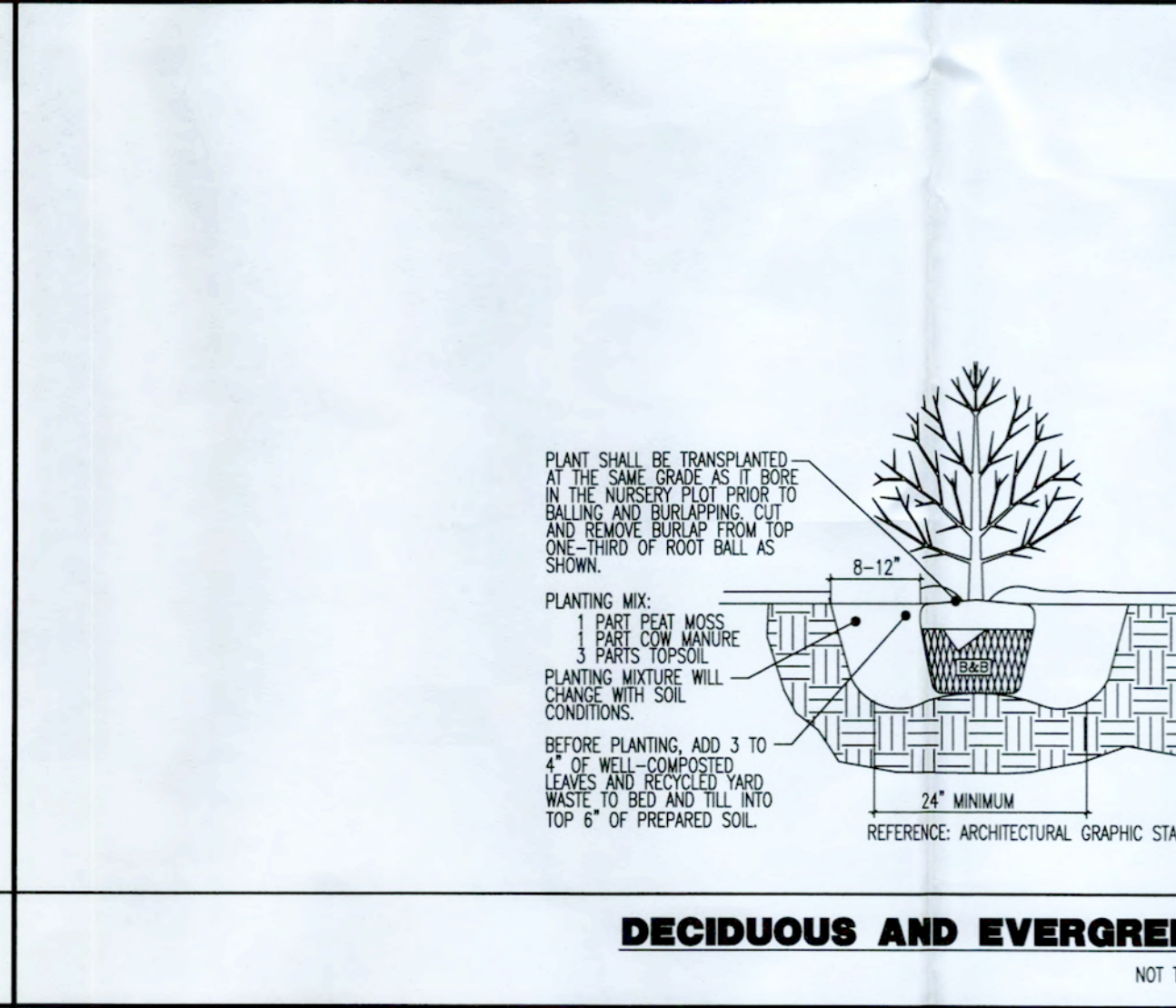
**CLEANOUT DETAIL**  
NOT TO SCALE



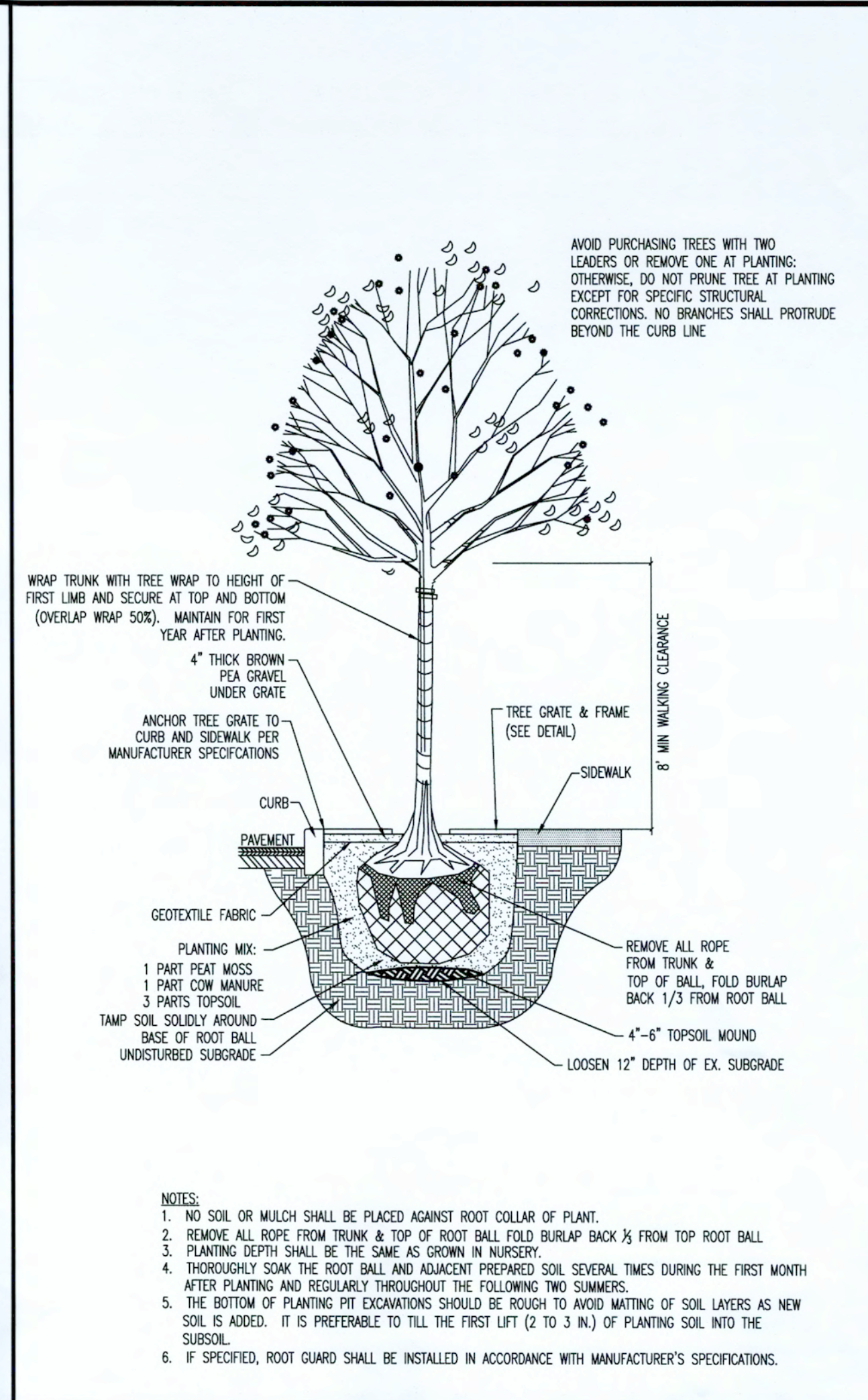
**SAN. LATERAL TO MH CONNECTION DETAIL**  
NOT TO SCALE



**STANDARD CONNECTION DETAIL**  
NOT TO SCALE



**DECIDUOUS AND EVERGREEN SHRUB PLANTING DETAIL**  
NOT TO SCALE



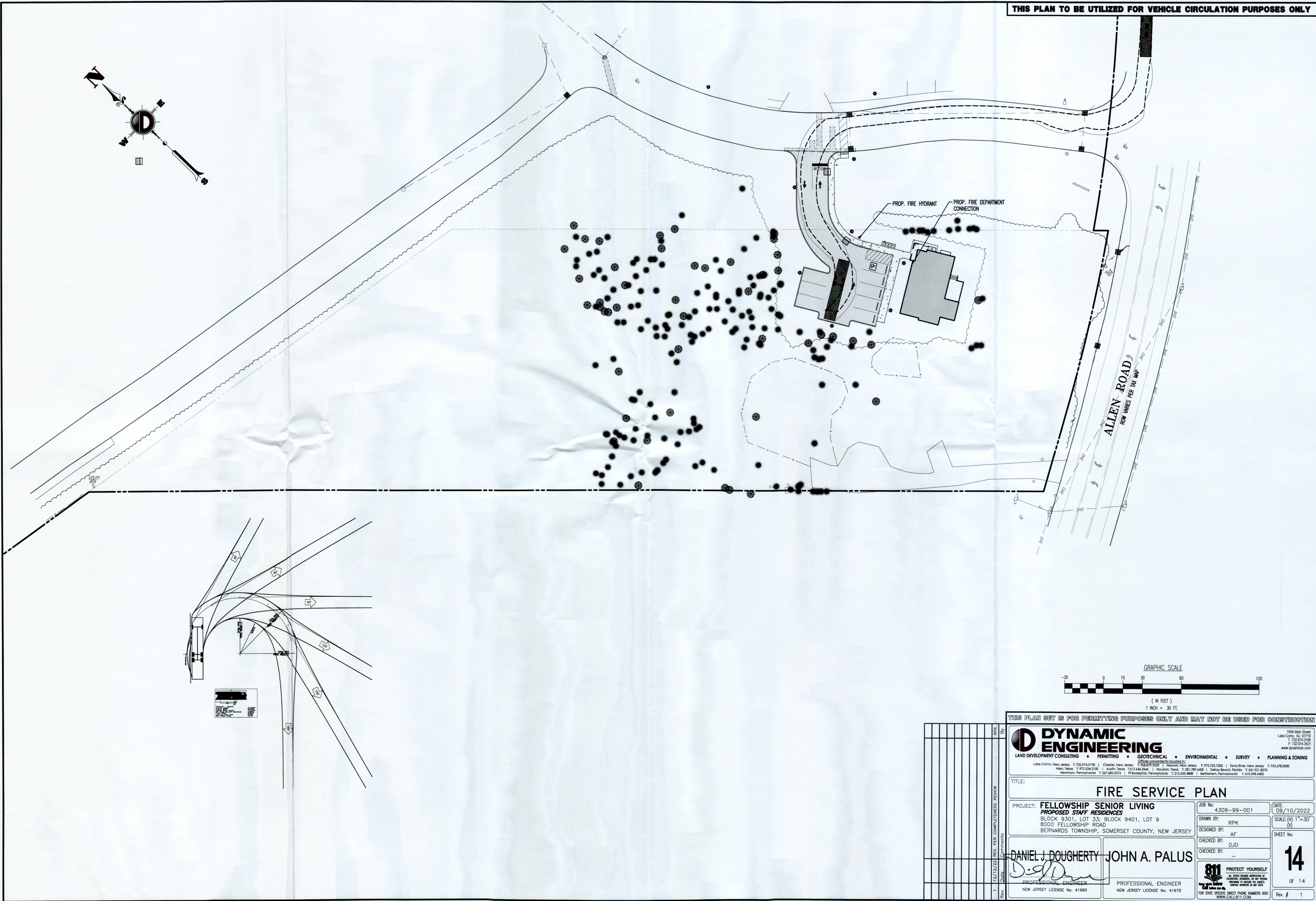
**STREET TREE PLANTING DETAIL**  
NOT TO SCALE

THIS PLAN SET IS FOR PERMITTING PURPOSES ONLY AND MAY NOT BE USED FOR CONSTRUCTION

|   |  |   |  |
|---|--|---|--|
| <b>DYNAMIC ENGINEERING</b><br>LAND DEVELOPMENT CONSULTING • PERMITTING • GEOTECHNICAL • ENVIRONMENTAL • SURVEY • PLANNING & ZONING  |  | 1024 Main Street<br>Lake Como, NJ 07719<br>T: 732.974.0198<br>F: 732.974.0198<br>www.dynamiceng.com             |  |
| TITLE: <b>CONSTRUCTION DETAILS</b>  |  |   |  |
| PROJECT: <b>FELLOWSHIP SENIOR LIVING<br/>PROPOSED STAFF RESIDENCES</b><br>BLOCK 9301, LOT 33, BLOCK 9401, LOT 9<br>8000 FELLOWSHIP ROAD<br>BERNARDS TOWNSHIP, SOMERSET COUNTY, NEW JERSEY                                   |  | JOB No: 4309-99-001<br>DATE: 09/10/2022<br>DRAWN BY: GMC<br>DESIGNED BY: AF<br>CHECKED BY: DJD<br>CHECKED BY: - | SCALE: (H) NOT TO SCALE<br>(V) SCALE<br>SHEET No: <b>13</b><br>OF 14 |
| DANIEL J. DOUGHERTY<br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41690  |  | JOHN A. PALUS<br>PROFESSIONAL ENGINEER<br>NEW JERSEY LICENSE No. 41975  |  |
| PROTECT YOURSELF<br>ALL STATES REQUIRE NOTIFICATION OF<br>CONSTRUCTION ACTIVITIES. IF YOU<br>PREPARE TO BEGIN THE WORK,<br>PLEASE ADVISE US BY E-MAIL.<br>FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT:<br>WWW.CALL811.COM |  |   |  |



Plotted: 02/09/23 - 11:49 AM, By: malvecchio, Product Ver: 24.2a (LMS Tech)  
File: \\dpcpl\local\desoldera\data\sepc\_projects\4309\_fellowship\_senior\_living\99-001\_bernarda.dwg, Site Plans\40999001SV1.dwg, ----> 14 FIRE SERVICE PLAN





**TOWNSHIP OF BERNARDS**  
**ZONING BOARD OF ADJUSTMENT**  
**APPLICATION STATUS FORM**

Application No: ZB23-001 Block: 11501 Lot: 15 Zone: R-3

Applicant: REALE, STEPHEN

Address of Property: 71 LONG ROAD

Description: CONSTRUCTION OF NEW DWELLING

**APPLICATION CHECKLIST**

|   |  |
|---|--|
| <input checked="" type="checkbox"/> Original + 16 copies of Application | <input checked="" type="checkbox"/> Engineering Plan/Plot Plan |
| <input checked="" type="checkbox"/> W-9                                 | <input checked="" type="checkbox"/> Architectural Plans        |
| <input checked="" type="checkbox"/> Site Visit Consent (A)              | <input checked="" type="checkbox"/> Survey                     |
| <input type="checkbox"/> Ownership Form (B)                             | <input checked="" type="checkbox"/> Photographs                |
| <input checked="" type="checkbox"/> 200' Property Search List (C)       | <input checked="" type="checkbox"/> Wetlands Report/LOI        |
| <input checked="" type="checkbox"/> Tax Certification (D)               | <input checked="" type="checkbox"/> Application Fee            |
| <input checked="" type="checkbox"/> Notice to be Served/Published (E)   | <input checked="" type="checkbox"/> Escrow Deposit             |
| <input checked="" type="checkbox"/> Dimensional Statistics Form (F)     | <input checked="" type="checkbox"/> Imaging Fee                |
| <input type="checkbox"/> Contributions Disclosure Form (G)              | <input type="checkbox"/> Tax Map Revision Fee                  |
|   | <input checked="" type="checkbox"/> Checklist                  |

**SCHEDULING**

02.02.23 Original Submission Date  
\_\_\_\_\_ Completeness Deadline (45 days)  
\_\_\_\_\_ Incomplete Date  
\_\_\_\_\_ Resubmission Date  
\_\_\_\_\_ Date Complete  
\_\_\_\_\_ Time to Act (45/95/120 days)

**HEARING**

\_\_\_\_\_ Notice to Property Owners  
\_\_\_\_\_ Date of Publication  
\_\_\_\_\_ Completeness Hearing  
03.09.23 Public Hearing  
\_\_\_\_\_ Carried to Date  
\_\_\_\_\_ Decision - Approved/Denied  
\_\_\_\_\_ Resolution Memorialized  
\_\_\_\_\_ Resolution Published

**DISTRIBUTION**

\_\_\_\_\_ Environmental Comm  
\_\_\_\_\_ Fire Official  
\_\_\_\_\_ LCFAS  
\_\_\_\_\_ Police

**NOTES**

**TOWNSHIP OF BERNARDS  
2023 ZONING BOARD OF ADJUSTMENT APPLICATION**

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> Bulk or Dimensional ("c") Variance<br><input type="checkbox"/> Use ("d") Variance<br><input type="checkbox"/> Conditional Use ("d") Variance<br><input type="checkbox"/> Floor Area Ratio, Density, or Height ("d") Variance<br><input type="checkbox"/> Site Plan - Preliminary / Final | <input type="checkbox"/> Appeal of Zoning Officer's Decision<br><input type="checkbox"/> Interpretation of Zoning Ordinance<br><input type="checkbox"/> Minor Subdivision<br><input type="checkbox"/> Major Subdivision - Preliminary / Final<br><input type="checkbox"/> Other (specify): _____ |
|--|--|

**1. APPLICANT:** Stephen Reale  
Address: 45 Pond Hill Rd  
Phone: (home) 9082094181 (work) \_\_\_\_\_ (mobile) 9082094181  
Email (will be used for official notifications): Snowp1224@aol.com

**2. OWNER** (if different from applicant): Neighbor - Stephanie VenB  
Address: 61 Long Rd Basking Ridge NJ 07920  
Phone: \_\_\_\_\_ Email (will be used for official notifications): Block 11501 - Lot 14

**3. ATTORNEY:** \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_ Email (will be used for official notifications): \_\_\_\_\_

**4. OTHER PROFESSIONALS** (Engineer, Architect, etc. Attach additional sheet if necessary):  
Name: Mike Roth Roth Engineering Profession: Engineer  
William Byrne Byrne Design LLC Profession: Architect  
Address: Roth Engineering 52 Quaker Run Long Valley NJ 07853  
Byrne Design - 10 Main St Chester NJ 07930  
Phone: 973-715-7827 Email (will be used for official notifications): Mike@RothEngineering.com  
908-879-0796 William@ByrneDesign.com

**5. PROPERTY INFORMATION:** Block(s): 11501 Lot(s): 15 Zone: R3

Street Address: 71 Long Rd Total Area (square feet/acres): 135,026.87 SF / 3.10 Acres  
Note: The Driveway is partially located on lot 14 Block 11501 (61 Long Rd)

**6. ARE THERE ANY PENDING OR PRIOR PLANNING BOARD OR BOARD OF ADJUSTMENT APPLICATIONS INVOLVING THE PROPERTY?** ☒ No ☐ Yes (if yes, explain or attach Board resolution) \_\_\_\_\_

**7. ARE THERE CURRENTLY ANY VIOLATIONS OF THE ZONING ORDINANCE INVOLVING THE PROPERTY?** ☒ No ☐ Yes (if yes, explain) \_\_\_\_\_

**8. ARE THERE ANY DEED RESTRICTIONS OR EASEMENTS AFFECTING THE PROPERTY?**



[ ] No [X] Yes (if yes, explain) Shared Driveway / Accession Building over property line

**9. DESCRIPTION OF THE EXISTING PROPERTY AND THE PROPOSAL/REQUEST:**

Stone/Wood Cabin = with Accession Building = with Gazebo  
2 Story Play House  
"Single Family Ranch"

**10. DESCRIPTION OF REQUESTED VARIANCES OR EXCEPTIONS (include Ordinance section no.):**

- 1) Table 501 (21 Attachment 7) = Rear yard Set Back for Principal Building (5) § 21-14-26  
2) Table 507 (21 Attachment 13) = Accessory Building, Rear yard Set Back steep slope Disturbance  
3) Table 401-A (21 Attachment 4) Part B: Min Impervious for Area 25% or greater  
4) § 21-38.1 Residential Driveway: a) width 6' grades of location

**11. THE FOLLOWING ARGUMENTS ARE MADE IN SUPPORT OF THE APPLICATION:**

A new Dwelling is Proposed on site. That is not occupied and greatly improves the property. the rear yard Set Back is Adjacent to the Rear yard and is over 250 feet from the Nearest Dwelling with Existing Buffering between the properties. The other Variance is a Pre Existing nonconforming

**12. NOTARIZED SIGNATURES (ALL APPLICANTS AND OWNERS MUST SIGN):**

**APPLICANT(S) SIGN HERE:**

I/we, Stephen Reale and \_\_\_\_\_ hereby depose and say that all of the above statements and the statements contained in the materials submitted herewith are true and correct.

Signature of Applicant(s): Stephen Reale and \_\_\_\_\_

Sworn and subscribed before me, this 10th day of 2nd, 20 23

CYNTHIA REEF  
Notary Public - New Jersey  
Notary Commission #2442187  
Expires 01/10/24

**OWNER(S) SIGN HERE (IF APPLICANT IS NOT THE OWNER):** (Lot 14 Block 11501)

If the application is made by a person or entity other than the property owner, or by less than all of the property owners, then the property owner or the additional owners must complete the following:

I/we, STEPHANIE VERB the owner(s) of the property described in this application,

hereby authorize STEPHEN REALE to act as my/our agent for purposes of making and prosecuting this application and I/we hereby consent to the variance relief (if any) granted and all conditions of approval thereof.

WITH THE EXPRESS UNDERSTANDING THAT MY CONSENT

Signature of owner(s): [Signature]

Sworn and subscribed before me, this 27th day of January, 20 23

Notary

DYAN M ROSARIO  
Notary Public, State of New Jersey  
Comm. # 2428001  
My Commission Expires 1/18/2028

**\* IS LIMITED TO ALLOWING ACCESS BY AND THROUGH THE EXISTING DRIVEWAY**

02/06/19

Bernards Township Zoning Board of Adjustment

Page 2 of 2

**EASEMENT AND DOES NOT CONSTITUTE WARRANT AND/OR REPRESENT ANY CONSENT TO VARIANCES SOUGHT BY PRIMARY APPLICANT**

**TOWNSHIP OF BERNARDS  
PLANNING BOARD / BOARD OF ADJUSTMENT**

**SITE INSPECTION CONSENT FORM**

Applicant: Stephen Reale

Block: 11501 Lot: 15

Street Address: 71 Long RD

I, Stephen Reale, owner of the above property, hereby acknowledge that, upon determination of completeness of the application, a site inspection may be scheduled with the Board for a mutually convenient date and time. I hereby authorize members of the Planning Board/Board of Adjustment and their representatives and consultants to enter onto the property at the time of the site inspection for the purpose of evaluating the application.

Signature: Stephen Reale Date: 1-12-2023

SUBMIT 17 COPIES TOTAL

**DIMENSIONAL STATISTICS**

|  | REQUIRED  | EXISTING   | PROPOSED   |
|--|-----------|------------|--|
| LOT AREA                               | 2 Acres   | 3.10 Acres | No Change  |
| LOT WIDTH                              | 250 Feet  | 322.2 Feet | No Change  |
| FRONTAGE                               | 125 Feet  | 371.4 Feet | No Change  |
| FRONT YARD<br>SETBACK                  | 100 Feet  | 309.7 Feet | 101.0 Feet from north property line<br>260.8 Feet from Long Road |
| REAR YARD<br>SETBACK                   | 100 Feet  | 143.6 Feet | 75.9 Feet (Variance)   |
| COMBINED SIDE<br>YARD                  | 100 Feet  | 206.6 Feet | N/A (One side yard)  |
| SIDE YARD                              | 50 Feet   | 93.9 Feet  | 132.1 Feet   |
| COVERAGE                               | 15%       | 7.00%      | 6.92%  |
| HEIGHT                                 | 35 Feet   | < 35 Feet  | 23.5 Feet  |
| IF REQUIRED,<br>GROSS FLOOR<br>AREA    | N/A       |            |  |
| IF REQUIRED,<br>FLOOR AREA<br>RATIO    | N/A       |            |  |
| IF REQUIRED,<br>IMPROVABLE<br>LOT AREA | 22,000 SF | 17,289 SF  | 6,752 SF (Variance)  |

## **Roth Engineering, LLC**

52 Quail Run  
Long Valley, NJ 07853  
Phone: 973-715-7427  
mike@rothengineers.com



---

January 4, 2023

**Via UPS Ground:**      **Tricia Cowell, Senior REHS**  
                                 **Bernards Township Health Department**  
                                 **262 South Finley Ave**  
                                 **Basking Ridge, NJ 07920**

**Re:**                      **Submission of Application to Construct a Subsurface Sewage Disposal System**  
                                 **71 Long Road**  
                                 **Block 11501, Lot 15**  
                                 **Township of Bernards, Somerset County, New Jersey**  
                                 **Roth Engineering Project # 221005**

Dear Ms. Cowell:

The applicant/owner of the project, Stephen Reale, is removing the existing dwelling and proposing a new dwelling on the lot. The property is a 3.10-acre tract of land located at 71 Long Road in the Township of Bernards. The project proposed a subsurface disposal system for the new construction of a single-family 4-bedroom dwelling. Please find the necessary items below for your review of the septic application:

- Check (#3957) made payable to *Bernards Township* in the amount of \$900.00 for the application, plan review and issuance of certificate of compliance fees.
- Three (3) copies of the Applications for Permit to Construct an Individual Subsurface Sewage Disposal System.
- Three (3) letters prepared by Premier Tech dated December 19, 2022 that confirms the design of advanced pretreatment device (Ecoflo Unit) meets their approval as per N.J.A.C. 7:9A.
- Three (3) copies of the Supplementary Calculations for Septic Permit Application for 71 Long Road dated December 19, 2022.
- Three (3) copies of the Septic Design Plan for 71 Long Road dated January 4, 2023.

Should you have any further questions, please do not hesitate to contact our office.

Best Regards,

Michael J. Roth, P.E., P.P.  
mike@rothengineers.com  
(973) 715-7427

Enclosures via email:

Stephen Reale, Owner (snowpizza2011@gmail.com)

January 4, 2023  
71 Long Road, Township of Bernards  
Page 1 of 1



**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 1—General Information**

**1. Type of Permit Needed (Check and Fill-in applicable categories):**

- ☒ a. New Construction
- ☐ b. Alteration/No Expansion or Change in Use
- ☐ c. Alteration/Expansion or Change in Use
- ☐ d. Alteration/Malfunctioning System
- ☐ e. Repair (in-kind replacement)/ Malfunctioning system
- ☐ f. Repair (in-kind replacement) System is not malfunctioning
- ☐ g. Deviation from Standards
- ☐ h. New system installed (existing structure)

**2. Location of Project:**

Municipality Township of Bernards Block No. 11501 Lot No. 15  
Street Address 71 Long Road, Basking Ridge, NJ Zip 07920

**3. Name of Applicant (print):** Stephen Reale

**4. Applicant's**

Present Address: 45 Pond Hill Road, Basking Ridge, NJ, 07920

**5. Applicant's Phone Number:** (908) 209 - 4181

**6. Type Of Facility:**

- ☒ Residential
- ☐ Commercial/Institutional
- Specify Type of Establishment: \_\_\_\_\_

**7. Type of Wastes to be Discharged:**

- ☒ Sanitary Sewage
- ☐ Industrial Wastes
- ☐ Other—Specify Type \_\_\_\_\_

**8. If d. or e. in 1. above are checked, indicate the type of malfunction and its cause (check all that apply):**

- ☐ Contamination of nearby wells or surface water bodies by sanitary sewage or effluent
- ☐ Ponding or breakout of sanitary sewage or effluent onto the surface of the ground
- ☐ Seepage of sanitary sewage or effluent into portions of building below ground
- ☐ Back-up of sanitary sewage into the building served, which is not caused by a physical blockage of the internal plumbing
- ☐ Any manner of leakage observed from components that are not designed to emit sanitary sewage or effluent.
- ☐ Direct discharges to ground water (no zone of treatment)

Describe the cause of the malfunction: \_\_\_\_\_

**9. Please expand on Question #1, above, by checking if any of the following apply):**

- ☐ A privy, outhouse, latrine or pit toilet is present, a system must be installed,
- ☐ A system must be upgraded as part of a real property transfer,
- ☐ A cesspool has been identified during a real property transfer and a conforming system must be installed,
- ☐ A malfunctioning cesspool has been identified and a conforming system must be installed.

Describe the alteration: \_\_\_\_\_

**10. Other Approvals/Certification/Waivers/Exemptions (Attach to Application):**

- ☐ Pinelands Commission
- ☐ Highlands Water Protection and Planning Act
- ☐ U.S. Army Corps of Engineers
- ☐ NJDEP—Bureau of Flood Plain Management
- ☐ Other—Specify: \_\_\_\_\_

**11. I hereby certify that the information furnished on Form 1 of this application is true. I am aware that false swearing is a crime in this State and subject to prosecution.**

Signature of Applicant Stephen Reale Date 12-20-2022

**FOR AGENCY USE ONLY**

☐ Application Denied—Reason for Denial/Citation of Rules Violated: \_\_\_\_\_

☐ Application Approved

☐ Application Approved Subject to Approval by NJDEP

Date of Action \_\_\_\_\_ Signature of Authorized Agent \_\_\_\_\_

Name and Title \_\_\_\_\_

**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 2a—General Site Evaluation Data**

1. Name of Site Evaluator (print): Michael Roth, P.E.
2. Business Address of  
Site Evaluator: Roth Engineering, LLC 52 Quail Run, Long Valley, NJ 07853
3. Business Phone Number of Site Evaluator: (973) 715-7427
4. Special Site Limitations Identified (Check appropriate Categories):
  - ☐ Flood Plains ☐ Bedrock Outcrops ☐ Wetlands
  - ☐ Excessively Stony ☐ Disturbed Ground ☐ Sink Holes
  - ☐ Sand Dunes ☐ Steep Slopes
  - ☐ Other—Specify \_\_\_\_\_
5. Soil Logs—Enter on Form 2b—Use one sheet for each soil log.
6. Considerations Relating to Disturbed Ground:
  - a) Type of Disturbance (Check appropriate categories):
    - ☐ Filled Area ☒ Excavated Area ☐ Re-graded Area
    - ☐ Subsurface Drains ☐ Other—Specify \_\_\_\_\_
  - b) Existing Ground Surface  
Elevation Relative to Ground Surface see each soil log for ground elevation  
Method of Identification conventional field measuring methods utilizing topographic mapping
  - c) Suitability of Disturbed Ground
    - ☐ Unsuitable: Objects Subject to Disintegration or Change in Volume
    - ☐ Excessively Coarse
    - ☐ Proctor Test performed ☐ % Standard Proctor Density = \_\_\_\_\_
7. Hydraulic Head Test: N/A
  - a) Hydraulically Restrictive Horizon: Depth Top to Bottom \_\_\_\_\_
  - b) Piezometer A: Depth to Bottom ☐ Depth of Water Level (24 hrs) ☐
  - c) Piezometer B: Depth to Bottom ☐ Depth of Water Level (24 hrs) ☐
  - d) Witnessed by \_\_\_\_\_ Signature \_\_\_\_\_ Date \_\_\_\_\_
8. Attachments (Check items included):
  - ☒ Site Plan
  - ☒ Key Map Showing Location of Site On U.S.G.S. Quadrangle or Other Accurate Map
  - ☐ Key Map Showing Location of Site on U.S.D.A. Soil Survey Map
  - ☐ Other—Specify \_\_\_\_\_
9. I hereby certify that the information furnished on Form 2a of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator Michael Roth Date 12/19/22

Signature of Professional Engineer Michael Roth License # 24GE05262600

**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 2b—Soil Log and Interpretation**

1. Log Number 1 Method (Check One): ☒ Profile Pit Boring
2. Soil Log

Existing Grade 443.5 +/-

0" - 24" TOPSOIL

24" - 156" 10 YR 3/6 DARK YELLOWISH BROWN, SILTY CLAY LOAM WITH 5% GRAVEL, 10% COBBLES  
AND 10% STONES, SUBANGULAR BLOCKY, MOIST AND FIRM

MOTTLING 96" TO 156", 10 YR 3/3 DARK BROWN, COMMON, COARSE AND DISTINCT  
SEEPAGE 108"  
STANDING WATER 156" @ 9:15 AM, 150" @ 9:45 AM  
ROOTS 60"  
LEDGEROCK NONE  
DISTURBED SAMPLE TAKEN AT 96"

3. Ground Water Observations:  
☒ Seepage—Indicate Depth 108"  
☐ Pit/Boring Flooded—Depth after    Hours
4. Soil Limiting Zones (Check Appropriate Categories):  
☐ Fractured Rock Substratum—Depth to Top  
☐ Massive Rock Substratum—Depth to Top  
☐ Excessively Coarse Horizon—Depth Top to Bottom  
☐ Excessively Coarse Substratum—Depth to Top  
☐ Hydraulically Restrictive Horizon—Depth Top to Bottom  
☐ Hydraulically Restrictive Substratum—Depth to Top  
☐ Perched Zone of Saturation—Depth Top to Bottom  
☒ Regional Zone of Saturation—Depth to Top 96"
5. Soil Suitability Classification: I
6. I hereby certify that the information furnished on Form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator *Michael Smith* Date 12/19/22

Signature of Professional Engineer *Michael Smith* License # 24GE05262600

**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 2b—Soil Log and Interpretation**

1. Log Number 2 Method (Check One): ☒ Profile Pit    Boring
2. Soil Log

Existing Grade 440.5 +/-

0" - 18" TOPSOIL

18" - 120" 10 YR 3/6 DARK YELLOWISH BROWN, SILTY CLAY LOAM WITH 5% GRAVEL, 15% COBBLES  
AND 20% STONES, SUBANGULAR BLOCKY, MOIST AND FIRM

|                |  |
|----------------|--|
| MOTTLING       | 78" TO 108", 10 YR 3/3 DARK BROWN, COMMON, COARSE AND DISTINCT |
| SEEPAGE        | 78"  |
| STANDING WATER | 108" @ 9:00 AM, 102" @ 9:30 AM                                 |
| ROOTS          | 24"  |
| LEDGEROCK      | NONE   |

3. Ground Water Observations:  
☒ Seepage—Indicate Depth 78"  
☐ Pit/Boring Flooded—Depth after    Hours
4. Soil Limiting Zones (Check Appropriate Categories):  
☐ Fractured Rock Substratum—Depth to Top  
☐ Massive Rock Substratum—Depth to Top  
☐ Excessively Coarse Horizon—Depth Top to Bottom  
☐ Excessively Coarse Substratum—Depth to Top  
☐ Hydraulically Restrictive Horizon—Depth Top to Bottom  
☐ Hydraulically Restrictive Substratum—Depth to Top  
☐ Perched Zone of Saturation—Depth Top to Bottom  
☒ Regional Zone of Saturation—Depth to Top 78"
5. Soil Suitability Classification: I
6. I hereby certify that the information furnished on Form 2b of this application is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator *Michael Smith* Date 12/19/22

Signature of Professional Engineer *Michael Smith* License # 24GE05262600



**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 3a—Soil Permeability Data**

Assign a number for each test and a letter for each test replicate. Show test data and calculations on Form 3b, 3c, 3d, 3e, 3f or 3g. Use one sheet for each separate test or test replicate.

1. Summary of Data -- Enter data for each test replicate on a separate line.

| Type of Test          | Test Number    | Replicate(letter) | Depth(inches) | Results* |
|-----------------------|----------------|-------------------|---------------|----------|
| Lab Permeability Test | 1 (Test Pit 1) | A                 | 96"           | K3       |
| (SEE ATTACHED)        |                | B                 | 96"           | K3       |

\* For tube permeameter, pit-bailing and piezometer tests report results in inches per hour. For Soil permeability class rating give soil permeability class number. For percolation test report result in minutes per inch. For basin flooding test report result as positive if basin drains completely within 24 hours after second filing, negative otherwise.

2. Design Permeability/Percolation Rate: Specify Test Number X SUITABLE FILL

☐ Average of Test Replicates  
☐ Single Replicate  
☐ Slowest of Replicates

3. Type of Limiting Zone Identified

4. Attachments (Check items included):

☐ Form 3b—Tube Permeameter Test Data—Number of Sheets       
☒ Form 3c—Soil Permeability Class Rating Test Data—Number of Sheets   2    
☐ Form 3d—Percolation Test Data—Number of Sheets       
☐ Form 3e—Pit-Bailing Test Data—Number of Sheets       
☐ Form 3f—Piezometer Test Data—Number of Sheets       
☐ Form 3g—Basin Flooding Test Data—Number of Sheets     

5. I hereby certify that the information furnished on Form 3a of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator *Michael Roth* Date 12/19/22

Signature of Professional Engineer *Michael Roth* License # 24GE05262600

COUNTY/MUNICIPALITY

Somerset / Bernards

Block

11501

Lot

15

APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR  
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

## Form 3c. Soil Permeability Class Rating Data

1. Test Number 21 Replicate Letter A  
 2. Sample Depth 96" Soil log/ Boring Number 1  
 Date Collected: 12/14/22

3. Coarse Fragment Content:  
 Total Weight of Sample, W.T. grams 450.00  
 Weight of Material Retained on 2mm Sieve, W.C.F., Grams 293.9  
 Weight % Coarse Fragment (W.C.F./W.T. x 100): 65.3%

4. Oven Dried Weight (24 hours at 105 deg C) of  
 40 Gram Air Dried Sample 38.50

5. Hydrometer Calibration, Rc 4.0 grams  
 6. Hydrometer Reading-40 Seconds, R1 22.0 grams  
 Temperature of Suspension 64.9 deg F  
 7. Corrected Hydrometer Reading, R1' 17.4 grams  
 8. Hydrometer Reading-2 Hours, R2 8.5 grams  
 Temperature of Suspension 66.9 deg F  
 9. Corrected Hydrometer Reading, R2' 4.3 grams

10. % Sand =  $(Wt. - R1') / Wt. \times 100$   
 $= (38.5 - 17.4) / 38.5 \times 100 = 54.8\%$

11. % Clay =  $R2' / Wt. \times 100 =$   
 $4.3 / 38.5 \times 100 = 11.1\%$

12. Sieve Analysis:  
 a: Oven Dry Weight (2 hrs, 105 deg C) Total Sand Fraction  
 (Soil Retained in 0.047 mm sieve) 18.8 grams  
 b: Weight of Fine Plus Very Fine Sand Fraction  
 (Sand Passing 0.25 mm Sieve) 7.4 grams  
 c: % Fine Plus Very Fine Sand (b/a) 39.4%

13. Soil Morphology (Natural Soil Samples Only)

Structure of Soil Samples Tested

Subangular Blocky

Consistence of Soil Samples Tested:

Dry:

Moist: Firm

14. Soil Permeability Class Rating (Based upon average textural  
 analysis of this replicated and other replicate samples)

K3

15: I hereby certify that the information furnished on form 3c of this application is true and accurate.

I am aware that falsification of data is a violation of Water Pollution Control Act (N.J.S.A.

58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator

Date: 12/20/22

Signature of Professional Engineer

James Glasston, NJPE 37703

For: Civil Engineering, Inc., 1 Cove Street Budd Lake, NJ 07828

COUNTY/MUNICIPALITY

Somerset / Bernards

Block

11501

Lot

15

APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR  
AN INDIVIDUAL SUBSURFACE SEWAGE DISPOSAL SYSTEM

## Form 3c. Soil Permeability Class Rating Data

1. Test Number 21 Replicate Letter B  
2. Sample Depth 96" Soil Pit/ Boring Number 1  
Date Collected: 12/14/22

3. Coarse Fragment Content:  
Total Weight of Sample, W.T. grams 450.00  
Weight of Material Retained on 2mm Sieve, W.C.F., Grams 293.9  
Weight % Coarse Fragment (W.C.F./W.T. x 100): 65.3%

4. Oven Dried Weight (24 hours at 105 deg C) of  
40 Gram Air Dried Sample 38.50

5. Hydrometer Calibration, Rc 4.0 grams  
6. Hydrometer Reading-40 Seconds, R1 23.0 grams  
Temperature of Suspension 64.9 deg F  
7. Corrected Hydrometer Reading, R1' 18.4 grams  
8. Hydrometer Reading-2 Hours, R2 9.0 grams  
Temperature of Suspension 66.9 deg F  
9. Corrected Hydrometer Reading, R2' 4.8 grams

10. % Sand =  $(Wt. - R1') / Wt. \times 100$   
= ( 38.5 - 18.4 ) 38.5 x 100 = 52.2%

11. % Clay =  $R2' / Wt. \times 100$  = ( 4.8 38.5 x 100 = 12.4%

12. Sieve Analysis:  
a: Oven Dry Weight (2 hrs, 105 deg C) Total Sand Fraction  
(Soil Retained in 0.047 mm sieve) 24.4 grams  
b: Weight of Fine Plus Very Fine Sand Fraction  
(Sand Passing 0.25 mm Sieve) 10.8 grams  
c: % Fine Plus Very Fine Sand (b/a) 44.3%

13. Soil Morphology (Natural Soil Samples Only)

Structure of Soil Samples Tested:

Subangular Blocky

Consistence of Soil Samples Tested:

Dry:

Moist: Firm

14. Soil Permeability Class Rating (Based upon average textural  
analysis of this replicated and other replicate samples)

K3

15: I hereby certify that the information furnished on form 3c of this application is true and accurate.

I am aware that falsification of data is a violation of Water Pollution Control Act (N.J.S.A.  
58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Soil Evaluator

Date: 12/20/22

Signature of Professional Engineer

James Glasson, NJPE 37703

For: Civil Engineering, Inc., 1 Cove Street Budd Lake, NJ 07828

**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 4. General Design Data**

1. Volume of Sanitary Sewage, gal. 650 GPD  
☒ Residential: No. of Dwelling Units 1 Total No. of Bedrooms 4  
    Commercial/Institutional—Indicate type of establishment and show method of calculation. If estimate is based on water meter data, indicate source of data, frequency of readings, average daily flow, and maximum recorded daily reading \_\_\_\_\_
2. Alterations or Repairs  
    a) Reason for Alteration or Repair (Check appropriate categories):  
        Expansion or Change in Use Upgrade Existing Facilities  
        Correct Malfunctioning System Other—Specify \_\_\_\_\_  
    b) Describe Nature of Alteration or Repairs: \_\_\_\_\_
3. System Components:  
    a) Grease Trap Capacity, gals \_\_\_\_\_  
        Show Calculation Used: \_\_\_\_\_  
    b) Septic Tank Capacities, gals: Proposed Ecoflo Cocofilter EC7-600-P-P-Pack  
        First (Single) Compartment Second Compartment Third Compartment \_\_\_\_\_  
    c) Effluent Distribution  
        Method: Gravity Flow Gravity Dosing ☒ Pressure Dosing w/ Advanced Treatment Unit  
        Dosing Device: Pump Siphon \_\_\_\_\_  
    d) Dosing Tank Capacities, gals: Total Capacity    Dose Volume    Reserve Capacity     
    e) Laterals: Number 3 Total Length 147 Pipe Size 1.5" Spacing 3'  
    f) Connecting Pipe: Size 2.0" Length 25'  
    g) Manifold: Size 3" Length 6'  
    h) Disposal Field: Type of Installation Soil Replacement Fill Enclosed  
        Design Permeability (Percolation Rate) Suitable Fill is Proposed  
        Disposal Bed: Dimensions 12' x 52' Total Area: 624 sf  
        Trenches: Width    Total Length    Bed: Area     
    i) Seepage Pits: Design Percolation Rate     
        Number of Pits    Total Percolating Area Provided
4. Attachments (Check items included):  
☒ General Plan of System Showing Location of All System Components  
☒ X-Sections of Each System Component Including Grease Trap, Septic Tank, Dosing Tank, Disposal Field, Seepage Pits and Interceptor Drains  
Pump Performance Curve  
Other—Specify \_\_\_\_\_
5. I hereby certify that the information furnished on Form 4 of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Professional Engineer  Date 12/19/22 License # 24GE05262600

**APPLICATION FOR PERMIT TO CONSTRUCT/ALTER/REPAIR AN INDIVIDUAL SUBSURFACE  
SEWAGE DISPOSAL SYSTEM**

COUNTY/MUNICIPALITY: Somerset / Township of Bernards

Lot 15 Block 11501

**Form 5. Design of Pressure Dosing System**

**1. Configuration of Distribution Network:**

Type of Manifold: ☒ End ☐ Central

Distribution Laterals: Number 3 Length, ft 49 Spacing, ft 3

Hole Diameter, ins 1/4 Hole Spacing, ins 36

Diameter of Laterals, ins 1.5

**2. Lateral Discharge Rate:**

Design Pressure Head at Supply End of Laterals, Hp, ft 2.5

Hole Discharge Rate, Q, gpm 1.18

Number of Holes per Lateral, n 17

Lateral Discharge Rate, (Q x n) gpm 20

**3. Manifold Length, ft 6 Manifold Diameter, ins 3**

**4. System Discharge Rate, gpm 60**

**5. Dose Volume:**

Design Volume of Sewage, gal/day 650

Internal Volume of Distribution Network 27 gal

Dose Volume 162.5

**6a. Pump Selection:**

Diameter of Delivery Pipe 2" Length of Delivery Pipe 25'

Friction Loss in Delivery Pipe, Hf, ft 1.4

Elevation of Dosing Tank Low Water Level 435.5

Elevation of Lateral Invert 444.0

Elevation Head, He, ft 4.5

Total Operating Head, Ht (Hp + Hf + He), ft 9

Pump Model Champion CPE5, 0.5 HP, Single Phase, 115V single phase Rated Horsepower 0.5

Pump Discharge Rate at Total Operating Head, gpm 64

**6b. Siphon Elevation:**

Diameter of Delivery Pipe    Length of Delivery Pipe   

Friction Loss in Delivery Pipe, Hf, ft   

Velocity Head, Hv, ft   

Total Operating Head, Ht (Hp + Hf + Hv), ft   

Elevation of Lateral Invert   

Elevation of Siphon Invert   

7. I hereby certify that the information furnished on Form 4 of this application (and the attachments thereto) is true and accurate. I am aware that falsification of data is a violation of the Water Pollution Control Act (N.J.S.A. 58:10A-1 et seq.) and is subject to penalties as prescribed in N.J.A.C. 7:14-8.

Signature of Professional Engineer  Date 12/19/22 License # 24GE05262600



December 19, 2022

Michael J. Roth, P.E., P.P.  
Roth Engineering  
10 Main Street  
Chester, NJ 07930

**SUBJECT:** ECOFLO COCO FILTER DESIGN

---

Site Location: 71 Long Road  
Municipality: Bernards Township  
Engineer: Roth Engineering  
Plan Date: 12/19/2022

This letter is in response to your request for approval of a design using a Premier Tech Ecoflo Coco Biofilter as it relates to the manufacturer's (Premier Tech) specifications. I reviewed the Onsite Wastewater Treatment System design for the property noted above utilizing an Ecoflo EC7-600-P-PACK and have found that the Ecoflo design is in accordance with the manufacturer's specifications based on the information provided on the plan.

Only eighteen (18) inches of risers are available for this Ecoflo unit. One 12 inch riser will come with the unit and an additional six (6) inch riser is available for purchase if needed. It shall be noted that under our warranty guidelines this is the maximum number of risers permitted and a two (2) inch gap is to be left between the bottom of the unit's lid and the final grade surface. The contractor should install the unit based on these parameters. Polyethylene units are to use a sandy backfill material free of rock and stone.

It is recommended that the installation contractor obtain the latest installation guide and float adjustment guide for Ecoflo units prior to the installation found at [ptzone.premiertechaqua.com](http://ptzone.premiertechaqua.com) or by contacting me using the information below. Training is available for installation contractors who are not yet trained in Ecoflo installations. If you have any questions, please do not hesitate to contact me at 973-600-9264 or [debb@premiertech.com](mailto:debb@premiertech.com).

A handwritten signature in black ink, reading 'Debbie Baadshaug'.

Debbie Baadshaug  
Regional Supervisor  
Premier Tech Water & Environment  
973-600-9264  
[debb@premiertech.com](mailto:debb@premiertech.com)

**PT Water et Environment**

200 Kelly Rd. Suite B  
Quakertown, PA  
18951 U.S.A.

T. +1 215 536-2782  
[PT-WaterEnvironment.com](http://PT-WaterEnvironment.com)

# **SUPPLEMENTARY CALCULATIONS FOR SEPTIC PERMIT APPLICATION**

**71 LONG ROAD  
BLOCK 11501, LOT 15  
TOWNSHIP OF BERNARDS  
SOMERSET COUNTY, NEW JERSEY**

**Date: December 19, 2022**

**Applicant:**

**Stephen Reale  
45 Pond Hill Road  
Basking Ridge, NJ 07920**

**Engineer:**

 **ROTH  
ENGINEERING**  
**52 Quail Run  
Long Valley, NJ 07853**



---

**Michael J. Roth, P.E.  
License No. 24GE05262600**

| <u>INVERTS</u>     | <u>IN</u> | <u>OUT</u> |
|--------------------|-----------|------------|
| BUILDING EXIT      |           | 439.9      |
| ECOFLO COCO FILTER | 439.5     | 439.0      |

### **DOSING TANK**

Required dose volume and tank size

N.J.A.C. 7:9A-9.2(b):

|                          |   |  |   |                      |
|--------------------------|---|--|---|----------------------|
| 147 L.F. (1.5" Laterals) | x | $\frac{3.14 (0.75 \text{ in.})^2}{144 \text{ in/ft.}^2}$ | = | 1.8 ft. <sup>3</sup> |
| 25 L.F. (2" Delivery)    | x | $\frac{3.14 (1.0 \text{ in.})^2}{144 \text{ in/ft.}^2}$  | = | 0.5 ft. <sup>3</sup> |
| 6 L.F. (3" Manifold)     | x | $\frac{3.14 (1.5 \text{ in.})^2}{144 \text{ in/ft.}^2}$  | = | 0.3 ft. <sup>3</sup> |
| Pump Displacement        |   |  | = | 1 ft. <sup>3</sup>   |
|                          |   |  |   | <hr/>                |
|                          |   |  | = | 3.6 ft. <sup>3</sup> |
|                          |   | x 7.48 gal/ ft. <sup>3</sup>                             | = | 27 gal               |

Minimum required dose volume = 10 V = 10 (27) = 270 Gal.

Maximum dose volume = 25% Q = 0.25 x 650 Gal. = 162.5 Gal.

25% Q governs, Use Dose Vol. = 162.5 Gal.

(Note: Based on Soil permeability rate of imported select fill in zone of treatment, 6-20 in/hr.)

PER N.J.A.C. 7:9A-9.2b(1) and (3): Required reserve capacity = daily vol. of sanitary sewage = 650 Gal.

Ecoflo Coc Filter – EC7-600-P-P-PACK has total built in capacity of greater than 650 Gal.



## **LATERAL PIPE SIZE AND HOLE SPACING**

PER N.J.A.C. 7:9A- 10.3(d) 2v and 9.7(a)2:

Use 1/4" Holes @ 24" Spacing

Figure 14, Appendix A, under 1/4" holes, lateral length = 49 feet  
and hole spacing = 3 ft. Use 1-1/2" PVC laterals

PER N.J.A.C. 7:9A- 9.7 (a)4: Hole Discharge Rate = 1.18 GPM

Lateral Discharge Rate = Hole Discharge Rate x # holes/lateral =  $1.18 \times 17 = 20$  GPM

Figure 15, Appendix A, under manifold length = 6' and 3 laterals in end manifold, Laterals and Flow per Lateral = 20 GPM, Use 3" Manifold (PVC)

System Discharge Rate = Lateral Discharge Rate x # Laterals =  $20 \text{ GPM} \times 3 \text{ Laterals} = 60 \text{ GPM}$

## **PUMP DESIGN**

Friction Loss in Schedule 40 Plastic Pipe (Figure 16, Appendix A),

Using 2" Delivery Pipe = 25 ft.

(between pump tank and field), friction loss = 5.58 ft/100 ft  
or 1.4 ft. in 25 ft.

Total operating head  $h_t = H_f + H_e + H_p$

$H_f$  = Friction Head = 1.4 ft (above)

$H_e$  = Elevation Head = 440.0 (invert of distribution laterals) – 435.5 (dosing tank low water elevation) = 4.5 ft.

$H_p = 2.5$

$H_t = 1.4 \text{ ft.} + 4.5 \text{ ft.} + 2.5 \text{ ft.} = 8.4 \text{ ft.}$  use 9 ft.

PER N.J.A.C. 7:9A- 9.7(a)7iii: A pump capable of delivering 60 GPM against 9 ft. of head is required. Use Champion CPE5, 0.5 HP, single phase, 115 V Pump.

# Champion Pump

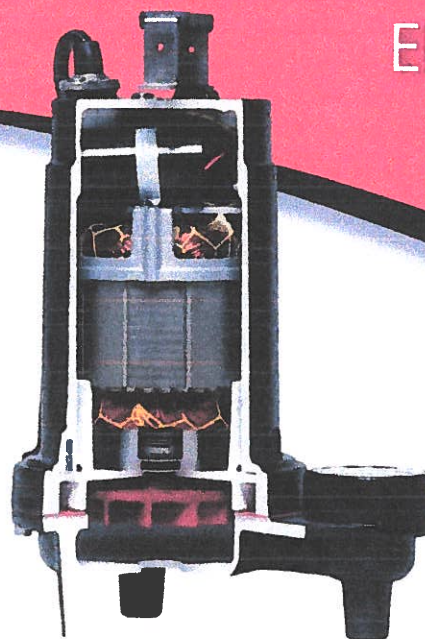
## CPE 4/10HP & 1/2HP EFFLUENT

### FEATURES/BENEFITS

- High Efficient Motor With Upper & Lower Ball Bearings/ Runs Cooler & Last Longer
- Vortex Impeller/ Helps Prevent Clogging
- Inboard Seal-Rotating Components Of Seal Are In The Motor Housing, Lubricated By The Motor Oil/ Seal Will Last Longer If Pump Runs Dry, Hair And Debris Cannot Wrap Around Seal Components
- Secondary Exclusion Seal/ Keeps Debris From Entering Seal Cavity
- Sealed Entry-Replaceable Power Cord/ Easy To Replace In The Field, Prevents Water From Entering The Motor Housing Through A Cut Power Cord (Up to 50' Available)
- Piggy-Back Switch Design/Defective Switches Can Be Diagnosed By Phone; Pump Can Be Operated Manually by Overriding The Switch
- Every Pump Is Tested In Water/Ensures That The Pump Meets Head & Flow Requirements

### APPLICATIONS

- Dewatering, Elevator Pits, Septic Systems, Residential & Commercial Developments, STEP Systems

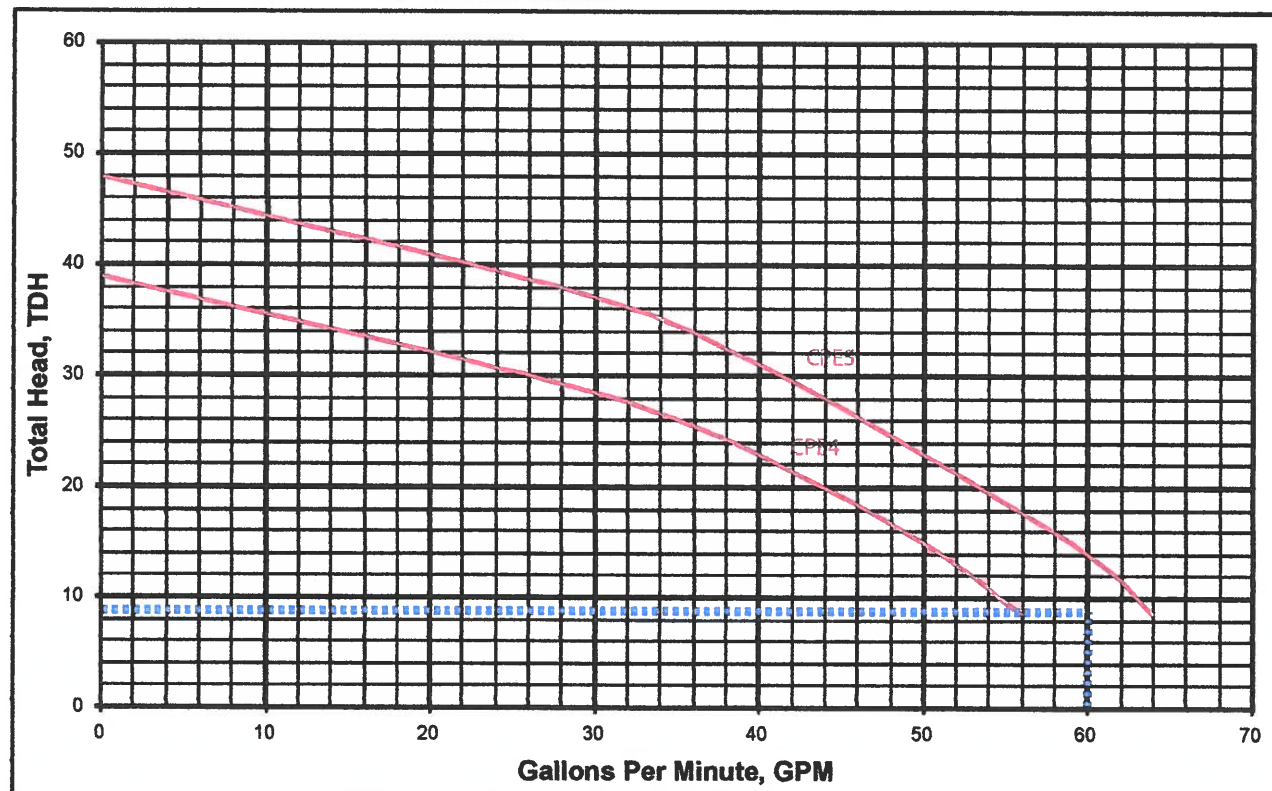


CPE5V

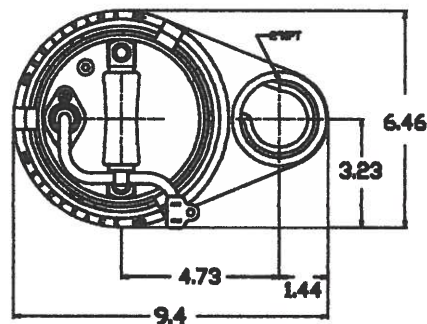
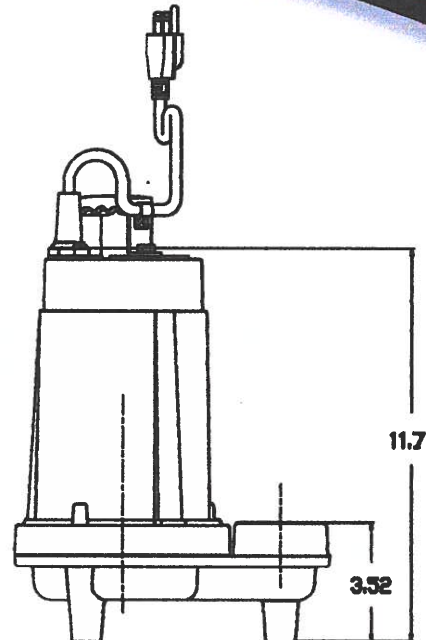
CPE5A



### CHAMPION PUMP - PUMP PERFORMANCE CURVE



|                                    |   |
|------------------------------------|---|
| <b>Discharge</b>                   | 2" NPT. Vertical  |
| <b>Solids Handling</b>             | 3/4"  |
| <b>Liquid Temperature</b>          | 140 Degrees F. (Intermittent)   |
| <b>Motor Housing</b>               | Cast Iron   |
| <b>Volute</b>                      | Cast Iron   |
| <b>Seal Plate</b>                  | Cast Iron   |
| <b>Impeller</b>                    | Cast Iron/Vortex  |
| <b>Shaft</b>                       | Stainless Steel   |
| <b>Shaft Seal</b>                  | Inboard Mechanical With<br>Secondary Exclusion Seal<br>Carbon- Rotating Face<br>Ceramic- Stationary Face<br>Buna-N-Elastomer              |
| <b>Bearing (Upper &amp; Lower)</b> | Single Row, Ball, Oil Lubricated  |
| <b>Hardware</b>                    | 300 Series Stainless Steel  |
| <b>Square Rings</b>                | Buna-N  |
| <b>Cord</b>                        | (UL/CUL) Listed 16 AWG, Type SJTW<br>20' Length Standards. Other<br>Lengths up to 50' Available   |
| <b>Cord Entry</b>                  | Compression Grommet- Outer<br>Jacket Seal, Quick Disconnect Pin<br>Terminals  |
| <b>Motor (Single Phase)</b>        | 4/10 & 1/2 HP, 3450 RPM, 60Hz<br>NEMA L Includes Overload<br>Protection In The Motor.<br>Oil Filled, Class B<br>Permanent Split Capacitor |
| <b>Weight</b>                      | 35lbs (Manual)  |



| Model             | HP         | Volts | Phase | Amps      | Cord Length | Switch         |
|-------------------|------------|-------|-------|-----------|-------------|----------------|
| CPE4-12 CPE5-12   | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 20          | Manual         |
| CPE4-22 CPE5-22   | 4/10 • 1/2 | 230   | 1     | 3.3 • 4.3 | 20          | Manual         |
| CPE4-13 CPE5-13   | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 30          | Manual         |
| CPE4-15 CPE5-15   | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 50          | Manual         |
| CPE4A-12 CPE5A-12 | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 20          | Float          |
| CPE4A-22 CPE5A-22 | 4/10 • 1/2 | 230   | 1     | 3.3 • 4.3 | 20          | Float          |
| CPE4A-13 CPE5A-13 | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 30          | Float          |
| CPE4V-12 CPE5V-12 | 4/10 • 1/2 | 115   | 1     | 6.6 • 8.5 | 20          | Vertical Float |
| CPE4V-22 CPE5V-22 | 4/10 • 1/2 | 230   | 1     | 3.3 • 4.3 | 20          | Vertical Float |





ENVIRONMENTAL  
TECHNOLOGY  
INC.

Environmental Consultants



January 10, 2023

SENT VIA EMAIL: [mike@rothengineers.com](mailto:mike@rothengineers.com)

Mr. Michael Roth, P.E., P.P.  
Roth Engineering  
10 Main Street  
Chester, NJ 07930

Re: Wetlands/Transition Area Investigation  
71 Long Road  
Block 11501, Lot 15  
Bernards Township, Somerset County, N.J.

Dear Mr. Roth,

Per your request, Environmental Technology Inc. has visited the above-referenced property and conducted a wetlands investigation to determine the presence or absence of freshwater wetlands and their associated transition areas within a specific area of disturbance for a proposed single family dwelling, driveway, septic system and associated improvements. The plans reviewed were prepared by your office and are entitled "Plot Plans for 71 Long Road" and consisting of three sheets, dated January 4, 2023. This review was pursuant to the Freshwater Wetlands Protection Act Rules (N.J.A.C 7:7A.)

Our methodology and findings are as follows:

### **STUDY METHODOLOGY**

The investigation of the site was performed by the staff of Environmental Technology, Inc. on October 20, 2022.

In accordance with the New Jersey Freshwater Wetlands Protection Act, and outlined by the New Jersey Department of Environmental Protection (NJDEP), the extent of the wetlands were determined by implementing the methodology that is currently accepted by the United States Environmental Protection Agency (USEPA), namely Federal Manual for Identifying and Delineating Jurisdictional Wetlands dated January 10, 1989 and supplements. This methodology states that for an area to be considered wetland all three of the following parameters must be present:

1. Hydric Soils
2. A Predominance of Hydrophytic Vegetation
3. Hydrology

The determination of hydric soils in the field is made by the use of a manually operated soil sampler. Then a determination of hydric soils is made by using Munsell Soil Color Charts. Transects are made from the wetlands to the uplands to determine the point at which soils no longer were determined to be hydric. Hydric soils are those soils that have a chroma of less than or equal to 1 (when no mottling is present) or a matrix chroma of less than or equal to 2 when mottling is present.

When soils classified as a sand soil are encountered Munsell Soil Color Charts are not used exclusively. In these instances hydric determinations are also made by the presence of one or more of the following conditions: high organic matter content in the surface horizon, the streaking of subsurface horizons by organic matter, or the presence of organic pans.

In situations in which soils exhibit significant coloration due to the nature of the parent material (e.g. red shales) the soils often do not exhibit the characteristic chromas associated with hydric soils. In the above situations the Munsell Soil Color Charts cannot always be used to evaluate the hydric nature of the soil. In these cases their hydric nature according to the Soil Conservation Service (SCS), and the other criteria carry more weight.

Vegetation is classified according to the Eastern Mountains and Piedmont 2014 Regional Wetland Plant List prepared by the USACOE. The classifications, according to this list are as follows:

Obligate (OBL) Always found in wetlands under natural (not planted) conditions (frequency greater than 99%), but may persist in nonwetlands if planted there by man or in wetlands that have been drained, filled, or otherwise transformed into nonwetlands.

Facultative Wetland (FACW) Usually found in wetlands (67%-99% frequency), but occasionally found in nonwetlands.

Facultative (FAC) Sometimes found in wetlands (34%-66% frequency), but also occurs in nonwetlands.

Facultative Upland (FACU) Seldom found in wetlands (1%-33% frequency) and usually occurs in nonwetlands.

Nonwetland (UPL) Occurs in wetlands in another region, but not found (<1% frequency) in wetlands in the region specified. If a species does not occur in wetlands in any region, it is not on the list.

According to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands dated January 10, 1989, an area has hydrophytic vegetation, when under normal circumstances more than 50 percent of the composition of the dominant species from all strata are obligate wetland (OBL), facultative wetland (FACW), and/or facultative (FAC) species.

In the non-growing season hydrophytic vegetation is assumed to be present, since during this time of the year many herbaceous species are either unidentifiable or non-existent.

January 10, 2023

Hydrology is determined by the evidence of water, either visible or indicators that water was present. This is noted by visible factors such as drift lines, high water marks on trees, sediment deposits including encrusted detritus, displacement of leaf litter as the result of water flowage, and drainage patterns. During the growing season, saturated soil samples and/or the water table is noted as evidence of hydrology when they are encountered within 12 inches of the soil surface.

Seasonal highwater table information is used, when available, from the Soil Conservation Service. Recent rainfall and/or other precipitation is also considered when evaluating hydrology.

In situations where the native conditions have been altered such as; cleared lands (e.g. agricultural lands), areas where the original soil has been altered (such as formerly plowed or filled lands), certain criteria are given more weight than others due to the lack of reliability of the affected parameter as an indicator.

### **FINDINGS**

The investigation found the site to be steeply sloping up from Long Road. It is mostly wooded, however an unoccupied single-family dwelling, multiple secondary structures, a gravel driveway, and surrounding cleared/previous lawn areas.

The investigation performed by the staff of ETI found that there are no wetlands identified on or within 150 feet of the proposed project, which is the maximum wetlands transition area.

Soil samples confirmed the presence of non-hydric soils throughout the site (Munsell Soil Color Chart Readings 10YR 3/3 from 0 to 10 inches and 10YR 4/4 from 10 to 18 inches

Vegetation observed on and adjacent to the area of disturbance consisted of upland species such as red oak (*Quercus rubra*, FACU), sugar maple (*Acer saccharum*, FACU), American beech (*Fagus grandifolia*, FACU), tulip-tree (*Liriodendron tulipifera*, FACU), wine raspberry (*Rubus phoenicolasius*, NL), Japanese barberry (*Berberis thunbergii*, FACU), white snakeroot (*Eupatorium rugosum*, NL) and grasses (*Poa and Panicum*, V). spp., V).

### **CONCLUSIONS**

Based on the methodology currently accepted by the NJDEP pursuant to N.J.A.C. 7:7A, there are no areas classified as freshwater wetlands or transition areas within the proposed area of disturbance.

Since no portion of the site is within the jurisdiction of NJDEP's Freshwater Wetlands Protection Act Rules no contact with the NJDEP regarding freshwater wetlands or transition areas is required.

The information provided is based on the most current information available and our best professional judgment. This letter does not consider pending or future legislation or regulations that may change the opinions provided.

Michael Roth, P.E., P.P.  
Re: Wetlands/Transition Area Investigation  
71 Long Road  
Block 11501, Lot 15  
Bernards Township, Somerset County, N.J.

January 10, 2023

Please do not hesitate to contact our office if you should have any questions regarding our findings.



Very truly,

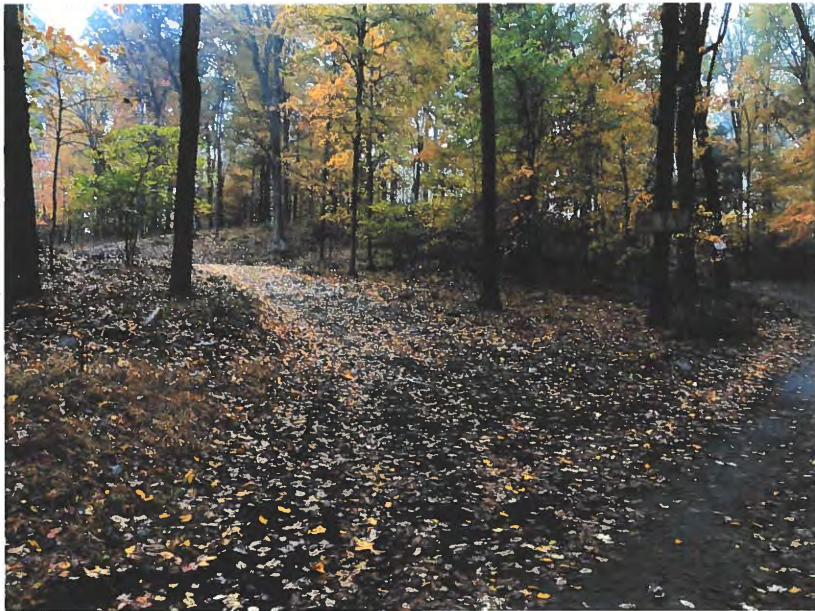
ENVIRONMENTAL TECHNOLOGY INC.

David C. Krueger, President  
Professional Wetland Scientist 000662  
Certified Wetland Delineator WDCP94MD03101146B

22189



**SITE PHOTOGRAPHS – 71 LONG ROAD, TOWNSHIP OF BERNARDS  
PHOTOS TAKEN ON OCTOBER 25, 2022**



**EXISTING DRIVEWAY (VIEW IS SOUTHWEST)**



**EXISTING DRIVEWAY & STRUCTURES (VIEW IS SOUTHWEST)**



**EXISTING DWELLING (VIEW IS WEST)**



**EXISTING ACCESSORY STRUCTURE (VIEW IS SOUTHWEST)**

















## SOMERSET - UNION SOIL CONSERVATION DISTRICT

Somerset County 4-H Center  
308 Milltown Road • Bridgewater, NJ 08807  
(908) 526-2701 Fax (908) 575-3977

January 27, 2023

Stephen Reale  
45 Pond Hill Rd.  
Basking Ridge, NJ 07920

**RE: Reale Single Family  
(plan dated 1/4/2023)  
Block 11501, Lot 11  
Bernards Township  
Application #2023-5746**

Dear Sir or Madam:

The Somerset-Union Soil Conservation District has reviewed the above erosion control plan and certifies that the plan is in accordance with the N.J. Erosion and Sediment Control Act, Chapter 251, P.L. 1975.

This approval is limited to the soil erosion and sedimentation controls specified in this plan. It is not authorization to engage in the proposed land use unless such use has been previously approved by the municipality or other controlling agency.

All revisions and municipal renewals of this project will require resubmission and approval by the District. Any conveyance of the project (or portion thereof) will transfer full responsibility for compliance to subsequent owner(s). The District must be notified in writing of any change of ownership.

The District requires written notification prior to the start of land disturbance. Please be advised that failure to do so is considered a violation of State Law and a fine will be imposed.

If there are any questions, please feel free to call our office.

Very truly yours,

**SOMERSET-UNION S.C.D.**

A handwritten signature in black ink, appearing to read "Mark Kirby".

Mark Kirby  
District Supervisor

MK/FC/JK F:\Access\MASTERS\CertLet-35-SU.doc

Enclosure

cc: Bernards Twp. Const. Off.  
Mun. Planning Board  
Mun. Engineer  
Roth Engineering, LLC

From: **David Schley** dschley@bernards.org  
Subject: RE: Reale 71 long rd  
Date: January 26, 2023 at 2:25 PM  
To: **Maria Reale** snowpizza2011@gmail.com

This letter will satisfy the zoning board's requirement relating to the Health Department's written approval. You should include the 2-page letter (not the actual permit) with your application.

David Schley, PP, AICP  
Township Planner  
Township of Bernards  
277 South Maple Avenue  
Basking Ridge, NJ 07920  
(908) 204-3004  
(908) 204-3089 fax  
dschley@bernards.org

**From:** Maria Reale <snowpizza2011@gmail.com>  
**Sent:** Thursday, January 26, 2023 7:34 AM  
**To:** David Schley <dschley@bernards.org>  
**Subject:** Reale 71 long rd

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

  
Bernards Township Health Department

Date: January 19, 2023  
TO: Bernards Twp Construction Department  
FROM: Tricia Cowell, Sr. REHS  
RE: 71 Long Road  
Block 11501 Lot 15  
Septic System Design: **New Construction**  
(650 GPD MSRE/ATU Pressure Dose)

The above referenced application to construct a septic system for **new 4-bedroom** dwelling has been **reviewed and approved**.

Please note the following comments:

**Septic:**

1. The design incorporates an advanced treatment using an Eco-Flo-Coco Filter Unit EC7-600-P-P unit. The owner must show proof of a service contract for the system before final approval will be issued. A copy of the signed maintenance agreement must be submitted to the health department before final approval will be issued for this project.
2. The installer must be trained by the manufacturer and supply proof of completed training to the Health Department if it is not on file.
3. The certified installer must be present for the start-up of the unit.

4. A deed restriction notice is required for this property and paperwork must be submitted to the health department for final approval to be issued.
5. If the total land disturbance exceeds 5,000 sq feet a permit must be applied for and obtained with the Somerset County Soil Conservation Program.
6. *A Land Disturbance Permit may be required for a septic system installation if the total land disturbance will exceed 2,500 square feet. This includes the actual septic field, related piping, grading and access to the construction area. A separate fee for this may be required. Please contact Barry Van Horn in the engineering department with any questions pertaining to this at 908-204-3018. A pdf version of the plan may be emailed directly to [bvanhorn@bernards.org](mailto:bvanhorn@bernards.org).*

#### **Well:**

The above referenced property must install a new well for potable water.

1. The new well must be 20 feet from any structure and 10 feet away from the property line.

For Somerset Township Health Dept. service in the Somerset Health Agency service area:  
Bernards Township, Bernardsville Borough, Chester Borough, Long Hill Township, Mendham Borough, Pipersburg and Gladstone Borough.



2. A permit must be obtained from the Bernards Twp Health Department for the well installation.
3. A water sample must be collected for the Private Well Testing Act standards and the results supplied to the health department.
4. A copy of the state well record must be submitted to the health department for final approval to be issued.
5. The Bernards Twp Health Dept. must witness the installation of the well.

Please contact me at [jcowell@bernards.org](mailto:jcowell@bernards.org) or (908) 204-3072 if you have any questions regarding this matter.

**APPENDIX D, ARTICLE III**

**Checklist**

**Application for Approval of a Variance Pursuant to NJSA 40:55D-70(c)**

\*Important: Each item must be marked Submitted, Not Applicable or Waiver Requested\*

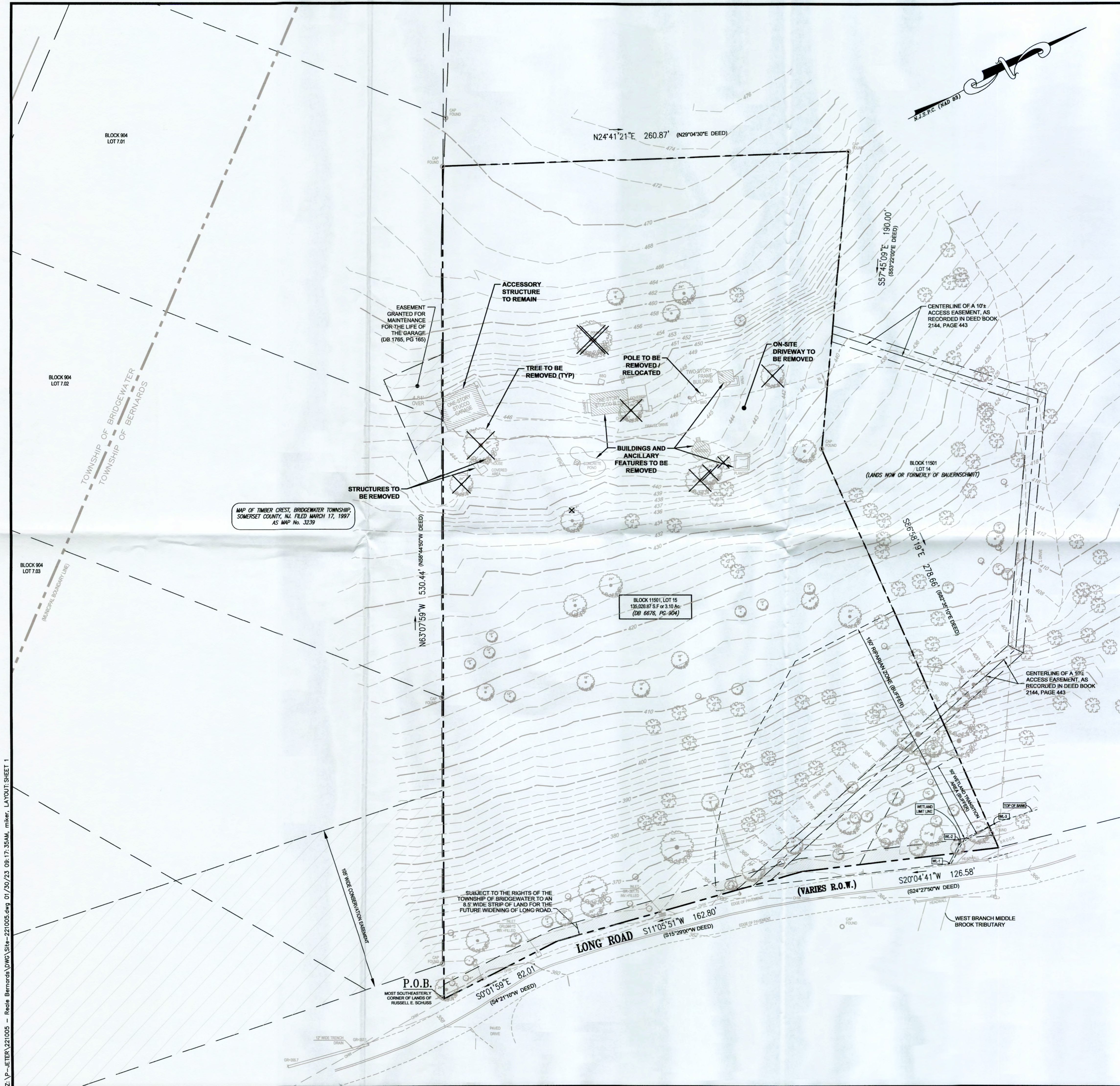
| No. | Item   | Submitted | Not Applicable | Waiver Requested |
|-----|--|-----------|----------------|------------------|
| 1   | A completed application form and checklist.  | ✓         |                |                  |
| 2   | A certificate from the tax collector indicating that taxes are paid.   | ✓         |                |                  |
| 3   | All required application and escrow deposit fees.  | ✓         |                |                  |
| 4   | Names and addresses of property owners within 200' of the subject property, as disclosed by current tax records and identified by block & lot numbers.   | ✓         |                |                  |
| 5   | A plot plan or survey accurately depicting the entire subject property and all existing buildings, structures, driveways, patios, etc.   | ✓         |                |                  |
| 6   | Sketch of all proposed improvements on the plot plan or survey, with dimensions of improvements and distances to property lines.   | ✓         |                |                  |
| 7   | Calculations of existing & proposed lot coverage percentages.  | ✓         |                |                  |
| 8   | Architectural sketches (floor plan and elevations) of the proposed improvements.   | ✓         |                |                  |
| 9   | Photographs of the property in the location of the proposed improvements.  | ✓         |                |                  |
| 10  | A wetlands delineation or wetlands absence determination prepared by a qualified consultant and verified by a letter of interpretation from the New Jersey Department of Environmental Protection, if required pursuant to Section 21-14.1.a.                  | ✓         |                |                  |
| 11  | The locations of percolation tests and a copy of the written approval of the tests and locations from the Bernards Township Health Department, if the application involves a new dwelling and sewage disposal is to be handled by an individual septic system. | ✓         |                |                  |
| 12  | Delineations of existing and proposed stream buffer conservation areas and stream buffer management plans, if required pursuant to Section 21-14.4.b.  |           | ✓              |                  |
| 13  | Existing topography, proposed grading, and proposed stormwater infiltration measures in accordance with §21-42.11.b.1, shown on the plot plan or survey, if 1,000sf or more of new impervious area is proposed.  | ✓         |                |                  |

Block 11501

LOT 15

Filled  
out  
17 copies





**KEY MAP**  
SCALE: 1"=2,000' (USGS BOUND BROOK & BERNARDSVILLE QUADRANGLE MAPS DATED 2019)

**OWNER / APPLICANT:**  
STEPHEN REALE  
45 POND HILL ROAD  
BASKING RIDGE, NJ 07920  
(908) 209-4181

**REFERENCES/NOTES:**

1. THE INTENTION OF THIS PLAN IS TO SHOW THE PROPOSED DWELLING AND OTHER SITE IMPROVEMENTS. REFER TO ARCHITECTURAL PLANS PREPARED BY OTHERS FOR INFORMATION RELATED TO PROPOSED DWELLING.
2. THIS PLAN IS BASED ON A SURVEY ENTITLED "BOUNDARY & TOPOGRAPHIC SURVEY, 71 LONG ROAD, LOT 15, BLOCK 11501, TOWNSHIP OF BERNARDS, SOMERSET COUNTY, NEW JERSEY" PREPARED BY HARBOR CONSULTANTS INC. ENGINEERS & SURVEYORS DATED MAY 20, 2015 REVISED THROUGH DECEMBER 30, 2022 ELEVATIONS SHOWN ARE BASED ON NAVD 88.
3. THE PROJECT IS LOCATED WITHIN A NON-CONFORMING PLANNING AREA THEREFORE THE PROJECT IS NOT SUBJECT TO ANY HIGHLANDS REGULATION.
4. LOCATION OF WETLANDS AND WETLAND TRANSITION AREAS ARE SHOWN BASED ON PLANS REFERENCED IN NOTE #2 AND ASSESSMENT PERFORMED BY DAVID KRUEGER, PWS, CWD OF ENVIRONMENTAL TECHNOLOGY, INC. THE PROJECT DOES NOT PROPOSED ANY DISTURBANCE WITHIN THE WETLAND AND/OR WETLAND TRANSITION AREAS THEREFORE WETLAND PERMITTING IS NOT APPLICABLE.
5. THE SUBJECT PROPERTY IS IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN) BASED ON THE FLOOD INSURANCE RATE MAP NUMBER 3403500102E WITH EFFECTIVE DATE OF SEPTEMBER 28, 2007. HOWEVER, A TRIBUTARY OF THE WEST BRANCH MIDDLE BROOK IS LOCATED ON-SITE ADJACENT TO LONG HILL ROAD. BASED ON THE DETERMINATION FROM ENVIRONMENTAL TECHNOLOGY, INC. THIS WATERCOURSE IS REGULATED AND IS CATEGORIZED AS A FRESH WATER 2 NONTROUT PRODUCING WATER (FW2-NT) BUT HAS A WATER CRITICAL SPECIES DOWNSTREAM THEREFORE IT IS ASSUMED THAT THE RIPARIAN ZONE IS 150 FEET MEASURED LANDWARD FROM THE TOP OF BANK. THE TRIBUTARY OF THE WEST BRANCH MIDDLE BROOK HAS A DRAINAGE OF 336 ACRES BASED ON USGS STREAM STATS WHICH IS GREATER THAN 50 ACRES THEREFORE THERE IS A FLOODPLAIN ASSOCIATED WITH THIS WATERCOURSE. IN CASES WHERE THE FEMA DOES NOT DELINEATE THE FLOODPLAIN, THE APPROXIMATION METHOD (N.J.A.C. 7-13-3.5 - METHOD 5) CAN BE USED AS SHOWN BELOW:  
WATERSHED MANAGEMENT AREA (WMA) = 9  
CONTRIBUTORY DRAINAGE AREA (CDA) = 326 ACRES +/-  
APPROX. FLOOD DEPTH ABOVE AVERAGE STREAMBED ELEVATION (FROM TABLE 1) = 10 FEET  
APPROX. STREAMBED ELEVATION ADJACENT TO PROJECT SITE = 362 +/-  
THE APPROXIMATE FLOOD HAZARD DESIGN FLOOD ELEVATION = 372 +/-  
THERE IS NO DISTURBANCE PROPOSED IN THE RIPARIAN ZONE AND/OR FLOODPLAIN THEREFORE FLOOD HAZARD AREA PERMITTING IS NOT APPLICABLE.
6. UTILITIES SHOWN HEREON ARE BASED ON ABOVE GROUND OBSERVATIONS ONLY IN ACCORDANCE WITH FIELD MARK-OUTS AND/OR PHYSICAL LOCATIONS OBSERVED DURING CONSTRUCTION. CONNECTIONS BETWEEN STRUCTURES, IF SHOWN, ARE BASED ON SAID MARK-OUTS AND OCCUPATIONS AND MAY NOT REPRESENT ACTUAL BELOW GROUND CONDITIONS.
7. THIS PLAN DOES NOT INCLUDE STAKEOUT OF PROPERTY AND PROPOSED STRUCTURES.
8. PRIOR TO ANY CONSTRUCTION OR SITE PREPARATION ACTIVITY, THE CONTRACTOR SHALL COMPLETE THE FOLLOWING:
  - VERIFY THE PLANS CONTAIN THE RAISED SEAL OF THE ENGINEER AND DISPLAY THE LATEST REVISION AS "ISSUED FOR CONSTRUCTION". THE USE OF ANY OTHER PLANS IS AT THE CONTRACTOR'S RISK.
  - VERIFY THE INFORMATION SHOWN ON THESE PLANS IS CONSISTENT WITH THE INFORMATION SHOWN ON ALL OTHER PLANS (ARCHITECTURAL, LANDSCAPING, ETC.) BEING USED FOR CONSTRUCTION OF THE PROJECT. ALSO, VERIFY THE PLANS ARE CONSISTENT WITH ALL CONDITIONS AND REQUIREMENTS SET FORTH IN THE PERMITS. REPORT ANY DISCREPANCIES/INCONSISTENCIES TO THE OWNER AND THE DESIGN ENGINEER PRIOR TO ANY CONSTRUCTION.
  - DETERMINE ALL APPLICABLE SPECIFICATIONS, AS WELL AS ALL REQUIREMENTS FOR SHOP DRAWINGS, INSPECTIONS AND TESTING APPLICABLE TO PROJECT BY CONTACTING THE LOCAL BUILDING OFFICIAL, MUNICIPAL ENGINEER AND EACH AFFECTED UTILITY COMPANY (OR AGENCY). IN THE EVENT OF A CONFLICT BETWEEN ANY SPECIFICATIONS AND THE INFORMATION SHOWN ON THESE PLANS, THE DESIGN ENGINEER AND THE OWNER SHALL BE NOTIFIED IN ORDER TO RESOLVE THE CONFLICT PRIOR TO ANY CONSTRUCTION.
9. CONTRACTOR IS RESPONSIBLE FOR THEIR OWN VERIFICATION OF EXISTING TOPOGRAPHIC INFORMATION. SHOULD THERE BE ANY SUSPECTED DISCREPANCIES WITH THE TOPOGRAPHY DEPICTED ON THE PLANS AND ACTUAL PHYSICAL CONDITIONS. ANY CONFIRMED DISCREPANCY IDENTIFIED BY THE CONTRACTOR'S VERIFICATION SHALL BE REPORTED TO THE ENGINEER FOR RESOLUTION PRIOR TO ANY SITE DISTURBANCE. ONCE ANY SITE DISTURBANCE OCCURS, THE CONTRACTOR SHALL HAVE NO CLAIM FOR EXTRA WORK BASED UPON SUSPECTED OR CONFIRMED TOPOGRAPHIC DISCREPANCIES.
10. ALL AREAS BEING GRADED AND WHERE SOIL IS BEING SPREAD ACROSS THE YARD SHALL BE TOP SOILED AND SEEDED IMMEDIATELY FOLLOWING GRADING OPERATIONS. EXISTING GRADES AT NEIGHBORING PROPERTY LINES TO BE MAINTAINED.
11. ALL ROOF LEADER DRAINS TO BE 6-INCH SCHEDULE 40 PVC, UNLESS OTHERWISE NOTED ON THE PLANS. ALL LEADER DRAINS TO BE INSTALLED WITH ONE FOOT MINIMUM COVER. ALL ROOF DRAINS SHALL DAYLIGHT TO GRADE AND DISCHARGE AWAY FROM DWELLING UNLESS OTHERWISE SHOWN ON THE PLANS. ALL PIPE SHALL BE INSTALLED IN ACCORDANCE TO APPLICABLE MANUFACTURERS' SPECIFICATIONS.
12. CONTRACTOR TO NOTIFY THE APPLICABLE SOIL CONSERVATION DISTRICT IN WRITING AT LEAST 72 HOURS PRIOR TO ANY SITE PREPARATION OR CONSTRUCTION ACTIVITIES. SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION IN ACCORDANCE WITH THE LOCAL SOIL CONSERVATION DISTRICT'S REQUIREMENTS. AS NOTED ON THE PLAN, THE LIMIT OF DISTURBANCE IS OVER 5,000 SQUARE FEET THEREFORE SESC CERTIFICATION IS REQUIRED.
13. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR CONSTRUCTION SITE SAFETY AND FOR DETERMINING THE MEANS AND METHODS FOR ALL CONSTRUCTION ACTIVITIES. ALL SAFETY PRECAUTIONS MUST BE UNDERTAKEN AND MAINTAINED AS REQUIRED BY LOCAL, STATE AND FEDERAL CODES.
14. GRASSED SWALES TO BE CONSTRUCTED TO DIRECT STORMWATER RUNOFF AWAY FROM DWELLING AND IN A MANNER TO MAINTAIN EXISTING DRAINAGE PATTERNS. THERE SHALL BE NO ADVERSE IMPACT ON ADJACENT PROPERTIES.
15. CONTRACTORS AND SUBCONTRACTORS ARE RESPONSIBLE FOR MAKING THEIR OWN DETERMINATIONS REGARDING SUBSURFACE CONDITIONS, INCLUDING BUT NOT LIMITED TO SOIL CHARACTERISTICS, AS WELL AS DEPTH TO ROCK AND GROUNDWATER. THE DESIGN ENGINEER WAS NOT CONTRACTED TO MAKE ANY SUCH DETERMINATIONS.

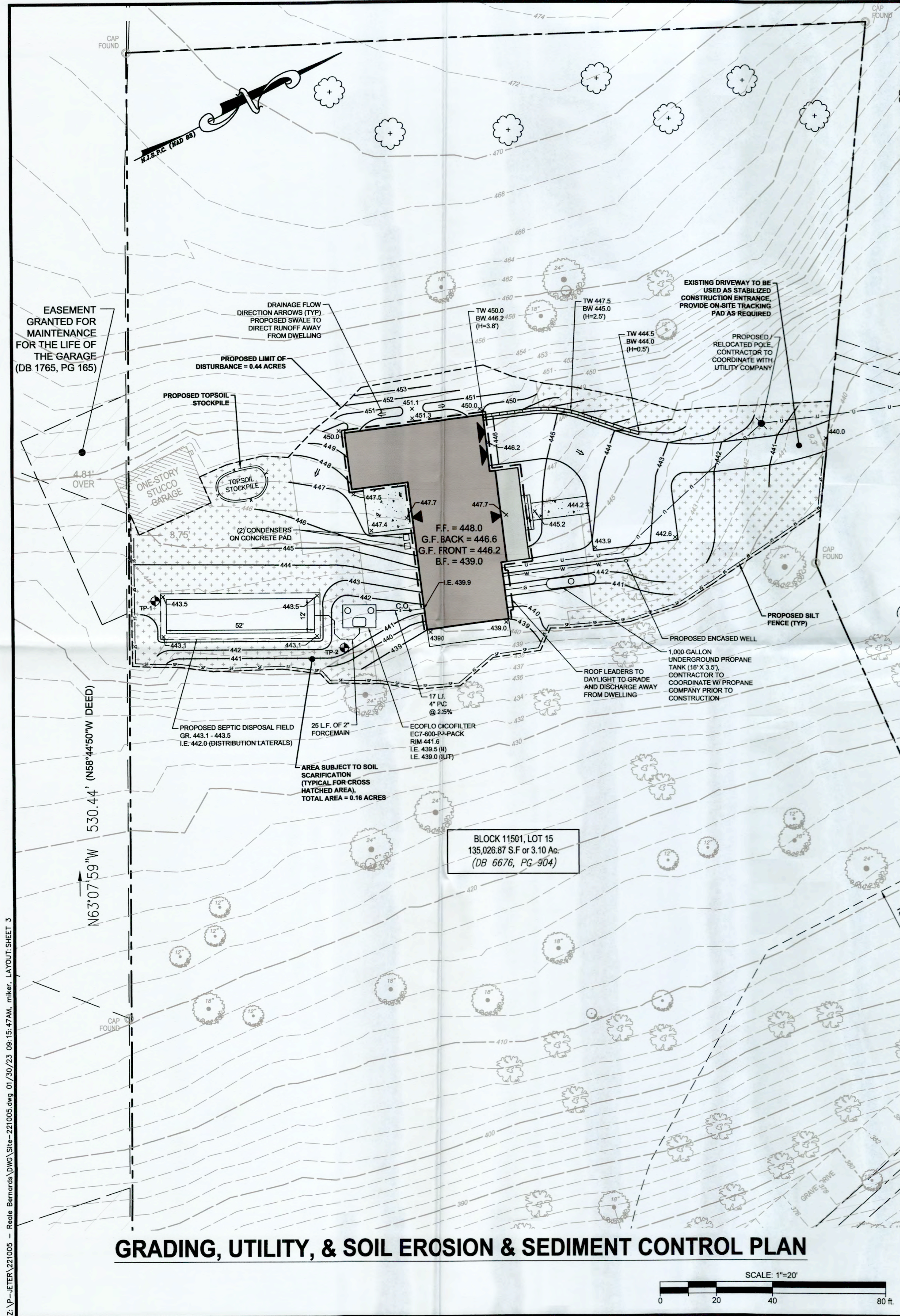
|  |          |
|--|----------|
| <b>ROTH ENGINEERING</b>  |          |
| PLOT PLANS FOR 71 LONG ROAD  |          |
| COVER SHEET / SITE PREPARATION PLAN  |          |
| DATE: 01/04/23   |          |
| PROJECT NO.: 221005  |          |
| SHEET NO.: 1 OF 3  |          |
| TOWNSHIP OF BERNARDS, SOMERSET COUNTY, NEW JERSEY  |          |
| BLOCK 11501, LOT 15  |          |
| MICHAEL J. ROTH  |          |
| PROFESSIONAL ENGINEER  |          |
| NEW JERSEY LICENSE NO. 24G05262600   |          |
| ALL RIGHTS RESERVED. COPY, REPRODUCTION OR DISTRIBUTION OF THIS PLAN OR ANY PORTION IS PROHIBITED WITHOUT WRITTEN PERMISSION OF ROTH ENGINEERING, LLC. |          |
| REV #  | DATE     |
| 1  | 01/30/23 |
| REVISED PER COMPLETENESS REVIEW COMMENTS ON 01/13/23   |          |







Z:\P-ETER 221005 - Reale Bernards DWS Site-221005.dwg 01/30/23 08:15:47AM, miker, LAYOUT: SHEET 3



**SOIL DE-COMPACTION NOTE:**  
IN ACCORDANCE TO THE STANDARDS OF SOIL EROSION AND SEDIMENT CONTROL IN NEW JERSEY (SECTION 19-2), SOIL COMPACTION TESTING IS NOT REQUIRED IF/WHEN SUBSOIL COMPACTION REMEDIATION (SCARIFICATION/TILLAGE OF SUBSOIL (6" MINIMUM DEPTH) OR SIMILAR) IS PROPOSED OR PART OF THE SEQUENCE OF CONSTRUCTION. SEE ITEM #5 IN SEQUENCE OF CONSTRUCTION ON THIS PLAN FOR SCARIFICATION.

**STANDARD FOR DUST CONTROL** (Per Standards... Dust Control 16-1, May 2012)

**DEFINITION:** The control of dust on construction sites and roads.

**PURPOSE:** To prevent blowing and movement of dust from exposed soil surfaces, reduce on and off-site damage and health hazards, and improve traffic safety.

**CONDITION WHERE PRACTICE APPLIES:** This practice is applicable to areas subject to dust blowing and movement where on- and off-site damage is likely without treatment. Consult with local municipal ordinances on any restrictions.

**WATER QUALITY ENHANCEMENT:** Sediments deposited as "dust" are often fine colloidal material which is extremely difficult to remove from water once it becomes suspended. Use of this standard will help to control the generation of dust from construction sites and subsequent blowing and deposition into local surface water resources.

**PLANNING CRITERIA:** The following methods should be considered for controlling dust:

**Mulches:** See Standards for Stabilization with Mulches Only (p. 5-1)

**Vegetative Cover:** See Standards for Temporary Vegetative Cover (p. 7-1).

**Permanent Vegetative Cover for Soil Stabilization** (p. 4-1) and **Permanent Stabilization with Sod** (p. 6-1)

**Spray-on Adhesives:** On mineral soils (not effective on muck soils). Keep traffic off these areas.

**Table 15-1: Dust Control Materials:**

| Water                         | Dilution  | Type of Nozzle | Gal./Acre |
|-------------------------------|---|----------------|-----------|
| Anionic asphalt emulsion      | 7:1   | Coarse Spray   | 1,200     |
| Latic Emulsion                | 12.5:1  | Fine Spray     | 235       |
| Resin in Water                | 4:1   | Fine Spray     | 300       |
| Polysilicate (PAM) - spray on | Apply according to manufacturer's instructions. May also be used as an additive to sediment basins to flocculate and precipitate suspended solids. See Sediment Basin standard (pg 26-1). |                |           |
| Acidified Soy Bean Soap Stick | None  | Coarse Spray   | 1,200     |

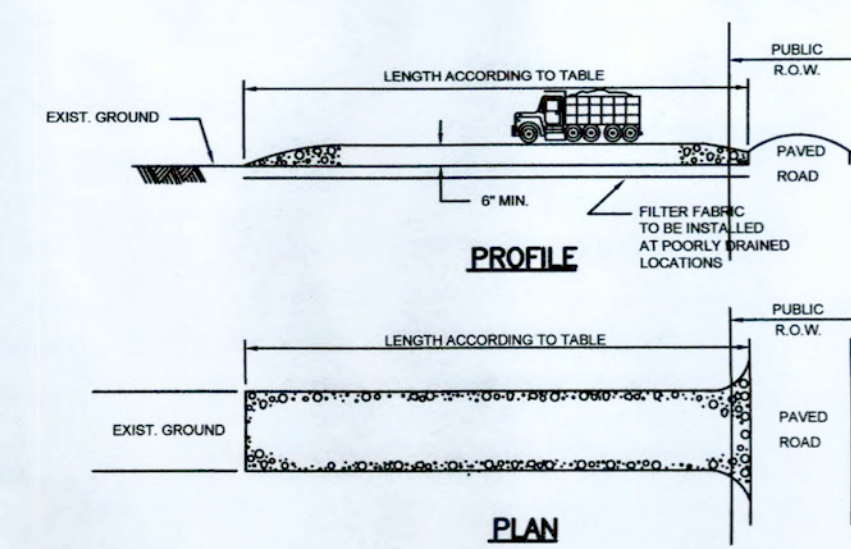
**Tillage:** To roughen surface and bring clods to the surface. This is a temporary emergency measure which should be used before soil blowing starts. Begin plowing on windward side of site. Chisel-type plows spaced about 12 inches apart, and spring-toothed harrows are examples of equipment which may produce the desired effect.

**Sprinkling:** Site is sprinkled until the surface is wet.

**Barriers:** Solid board fences, snow fences, burlap fences, crate walls, bales of hay, and similar material can be used to control air currents and soil blowing.

**Calcium Chloride:** Shall be in the form of loose, dry granules of flakes fine enough to feed through commonly used spreaders at a rate that will keep surface moist but will not cause pollution or plant damage. If used on steeper slopes, then use other practices to prevent washing into streams or accumulation around plants.

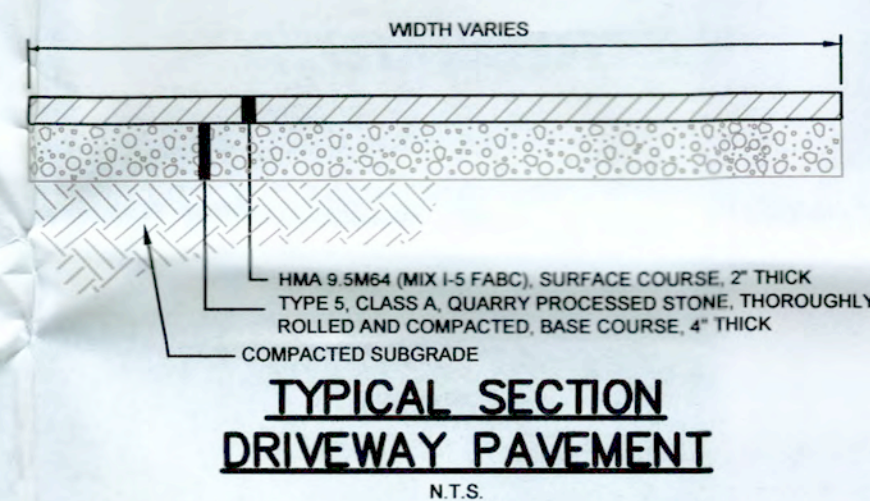
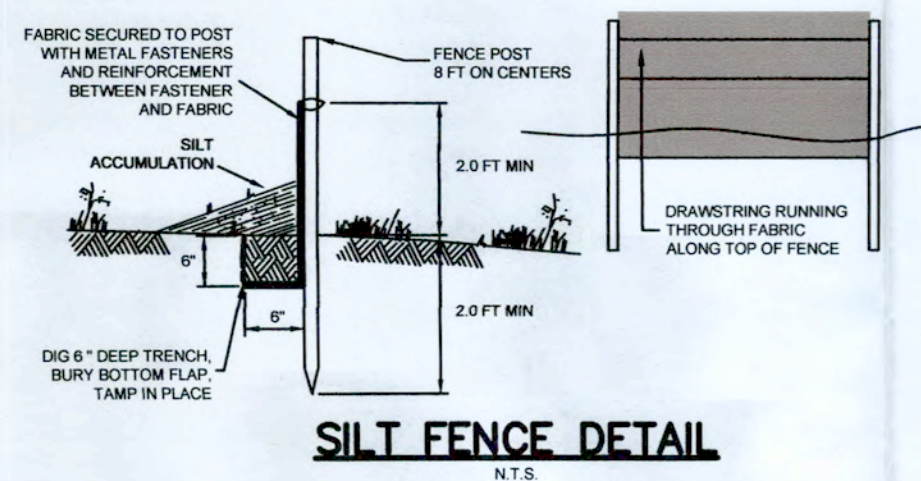
**Stone:** Cover surface with crushed stone or coarse gravel.



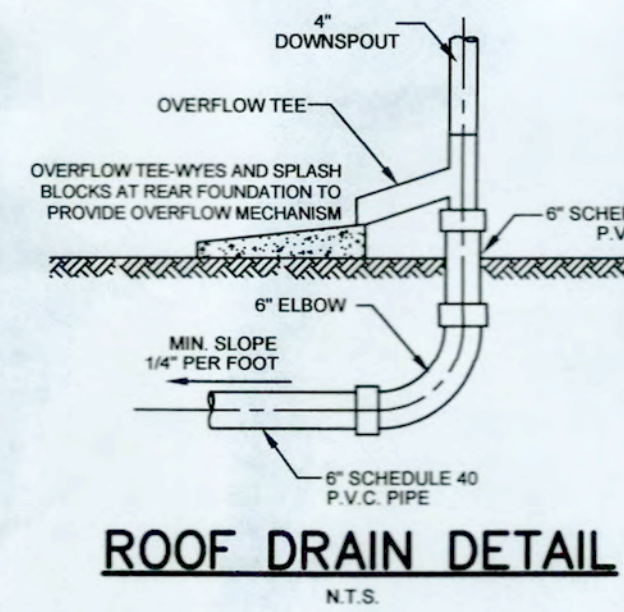
**NOTES**

- STONE SIZE: 1 1/2" - 2 1/2" CRUSHED STONE.
  - WIDTH NOT LESS THAN FULL WIDTH AT POINTS OF EGRESS AND INGRESS.
  - WASHING: WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC R.O.W. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN.
  - MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC R.O.W. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRAPPED ONTO PUBLIC R.O.W. MUST BE REMOVED IMMEDIATELY.
  - WHEN THE CONSTRUCTION ACCESS EXITS ONTO A MAJOR ROADWAY, A PAVED TRANSITION AREA MAY BE INSTALLED BETWEEN THE MAJOR ROADWAY AND THE STONED ENTRANCE TO PREVENT LOOSE STONES FROM BEING TRANSPORTED OUT ONTO THE ROADWAY BY HEAVY EQUIPMENT ENTERING OR LEAVING THE SITE.
- | PERCENT SLOPE OF ROADWAY | LENGTH OF STONE REQUIRED      |
|--------------------------|-------------------------------|
| 0 TO 2%                  | COARSE GRAINED SOLS<br>50 ft. |
| 2 TO 5%                  | 50 ft.                        |
| 5 TO 10%                 | 100 ft.                       |
| 10% AND GREATER          | 200 ft.                       |
1. AS PRESCRIBED BY LOCAL ORDINANCE OR OTHER GOVERNING AUTHORITY

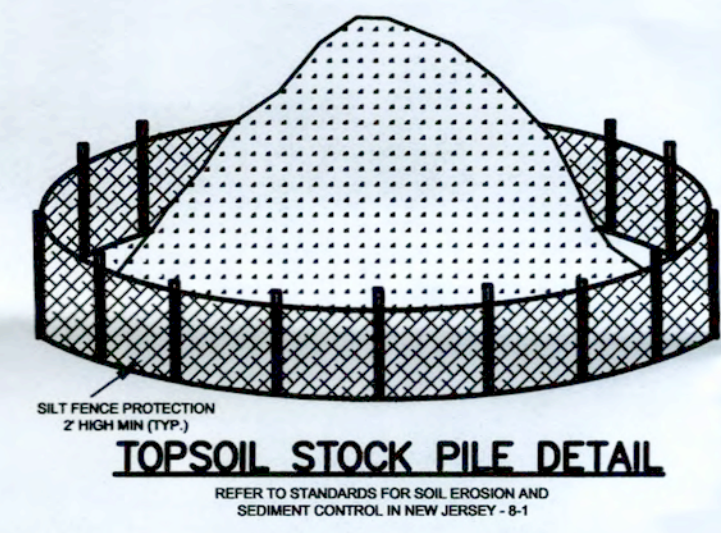
**STABILIZED CONSTRUCTION ENTRANCE (AS REQUIRED)**



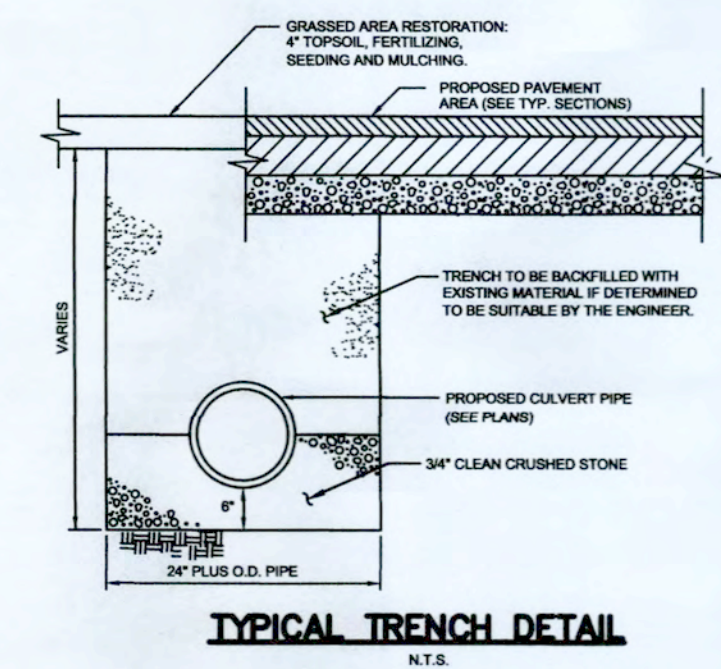
**TYPICAL SECTION DRIVEWAY PAVEMENT**



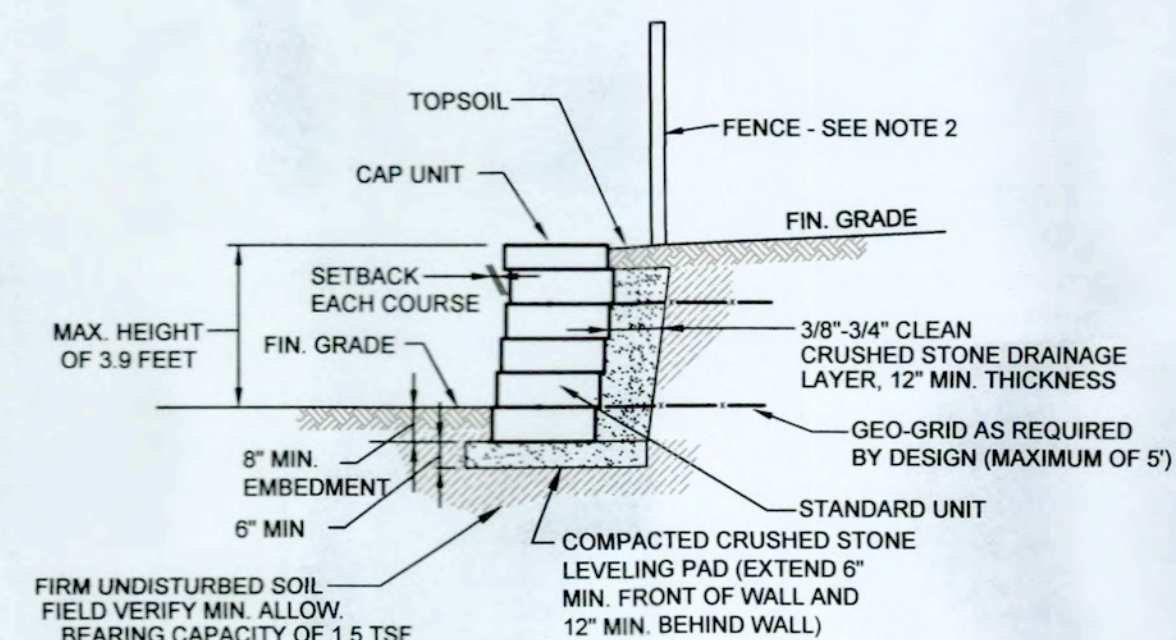
**ROOF DRAIN DETAIL**



**TOPSOIL STOCK PILE DETAIL**



**TYPICAL TRENCH DETAIL**



- NOTES:**
- THIS DETAIL IS FOR CONSTRUCTION OF WALLS LESS THAN 4 FEET HIGH. FOR WALLS 4 FEET OR HIGHER, SIGNED AND SEALED STABILITY CALCULATIONS PREPARED BY A P.E. ARE TO BE PROVIDED TO THE BUILDING DEPARTMENT FOR APPROVAL PRIOR TO CONSTRUCTION.
  - FOR WALLS 30" OR HIGHER PROVIDE GUARD PER IBC 1015.
  - CONTRACTOR SHALL VERIFY THAT SELECTED WALL MANUFACTURER'S BATTER WILL NOT IMPACT DESIGN OF IMPROVEMENTS AT TOP OF WALL.
  - STYLE AND COLOR OF FACE OF WALL TO BE COORDINATED WITH OWNER.

**TYPICAL MODULAR RETAINING WALL DETAIL**



**SOMERSET - UNION SOIL CONSERVATION DISTRICT**  
Somerset County 4-H Center  
308 Milltown Road - Bridgewater, NJ 08807  
(908) 526-2701 Fax (908) 526-7017

**SOIL EROSION AND SEDIMENT CONTROL NOTES**

- All Soil Erosion and Sediment Control practices shall be installed prior to any major soil disturbances, or in their proper sequence and maintained until permanent protection is established.
- Any Disturbed areas that will be left exposed more than 30 Days and not subject to construction traffic, will immediately receive a temporary seeding. If the season prevents the establishment of a temporary cover, the disturbed areas will be mulched with straw, or equivalent material, at a rate of two (2) tons per acre, according to NJ State Standards.
- Permanent Vegetation shall be seeded or sodded on all exposed areas within ten (10) days after final grading. Mulch will be used for protection until seeding is established.
- All work shall be done in accordance with the NJ State Standards for Soil Erosion and Sediment Control in New Jersey, 7th Edition last revised January 2014.
- A sub-base course will be applied immediately following rough grading and installation of improvements in order to stabilize streets, roads, driveways and parking areas. In areas where no utilities are present, the sub-base shall be installed within 15 days or preliminary grading.
- Immediately following initial disturbance or rough grading all critical areas subject to erosion (i.e.: steep slopes, roadway embankments) will receive a temporary seeding in combination with straw mulch or a suitable equivalent, at a rate of two (2) tons per acre, according to the NJ State Standards.
- Any steep slopes receiving pipeline installation will be backfilled and stabilized daily, as the installation proceeds (i.e.: slopes greater than 3:1).
- Traffic control Standards require the installation of a 50'x30'x6" pad of 1 1/2" or 2" stone, at all construction driveways, immediately after initial site disturbance.
- The Somerset-Union Soil Conservation District shall be notified in writing 48 hours in advance of any land disturbing activity.
- At the time when the site preparation for permanent vegetative stabilization is going to be accomplished, any soil that will not provide a suitable environment to support adequate vegetative ground cover, shall be removed or treated in such a way that will permanently adjust the soil conditions and render it suitable for vegetative ground cover. If the removal or treatment of the soil will not provide suitable conditions, non-vegetative means of permanent ground stabilization will have to be employed. Topsoil should be handled only when it is dry enough to work without damaging the soil structure. A uniform application to a depth of 5 inches (unsettled) is required on all sites.
- In that NJSA 4:24-39 et seq., requires that no Certificate of Occupancy be issued before the provisions of the Certified Plan for Soil Erosion and Sediment Control have been complied with for permanent measures, all site work for site plans and all work around individual lots in subdivisions, will have to be completed prior to the District issuing a Report of Compliance for the issuance of a Certificate of Occupancy by the Municipality.
- Conduit Outlet Protection must be installed at all required outfalls prior to the drainage system becoming operational.
- Any changes to the Certified Soil Erosion and Sediment Control Plan will require the submission of revised Soil Erosion and Sediment Control Plans to the District for re-certification. The revised plans must meet all current NJ State Soil Erosion & Sediment Control Standards.
- The Somerset-Union Soil Conservation District shall be notified of any changes in ownership.
- Mulching to the NJ Standards is required for obtaining a Conditional Report of Compliance. Conditionals are only issued when the season prohibits seeding.
- Contractor is responsible for keeping all adjacent roads clean during life of construction project.
- The developer shall be responsible for remediating any erosion or sediment problems that arise as a result of ongoing construction at the request of the Somerset-Union Soil Conservation District.
- Hydro seeding is a two-step process. The first step includes seed, fertilizer, lime, etc., along with minimal amounts of mulch to promote consistency, good seed to soil contact, and give a visual indication of coverage. Upon completion of seeding operation, hydro-mulch should be applied at a rate of 1500 lbs. per acre in second step. The use of hydro-mulch, as opposed to straw, is limited to optimum seeding dates as listed in the NJ Standards.

- REV 8/24/20
- 19. Topsoil Stockpile Protection**
- Apply Ground Limestone at a rate of 90 lbs per 1000 sq. ft.
  - Apply fertilizer (10-20-10) at a rate of 11 lbs. per 1000 sq. ft.
  - Apply Perennial Ryegrass seed at 1 lb. per 1000 sq. ft. and Annual Ryegrass at 1 lb. per 1000 sq. ft.
  - Mulch stockpile with straw or hay at a rate of 90 lbs. per 1000 sq. ft.
  - Apply a liquid mulch binder or tack to straw or hay mulch.
  - Property entrance a silt fence at the bottom of the stockpile.
- 20. Temporary Stabilization Specifications**
- Apply Ground Limestone at a rate of 90 lbs per 1000 sq. ft.
  - Apply fertilizer (10-20-10) at a rate of 11 lbs. per 1000 sq. ft.
  - Apply Perennial Ryegrass seed at 1 lb. per 1000 sq. ft. and Annual Ryegrass at 1 lb. per 1000 sq. ft.
  - Mulch stockpile with straw or hay at a rate of 90 lbs. per 1000 sq. ft.
  - Apply a liquid mulch binder or tack to straw or hay mulch.
- 22. Permanent Stabilization Specifications**
- Apply topsoil to a depth of 5 inches (unsettled).
  - Apply Ground Limestone at a rate of 90 lbs per 1000 sq. ft. and work four inches into soil.
  - Apply fertilizer (10-20-10) at a rate of 11 lbs. per 1000 sq. ft.
  - Apply Hard Fescue seed at 2.7 lbs. per 1000 sq. ft. and Creeping Red Fescue seed at 0.7 lbs per 1000 sq. ft. and Perennial Ryegrass seed at 0.25 lbs per 1000 sq. ft.
  - Mulch stockpile with straw or hay at a rate of 90 lbs. per 1000 sq. ft.
  - Apply a liquid mulch binder or tack to straw or hay mulch.

**CONSTRUCTION SEQUENCE**

- |   | APPROX. PROJECT DURATION |
|---|--------------------------|
| 1. INSTALL SOIL EROSION AND SEDIMENT CONTROL DEVICES (STABILIZED CONSTRUCTION ACCESS, SILT FENCE, ETC.) | 1 DAY                    |
| 2. ROUGH GRADE SITE   | 1 MONTH                  |
| 3. BEGIN DWELLING CONSTRUCTION  | 8 MONTHS                 |
| 4. CONSTRUCT OTHER SITE FEATURES  | 1 MONTH                  |
| 5. PERFORM SOIL SCARIFICATION OR TILLAGE OF SUBSOIL (6" MINIMUM DEPTH) PRIOR TO ADDING TOPSOIL          | 1 DAY                    |
| 6. UNIFORMLY APPLY TOPSOIL AND FINE GRADE ALL AREAS TO SPECIFIED GRADES                                 | 1 WEEK                   |
| 7. PERMANENT SEED AND STABILIZED ALL AREAS  | 1 DAY                    |
| 8. REMOVE SOIL EROSION CONTROL DEVICES WHEN SITE IS STABILIZED  | 1 DAY                    |
|   | 12 MONTHS                |

MICHAEL J. ROTH

**ROTH ENGINEERING**

PLOT PLANS FOR 71 LONG ROAD  
GRADING, UTILITY, AND SOIL EROSION  
& SEDIMENT CONTROL PLAN  
BLOCK 11501, LOT 15  
TOWNSHIP OF BERNARDS, SOMERSET COUNTY, NEW JERSEY

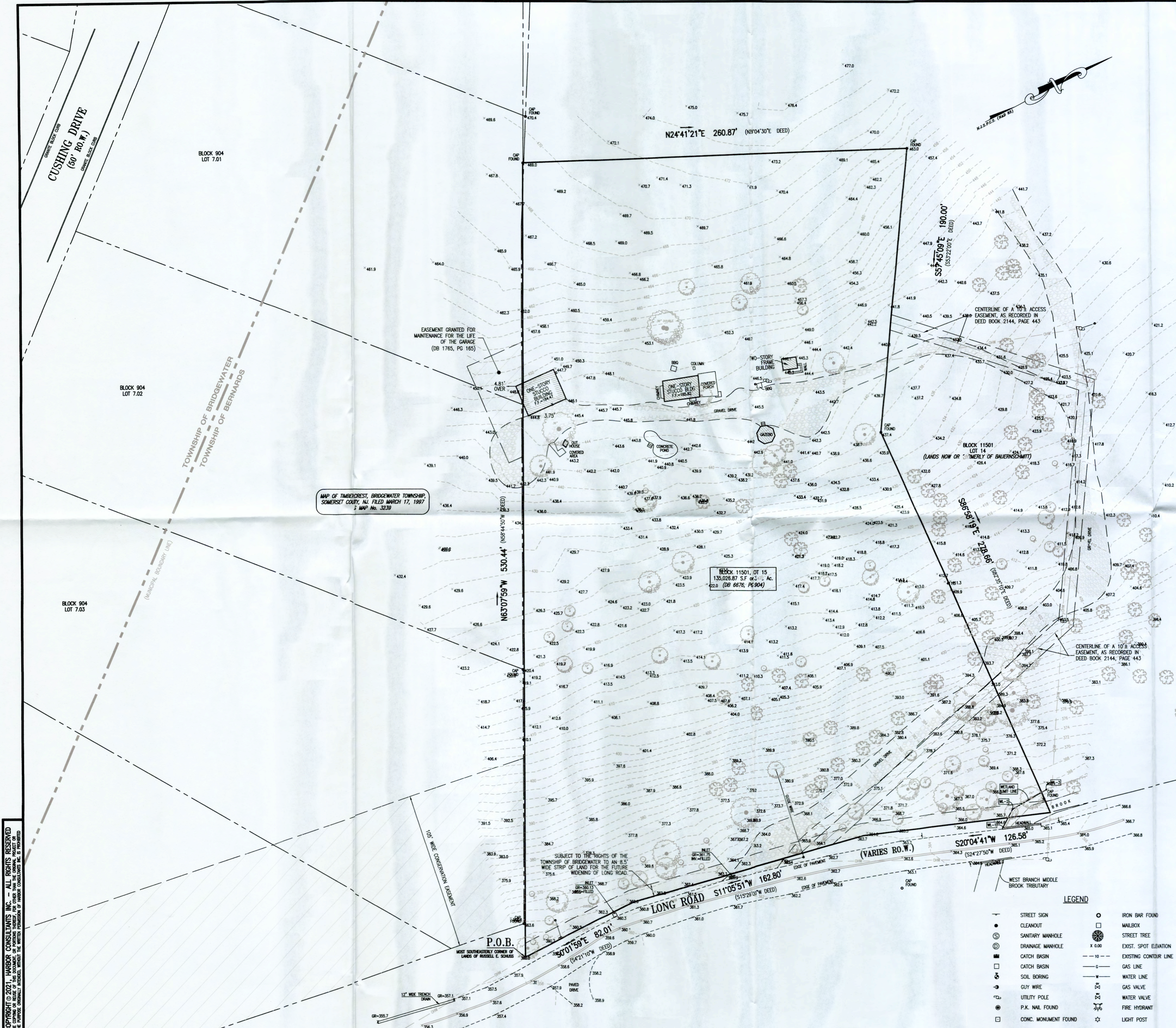
DATE: 01/04/23  
PROJECT NO.: 221005  
SHEET NO.:  
**3 OF 3**

REVISED PER COMPLETENESS REVIEW COMMENTS ON 01/13/23

1 01/30/23 DATE

PROFESSIONAL ENGINEER  
NEW JERSEY LICENSE NO. 24606262600  
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**CERTIFICATION:**  
I CERTIFY THAT THIS PLAN IS THE RESULT OF A FIELD SURVEY MADE ON MAY 20, 2015 AND UPDATED ON DECEMBER 27, 2022, BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH THE RULES AND REGULATIONS PROMULGATED BY THE "STATE BOARD OF PROFESSIONAL ENGINEERS & LAND SURVEYORS."  
THE INFORMATION SHOWN HEREON CORRECTLY REPRESENTS THE CONDITIONS FOUND AT, AND AS OF THE DATE OF THE FIELD SURVEY, EXCEPT SUCH IMPROVEMENTS OR EASEMENTS, IF ANY, BELOW THE SURFACE AND NOT VISIBLE.  
SUBJECT TO SUCH FACTS AS AN ACCURATE TITLE SEARCH MAY DISCLOSE.  
TO: STEPHEN REALE

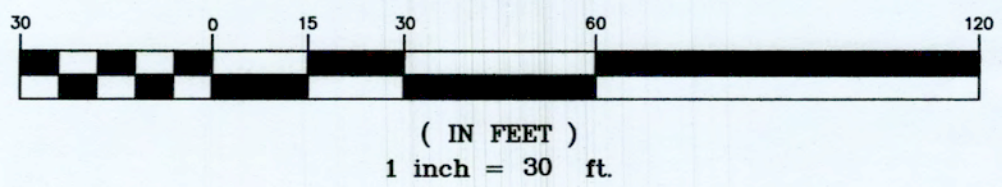
- GENERAL NOTES:**
1. THE PREMISES SHOWN HEREON WERE SURVEYED WITH THE BENEFIT OF A TITLE SEARCH BY ATTORNEY TITLE SERVICES, LLC DATED 12/18/2013 AND IS SUBJECT TO SUCH FACTS AS A CURRENT TITLE SEARCH MAY DISCLOSE. THE PROPERTY ALSO MAY BE SUBJECT TO THE FOLLOWING:  
A.) RIGHTS OF CLAIMS OF PARTIES IN POSSESSION SHOWN BY THE PUBLIC RECORD.  
B.) RIGHTS OF CLAIMS OF PARTIES IN POSSESSION NOT SHOWN BY THE PUBLIC RECORD.  
C.) EASEMENTS OR CLAIMS OF EASEMENTS, SHOWN BY THE PUBLIC RECORD.  
D.) EASEMENTS OR CLAIMS OF EASEMENTS, NOT SHOWN BY THE PUBLIC RECORD.
  2. NO DETERMINATIONS HAVE BEEN MADE REGARDING UNDERGROUND UTILITIES WHICH MAY EXIST, UNLESS AS SHOWN.
  3. NO DETERMINATIONS HAVE BEEN MADE REGARDING HAZARDOUS MATERIAL CONDITIONS.
  4. NO DETERMINATIONS HAVE BEEN MADE REGARDING WETLANDS LOCATION.
  5. PROPERTY IS SITUATED IN FLOOD ZONE X (BASE FLOOD ELEVATIONS DETERMINED) PER A PLAN ENTITLED "FIRM" FLOOD INSURANCE RATE MAP, FOR THE TOWNSHIP OF BERNARDS COMMUNITY/PANEL No. 340428 0064 E, MAP No. 340500064E EFFECTIVE DATE SEPTEMBER 28th, 2007.
  6. PLANNIMETRIC FEATURES SHOWN HEREON HAVE BEEN DRAWN IN ACCORDANCE WITH FIELD SURVEY PERFORMED BY HARBOR CONSULTANTS, INC., MAY 20, 2015 AND UPDATED DECEMBER 27, 2022.
  7. EXISTING UTILITY INFORMATION SHOWN HEREON HAS BEEN COLLECTED FROM VARIOUS SOURCES AND IS NOT GUARANTEED AS TO ACCURACY OR COMPLETENESS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION TO HIS SATISFACTION PRIOR TO EXCAVATION. WHERE EXISTING UTILITIES ARE TO BE CROSSED BY PROPOSED CONSTRUCTION, TEST PITS SHALL BE DUG BY THE CONTRACTOR PRIOR TO CONSTRUCTION TO ASCERTAIN EXISTING INVENTS, MATERIALS AND SIZES. TEST PIT INFORMATION SHALL BE GIVEN TO THE ENGINEER PRIOR TO CONSTRUCTION TO PERMIT ADJUSTMENTS AS REQUIRED TO AVOID CONFLICTS.
  8. TOPOGRAPHIC INFORMATION SHOWN HEREON HAVE BEEN DRAWN IN ACCORDANCE WITH FIELD SURVEY PERFORMED BY HARBOR CONSULTANTS, INC., MAY 20, 2015.

**DESCRIPTION:**  
BEING KNOWN AND DESIGNATED AS LOT 15 IN BLOCK 11501 ON THE TOWNSHIP OF BERNARDS TAX ASSESSMENT MAP.  
BEING MORE COMMONLY KNOWN AS No. 71 LONG ROAD TOWNSHIP OF BERNARDS, SOMERSET COUNTY, NEW JERSEY

- NOTES:**
1. REFERENCES WERE MADE TO DEED BOOK 6676, PAGE 904
  2. AT THE REQUEST OF THE OWNERS, PROPERTY CORNERS WERE NOT SET AT THIS TIME. PURSUANT TO ARTICLE 13-40-5.1 OF THE N.J.A.C., A WRITTEN WAIVER FROM THE SETTING OF CORNER MARKERS HAS BEEN OBTAINED.
  3. DIMENSIONS AS SHOWN ARE NOT INTENDED FOR THE CONSTRUCTION OF FENCES OR PERMANENT STRUCTURES.
  4. OFFSETS SHOWN ARE MEASURED FROM THE FRAME OF THE STRUCTURE PERPENDICULAR TO THE PROPERTY LINE, UNLESS OTHERWISE NOTED.
- CAUTION: IF THIS DOCUMENT DOES NOT CONTAIN A RAISED IMPRESSION SEAL OF THE PROFESSIONAL, IT IS NOT AN AUTHORIZED ORIGINAL DOCUMENT AND MAY HAVE BEEN ALTERED.

ELEVATIONS SHOWN ARE BASED ON NAVD 88

GRAPHIC SCALE



| REV. | DATE       | DESCRIPTION   | A.M. |
|------|------------|---|------|
| 1    | 12/30/2022 | UPDATED SURVEY TO CONFIRM EXISTING STRUCTURES AND TREES |      |



**Harbor Consultants Inc.**  
Engineers & Surveyors  
320 NORTH AVENUE EAST  
CRANFORD, N.J. 07016  
Phone (908) 276-2715 Fax (908) 709-1738  
Email: info@hcieg.net

*[Signature]*  
**VICTOR E. VINEGRA**  
PROFESSIONAL ENGINEER & LAND SURVEYOR  
NEW JERSEY LICENSE No. 34460

**BOUNDARY & TOPOGRAPHIC SURVEY**

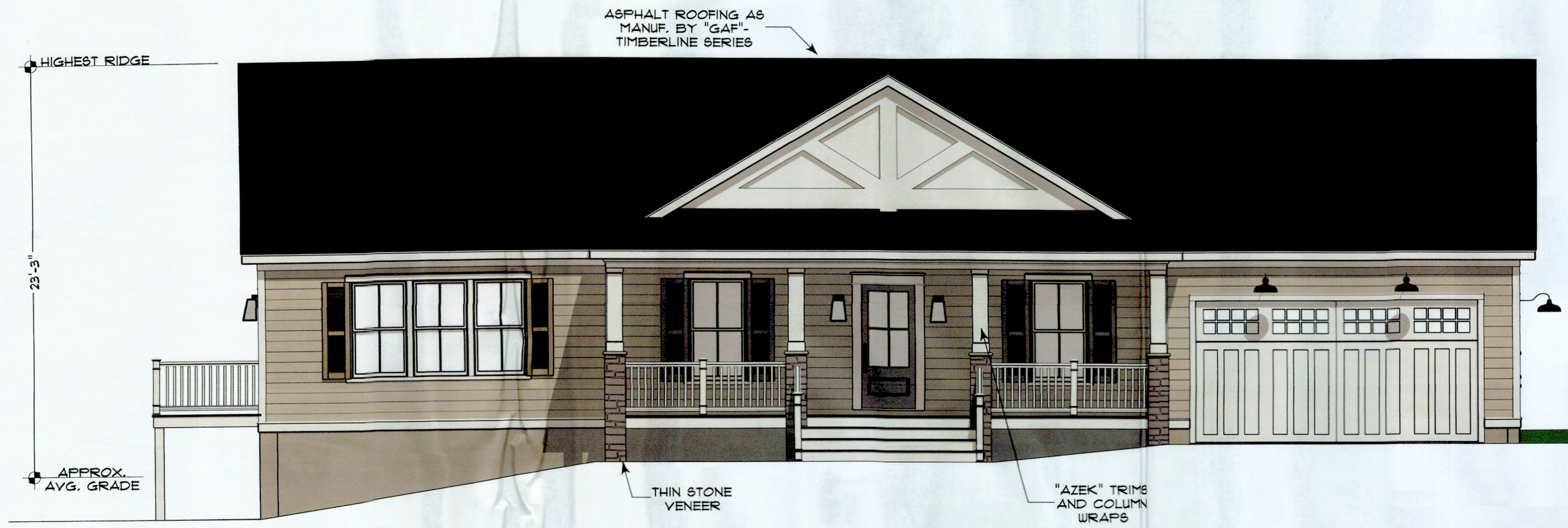
TOWNSHIP OF BERNARDS  
SOMERSET COUNTY  
NEW JERSEY

SCALE: 1"=30'  
DATE: 05/20/2015  
DESIGNED BY: V.E.V.  
DRAWN BY: AR/J.B.  
WORK FILE: 2022170 Survey

CERTIFICATE OF AUTHORIZATION No. 246A27962100  
PROJECT No: 2022170

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FRONT ELEVATION  
SCALE: 1/4" = 1' - 0"



RIGHT SIDE ELEVATION  
SCALE: 1/4" = 1' - 0"

| APPROVALS       |      |
|-----------------|------|
| BOARD ENGINEER  | DATE |
| BOARD CHAIRMAN  | DATE |
| BOARD SECRETARY | DATE |

revision:

**Byrne Design Associates LLC.**  
architecture / design / planning  
10 MAIN STREET • CHESTER, NJ 07930  
PHONE (908) 879-0936  
WILLIAMBYRNEAIA@AOL.COM

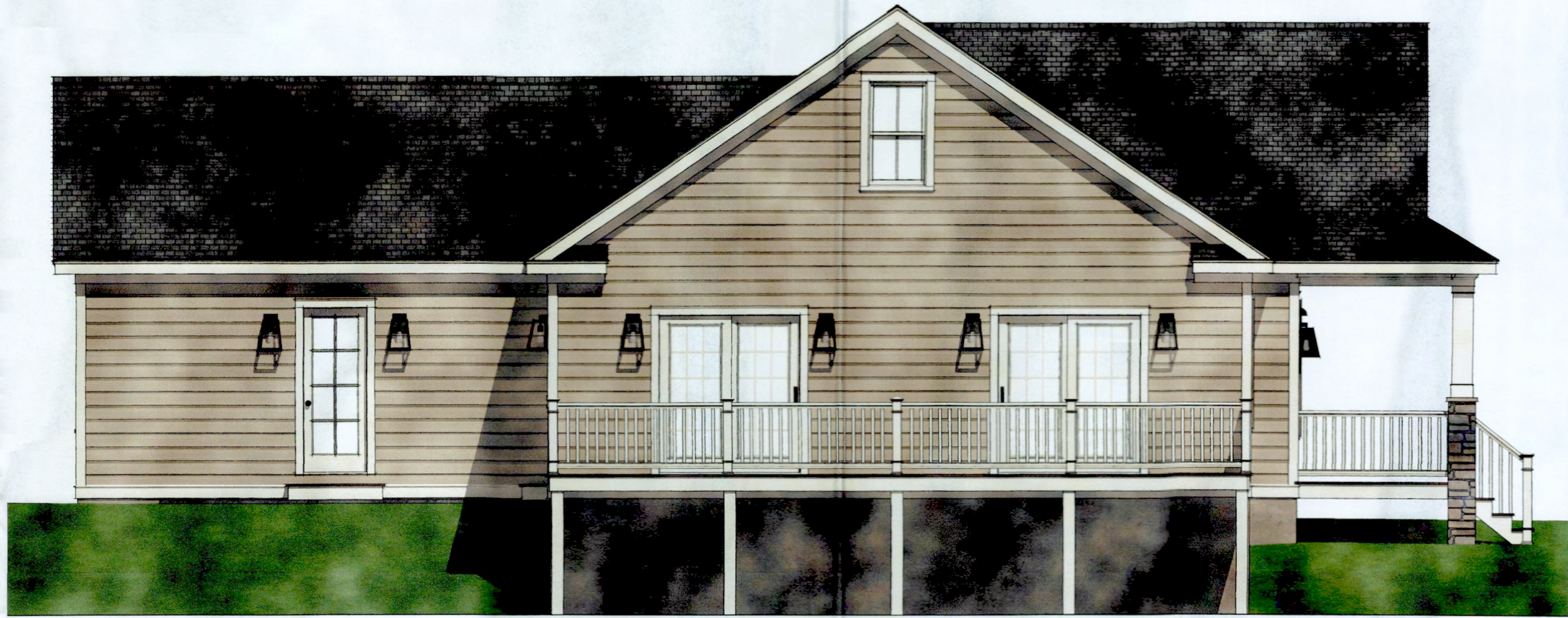
1712 NOVUM CHURCH ROAD • MADISON, VA 22135  
PHONE (540) 547-2140

PROJECT: REALE RESIDENCE  
11 LONG ROAD  
BERNARDS TOWNSHIP, NJ

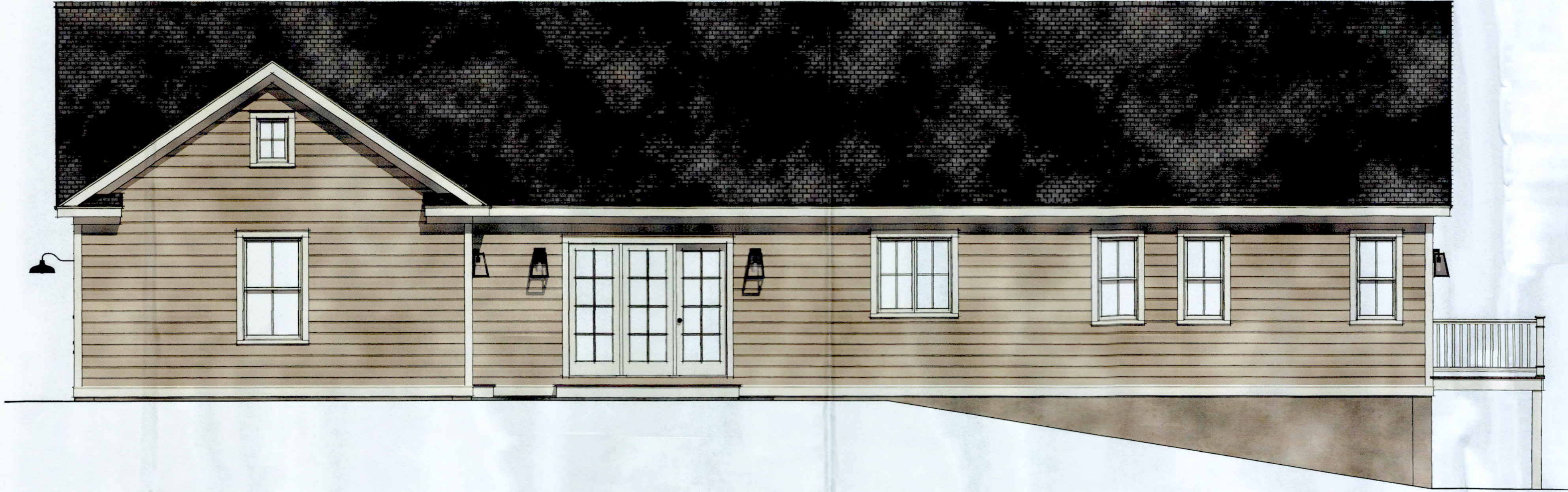
DATE: 1/10/23  
JOB:  
SCALE: NOTED  
SHEET: 1

WILLIAM F. BYRNE / ARCHITECT  
NEW JERSEY #A-14655  
PENDING #C0393





LEFT SIDE ELEVATION  
SCALE: 1/4" = 1' - 0"



REAR ELEVATION  
SCALE: 1/4" = 1' - 0"

PROJECT: REALE RESIDENCE  
71 LONG ROAD  
BERNARDS TOWNSHIP, NJ

WILLIAM E. BYRNE | ARCHITECT  
NEW JERSEY | A 14492  
VIRGINIA | 009838

Byrne Design Associates LLC.  
architecture / design / planning  
10 MAIN STREET • CHESTER, NJ 07930  
PHONE (908) 879-0996  
WILLIAMBYRNEAIA@AOL.COM  
1712 NOVUM CHURCH ROAD • MADISON, VA 22135  
PHONE (540) 547-2140

revision :

DATE: 1/10/23

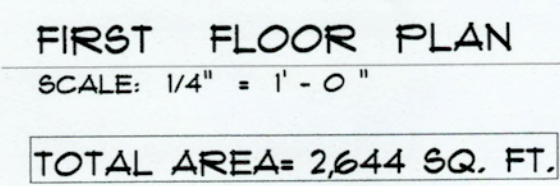
JOB :

SCALE: NOTED

SHEET :

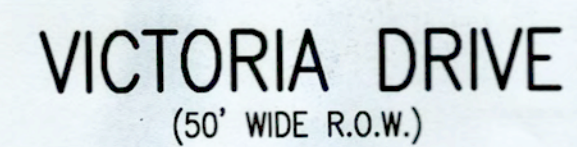
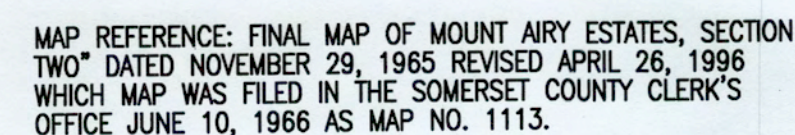
2



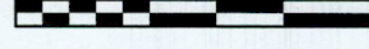

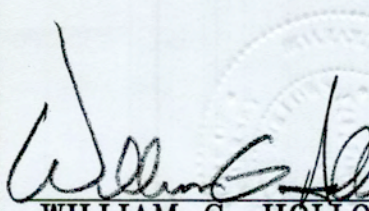
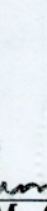


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LIGHT - ADDITIONAL  
ZBZZ-026  
HEARING 3/8  
ADD'L INFO  
Feb

|   |  |
|---|--|
| DRAWN BY:<br><div style="text-align: center; font-weight: bold; font-size: 1.2em;">SP</div>   | CHECKED BY:<br><div style="text-align: center; font-weight: bold; font-size: 1.2em;">WGH</div> |
| JOB No. <span style="float: right; font-size: 1.2em;">21-063</span>   |  |
| BOOK  |  |
| SCALE<br><div style="text-align: center; margin-top: 10px;"><math>1" = 30'</math></div> <div style="text-align: center; margin-top: 5px;"></div> <div style="text-align: center; font-size: 0.8em; margin-top: 5px;">GRAPHIC SCALE</div>   |  |
| DATE<br><div style="text-align: center; font-size: 1.2em; font-weight: bold;">JANUARY 23, 2023</div>  |  |
| REVISIONS   |  |
| NOTES<br><p>TOPOGRAPHY AS SHOWN<br/>HEREON TAKEN FROM A<br/>CURRENT TOPOGRAPHICAL<br/>SURVEY BY JAMES P. DEADY,<br/>SURVEYOR, LLC</p>   |  |
| <div style="display: flex; justify-content: space-between; align-items: center;"><div style="flex: 1;"><h1 style="margin: 0;">Murphy<br/>&amp; Hollows<br/>Associates LLC</h1><p style="font-size: 0.8em; margin: 0;">CIVIL ENGINEERING AND SURVEYING<br/>192 CENTRAL AVENUE, STIRLING, NJ 07980<br/>908.550.1255 <a href="mailto:murphyhollows@gmail.com">murphyhollows@gmail.com</a></p></div><div style="flex: 0.1; text-align: center;"></div></div> <div style="text-align: center; font-weight: bold; font-size: 1.1em; margin-top: 10px;">SURVEY &amp; TOPOGRAPHY<br/>OF<br/>LOT 2<br/>BLOCK 5001<br/>13 VICTORIA DRIVE<br/>TOWNSHIP OF<br/>BERNARDS<br/>SOMERSET COUNTY<br/>NEW JERSEY</div> <div style="text-align: center; margin-top: 20px;"><div style="font-weight: bold; font-size: 1.1em;">AIDAN T. MURPHY</div><div style="font-size: 0.8em;">N.J. L.C. PROFESSIONAL ENGINEER #21319<br/>1973-2016</div></div> |  |
| <div style="display: flex; justify-content: space-around; align-items: center;"><div style="text-align: center;"><div style="font-weight: bold; font-size: 1.1em;">WILLIAM G. HOLLOWES</div><div style="font-size: 0.8em;">N.J. L.C. PROFESSIONAL ENGINEER<br/>&amp; LAND SURVEYOR #27473<br/>N.J. PROFESSIONAL PLANNER #2530</div></div><div style="text-align: center;"></div></div>  |  |
| FILE<br><div style="text-align: center; font-weight: bold; font-size: 1.1em;">LF21-063</div>  | SHEET<br><div style="margin-top: 20px;">1<br/>OF<br/>1</div>                                   |



# Rent Roll

Property: 0019 From Date: 03/31/2018 By Property

| Property                                | Unit(s)                 | Lease  | Lease Type        | Area                | Lease From         | Lease To   | Term | Monthly Rent      | Monthly Rent Per Area | Annual Rent         | Annual Rent Per Area | Annual Rec. Per Area | Annual Misc Per Area | Security Deposit  | LOC Amount/ Bank Guarantee |
|---|-------------------------|--|-------------------|---------------------|--------------------|------------|------|-------------------|-----------------------|---------------------|----------------------|----------------------|----------------------|-------------------|----------------------------|
| <b>0019 - SIG 150 LLC,Basking Ridge</b> |                         |  |                   |                     |                    |            |      |                   |                       |                     |                      |                      |                      |                   |                            |
| <b>Current Leases</b>                   |                         |  |                   |                     |                    |            |      |                   |                       |                     |                      |                      |                      |                   |                            |
| 0019                                    |                         | Cablevision Lightpath-NJ Inc.                                  | Office GLA        | 0.00                | 01/01/2018         | 12/31/2023 | 72   | 590.98            | 0.00                  | 7,091.76            | 0.00                 | 0.00                 | 0.00                 | 0.00              | 0.00                       |
| 0019                                    | 100                     | Concurrent Technologies Corp.                                  | Office Net        | 4,263.00            | 05/01/2016         | 04/30/2023 | 84   | 9,591.75          | 2.25                  | 115,101.00          | 27.00                | 0.00                 | 0.00                 | 38,494.14         | 0.00                       |
| 0019                                    | 101, 202, 203, 204, 207 | ACE American Insurance Company                                 | Office Net        | 51,971.00           | 05/01/2011         | 02/28/2022 | 130  | 90,949.25         | 1.75                  | 1,091,391.00        | 21.00                | 0.33                 | 0.15                 | 0.00              | 0.00                       |
| 0019                                    | 102, 105                | Torrent Pharma Inc.  | Office Net        | 12,212.00           | 11/19/2012         | 06/30/2022 | 116  | 23,917.13         | 1.96                  | 287,005.56          | 23.50                | 0.10                 | 0.00                 | 0.00              | 0.00                       |
| 0019                                    | 103, 2FL -STR           | Dematic Corp.  | Office Net        | 9,022.00            | 01/01/2011         | 04/30/2021 | 124  | 16,151.25         | 1.79                  | 193,815.00          | 21.48                | 0.15                 | 1.90                 | 0.00              | 0.00                       |
| 0019                                    | 107                     | Accuspec, Inc.   | Office Net        | 1,160.00            | 08/01/2015         | 08/31/2026 | 133  | 2,030.00          | 1.75                  | 24,360.00           | 21.00                | 0.16                 | 1.75                 | 6,090.00          | 0.00                       |
| 0019                                    | 108                     | Parker Homescape LLC   | Office Net        | 585.00              | 05/01/2012         | 10/17/2022 | 125  | 500.00            | 0.85                  | 6,000.00            | 10.26                | 0.00                 | 0.00                 | 0.00              | 0.00                       |
| 0019                                    | 110                     | Joshua Saunders, Elaine Gaudy, B.Scoff, A.Honrath, K.Niederaue | Office Net        | 2,357.00            | 09/01/2014         | 03/31/2023 | 103  | 4,124.75          | 1.75                  | 49,497.00           | 21.00                | 0.25                 | 1.75                 | 8,249.50          | 0.00                       |
| 0019                                    | 200                     | Adelson, Testan, Brundo & Jimenez                              | Office Net        | 7,021.00            | 07/01/2013         | 01/23/2019 | 66   | 13,456.92         | 1.92                  | 161,483.04          | 23.00                | 0.48                 | 1.75                 | 0.00              | 0.00                       |
| 0019                                    | 201, LL-01, LL-STR      | Electrocore LLC  | Office Net        | 25,329.00           | 07/01/2013         | 10/05/2021 | 99   | 45,526.42         | 1.80                  | 546,317.04          | 21.57                | 0.47                 | 0.20                 | 0.00              | 0.00                       |
| 0019                                    | 204-1                   | LiteSpeed Technologies, Inc.                                   | Office Net        | 4,998.00            | 06/01/2016         | 03/31/2022 | 70   | 8,954.75          | 1.79                  | 107,457.00          | 21.50                | 0.00                 | 1.75                 | 0.00              | 0.00                       |
| 0019                                    | 208                     | Peterpaul & Clark, P.C.  | Office GLA        | 600.00              | 01/01/2017         | 12/31/2022 | 72   | 412.00            | 0.69                  | 4,944.00            | 8.24                 | 0.00                 | 0.00                 | 0.00              | 0.00                       |
| 0019                                    | 302, 302-E              | Matheson Tri-Gas, Inc.   | Office Net        | 33,053.00           | 06/01/2011         | 12/31/2022 | 139  | 66,106.00         | 2.00                  | 793,272.00          | 24.00                | 0.00                 | 1.75                 | 91,774.18         | 0.00                       |
| 0019                                    | 303                     | Pulte Homes of NJ, Limited Partnership                         | Office Net        | 24,946.00           | 10/01/2015         | 01/31/2023 | 88   | 44,694.92         | 1.79                  | 536,339.04          | 21.50                | 0.45                 | 1.75                 | 0.00              | 0.00                       |
| 0019                                    | 304                     | TurnPoint Medical Devices, Inc.                                | Office GLA        | 6,311.00            | 12/01/2015         | 11/23/2022 | 83   | 10,000.00         | 1.58                  | 120,000.00          | 19.01                | 0.00                 | 0.00                 | 0.00              | 0.00                       |
| 0019                                    | SHED                    | Becht Engineering BT, Inc.                                     | Office GLA        | 0.00                | 07/01/2015         | 12/31/2022 | 90   | 0.00              | 0.00                  | 0.00                | 0.00                 | 0.00                 | 0.00                 | 0.00              | 0.00                       |
| <b>Total Current</b>                    |                         |  |                   | <b>183,828.00</b>   |                    |            |      | <b>337,006.12</b> | <b>1.83</b>           | <b>4,044,073.44</b> | <b>22.00</b>         | <b>0.26</b>          | <b>0.89</b>          | <b>144,607.82</b> | <b>0.00</b>                |
|   | <b>Total Units</b>      | <b>Total Area</b>  | <b>Percentage</b> | <b>Monthly Rent</b> | <b>Annual Rent</b> |            |      |                   |                       |                     |                      |                      |                      |                   |                            |



# Rent Roll

Property: 0019 From Date: 03/31/2018 By Property

| Property     | Unit(s)   | Lease             | Lease Type | Area              | Lease From          | Lease To | Term | Monthly Rent | Monthly Rent Per Area | Annual Rent | Annual Rent Per Area | Annual Rec. Per Area | Annual Misc Per Area | Security Deposit | LOC Amount/ Bank Guarantee |
|--------------|-----------|-------------------|------------|-------------------|---------------------|----------|------|--------------|-----------------------|-------------|----------------------|----------------------|----------------------|------------------|----------------------------|
| Occupied     | 24        | 183,828.00        | 100.00     | 337,006.12        | 4,044,073.44        |          |      |              |                       |             |                      |                      |                      |                  |                            |
| Vacant       | 0         | 0.00              | 0.00       | 0.00              | 0.00                |          |      |              |                       |             |                      |                      |                      |                  |                            |
| <b>Total</b> | <b>24</b> | <b>183,828.00</b> |            | <b>337,006.12</b> | <b>4,044,073.44</b> |          |      |              |                       |             |                      |                      |                      |                  |                            |



# Export Preview



## 150 Allen Road

150 Allen Road



Export

Size 184K Occupancy 5% Avg. Base Rent \$22.54 WALT 1.13 18 Mo. L. Roll 4% Total Avail. 82%



|            |           |   |       |  |        |                                      |     |   |         |                 |     |
|------------|-----------|---|-------|--|--------|--------------------------------------|-----|---|---------|-----------------|-----|
| 3          | 64,310 sf | Vacant<br>22,520sf                              | 302   | Vacant<br>10,533                             | 302-E  | Vacant<br>24,946sf                   | 303 | Vacant<br>6,311   | 304     |                 |     |
|            |           | Vacant<br>7,021                                 | 200   | Vacant<br>19,329sf                           | 201    | Vacant<br>8,466                      | 202 | Vacant<br>6,872   | 203     | Vacant<br>2,282 | 204 |
| 2          | 58,563 sf | Vacant<br>4,998sf                               | 204-1 | Vacant<br>8,587sf                            | 207    | Vacant<br>600                        | 208 | Vacant<br>408   | 2FL-STR |                 |     |
|            |           | Concurrent Tec...<br>4,263   04/30/23   \$28.00 | 100   | Vacant<br>25,764sf                           | 101    | Vacant<br>6,106                      | 102 | Vacant<br>8,614   | 103     |                 |     |
| 1          | 54,955 sf | Vacant<br>6,106sf                               | 105   | Accuspec, Inc.<br>1,160   08/31/26   \$23.00 | 107    | Vacant<br>585                        | 108 | Joshua Saunders, Elaine Gau...<br>2,357sf   LXD 03/31/23   BR \$22.00 | 110     |                 |     |
| Lower L... | 6,000 sf  | Vacant<br>5,500sf                               | LL-01 | Vacant<br>500                                | LL-STR | Property Manage...<br>600   12/31/30 |     |   |         |                 |     |



Rent Roll

Property: 0019 From Date: 02/01/2023 By Property

| Property                         | Unit(s)     | Lease  | Lease Type | Area         | Lease From  | Lease To   | Term | Monthly Rent | Monthly Rent Per Area | Annual Rent | Annual Rent Per Area | Annual Rec. Per Area | Annual Misc Per Area | Security Deposit | LOC Amount/ Bank Guarantee |
|----------------------------------|-------------|--|------------|--------------|-------------|------------|------|--------------|-----------------------|-------------|----------------------|----------------------|----------------------|------------------|----------------------------|
| 0019 - SIG 150 LLC,Basking Ridge |             |  |            |              |             |            |      |              |                       |             |                      |                      |                      |                  |                            |
| Current Leases                   |             |  |            |              |             |            |      |              |                       |             |                      |                      |                      |                  |                            |
| 0019                             |             | Cablevision Lightpath-NJ Inc.                                  | Office GLA | 0.00         | 01/01/2018  | 12/31/2023 | 72   | 590.98       | 0.00                  | 7,091.76    | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             |             | CenturyLink Communications, LLC                                | Office GLA | 0.00         | 06/12/2018  | 06/11/2023 | 60   | 250.00       | 0.00                  | 3,000.00    | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 100         | Concurrent Technologies Corp.                                  | Office Net | 4,263.00     | 05/01/2016  | 04/30/2023 | 84   | 9,947.00     | 2.33                  | 119,364.00  | 28.00                | 1.94                 | 0.00                 | 38,494.14        | 0.00                       |
| 0019                             | 107         | Accuspec, Inc.   | Office Net | 1,160.00     | 08/01/2015  | 08/31/2026 | 133  | 2,223.33     | 1.92                  | 26,679.96   | 23.00                | 1.34                 | 1.75                 | 6,090.00         | 0.00                       |
| 0019                             | 110         | Joshua Saunders, Elaine Gaudy, B.Scoff, A.Honrath, K.Niederaue | Office Net | 2,357.00     | 09/01/2014  | 03/31/2023 | 103  | 4,321.17     | 1.83                  | 51,854.04   | 22.00                | 1.34                 | 1.75                 | 8,249.50         | 0.00                       |
| 0019                             | 101         | VACANT   |            | 25,764.00    |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 102         | VACANT   |            | 6,106.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 103         | VACANT   |            | 8,614.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 105         | VACANT   |            | 6,106.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 108         | VACANT   |            | 585.00       |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 200         | VACANT   |            | 7,021.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 201         | VACANT   |            | 19,329.00    |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 202         | VACANT   |            | 8,466.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 203         | VACANT   |            | 6,872.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 204         | VACANT   |            | 2,282.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 204-1       | VACANT   |            | 4,998.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 207         | VACANT   |            | 8,587.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 208         | VACANT   |            | 600.00       |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 2FL-STR     | VACANT   |            | 408.00       |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 302         | VACANT   |            | 22,520.00    |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 302-E       | VACANT   |            | 10,533.00    |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 303         | VACANT   |            | 24,946.00    |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | 304         | VACANT   |            | 6,311.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | LL-01       | VACANT   |            | 5,500.00     |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | LL-STR      | VACANT   |            | 500.00       |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| 0019                             | SHED        | VACANT   |            | 0.00         |             |            | 0    | 0.00         | 0.00                  | 0.00        | 0.00                 | 0.00                 | 0.00                 | 0.00             | 0.00                       |
| Total Current                    |             |  |            | 183,828.00   |             |            |      | 17,332.48    | 0.09                  | 207,989.76  | 1.13                 | 0.07                 | 0.03                 | 52,833.64        | 0.00                       |
|                                  |             |  |            |              |             |            |      |              |                       |             |                      |                      |                      |                  |                            |
|                                  | Total Units | Total Area   | Percentage | Monthly Rent | Annual Rent |            |      |              |                       |             |                      |                      |                      |                  |                            |
| Occupied                         | 3           | 7,780.00   | 4.23       | 17,332.48    | 207,989.76  |            |      |              |                       |             |                      |                      |                      |                  |                            |
| Vacant                           | 21          | 176,048.00   | 95.76      | 0.00         | 0.00        |            |      |              |                       |             |                      |                      |                      |                  |                            |



Rent Roll

Property: 0019 From Date: 02/01/2023 By Property

| Property | Unit(s) | Lease      | Lease Type | Area      | Lease From | Lease To | Term | Monthly Rent | Monthly Rent Per Area | Annual Rent | Annual Rent Per Area | Annual Rec. Per Area | Annual Misc Per Area | Security Deposit | LOC Amount/ Bank Guarantee |
|----------|---------|------------|------------|-----------|------------|----------|------|--------------|-----------------------|-------------|----------------------|----------------------|----------------------|------------------|----------------------------|
| Total    | 24      | 183,828.00 |            | 17,332.48 | 207,989.76 |          |      |              |                       |             |                      |                      |                      |                  |                            |





# TRAFFIC IMPACT STUDY

## PROPOSED LIGHT MANUFACTURING REDEVELOPMENT

Proposed Light  
Manufacturing Development  
150 Allen Road  
Bernards Township Somerset  
County, New Jersey

Prepared For:  
Sig150 Allen LLC

September 16, 2022  
**Revised: January 24, 2023**  
SE&D Job No. PRI-220206



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John R. Corak, PE  
Project Manager  
NJ P.E. License #54973



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Matthew J. Seckler PE, PP, PTOE  
Principal  
NJ P.E. License #48731

**STONEFIELD**

92 Park Avenue, Rutherford, NJ 07070



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## **TECHNICAL APPENDIX**

### **LEVEL OF SERVICE/AVERAGE CONTROL DELAY CRITERIA**

Table A1: Comparative Level of Service (Delay) Table

### **TURNING MOVEMENT COUNT DATA**

Intersection of Liberty Corner Road and Interstate Route 78 EB Ramp

Intersection of Liberty Corner Road and Interstate Route 78 WB Ramp

Intersection of Liberty Corner Road and Allen Road

Intersection of Allen Road and Existing Site Driveway

Intersection of Allen Road and Somerville Road

### **FIGURES**

Figure 1 – Site Location Map

Figure 2 – 2022 Existing Traffic Volumes

Figure 3 – 2024 No-Build Traffic Volumes

Figure 4 – “New” Site-Generated Traffic Volumes

Figure 5 – 2024 Build Traffic Volumes

### **HIGHWAY CAPACITY ANALYSIS DETAIL SHEETS**

2022 Existing Traffic Conditions

2024 No-Build Traffic Conditions

2024 Build Traffic Conditions

### **TRAFFIC SIGNAL TIMING DIRECTIVE**

Intersection of Liberty Corner Road and Interstate Route 78 EB Ramp

Intersection of Liberty Corner Road and Interstate Route 78 WB Ramp

Intersection of Liberty Corner Road and Allen Road



## EXECUTIVE SUMMARY

The initial iteration of this Traffic Impact Study was dated September 16, 2022. A comment letter from Bright View Engineering was issued, dated December 9, 2022. The following changes were made to this report based on that comment letter:

1. Turning movement counts were conducted at the intersection of Allen Road and Somerville Road. Level of Service and Capacity analysis was also conducted at this intersection.
2. Additional turning movement counts were conducted at the intersection of Liberty Corner Road and Allen Road to calibrate the August 2022 counts. Previously, calibration of the August 2022 counts was done based seasonal adjustment factors published by the NJDOT.
3. The trip generation of the proposed development was updated to account for the office space separate from the manufacturing space.
4. The Journey-to-Work Model was updated, using Census data from 2019.
5. The Level of Service and Capacity analysis has been updated to account for the changes to roadway volumes, trip generation, and trip distribution.



## INTRODUCTION

This Traffic Impact Study was prepared to investigate the potential impacts of the proposed light manufacturing development on the adjacent roadway network. The subject property is located along Allen Road in the Township of Bernards, Somerset County, New Jersey. The site location is shown on appended **Figure 1**.

The subject property is designated as Block 11201, Lot 3 as depicted on the Township of Bernards Tax Map. The site has approximately 66 feet of frontage along Allen Road and approximately 1,896 feet of frontage along Interstate Route 78. The existing site is occupied by a three (3) story, 174,546 square-foot footprint, office building known as The Offices at Liberty Corner. Access is presently provided via one (1) full-movement driveway along Allen Road, with cross-access provided to the Block 11201, Lots 4, 5, and 15. Under the proposed development program, the existing structures would be razed, and two (2) separate light manufacturing buildings (known as Building A and Building B) would be constructed. Building A would be 127,977 square-feet and Building B would be 130,551 square-feet, for a total of 258,528 square-feet. Access is proposed to remain via one (1) full-movement driveway along Allen Road, with cross-access provided to the Block 11201, Lots 4, 5, and 15.

## METHODOLOGY

Stonefield Engineering & Design, LLC has prepared this Traffic Impact Study in accordance with the recommended guidelines and practices outlined by the Institute of Transportation Engineers (ITE) within Transportation Impact Analyses for Site Development. A detailed field investigation was performed to assess the existing conditions of the adjacent roadway network. A data collection effort was completed to identify the existing traffic volumes at the study intersections to serve as a base for the traffic analyses. Capacity analysis, a procedure used to estimate the traffic-carrying ability of roadway facilities over a range of defined operating conditions, was performed using the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM) and the Synchro II Software for all study conditions to assess the roadway operations.

For an unsignalized intersection, Level of Service (LOS) A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay of less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 80 seconds per vehicle. The Technical Appendix contains the Highway Capacity Analysis Detail Sheets for the study intersections analyzed in this assessment. The traffic signal timing utilized within the signalized analysis is based on timing directives provided by the NJDOT and Somerset County.



## **2022 EXISTING CONDITION**

### **2022 EXISTING ROADWAY CONDITIONS**

The proposed light manufacturing development is located along Allen Road in the Township of Bernards, Somerset County, New Jersey. The subject property is designated as Block 11201, Lot 3 as depicted on the Township of Bernards Tax Map. The site has approximately 66 feet of frontage along Allen Road and approximately 1,896 feet of frontage along Interstate Route 78. Land uses in the area are a mix of commercial, industrial, and residential.

Interstate Route 78 is classified as an Urban Interstate roadway with a general east-west orientation and is under the jurisdiction of the New Jersey Department of Transportation (NJDOT). Along the site frontage, the roadway provides three (3) lanes of travel in each direction, separated by a grass median, and has a posted speed limit of 65 mph. Curb and sidewalk are not provided, shoulders are provided along both sides of the roadway, and on-street parking is not permitted. Interstate Route 78 provides east-west mobility throughout the New Jersey and access to Pennsylvania to the west.

Liberty Corner Road (CR 525) is classified as an Urban Minor Arterial roadway with a general north-south orientation and is under the jurisdiction of Somerset County. The roadway generally provides two (2) lanes of travel in each direction, with additional lanes provided at key intersections to facilitate turning movements and has a posted speed limit of 45 mph. Curb is provided along both sides of the roadway, sidewalk is not provided, shoulders are not provided, and on-street parking is not permitted. Liberty Corner Road provides north-south mobility throughout Somerset County and provides access to Interstate Route 287 to the north and Interstate 78 to the south, for a mix of commercial and residential uses along its length.

Allen Road (CR 652) is classified as an Urban Major Collector roadway with a general east-west orientation and is under the jurisdiction of Somerset County. Along the site frontage, the roadway provides one (1) lane of travel along both sides of the roadway, intermittently separated by a two-way left-turn lane, and has a posted speed limit of 40 mph. Curb is provided along both sides of the roadway, sidewalk is not provided, shoulders are provided along both sides of the roadway, and on-street parking is not permitted. Allen Road provides east-west mobility through Bernards Township and the surrounding municipalities for a mix of commercial and residential developments along its length.

Somerville Road is classified as an Urban Minor Collector to the north of Allen Road and classified as a local roadway to the south of Allen Road with a general north-south orientation and is under the jurisdiction of Bernards Township. The roadway generally provides one (1) lane of travel in each direction and has a posted speed limit of 35 mph. Curb is generally provided to the north of Allen Road and not provided to the south



of Allen Road, sidewalk is generally provided along the westerly side of the roadway, shoulders are provided along both sides of the roadway, and on-street parking is not permitted. Somerville Road provides north-south mobility through Bernards Township, for primarily residential uses along its length.

Liberty Corner Road and the Interstate Route 78 Eastbound ramps intersect to form a T-intersection controlled by a two (2)-phase traffic signal operating on a 60 or 90-second fixed background cycle. The northbound approach of Liberty Corner Road provides three (3) exclusive through lanes and one (1) unsignalized right-turn ramp-entrance lane and the southbound approach of Liberty Corner Road provides two (2) exclusive through lanes and one (1) unsignalized right-turn ramp-entrance lane. The eastbound approach of the Interstate Route 78 Eastbound exit ramp provides two (2) exclusive left-turn lanes and two (2) exclusive right-turn lanes.

Liberty Corner Road and the Interstate Route 78 Westbound ramps intersect to form a T-intersection controlled by a two (2)-phase traffic signal operating on a 60 or 90-second fixed background cycle. The northbound and southbound approaches of Liberty Corner Road provide two (2) exclusive through lanes and one (1) unsignalized right-turn ramp-entrance lane. The westbound approach of the Interstate Route 78 westbound exit ramp provides two (2) exclusive left-turn lanes and one exclusive right-turn lane.

Liberty Corner Road, Allen Road, and the driveway for Tamke Tree Experts intersect to form a four (4)-leg intersection controlled by a three (3)-phase traffic signal operating on a 90-second fixed background cycle. The northbound and southbound approaches of Liberty Corner Road provide one (1) exclusive left-turn lane, one (1) exclusive through lanes, and one (1) shared through/right-turn lane. The eastbound approach of Allen Road provides one (1) shared left-turn/through lane and one (1) exclusive right-turn lane. The westbound approach of the Tamke Tree Experts driveway provides one (1) shared full-movement lane. Crosswalks and pedestrian signals are provided along the easterly, westerly, and southerly legs of the intersection.

Allen Road and Somerville Road intersect to form an unsignalized four (4)-leg intersection, with all four (4) approaches operating under stop control. The eastbound and westbound approaches of Allen Road provide one (1) exclusive left-turn lane and one (1) shared through/right-turn lane. The northbound approach of Somerville Road provides one (1) full-movement and the southbound approach of Somerville Road provides one (1) shared left-turn/through lane and one (1) exclusive right turn lane. A crosswalk is provided along the westerly leg of the intersection.

#### 2022 EXISTING TRAFFIC VOLUMES

Manual turning movement counts were collected during the typical weekday morning and weekday evening time periods to evaluate existing traffic conditions and identify the specific hours when traffic activity on the adjacent roadways is at a maximum and could be potentially impacted by the development of the site. Turning movement counts were collected at the following intersections:



- ◆ Liberty Corner Road and Interstate Route 78 Eastbound Ramps
- ◆ Liberty Corner Road and Interstate Route 78 Westbound Ramps
- ◆ Liberty Corner Road and Allen Road
- ◆ Allen Road and Site Driveway

Specifically, manual turning movement counts were conducted on Tuesday, August 2, 2022, from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 7:00 p.m.

The study time periods were chosen as they are representative of the peak periods of both the adjacent roadway network and the proposed development. The traffic volume data was collected and analyzed to identify the design peak hour in accordance with HCM and ITE guidelines. Based on the review of the count data the weekday morning network peak hour occurred from 8:00 a.m. to 9:00 a.m. and the weekday evening network peak hour occurred from 4:45 p.m. to 5:45 p.m.

As per the engineering review letter by Bright View Engineering, dated December 8, 2022, additional turning movement count data was collected in order to perform Level of Service and Volume/Capacity analysis at the intersection of Allen Road and Somerville Road, and to calibrate the previous counts to a month when school is in session. Additional turning movement counts were collected at the following intersections:

- ◆ Liberty Corner Road and Allen Road
- ◆ Allen Road and Somerville Road

Specifically, manual turning movement counts were conducted on Tuesday, January 10, 2023, from 7:00 a.m. to 9:00 a.m. and from 4:00 p.m. to 6:00 p.m.

The August 2022 counts at the intersection of Liberty Corner Road and Allen Road were compared to the January 2023 counts at this same intersection. It was found that the January 2023 counts were approximately 11.7% higher than the August 2022 counts during the weekday morning peak hour and approximately 25.9% higher than the August 2022 counts during the weekday evening peak hour. As such, the volumes at the intersections counted during the August 2022 counts were grown by 11.7% and 25.9% during the weekday morning and weekday evening peak hours, respectively. The Technical Appendix contains a summary of the turning movement count data. The 2022 Existing weekday morning and weekday evening peak-hour volumes are summarized on appended **Figure 2**.

## 2022 EXISTING LOS/CAPACITY ANALYSIS

A Level of Service and Volume/Capacity analysis was conducted for the 2022 Existing Condition during the weekday morning and weekday evening peak hours at the study intersections and existing site driveway. Under



the existing condition, the signalized intersection of Interstate Route 78 Eastbound Ramp and Liberty Corner Road is calculated to operate at overall Level of Service B during the weekday morning peak hour and overall Level of Service A during the weekday evening peak hour. The signalized intersection of Interstate Route 78 Westbound Ramp and Liberty Corner Road is calculated to operate at overall Level of Service B during the weekday morning and weekday evening peak hours. The signalized intersection of Liberty Corner Road and Allen Road is calculated to operate at overall Level of Service B during the weekday morning and weekday evening peak hours. The turning movements at the unsignalized intersection of Allen Road and Somerville Road are calculated to operate at Level of Service B or better during the weekday morning peak hour and Level of Service D or better during the weekday evening peak hour. The turning movements at the unsignalized intersection of Allen Road and the site driveway are calculated to operate at Level of Service A during the weekday morning peak hour and Level of Service B or better during the weekday evening peak hour.

## **2024 NO-BUILD CONDITION**

### **BACKGROUND GROWTH**

The 2022 Existing Condition traffic volume data was grown to a future horizon year of 2024, which is a conservative estimate for when the proposed light manufacturing development is expected to be fully constructed. In accordance with industry guidelines, the existing traffic volumes at the study intersections were increased by 1.75% annually for two (2) years. The 1.75% background growth rate was obtained from NJDOT Annual Background Growth Rate Table.

### **2024 NO-BUILD TRAFFIC VOLUMES**

The background growth rate was applied to the 2022 Existing Traffic Volumes to calculate the 2024 No-Build Traffic Volumes for the weekday morning and weekday evening peak hours. These volumes are summarized on appended **Figure 3**.

### **2024 NO-BUILD LOS/CAPACITY ANALYSIS**

A Level of Service and Volume/Capacity analysis was also conducted for the 2024 No-Build Condition during the weekday morning and weekday evening peak hours at the study intersections and existing site driveway. The signalized intersection of Interstate Route 78 Eastbound Ramp and Liberty Corner Road is calculated to operate generally consistent with the findings of the Existing Condition during the weekday morning and weekday evening peak hours. The signalized intersection of Interstate Route 78 Westbound Ramp and Liberty Corner Road is calculated to operate generally consistent with the findings of the Existing Condition during the weekday morning and weekday evening peak hours. The signalized intersection of Liberty Corner Road and Allen Road is calculated to operate generally consistent with the findings of the Existing



Condition during the weekday morning and weekday evening peak hours. The turning movements at the unsignalized intersection of Allen Road and Somerville Road are calculated to operate at Level of Service B or better during the weekday morning peak hour and Level of Service E or better during the weekday evening peak hour. The turning movements at the unsignalized intersection of Allen Road and the site driveway are calculated to operate generally consistent with the findings of the Existing Condition during the weekday morning and weekday evening peak hours.

## **2024 BUILD CONDITION**

The site-generated traffic volume of the proposed light manufacturing development was estimated to identify the potential impacts of the project. For the purpose of this analysis, a complete project "build out" is assumed within two (2) years of the preparation of this study.

### **TRIP GENERATION**

In order to determine the impact of the proposed development on the roadway network in the event that the proposed tenant vacates the building, trip generation projections for the proposed warehouse were also prepared utilizing the ITE's Trip Generation Manual, 11<sup>th</sup> Edition. Trip generation rates associated with Land Use 140 "Manufacturing" were cited for the 127,977 square-foot and 130,551 square-foot light manufacturing buildings. It should be noted light manufacturing does not exist as a land use within ITE's Trip Generation Manual, 11<sup>th</sup> Edition. Through review of the ITE Land Use definitions, it was determined that Land Use 140 "Manufacturing" is most analogous to the permitted light manufacturing use, as described in the Township E-2 Zone Ordinance, and best matches the proposed use of this development. **Table 1** provides the weekday morning and weekday evening trip generation volumes associated with the proposed development.



**TABLE 1 – PROPOSED TRIP GENERATION**

| Land Use  | Weekday Morning<br>Peak Hour |           |            | Weekday Evening<br>Peak Hour |            |            |
|---|------------------------------|-----------|------------|------------------------------|------------|------------|
|   | Enter                        | Exit      | Total      | Enter                        | Exit       | Total      |
| Building A<br>97,005 SF Light<br>Manufacturing<br>ITE Land Use 140  | 50                           | 16        | 66         | 22                           | 50         | 72         |
| Building A<br>30,972 SF Office Space<br>ITE Land Use 710            | 41                           | 6         | 47         | 8                            | 37         | 45         |
| Building B<br>101,792 SF Light<br>Manufacturing<br>ITE Land Use 140 | 53                           | 16        | 69         | 23                           | 52         | 75         |
| Building B<br>28,759 SF Office Space<br>ITE Land Use 710            | 38                           | 6         | 44         | 7                            | 34         | 41         |
| <b>Total</b>  | <b>182</b>                   | <b>44</b> | <b>226</b> | <b>60</b>                    | <b>173</b> | <b>233</b> |

ITE's Trip Generation Manual, 11<sup>th</sup> Edition also provides separate trip generation rates for passenger vehicles and trucks for Land Use 140 "Manufacturing". **Table 2** provides the weekday morning and weekday evening passenger vehicle and truck trip generation volumes associated with the proposed development.

**TABLE 2 – PROPOSED TRIP GENERATION – TRUCK & PASSENGER VEHICLE TRIPS**

| Land Use                | Weekday Morning<br>Peak Hour |           |            | Weekday Evening<br>Peak Hour |            |            |
|-------------------------|------------------------------|-----------|------------|------------------------------|------------|------------|
|                         | Enter                        | Exit      | Total      | Enter                        | Exit       | Total      |
| Truck Trips             | 4                            | 2         | 6          | 2                            | 4          | 6          |
| Passenger Vehicle Trips | 178                          | 42        | 220        | 58                           | 169        | 227        |
| <b>Total</b>            | <b>182</b>                   | <b>44</b> | <b>226</b> | <b>60</b>                    | <b>173</b> | <b>233</b> |

It should be noted that the proposed light manufacturing development would be replacing the previously operational office development that was located at this site. In order to determine the impacts of the proposed development over those of the previous development, the trip generation for both the proposed and previously operational developments were compared below in **Table 3**. Trip generation rates associated with Land Use 710 "General Office Building" were cited for the 174,546 square-feet of previously operational office building.



**TABLE 3 – TRIP GENERATION COMPARISON**

| Land Use   | Weekday Morning Peak Hour |            |            | Weekday Evening Peak Hour |            |            |
|--|---------------------------|------------|------------|---------------------------|------------|------------|
|  | Enter                     | Exit       | Total      | Enter                     | Exit       | Total      |
| <b>Proposed</b><br>258,528 SF Light<br>Manufacturing & Office<br><i>ITE Land Use 140 / 710</i> | 182                       | 44         | 226        | 60                        | 173        | 233        |
| <b>Previous</b><br>176,546 SF Office<br><i>ITE Land Use 710</i>                                | 240                       | 33         | 273        | 45                        | 221        | 266        |
| <b>Difference</b>  | <b>-58</b>                | <b>+11</b> | <b>-47</b> | <b>+15</b>                | <b>-48</b> | <b>-33</b> |

As can be seen in Table 3, the proposed light manufacturing development would generate less traffic than the previously operational office development during both the weekday morning and weekday evening peak hours. As such, the impact of the proposed light manufacturing development on the roadway network would be a fraction of the impact of the office development.

#### TRIP ASSIGNMENT/DISTRIBUTION

The trips generated by the proposed development were distributed according to a Journey-to-Work Model prepared for the site using the 2019 census data with Bernards Township as a place of work and the access management plan of the site. The methodology used in the preparation of the Journey-To-Work Model utilizes the location of Bernards employees' place of residence, identified through 2019 Census Data published by the US Census Bureau, divided by municipality, in the surrounding area to determine the trip distribution. The Journey-To-Work Model can be found the Appendix. The results of the Journey-To-Work Model were used to distribute the site-generated traffic along the adjacent roadway network and are summarized in **Table 4**.

**TABLE 4 – JOURNEY-TO-WORK MODEL TRIP DISTRIBUTION**

| Destination                         | Percentage  |
|-------------------------------------|-------------|
| From North – Liberty Corner Road SB | 29%         |
| From South – Somerville Road        | 13%         |
| From South – I-78 EB                | 35%         |
| From South – I-78 WB                | 15%         |
| From West – Allen Road EB           | 8%          |
| <b>TOTAL</b>                        | <b>100%</b> |

The “New” Site-Generated Traffic Volumes are illustrated on **Figure 4**.



## **2024 BUILD TRAFFIC VOLUMES**

The site-generated trips were added to the 2024 No-Build Traffic Volumes to calculate the 2024 Build Traffic Volumes and are shown on appended **Figure 5**.

## **2024 BUILD LOS/CAPACITY ANALYSIS**

A Level of Service and Volume/Capacity analysis was also conducted for the 2024 Build Condition during the weekday morning and weekday evening peak hours at the study intersections and proposed site driveway. Appended **Table AI** compare the Existing, No-Build, and Build Conditions Level of Service and delay values.

The signalized intersection of Interstate Route 78 Eastbound Ramp and Liberty Corner Road is calculated to operate generally consistent with the findings of the No-Build Condition during the weekday morning and weekday evening peak hours. The signalized intersection of Interstate Route 78 Westbound Ramp and Liberty Corner Road is calculated to operate generally consistent with the findings of the No-Build Condition during the weekday morning and weekday evening peak hours. The signalized intersection of Liberty Corner Road and Allen Road is calculated to operate generally consistent with the findings of the No-Build Condition during the weekday morning and weekday evening peak hours. The turning movement at the unsignalized intersection of Allen Road and Somerville Road are calculated to operate at Level of Service C or better during the weekday morning and Level of Service E or better during the weekday evening peak hour. The turning movements at the unsignalized intersection of Allen Road and the site driveway are calculated to operate at Level of Service C or better during the weekday morning and weekday evening peak hours.

## **SITE CIRCULATION/PARKING SUPPLY**

A review was conducted of the proposed light manufacturing development using the Site Plan prepared by Gladstone Design, Inc, dated September 16, 2022. In completing this review, particular attention was focused on the site access, circulation, and parking supply.

Access is proposed to remain via one (1) full-movement driveway along Allen Road, with cross-access provided to the Block 11201, Lots 4, 5, and 15. The two (2) proposed buildings would be located central to the site, and both would have a parking garage located along the easterly side of the building. Loading spaces would be located along the southerly side of each building. Additional parking would be provided along the northerly side of Building A and to the west of Building B. Two-way circulation about the site would be provided via circulating roadway with a minimum width of 28 feet. Two-way circulation about the parking garages and other parking areas would be provided via 24-foot-wide drive aisles. The loading areas would provide two-way drive aisles with a minimum width of 70 feet.



Regarding the parking requirements for the proposed development, the Bernards Township Ordinance requires one (1) space per 500 square-feet of light manufacturing space and one (1) space per 1,000 square-feet of office space. For the proposed development with a total of 198,977 square-feet of light manufacturing space and 59,551 square-feet of office space, this equates to 629 required spaces. The site would provide 314 total parking spaces, inclusive of nine (9) ADA accessible parking spaces. The spaces would be nine (9) feet wide by 18 feet deep in accordance with industry standards.

As per P.L. 2021, c.171 (C.40:55D-66.18 et al.), all non-residential projects involving a parking garage or parking lot, except retailers with fewer than 25 parking spaces, must provide parking spaces pre-wired for electric vehicle charging stations ("make-ready") according to the following requirements:

- 1 make-ready space if the garage or lot has 50 or fewer spaces;
- 2 make-ready spaces if the garage or lot has between 51 and 75 spaces;
- 3 make-ready spaces if the garage or lot has between 76 and 100 spaces;
- 4 make-ready spaces if the garage or lot has between 101 and 150 spaces (at least one of which must be accessible for people with disabilities).
- At least 4% of the total parking spaces if the garage or lot has over 150 spaces (at least 5% of which must be accessible for people with disabilities).

For the proposed parking supply of 314 parking spaces, this equates to 14 make-ready spaces with one (1) being ADA accessible. The electric vehicle requirements consider electric vehicle spaces as a minimum of two (2) parking spaces for the purpose of satisfying parking requirements, up to a 10% reduction of total requirement. As such, the development plan would be considered to provide 328 (314 + 14) total parking spaces.

The parking supply was evaluated with respect to data published within the ITE's Parking Generation, 5<sup>th</sup> Edition, for Land Use 140 "Manufacturing." It should be noted that ITE's definition for Land Use 140 "Manufacturing," includes "In addition to the actual production of goods, a manufacturing facility typically has an office and may provide space for warehouse, research, and associated functions." The average parking demand rate during the peak period for Land Use 140 "Manufacturing" is 0.93 vehicles per 1,000 square-feet. For the 258,528 square-foot light manufacturing development, this equates to 240 parking spaces. As such, the proposed parking supply of 328 spaces would be sufficient to support the parking demand of the site.

## CONCLUSIONS

This report was prepared to examine the potential traffic impact of the proposed light manufacturing development. The analysis findings, which have been based on industry-standard guidelines, indicate that the proposed development would not have a significant impact on the traffic operations of the adjacent roadway network, especially compared to the use previously occupying the site. The site driveways and on-site layout



have been designed to provide for effective access to and from the subject property. Based on use of the site, industry data, and local characteristics of the site and surrounding area, the parking supply would be sufficient to support this project.

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## TECHNICAL APPENDIX




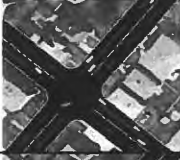
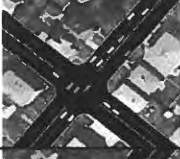



**LEVEL OF SERVICE/AVERAGE CONTROL DELAY CRITERIA**



## LEVEL OF SERVICE /AVERAGE CONTROL DELAY CRITERIA

The ability of a roadway to effectively accommodate traffic demand is determined through an assessment of the volume-to-capacity ratio, delay and Level of Service of the lane group and/or intersection. The volume-to-capacity ratio is the ratio of traffic flow rate to capacity for a given transportation facility. As defined within the Highway Capacity Manual, 6<sup>th</sup> Edition (HCM), intersection delay is the total additional travel time experienced by drivers, passengers, or pedestrians as a result of control measures and interaction with other users of the facility, divided by the volume departing from the corresponding cross section of the facility. Level of service is a qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience.

For an unsignalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle, while LOS F describes operations with delay in excess of 50 seconds per vehicle. For a signalized intersection, LOS A indicates operations with delay less than 10 seconds per vehicle and LOS F denotes operations with delay in excess of 80 seconds per vehicle.

|   | Level Of Service (LOS) | Signalized Delay Range (average control delay in sec/veh) | Unsignalized Delay Range (average control delay in sec/veh) |
|---|------------------------|---|---|
|   | A                      | $\leq 10$   | $\leq 10$   |
|  | B                      | $> 10$ and $\leq 20$                                      | $> 10$ and $\leq 15$  |
|  | C                      | $> 20$ and $\leq 35$                                      | $> 15$ and $\leq 25$  |
|  | D                      | $> 35$ and $\leq 55$                                      | $> 25$ and $\leq 35$  |
|  | E                      | $> 55$ and $\leq 80$                                      | $> 35$ and $\leq 50$  |
|  | F                      | $> 80$  | $> 50$  |

Source: Highway Capacity Manual, 6<sup>th</sup> Edition



# STONEFIELD

**Table A1**  
Comparative Level of Service (Delay) Tables  
X (n) = Level of Service (seconds of delay)

| Intersection   | Lane Group            | 2022 Existing Condition |             | 2024 No-Build Condition |             | 2024 Build Condition |             |
|--|-----------------------|-------------------------|-------------|-------------------------|-------------|----------------------|-------------|
|  |                       | AM Peak                 | LOS (Delay) | PM Peak                 | LOS (Delay) | AM Peak              | LOS (Delay) |
| Interstate Route 78 EB Ramp (EB) and Liberty Corner Road (NB/SB) | EB Left               | D (38.3)                | D (41.6)    | D (38.1)                | D (41.8)    | D (37.1)             | D (42.2)    |
|  | EB Right              | D (36.1)                | D (41.3)    | D (35.8)                | D (41.4)    | C (33.9)             | D (41.1)    |
|  | NB Through            | A (4.0)                 | A (2.3)     | A (4.1)                 | A (2.3)     | A (4.8)              | A (2.4)     |
|  | SB Through            | A (0.3)                 | A (2.8)     | A (0.3)                 | A (2.9)     | A (0.3)              | A (2.9)     |
|  | Overall               | B (11.8)                | A (8.6)     | B (11.7)                | A (8.7)     | B (12.4)             | A (9.1)     |
|  | WB Left               | C (28.5)                | D (35.6)    | C (27.9)                | D (35.0)    | C (27.0)             | C (34.6)    |
|  | WB Right              | D (48.2)                | D (48.3)    | D (49.8)                | D (50.3)    | D (53.0)             | D (51.4)    |
|  | NB Through            | A (3.8)                 | A (0.2)     | A (4.2)                 | A (0.2)     | A (4.8)              | A (0.2)     |
|  | SB Through            | A (0.4)                 | A (6.1)     | A (0.4)                 | A (6.5)     | A (0.4)              | A (6.7)     |
|  | Overall               | B (12.4)                | B (13.8)    | B (12.8)                | B (14.2)    | B (13.5)             | B (14.3)    |
| Interstate Route 78 WB Ramp (WB) and Liberty Corner Road (NB/SB) | EB Left/Through       | D (37.7)                | D (46.9)    | D (37.4)                | D (46.6)    | D (37.4)             | D (43.1)    |
|  | EB Right              | C (30.4)                | D (36.6)    | C (29.7)                | D (36.0)    | C (26.0)             | C (31.8)    |
|  | WB Left/Through/Right | C (34.9)                | D (40.0)    | C (34.5)                | D (39.6)    | C (34.1)             | D (36.1)    |
|  | NB Left               | B (10.8)                | B (10.0)    | B (13.6)                | B (11.8)    | C (29.2)             | C (20.4)    |
|  | NB Through            | A (0.5)                 | A (7.6)     | A (0.5)                 | A (8.0)     | A (0.5)              | B (10.4)    |
|  | NB Through/Right      | A (0.4)                 | A (7.6)     | A (0.5)                 | A (8.0)     | A (0.4)              | B (10.4)    |
|  | SB Left               | A (6.9)                 | A (7.7)     | A (7.3)                 | A (8.1)     | A (9.3)              | B (10.9)    |
|  | SB Through            | B (12.1)                | B (11.6)    | B (13.2)                | B (12.3)    | B (17.6)             | B (16.9)    |
|  | SB Through/Right      | B (12.1)                | B (11.6)    | B (13.2)                | B (12.3)    | B (17.7)             | B (16.9)    |
|  | Overall               | B (10.7)                | B (13.9)    | B (11.6)                | B (14.5)    | B (16.3)             | B (18.4)    |
| Allen Road/Driveaway (EB/WB) and Liberty Corner Road (NB/SB)     | WB Left               | A (8.6)                 | A (8.4)     | A (8.7)                 | A (8.4)     | A (9.6)              | A (8.7)     |
|  | NB Left/Right         | A (0.0)                 | B (12.7)    | A (0.0)                 | B (12.9)    | C (17.4)             | C (18.5)    |
|  | EB Left               | B (10.2)                | B (11.0)    | B (10.4)                | B (11.2)    | B (10.6)             | B (11.5)    |
|  | EB Through/Right      | B (13.5)                | B (13.8)    | B (14.2)                | B (14.4)    | C (15.5)             | C (15.3)    |
|  | WB Left               | A (9.2)                 | A (9.7)     | A (9.3)                 | A (9.8)     | A (9.5)              | B (10.4)    |
|  | WB Through/Right      | B (11.1)                | D (31.8)    | B (11.4)                | E (37.1)    | B (11.9)             | E (46.2)    |
|  | NB Through            | A (10.0)                | B (11.6)    | B (10.2)                | B (11.9)    | B (10.3)             | B (12.2)    |
|  | SB Left/Through       | B (10.8)                | B (10.4)    | B (11.0)                | B (10.5)    | B (11.2)             | B (10.7)    |
|  | SB Right              | A (9.3)                 | B (13.2)    | A (9.4)                 | B (13.7)    | A (9.6)              | B (14.4)    |
|  | Overall               | B (10.7)                | B (13.9)    | B (11.6)                | B (14.5)    | B (16.3)             | B (18.4)    |
| Allen Road (EB/WB) and Site Driveaway (NB)                       | WB Left               | A (8.6)                 | A (8.4)     | A (8.7)                 | A (8.4)     | A (9.6)              | A (8.7)     |
|  | NB Left/Right         | A (0.0)                 | B (12.7)    | A (0.0)                 | B (12.9)    | C (17.4)             | C (18.5)    |
|  | EB Left               | B (10.2)                | B (11.0)    | B (10.4)                | B (11.2)    | B (10.6)             | B (11.5)    |
|  | EB Through/Right      | B (13.5)                | B (13.8)    | B (14.2)                | B (14.4)    | C (15.5)             | C (15.3)    |
|  | WB Left               | A (9.2)                 | A (9.7)     | A (9.3)                 | A (9.8)     | A (9.5)              | B (10.4)    |
|  | WB Through/Right      | B (11.1)                | D (31.8)    | B (11.4)                | E (37.1)    | B (11.9)             | E (46.2)    |
|  | NB Through            | A (10.0)                | B (11.6)    | B (10.2)                | B (11.9)    | B (10.3)             | B (12.2)    |
|  | SB Left/Through       | B (10.8)                | B (10.4)    | B (11.0)                | B (10.5)    | B (11.2)             | B (10.7)    |
|  | SB Right              | A (9.3)                 | B (13.2)    | A (9.4)                 | B (13.7)    | A (9.6)              | B (14.4)    |
|  | Overall               | B (10.7)                | B (13.9)    | B (11.6)                | B (14.5)    | B (16.3)             | B (18.4)    |
| Allen Road (EB/WB) and Somerville Road (NB/SB)                   | WB Left               | A (8.6)                 | A (8.4)     | A (8.7)                 | A (8.4)     | A (9.6)              | A (8.7)     |
|  | NB Left/Right         | A (0.0)                 | B (12.7)    | A (0.0)                 | B (12.9)    | C (17.4)             | C (18.5)    |
|  | EB Left               | B (10.2)                | B (11.0)    | B (10.4)                | B (11.2)    | B (10.6)             | B (11.5)    |
|  | EB Through/Right      | B (13.5)                | B (13.8)    | B (14.2)                | B (14.4)    | C (15.5)             | C (15.3)    |
|  | WB Left               | A (9.2)                 | A (9.7)     | A (9.3)                 | A (9.8)     | A (9.5)              | B (10.4)    |
|  | WB Through/Right      | B (11.1)                | D (31.8)    | B (11.4)                | E (37.1)    | B (11.9)             | E (46.2)    |
|  | NB Through            | A (10.0)                | B (11.6)    | B (10.2)                | B (11.9)    | B (10.3)             | B (12.2)    |
|  | SB Left/Through       | B (10.8)                | B (10.4)    | B (11.0)                | B (10.5)    | B (11.2)             | B (10.7)    |
|  | SB Right              | A (9.3)                 | B (13.2)    | A (9.4)                 | B (13.7)    | A (9.6)              | B (14.4)    |
|  | Overall               | B (10.7)                | B (13.9)    | B (11.6)                | B (14.5)    | B (16.3)             | B (18.4)    |



## **TURNING MOVEMENT COUNT DATA**





TRAFFIC & DATA COLLECTION

Imperial Traffic & Data Collection

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PO BOX 4637

Cherry Hill, New Jersey, United States 08034

609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.645524, -74.575684

Count Name: 1. Liberty Corner Road and Rt 78  
EB Ramp  
Site Code: 1  
Start Date: 08/02/2022  
Page No: 1

## Turning Movement Data

| Start Time    | On/Off Ramp<br>Eastbound |      |      |       |      |            | On Ramp<br>Westbound |      |      |       |      |            | Liberty Crossing Road<br>Northbound |      |      |       |      |            | Liberty Crossing Road<br>Southbound |      |      |       |      |            | Int. Total |
|---------------|--------------------------|------|------|-------|------|------------|----------------------|------|------|-------|------|------------|-------------------------------------|------|------|-------|------|------------|-------------------------------------|------|------|-------|------|------------|------------|
|               | U-Turn                   | Left | Thru | Right | Peds | App. Total | U-Turn               | Left | Thru | Right | Peds | App. Total | U-Turn                              | Left | Thru | Right | Peds | App. Total | U-Turn                              | Left | Thru | Right | Peds | App. Total |            |
| 7:00 AM       | 0                        | 47   | 0    | 23    | 0    | 70         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 60   | 68    | 0    | 128        | 0                                   | 0    | 66   | 67    | 0    | 133        | 331        |
| 7:15 AM       | 0                        | 70   | 0    | 29    | 0    | 99         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 88   | 74    | 0    | 162        | 0                                   | 0    | 84   | 66    | 0    | 150        | 411        |
| 7:30 AM       | 0                        | 69   | 0    | 35    | 0    | 104        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 104  | 85    | 0    | 189        | 2                                   | 0    | 112  | 94    | 0    | 208        | 501        |
| 7:45 AM       | 0                        | 85   | 0    | 44    | 0    | 129        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 116  | 69    | 0    | 185        | 0                                   | 0    | 149  | 66    | 0    | 215        | 529        |
| Hourly Total  | 0                        | 271  | 0    | 131   | 0    | 402        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 368  | 296   | 0    | 664        | 2                                   | 0    | 411  | 293   | 0    | 706        | 1772       |
| 8:00 AM       | 0                        | 89   | 0    | 44    | 0    | 133        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 116  | 96    | 0    | 212        | 1                                   | 0    | 136  | 84    | 0    | 221        | 566        |
| 8:15 AM       | 0                        | 64   | 0    | 30    | 0    | 94         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 121  | 101   | 0    | 222        | 0                                   | 0    | 138  | 96    | 0    | 234        | 550        |
| 8:30 AM       | 0                        | 63   | 0    | 40    | 0    | 103        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 135  | 75    | 0    | 210        | 0                                   | 0    | 184  | 109   | 0    | 293        | 606        |
| 8:45 AM       | 0                        | 85   | 0    | 48    | 0    | 133        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 126  | 81    | 0    | 207        | 1                                   | 0    | 242  | 96    | 0    | 339        | 679        |
| Hourly Total  | 0                        | 301  | 0    | 162   | 0    | 463        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 498  | 353   | 0    | 851        | 2                                   | 0    | 700  | 385   | 0    | 1087       | 2401       |
| *** BREAK *** | -                        | -    | -    | -     | -    | -          | -                    | -    | -    | -     | -    | -          | -                                   | -    | -    | -     | -    | -          | -                                   | -    | -    | -     | -    | -          | -          |
| 4:00 PM       | 0                        | 31   | 0    | 18    | 0    | 49         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 126  | 79    | 0    | 205        | 0                                   | 0    | 169  | 107   | 0    | 276        | 530        |
| 4:15 PM       | 0                        | 31   | 0    | 21    | 0    | 52         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 112  | 78    | 0    | 190        | 0                                   | 0    | 156  | 100   | 0    | 256        | 498        |
| 4:30 PM       | 0                        | 33   | 0    | 23    | 0    | 56         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 125  | 93    | 0    | 218        | 0                                   | 0    | 153  | 119   | 0    | 272        | 546        |
| 4:45 PM       | 0                        | 32   | 0    | 24    | 0    | 56         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 85   | 83    | 0    | 168        | 0                                   | 0    | 155  | 107   | 0    | 262        | 486        |
| Hourly Total  | 0                        | 127  | 0    | 86    | 0    | 213        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 448  | 333   | 0    | 781        | 0                                   | 0    | 633  | 433   | 0    | 1066       | 2080       |
| 5:00 PM       | 0                        | 24   | 0    | 18    | 0    | 42         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 143  | 100   | 0    | 243        | 0                                   | 0    | 143  | 137   | 0    | 280        | 565        |
| 5:15 PM       | 0                        | 31   | 0    | 31    | 0    | 62         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 125  | 81    | 0    | 206        | 0                                   | 0    | 183  | 105   | 0    | 288        | 556        |
| 5:30 PM       | 0                        | 35   | 0    | 16    | 0    | 51         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 112  | 94    | 0    | 206        | 1                                   | 0    | 206  | 110   | 0    | 317        | 574        |
| 5:45 PM       | 0                        | 34   | 0    | 26    | 0    | 60         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 94   | 64    | 0    | 158        | 0                                   | 0    | 172  | 78    | 0    | 250        | 468        |
| Hourly Total  | 0                        | 124  | 0    | 91    | 0    | 215        | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 474  | 339   | 0    | 813        | 1                                   | 0    | 704  | 430   | 0    | 1135       | 2163       |
| 6:00 PM       | 0                        | 37   | 0    | 16    | 0    | 53         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 103  | 64    | 0    | 167        | 1                                   | 0    | 151  | 70    | 0    | 222        | 442        |
| 6:15 PM       | 0                        | 37   | 0    | 23    | 0    | 60         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 90   | 41    | 0    | 131        | 3                                   | 0    | 157  | 68    | 0    | 228        | 419        |
| 6:30 PM       | 0                        | 21   | 0    | 12    | 0    | 33         | 0                    | 0    | 0    | 0     | 0    | 0          | 1                                   | 0    | 83   | 47    | 0    | 131        | 0                                   | 0    | 120  | 59    | 0    | 179        | 343        |
| 6:45 PM       | 0                        | 29   | 0    | 14    | 0    | 43         | 0                    | 0    | 0    | 0     | 0    | 0          | 0                                   | 0    | 75   | 43    | 0    | 118        | 1                                   | 0    | 143  | 55    | 0    | 199        | 360        |
| Hourly Total  | 0                        | 124  | 0    | 65    | 0    | 189        | 0                    | 0    | 0    | 0     | 0    | 0          | 1                                   | 0    | 351  | 195   | 0    | 547        | 5                                   | 0    | 571  | 252   | 0    | 828        | 1564       |
| Grand Total   | 0                        | 947  | 0    | 535   | 0    | 1482       | 0                    | 0    | 0    | 0     | 2    | 0          | 1                                   | 0    | 2139 | 1516  | 0    | 3656       | 10                                  | 0    | 3019 | 1793  | 0    | 4822       | 9960       |
| Approach %    | 0.0                      | 63.9 | 0.0  | 36.1  | -    | -          | 0.0                  | 0.0  | 0.0  | 0.0   | -    | -          | 0.0                                 | 0.0  | 58.5 | 41.5  | -    | -          | 0.2                                 | 0.0  | 62.6 | 37.2  | -    | -          | -          |
| Total %       | 0.0                      | 9.5  | 0.0  | 5.4   | -    | 14.9       | 0.0                  | 0.0  | 0.0  | 0.0   | -    | 0.0        | 0.0                                 | 0.0  | 21.5 | 15.2  | -    | 36.7       | 0.1                                 | 0.0  | 30.3 | 18.0  | -    | 48.4       | -          |
| Lights        | 0                        | 917  | 0    | 516   | -    | 1433       | 0                    | 0    | 0    | 0     | -    | 0          | 1                                   | 0    | 2078 | 1498  | -    | 3577       | 10                                  | 0    | 2944 | 1772  | -    | 4726       | 9736       |
| % Lights      | -                        | 96.8 | -    | 96.4  | -    | 96.7       | -                    | -    | -    | -     | -    | -          | 100.0                               | -    | 97.1 | 98.8  | -    | 97.8       | 100.0                               | -    | 97.5 | 98.8  | -    | 98.0       | 97.8       |
| Buses         | 0                        | 9    | 0    | 5     | -    | 14         | 0                    | 0    | 0    | 0     | -    | 0          | 0                                   | 0    | 17   | 10    | -    | 27         | 0                                   | 0    | 16   | 2     | -    | 18         | 59         |
| % Buses       | -                        | 1.0  | -    | 0.9   | -    | 0.9        | -                    | -    | -    | -     | -    | -          | 0.0                                 | -    | 0.8  | 0.7   | -    | 0.7        | 0.0                                 | -    | 0.5  | 0.1   | -    | 0.4        | 0.6        |
| Trucks        | 0                        | 21   | 0    | 14    | -    | 35         | 0                    | 0    | 0    | 0     | -    | 0          | 0                                   | 0    | 44   | 8     | -    | 52         | 0                                   | 0    | 59   | 19    | -    | 78         | 165        |
| % Trucks      | -                        | 2.2  | -    | 2.6   | -    | 2.4        | -                    | -    | -    | -     | -    | -          | 0.0                                 | -    | 2.1  | 0.5   | -    | 1.4        | 0.0                                 | -    | 2.0  | 1.1   | -    | 1.6        | 1.7        |





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Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County, NJ  
Setup: GP  
Location: 40.645524, -74.575684

Count Name: 1. Liberty Corner Road and Rt 78  
EB Ramp  
Site Code: 1  
Start Date: 08/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

| Start Time              | On/Off Ramp Eastbound |       |       |       |      |            | On Ramp Westbound |       |       |       |      |            | Liberty Crossing Road Northbound |       |       |       |      |            | Liberty Crossing Road Southbound |       |       |       |      |            | Int. Total |
|-------------------------|-----------------------|-------|-------|-------|------|------------|-------------------|-------|-------|-------|------|------------|----------------------------------|-------|-------|-------|------|------------|----------------------------------|-------|-------|-------|------|------------|------------|
|                         | U-Turn                | Left  | Thru  | Right | Peds | App. Total | U-Turn            | Left  | Thru  | Right | Peds | App. Total | U-Turn                           | Left  | Thru  | Right | Peds | App. Total | U-Turn                           | Left  | Thru  | Right | Peds | App. Total |            |
| 8:00 AM                 | 0                     | 89    | 0     | 44    | 0    | 133        | 0                 | 0     | 0     | 0     | 0    | 0          | 0                                | 0     | 116   | 96    | 0    | 212        | 1                                | 0     | 136   | 84    | 0    | 221        | 566        |
| 8:15 AM                 | 0                     | 64    | 0     | 30    | 0    | 94         | 0                 | 0     | 0     | 0     | 0    | 0          | 0                                | 0     | 121   | 101   | 0    | 222        | 0                                | 0     | 138   | 96    | 0    | 234        | 550        |
| 8:30 AM                 | 0                     | 63    | 0     | 40    | 0    | 103        | 0                 | 0     | 0     | 0     | 0    | 0          | 0                                | 0     | 135   | 75    | 0    | 210        | 0                                | 0     | 184   | 109   | 0    | 293        | 606        |
| 8:45 AM                 | 0                     | 85    | 0     | 48    | 0    | 133        | 0                 | 0     | 0     | 0     | 0    | 0          | 0                                | 0     | 126   | 81    | 0    | 207        | 1                                | 0     | 242   | 96    | 0    | 339        | 679        |
| Total                   | 0                     | 301   | 0     | 162   | 0    | 463        | 0                 | 0     | 0     | 0     | 0    | 0          | 0                                | 0     | 498   | 353   | 0    | 851        | 2                                | 0     | 700   | 385   | 0    | 1087       | 2401       |
| Approach %              | 0.0                   | 65.0  | 0.0   | 35.0  | -    | -          | 0.0               | 0.0   | 0.0   | 0.0   | -    | -          | 0.0                              | 0.0   | 58.5  | 41.5  | -    | -          | 0.2                              | 0.0   | 64.4  | 35.4  | -    | -          | -          |
| Total %                 | 0.0                   | 12.5  | 0.0   | 6.7   | -    | 19.3       | 0.0               | 0.0   | 0.0   | 0.0   | -    | 0.0        | 0.0                              | 0.0   | 20.7  | 14.7  | -    | 35.4       | 0.1                              | 0.0   | 29.2  | 16.0  | -    | 45.3       | -          |
| PHF                     | 0.000                 | 0.846 | 0.000 | 0.844 | -    | 0.870      | 0.000             | 0.000 | 0.000 | 0.000 | -    | 0.000      | 0.000                            | 0.000 | 0.922 | 0.874 | -    | 0.958      | 0.500                            | 0.000 | 0.723 | 0.883 | -    | 0.802      | 0.884      |
| Lights                  | 0                     | 290   | 0     | 158   | -    | 448        | 0                 | 0     | 0     | 0     | -    | 0          | 0                                | 0     | 478   | 350   | -    | 828        | 2                                | 0     | 684   | 381   | -    | 1067       | 2343       |
| % Lights                | -                     | 96.3  | -     | 97.5  | -    | 96.8       | -                 | -     | -     | -     | -    | -          | -                                | -     | 96.0  | 99.2  | -    | 97.3       | 100.0                            | -     | 97.7  | 99.0  | -    | 98.2       | 97.6       |
| Buses                   | 0                     | 1     | 0     | 1     | -    | 2          | 0                 | 0     | 0     | 0     | -    | 0          | 0                                | 0     | 8     | 0     | -    | 8          | 0                                | 0     | 3     | 1     | -    | 4          | 14         |
| % Buses                 | -                     | 0.3   | -     | 0.6   | -    | 0.4        | -                 | -     | -     | -     | -    | -          | -                                | -     | 1.6   | 0.0   | -    | 0.9        | 0.0                              | -     | 0.4   | 0.3   | -    | 0.4        | 0.6        |
| Trucks                  | 0                     | 10    | 0     | 3     | -    | 13         | 0                 | 0     | 0     | 0     | -    | 0          | 0                                | 0     | 12    | 3     | -    | 15         | 0                                | 0     | 13    | 3     | -    | 16         | 44         |
| % Trucks                | -                     | 3.3   | -     | 1.9   | -    | 2.8        | -                 | -     | -     | -     | -    | -          | -                                | -     | 2.4   | 0.8   | -    | 1.8        | 0.0                              | -     | 1.9   | 0.8   | -    | 1.5        | 1.8        |
| Bicycles on Crosswalk   | -                     | -     | -     | -     | 0    | -          | -                 | -     | -     | -     | 0    | -          | -                                | -     | -     | -     | 0    | -          | -                                | -     | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                     | -     | -     | -     | -    | -          | -                 | -     | -     | -     | -    | -          | -                                | -     | -     | -     | -    | -          | -                                | -     | -     | -     | -    | -          | -          |
| Pedestrians             | -                     | -     | -     | -     | 0    | -          | -                 | -     | -     | -     | 0    | -          | -                                | -     | -     | -     | 0    | -          | -                                | -     | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                     | -     | -     | -     | -    | -          | -                 | -     | -     | -     | -    | -          | -                                | -     | -     | -     | -    | -          | -                                | -     | -     | -     | -    | -          | -          |





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Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.645524, -74.575684

Count Name: 1. Liberty Corner Road and Rt 78  
EB Ramp  
Site Code: 1  
Start Date: 08/02/2022  
Page No: 6

### Turning Movement Peak Hour Data (4:45 PM)

| Start Time              | On/Off Ramp<br>Eastbound |       |       |       |      |            | On Ramp<br>Westbound |       |       |       |      |            | Liberty Crossing Road<br>Northbound |       |       |       |      |            | Liberty Crossing Road<br>Southbound |       |       |       |      |            | Int. Total |
|-------------------------|--------------------------|-------|-------|-------|------|------------|----------------------|-------|-------|-------|------|------------|-------------------------------------|-------|-------|-------|------|------------|-------------------------------------|-------|-------|-------|------|------------|------------|
|                         | U-Turn                   | Left  | Thru  | Right | Peds | App. Total | U-Turn               | Left  | Thru  | Right | Peds | App. Total | U-Turn                              | Left  | Thru  | Right | Peds | App. Total | U-Turn                              | Left  | Thru  | Right | Peds | App. Total |            |
| 4:45 PM                 | 0                        | 32    | 0     | 24    | 0    | 56         | 0                    | 0     | 0     | 0     | 0    | 0          | 0                                   | 0     | 85    | 83    | 0    | 168        | 0                                   | 0     | 155   | 107   | 0    | 262        | 486        |
| 5:00 PM                 | 0                        | 24    | 0     | 18    | 0    | 42         | 0                    | 0     | 0     | 0     | 0    | 0          | 0                                   | 0     | 143   | 100   | 0    | 243        | 0                                   | 0     | 143   | 137   | 0    | 280        | 565        |
| 5:15 PM                 | 0                        | 31    | 0     | 31    | 0    | 62         | 0                    | 0     | 0     | 0     | 0    | 0          | 0                                   | 0     | 125   | 81    | 0    | 206        | 0                                   | 0     | 183   | 105   | 0    | 288        | 556        |
| 5:30 PM                 | 0                        | 35    | 0     | 16    | 0    | 51         | 0                    | 0     | 0     | 0     | 0    | 0          | 0                                   | 0     | 112   | 94    | 0    | 206        | 1                                   | 0     | 206   | 110   | 0    | 317        | 574        |
| Total                   | 0                        | 122   | 0     | 89    | 0    | 211        | 0                    | 0     | 0     | 0     | 0    | 0          | 0                                   | 0     | 465   | 358   | 0    | 823        | 1                                   | 0     | 687   | 459   | 0    | 1147       | 2181       |
| Approach %              | 0.0                      | 57.8  | 0.0   | 42.2  | -    | -          | 0.0                  | 0.0   | 0.0   | 0.0   | -    | -          | 0.0                                 | 0.0   | 56.5  | 43.5  | -    | -          | 0.1                                 | 0.0   | 59.9  | 40.0  | -    | -          | -          |
| Total %                 | 0.0                      | 5.6   | 0.0   | 4.1   | -    | 9.7        | 0.0                  | 0.0   | 0.0   | 0.0   | -    | 0.0        | 0.0                                 | 0.0   | 21.3  | 16.4  | -    | 37.7       | 0.0                                 | 0.0   | 31.5  | 21.0  | -    | 52.6       | -          |
| PHF                     | 0.000                    | 0.871 | 0.000 | 0.718 | -    | 0.851      | 0.000                | 0.000 | 0.000 | 0.000 | -    | 0.000      | 0.000                               | 0.000 | 0.813 | 0.895 | -    | 0.847      | 0.250                               | 0.000 | 0.834 | 0.838 | -    | 0.905      | 0.950      |
| Lights                  | 0                        | 118   | 0     | 89    | -    | 207        | 0                    | 0     | 0     | 0     | -    | 0          | 0                                   | 0     | 462   | 356   | -    | 818        | 1                                   | 0     | 672   | 451   | -    | 1124       | 2149       |
| % Lights                | -                        | 96.7  | -     | 100.0 | -    | 98.1       | -                    | -     | -     | -     | -    | -          | -                                   | -     | 99.4  | 99.4  | -    | 99.4       | 100.0                               | -     | 97.8  | 98.3  | -    | 98.0       | 98.5       |
| Buses                   | 0                        | 1     | 0     | 0     | -    | 1          | 0                    | 0     | 0     | 0     | -    | 0          | 0                                   | 0     | 2     | 0     | -    | 2          | 0                                   | 0     | 10    | 1     | -    | 11         | 14         |
| % Buses                 | -                        | 0.8   | -     | 0.0   | -    | 0.5        | -                    | -     | -     | -     | -    | -          | -                                   | -     | 0.4   | 0.0   | -    | 0.2        | 0.0                                 | -     | 1.5   | 0.2   | -    | 1.0        | 0.6        |
| Trucks                  | 0                        | 3     | 0     | 0     | -    | 3          | 0                    | 0     | 0     | 0     | -    | 0          | 0                                   | 0     | 1     | 2     | -    | 3          | 0                                   | 0     | 5     | 7     | -    | 12         | 18         |
| % Trucks                | -                        | 2.5   | -     | 0.0   | -    | 1.4        | -                    | -     | -     | -     | -    | -          | -                                   | -     | 0.2   | 0.6   | -    | 0.4        | 0.0                                 | -     | 0.7   | 1.5   | -    | 1.0        | 0.8        |
| Bicycles on Crosswalk   | -                        | -     | -     | -     | 0    | -          | -                    | -     | -     | -     | 0    | -          | -                                   | -     | -     | -     | 0    | -          | -                                   | -     | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                        | -     | -     | -     | -    | -          | -                    | -     | -     | -     | -    | -          | -                                   | -     | -     | -     | -    | -          | -                                   | -     | -     | -     | -    | -          | -          |
| Pedestrians             | -                        | -     | -     | -     | 0    | -          | -                    | -     | -     | -     | 0    | -          | -                                   | -     | -     | -     | 0    | -          | -                                   | -     | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                        | -     | -     | -     | -    | -          | -                    | -     | -     | -     | -    | -          | -                                   | -     | -     | -     | -    | -          | -                                   | -     | -     | -     | -    | -          | -          |





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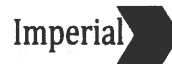
Project: Liberty Corner Road  
Municipality: Berlin, Camden County, NJ  
Setup: GP  
Location: 40.648193, -74.575188

Count Name: 2. Liberty Corner Road and Rt 78  
WB Ramp  
Site Code: 2  
Start Date: 08/02/2022  
Page No: 1

### Turning Movement Data

| Start Time    | On Ramp Eastbound |      |      |       |      |            | On/Off Ramp Westbound |      |      |       |      |            | Liberty Corner Road Northbound |      |      |       |      |            | Liberty Corner Road Southbound |      |      |       |      |            | Int. Total |
|---------------|-------------------|------|------|-------|------|------------|-----------------------|------|------|-------|------|------------|--------------------------------|------|------|-------|------|------------|--------------------------------|------|------|-------|------|------------|------------|
|               | U-Turn            | Left | Thru | Right | Peds | App. Total | U-Turn                | Left | Thru | Right | Peds | App. Total | U-Turn                         | Left | Thru | Right | Peds | App. Total | U-Turn                         | Left | Thru | Right | Peds | App. Total |            |
| 7:00 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 21   | 0    | 60    | 0    | 81         | 0                              | 0    | 92   | 9     | 0    | 101        | 0                              | 0    | 110  | 30    | 0    | 140        | 322        |
| 7:15 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 40   | 0    | 75    | 0    | 115        | 0                              | 0    | 149  | 17    | 0    | 166        | 0                              | 0    | 108  | 32    | 0    | 140        | 421        |
| 7:30 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 51   | 0    | 96    | 0    | 147        | 0                              | 0    | 155  | 21    | 0    | 176        | 0                              | 0    | 162  | 64    | 0    | 226        | 549        |
| 7:45 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 71   | 0    | 101   | 0    | 172        | 0                              | 0    | 178  | 21    | 0    | 199        | 0                              | 0    | 149  | 45    | 0    | 194        | 565        |
| Hourly Total  | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 183  | 0    | 332   | 0    | 515        | 0                              | 0    | 574  | 68    | 0    | 642        | 0                              | 0    | 529  | 171   | 0    | 700        | 1857       |
| 8:00 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 58   | 0    | 111   | 0    | 169        | 0                              | 0    | 194  | 19    | 0    | 213        | 0                              | 0    | 158  | 47    | 0    | 205        | 587        |
| 8:15 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 61   | 0    | 104   | 0    | 165        | 0                              | 0    | 150  | 27    | 0    | 177        | 0                              | 0    | 173  | 48    | 0    | 221        | 563        |
| 8:30 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 81   | 0    | 143   | 0    | 224        | 0                              | 0    | 183  | 28    | 0    | 211        | 0                              | 0    | 219  | 45    | 0    | 264        | 699        |
| 8:45 AM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 81   | 0    | 96    | 0    | 177        | 0                              | 0    | 198  | 27    | 0    | 225        | 0                              | 0    | 247  | 28    | 0    | 275        | 677        |
| Hourly Total  | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 281  | 0    | 454   | 0    | 735        | 0                              | 0    | 725  | 101   | 0    | 826        | 0                              | 0    | 797  | 168   | 0    | 965        | 2526       |
| *** BREAK *** | -                 | -    | -    | -     | -    | -          | -                     | -    | -    | -     | -    | -          | -                              | -    | -    | -     | -    | -          | -                              | -    | -    | -     | -    | -          | -          |
| 4:00 PM       | 0                 | 0    | 0    | 1     | 0    | 1          | 0                     | 58   | 0    | 71    | 0    | 129        | 0                              | 0    | 123  | 36    | 0    | 159        | 0                              | 0    | 212  | 106   | 0    | 318        | 607        |
| 4:15 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 61   | 0    | 63    | 0    | 124        | 0                              | 0    | 108  | 34    | 0    | 142        | 0                              | 0    | 199  | 86    | 0    | 285        | 551        |
| 4:30 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 59   | 0    | 79    | 0    | 138        | 0                              | 0    | 118  | 36    | 0    | 154        | 0                              | 0    | 227  | 82    | 0    | 309        | 601        |
| 4:45 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 57   | 0    | 80    | 0    | 137        | 0                              | 0    | 99   | 29    | 0    | 128        | 0                              | 0    | 208  | 78    | 0    | 286        | 551        |
| Hourly Total  | 0                 | 0    | 0    | 1     | 0    | 1          | 0                     | 235  | 0    | 293   | 0    | 528        | 0                              | 0    | 448  | 135   | 0    | 583        | 0                              | 0    | 846  | 352   | 0    | 1198       | 2310       |
| 5:00 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 55   | 0    | 96    | 0    | 151        | 0                              | 0    | 110  | 55    | 0    | 165        | 0                              | 0    | 228  | 89    | 0    | 317        | 633        |
| 5:15 PM       | 0                 | 0    | 0    | 1     | 0    | 1          | 0                     | 71   | 0    | 105   | 0    | 176        | 0                              | 0    | 109  | 47    | 0    | 156        | 0                              | 0    | 227  | 80    | 0    | 307        | 640        |
| 5:30 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 100  | 0    | 107   | 0    | 207        | 0                              | 0    | 117  | 36    | 0    | 153        | 0                              | 0    | 220  | 56    | 0    | 276        | 636        |
| 5:45 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 72   | 0    | 99    | 0    | 171        | 0                              | 0    | 104  | 33    | 0    | 137        | 0                              | 0    | 180  | 54    | 0    | 234        | 542        |
| Hourly Total  | 0                 | 0    | 0    | 1     | 0    | 1          | 0                     | 298  | 0    | 407   | 0    | 705        | 0                              | 0    | 440  | 171   | 0    | 611        | 0                              | 0    | 855  | 279   | 0    | 1134       | 2451       |
| 6:00 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 71   | 0    | 127   | 0    | 198        | 0                              | 0    | 115  | 26    | 0    | 141        | 0                              | 0    | 157  | 40    | 0    | 197        | 536        |
| 6:15 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 77   | 0    | 133   | 0    | 210        | 1                              | 0    | 114  | 17    | 0    | 132        | 1                              | 0    | 154  | 35    | 0    | 190        | 532        |
| 6:30 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 56   | 0    | 141   | 0    | 197        | 0                              | 0    | 89   | 17    | 0    | 106        | 0                              | 0    | 120  | 35    | 0    | 155        | 458        |
| 6:45 PM       | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 69   | 0    | 99    | 0    | 168        | 0                              | 0    | 86   | 16    | 0    | 102        | 0                              | 0    | 122  | 33    | 0    | 155        | 425        |
| Hourly Total  | 0                 | 0    | 0    | 0     | 0    | 0          | 0                     | 273  | 0    | 500   | 0    | 773        | 1                              | 0    | 404  | 76    | 0    | 481        | 1                              | 0    | 553  | 143   | 0    | 697        | 1851       |
| Grand Total   | 0                 | 0    | 0    | 2     | 0    | 2          | 0                     | 1270 | 0    | 1986  | 0    | 3256       | 1                              | 0    | 2591 | 551   | 0    | 3143       | 1                              | 0    | 3580 | 1113  | 0    | 4694       | 11095      |
| Approach %    | 0.0               | 0.0  | 0.0  | 100.0 | -    | -          | 0.0                   | 39.0 | 0.0  | 61.0  | -    | -          | 0.0                            | 0.0  | 82.4 | 17.5  | -    | -          | 0.0                            | 0.0  | 76.3 | 23.7  | -    | -          | -          |
| Total %       | 0.0               | 0.0  | 0.0  | 0.0   | -    | 0.0        | 0.0                   | 11.4 | 0.0  | 17.9  | -    | 29.3       | 0.0                            | 0.0  | 23.4 | 5.0   | -    | 28.3       | 0.0                            | 0.0  | 32.3 | 10.0  | -    | 42.3       | -          |
| Lights        | 0                 | 0    | 0    | 2     | -    | 2          | 0                     | 1235 | 0    | 1954  | -    | 3189       | 1                              | 0    | 2524 | 523   | -    | 3048       | 1                              | 0    | 3517 | 1095  | -    | 4613       | 10852      |
| % Lights      | -                 | -    | -    | 100.0 | -    | 100.0      | -                     | 97.2 | -    | 98.4  | -    | 97.9       | 100.0                          | -    | 97.4 | 94.9  | -    | 97.0       | 100.0                          | -    | 98.2 | 98.4  | -    | 98.3       | 97.8       |
| Buses         | 0                 | 0    | 0    | 0     | -    | 0          | 0                     | 10   | 0    | 1     | -    | 11         | 0                              | 0    | 21   | 3     | -    | 24         | 0                              | 0    | 9    | 5     | -    | 14         | 49         |
| % Buses       | -                 | -    | -    | 0.0   | -    | 0.0        | -                     | 0.8  | -    | 0.1   | -    | 0.3        | 0.0                            | -    | 0.8  | 0.5   | -    | 0.8        | 0.0                            | -    | 0.3  | 0.4   | -    | 0.3        | 0.4        |
| Trucks        | 0                 | 0    | 0    | 0     | -    | 0          | 0                     | 25   | 0    | 31    | -    | 56         | 0                              | 0    | 46   | 25    | -    | 71         | 0                              | 0    | 54   | 13    | -    | 67         | 194        |
| % Trucks      | -                 | -    | -    | 0.0   | -    | 0.0        | -                     | 2.0  | -    | 1.6   | -    | 1.7        | 0.0                            | -    | 1.8  | 4.5   | -    | 2.3        | 0.0                            | -    | 1.5  | 1.2   | -    | 1.4        | 1.7        |





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609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Berlin, Camden County, NJ  
Setup: GP  
Location: 40.648193, -74.575188

Count Name: 2. Liberty Corner Road and Rt 78  
WB Ramp  
Site Code: 2  
Start Date: 08/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

| Start Time              | On Ramp Eastbound |       |       |       |      |            | On/Off Ramp Westbound |       |       |       |      |            | Liberty Corner Road Northbound |       |       |       |      |            | Liberty Corner Road Southbound |       |       |       |      |            | Int. Total |
|-------------------------|-------------------|-------|-------|-------|------|------------|-----------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|------------|
|                         | U-Turn            | Left  | Thru  | Right | Peds | App. Total | U-Turn                | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total |            |
| 8:00 AM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 58    | 0     | 111   | 0    | 169        | 0                              | 0     | 194   | 19    | 0    | 213        | 0                              | 0     | 158   | 47    | 0    | 205        | 587        |
| 8:15 AM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 61    | 0     | 104   | 0    | 165        | 0                              | 0     | 150   | 27    | 0    | 177        | 0                              | 0     | 173   | 48    | 0    | 221        | 563        |
| 8:30 AM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 81    | 0     | 143   | 0    | 224        | 0                              | 0     | 183   | 28    | 0    | 211        | 0                              | 0     | 219   | 45    | 0    | 264        | 699        |
| 8:45 AM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 81    | 0     | 96    | 0    | 177        | 0                              | 0     | 198   | 27    | 0    | 225        | 0                              | 0     | 247   | 28    | 0    | 275        | 677        |
| Total                   | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 281   | 0     | 454   | 0    | 735        | 0                              | 0     | 725   | 101   | 0    | 826        | 0                              | 0     | 797   | 168   | 0    | 965        | 2526       |
| Approach %              | 0.0               | 0.0   | 0.0   | 0.0   | -    | -          | 0.0                   | 38.2  | 0.0   | 61.8  | -    | -          | 0.0                            | 0.0   | 87.8  | 12.2  | -    | -          | 0.0                            | 0.0   | 82.6  | 17.4  | -    | -          | -          |
| Total %                 | 0.0               | 0.0   | 0.0   | 0.0   | -    | 0.0        | 0.0                   | 11.1  | 0.0   | 18.0  | -    | 29.1       | 0.0                            | 0.0   | 28.7  | 4.0   | -    | 32.7       | 0.0                            | 0.0   | 31.6  | 6.7   | -    | 38.2       | -          |
| PHF                     | 0.000             | 0.000 | 0.000 | 0.000 | -    | 0.000      | 0.000                 | 0.867 | 0.000 | 0.794 | -    | 0.820      | 0.000                          | 0.000 | 0.915 | 0.902 | -    | 0.918      | 0.000                          | 0.000 | 0.807 | 0.875 | -    | 0.877      | 0.903      |
| Lights                  | 0                 | 0     | 0     | 0     | -    | 0          | 0                     | 273   | 0     | 447   | -    | 720        | 0                              | 0     | 704   | 88    | -    | 792        | 0                              | 0     | 786   | 160   | -    | 946        | 2458       |
| % Lights                | -                 | -     | -     | -     | -    | -          | -                     | 97.2  | -     | 98.5  | -    | 98.0       | -                              | -     | 97.1  | 87.1  | -    | 95.9       | -                              | -     | 98.6  | 95.2  | -    | 98.0       | 97.3       |
| Buses                   | 0                 | 0     | 0     | 0     | -    | 0          | 0                     | 2     | 0     | 0     | -    | 2          | 0                              | 0     | 6     | 2     | -    | 8          | 0                              | 0     | 2     | 1     | -    | 3          | 13         |
| % Buses                 | -                 | -     | -     | -     | -    | -          | -                     | 0.7   | -     | 0.0   | -    | 0.3        | -                              | -     | 0.8   | 2.0   | -    | 1.0        | -                              | -     | 0.3   | 0.6   | -    | 0.3        | 0.5        |
| Trucks                  | 0                 | 0     | 0     | 0     | -    | 0          | 0                     | 6     | 0     | 7     | -    | 13         | 0                              | 0     | 15    | 11    | -    | 26         | 0                              | 0     | 9     | 7     | -    | 16         | 55         |
| % Trucks                | -                 | -     | -     | -     | -    | -          | -                     | 2.1   | -     | 1.5   | -    | 1.8        | -                              | -     | 2.1   | 10.9  | -    | 3.1        | -                              | -     | 1.1   | 4.2   | -    | 1.7        | 2.2        |
| Bicycles on Crosswalk   | -                 | -     | -     | -     | 0    | -          | -                     | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                 | -     | -     | -     | -    | -          | -                     | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |
| Pedestrians             | -                 | -     | -     | -     | 0    | -          | -                     | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                 | -     | -     | -     | -    | -          | -                     | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |





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Project: Liberty Corner Road  
Municipality: Berlin, Camden County, NJ  
Setup: GP  
Location: 40.648193, -74.575188

Count Name: 2. Liberty Corner Road and Rt 78  
WB Ramp  
Site Code: 2  
Start Date: 08/02/2022  
Page No: 6

### Turning Movement Peak Hour Data (4:45 PM)

| Start Time              | On Ramp Eastbound |       |       |       |      |            | On/Off Ramp Westbound |       |       |       |      |            | Liberty Corner Road Northbound |       |       |       |      |            | Liberty Corner Road Southbound |       |       |       |      |            | Int. Total |
|-------------------------|-------------------|-------|-------|-------|------|------------|-----------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|------------|
|                         | U-Turn            | Left  | Thru  | Right | Peds | App. Total | U-Turn                | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total |            |
| 4:45 PM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 57    | 0     | 80    | 0    | 137        | 0                              | 0     | 99    | 29    | 0    | 128        | 0                              | 0     | 208   | 78    | 0    | 286        | 551        |
| 5:00 PM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 55    | 0     | 96    | 0    | 151        | 0                              | 0     | 110   | 55    | 0    | 165        | 0                              | 0     | 228   | 89    | 0    | 317        | 633        |
| 5:15 PM                 | 0                 | 0     | 0     | 1     | 0    | 1          | 0                     | 71    | 0     | 105   | 0    | 176        | 0                              | 0     | 109   | 47    | 0    | 156        | 0                              | 0     | 227   | 80    | 0    | 307        | 640        |
| 5:30 PM                 | 0                 | 0     | 0     | 0     | 0    | 0          | 0                     | 100   | 0     | 107   | 0    | 207        | 0                              | 0     | 117   | 36    | 0    | 153        | 0                              | 0     | 220   | 56    | 0    | 276        | 636        |
| Total                   | 0                 | 0     | 0     | 1     | 0    | 1          | 0                     | 283   | 0     | 388   | 0    | 671        | 0                              | 0     | 435   | 167   | 0    | 602        | 0                              | 0     | 883   | 303   | 0    | 1186       | 2460       |
| Approach %              | 0.0               | 0.0   | 0.0   | 100.0 | -    | -          | 0.0                   | 42.2  | 0.0   | 57.8  | -    | -          | 0.0                            | 0.0   | 72.3  | 27.7  | -    | -          | 0.0                            | 0.0   | 74.5  | 25.5  | -    | -          | -          |
| Total %                 | 0.0               | 0.0   | 0.0   | 0.0   | -    | 0.0        | 0.0                   | 11.5  | 0.0   | 15.8  | -    | 27.3       | 0.0                            | 0.0   | 17.7  | 6.8   | -    | 24.5       | 0.0                            | 0.0   | 35.9  | 12.3  | -    | 48.2       | -          |
| PHF                     | 0.000             | 0.000 | 0.000 | 0.250 | -    | 0.250      | 0.000                 | 0.708 | 0.000 | 0.907 | -    | 0.810      | 0.000                          | 0.000 | 0.929 | 0.759 | -    | 0.912      | 0.000                          | 0.000 | 0.968 | 0.851 | -    | 0.935      | 0.961      |
| Lights                  | 0                 | 0     | 0     | 1     | -    | 1          | 0                     | 273   | 0     | 385   | -    | 658        | 0                              | 0     | 430   | 164   | -    | 594        | 0                              | 0     | 870   | 299   | -    | 1169       | 2422       |
| % Lights                | -                 | -     | -     | 100.0 | -    | 100.0      | -                     | 96.5  | -     | 99.2  | -    | 98.1       | -                              | -     | 98.9  | 98.2  | -    | 98.7       | -                              | -     | 98.5  | 98.7  | -    | 98.6       | 98.5       |
| Buses                   | 0                 | 0     | 0     | 0     | -    | 0          | 0                     | 7     | 0     | 0     | -    | 7          | 0                              | 0     | 2     | 1     | -    | 3          | 0                              | 0     | 5     | 2     | -    | 7          | 17         |
| % Buses                 | -                 | -     | -     | 0.0   | -    | 0.0        | -                     | 2.5   | -     | 0.0   | -    | 1.0        | -                              | -     | 0.5   | 0.6   | -    | 0.5        | -                              | -     | 0.6   | 0.7   | -    | 0.6        | 0.7        |
| Trucks                  | 0                 | 0     | 0     | 0     | -    | 0          | 0                     | 3     | 0     | 3     | -    | 6          | 0                              | 0     | 3     | 2     | -    | 5          | 0                              | 0     | 8     | 2     | -    | 10         | 21         |
| % Trucks                | -                 | -     | -     | 0.0   | -    | 0.0        | -                     | 1.1   | -     | 0.8   | -    | 0.9        | -                              | -     | 0.7   | 1.2   | -    | 0.8        | -                              | -     | 0.9   | 0.7   | -    | 0.8        | 0.9        |
| Bicycles on Crosswalk   | -                 | -     | -     | -     | 0    | -          | -                     | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                 | -     | -     | -     | -    | -          | -                     | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |
| Pedestrians             | -                 | -     | -     | -     | 0    | -          | -                     | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                 | -     | -     | -     | -    | -          | -                     | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |





TRAFFIC & DATA COLLECTION

Imperial Traffic & Data Collection

www.imperialtdc.com

PO BOX 4637

Cherry Hill, New Jersey, United States 08034

609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.649909, -74.587291

Count Name: 5. Allen Road and Site Driveway  
Site Code: 5  
Start Date: 08/02/2022  
Page No: 1

### Turning Movement Data

| Start Time            | Allen Road Eastbound |      |       |      |            | Allen Road Westbound |      |      |      |            | Site Driveway Northbound |       |       |      |            | Int. Total |
|-----------------------|----------------------|------|-------|------|------------|----------------------|------|------|------|------------|--------------------------|-------|-------|------|------------|------------|
|                       | U-Turn               | Thru | Right | Peds | App. Total | U-Turn               | Left | Thru | Peds | App. Total | U-Turn                   | Left  | Right | Peds | App. Total |            |
| 7:00 AM               | 0                    | 40   | 0     | 0    | 40         | 0                    | 2    | 16   | 0    | 18         | 0                        | 0     | 0     | 0    | 0          | 58         |
| 7:15 AM               | 0                    | 60   | 3     | 0    | 63         | 0                    | 2    | 20   | 0    | 22         | 0                        | 1     | 0     | 0    | 1          | 86         |
| 7:30 AM               | 0                    | 85   | 1     | 0    | 86         | 0                    | 2    | 32   | 0    | 34         | 0                        | 0     | 0     | 0    | 0          | 120        |
| 7:45 AM               | 0                    | 64   | 1     | 0    | 65         | 0                    | 4    | 34   | 0    | 38         | 0                        | 0     | 0     | 0    | 0          | 103        |
| Hourly Total          | 0                    | 249  | 5     | 0    | 254        | 0                    | 10   | 102  | 0    | 112        | 0                        | 1     | 0     | 0    | 1          | 367        |
| 8:00 AM               | 0                    | 81   | 1     | 0    | 82         | 0                    | 6    | 47   | 0    | 53         | 0                        | 0     | 0     | 0    | 0          | 135        |
| 8:15 AM               | 0                    | 109  | 3     | 0    | 112        | 0                    | 4    | 40   | 0    | 44         | 0                        | 0     | 0     | 0    | 0          | 156        |
| 8:30 AM               | 0                    | 117  | 4     | 0    | 121        | 0                    | 6    | 59   | 0    | 65         | 0                        | 0     | 0     | 0    | 0          | 186        |
| 8:45 AM               | 0                    | 119  | 2     | 0    | 121        | 0                    | 4    | 56   | 0    | 60         | 0                        | 0     | 0     | 0    | 0          | 181        |
| Hourly Total          | 0                    | 426  | 10    | 0    | 436        | 0                    | 20   | 202  | 0    | 222        | 0                        | 0     | 0     | 0    | 0          | 658        |
| *** BREAK ***         | -                    | -    | -     | -    | -          | -                    | -    | -    | -    | -          | -                        | -     | -     | -    | -          | -          |
| 4:00 PM               | 0                    | 59   | 1     | 0    | 60         | 0                    | 0    | 64   | 0    | 64         | 0                        | 1     | 5     | 0    | 6          | 130        |
| 4:15 PM               | 0                    | 61   | 0     | 0    | 61         | 0                    | 2    | 67   | 0    | 69         | 0                        | 0     | 4     | 0    | 4          | 134        |
| 4:30 PM               | 0                    | 68   | 0     | 0    | 68         | 0                    | 0    | 83   | 0    | 83         | 0                        | 1     | 4     | 0    | 5          | 156        |
| 4:45 PM               | 0                    | 62   | 0     | 0    | 62         | 0                    | 0    | 73   | 0    | 73         | 0                        | 2     | 3     | 0    | 5          | 140        |
| Hourly Total          | 0                    | 250  | 1     | 0    | 251        | 0                    | 2    | 287  | 0    | 289        | 0                        | 4     | 16    | 0    | 20         | 560        |
| 5:00 PM               | 0                    | 49   | 0     | 0    | 49         | 0                    | 1    | 97   | 0    | 98         | 0                        | 2     | 5     | 0    | 7          | 154        |
| 5:15 PM               | 0                    | 77   | 0     | 0    | 77         | 0                    | 0    | 97   | 0    | 97         | 0                        | 1     | 4     | 0    | 5          | 179        |
| 5:30 PM               | 0                    | 85   | 0     | 0    | 85         | 0                    | 3    | 86   | 0    | 89         | 0                        | 1     | 1     | 0    | 2          | 176        |
| 5:45 PM               | 0                    | 63   | 1     | 0    | 64         | 1                    | 0    | 84   | 0    | 85         | 0                        | 3     | 1     | 0    | 4          | 153        |
| Hourly Total          | 0                    | 274  | 1     | 0    | 275        | 1                    | 4    | 364  | 0    | 369        | 0                        | 7     | 11    | 0    | 18         | 662        |
| 6:00 PM               | 0                    | 56   | 0     | 0    | 56         | 0                    | 0    | 101  | 0    | 101        | 0                        | 0     | 1     | 0    | 1          | 158        |
| 6:15 PM               | 0                    | 59   | 0     | 0    | 59         | 0                    | 0    | 112  | 0    | 112        | 0                        | 1     | 3     | 0    | 4          | 175        |
| 6:30 PM               | 0                    | 61   | 0     | 0    | 61         | 0                    | 0    | 113  | 0    | 113        | 0                        | 0     | 0     | 0    | 0          | 174        |
| 6:45 PM               | 0                    | 52   | 0     | 0    | 52         | 0                    | 0    | 95   | 0    | 95         | 0                        | 0     | 2     | 0    | 2          | 149        |
| Hourly Total          | 0                    | 228  | 0     | 0    | 228        | 0                    | 0    | 421  | 0    | 421        | 0                        | 1     | 6     | 0    | 7          | 656        |
| Grand Total           | 0                    | 1427 | 17    | 0    | 1444       | 1                    | 36   | 1376 | 0    | 1413       | 0                        | 13    | 33    | 0    | 46         | 2903       |
| Approach %            | 0.0                  | 98.8 | 1.2   | -    | -          | 0.1                  | 2.5  | 97.4 | -    | -          | 0.0                      | 28.3  | 71.7  | -    | -          | -          |
| Total %               | 0.0                  | 49.2 | 0.6   | -    | 49.7       | 0.0                  | 1.2  | 47.4 | -    | 48.7       | 0.0                      | 0.4   | 1.1   | -    | 1.6        | -          |
| Lights                | 0                    | 1410 | 17    | -    | 1427       | 1                    | 35   | 1349 | -    | 1385       | 0                        | 13    | 33    | -    | 46         | 2858       |
| % Lights              | -                    | 98.8 | 100.0 | -    | 98.8       | 100.0                | 97.2 | 98.0 | -    | 98.0       | -                        | 100.0 | 100.0 | -    | 100.0      | 98.4       |
| Buses                 | 0                    | 7    | 0     | -    | 7          | 0                    | 0    | 8    | -    | 8          | 0                        | 0     | 0     | -    | 0          | 15         |
| % Buses               | -                    | 0.5  | 0.0   | -    | 0.5        | 0.0                  | 0.0  | 0.6  | -    | 0.6        | -                        | 0.0   | 0.0   | -    | 0.0        | 0.5        |
| Trucks                | 0                    | 10   | 0     | -    | 10         | 0                    | 1    | 19   | -    | 20         | 0                        | 0     | 0     | -    | 0          | 30         |
| % Trucks              | -                    | 0.7  | 0.0   | -    | 0.7        | 0.0                  | 2.8  | 1.4  | -    | 1.4        | -                        | 0.0   | 0.0   | -    | 0.0        | 1.0        |
| Bicycles on Crosswalk | -                    | -    | -     | 0    | -          | -                    | -    | -    | 0    | -          | -                        | -     | -     | 0    | -          | -          |





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609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.649909, -74.587291

Count Name: 5. Allen Road and Site Driveway  
Site Code: 5  
Start Date: 08/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

| Start Time              | Allen Road<br>Eastbound |       |       |      |            | Allen Road<br>Westbound |       |       |      |            | Site Driveway<br>Northbound |       |       |      |            | Int. Total |
|-------------------------|-------------------------|-------|-------|------|------------|-------------------------|-------|-------|------|------------|-----------------------------|-------|-------|------|------------|------------|
|                         | U-Turn                  | Thru  | Right | Peds | App. Total | U-Turn                  | Left  | Thru  | Peds | App. Total | U-Turn                      | Left  | Right | Peds | App. Total |            |
| 8:00 AM                 | 0                       | 81    | 1     | 0    | 82         | 0                       | 6     | 47    | 0    | 53         | 0                           | 0     | 0     | 0    | 0          | 135        |
| 8:15 AM                 | 0                       | 109   | 3     | 0    | 112        | 0                       | 4     | 40    | 0    | 44         | 0                           | 0     | 0     | 0    | 0          | 156        |
| 8:30 AM                 | 0                       | 117   | 4     | 0    | 121        | 0                       | 6     | 59    | 0    | 65         | 0                           | 0     | 0     | 0    | 0          | 186        |
| 8:45 AM                 | 0                       | 119   | 2     | 0    | 121        | 0                       | 4     | 56    | 0    | 60         | 0                           | 0     | 0     | 0    | 0          | 181        |
| Total                   | 0                       | 426   | 10    | 0    | 436        | 0                       | 20    | 202   | 0    | 222        | 0                           | 0     | 0     | 0    | 0          | 658        |
| Approach %              | 0.0                     | 97.7  | 2.3   | -    | -          | 0.0                     | 9.0   | 91.0  | -    | -          | 0.0                         | 0.0   | 0.0   | -    | -          | -          |
| Total %                 | 0.0                     | 64.7  | 1.5   | -    | 66.3       | 0.0                     | 3.0   | 30.7  | -    | 33.7       | 0.0                         | 0.0   | 0.0   | -    | 0.0        | -          |
| PHF                     | 0.000                   | 0.895 | 0.625 | -    | 0.901      | 0.000                   | 0.833 | 0.856 | -    | 0.854      | 0.000                       | 0.000 | 0.000 | -    | 0.000      | 0.884      |
| Lights                  | 0                       | 420   | 10    | -    | 430        | 0                       | 20    | 187   | -    | 207        | 0                           | 0     | 0     | -    | 0          | 637        |
| % Lights                | -                       | 98.6  | 100.0 | -    | 98.6       | -                       | 100.0 | 92.6  | -    | 93.2       | -                           | -     | -     | -    | -          | 96.8       |
| Buses                   | 0                       | 4     | 0     | -    | 4          | 0                       | 0     | 6     | -    | 6          | 0                           | 0     | 0     | -    | 0          | 10         |
| % Buses                 | -                       | 0.9   | 0.0   | -    | 0.9        | -                       | 0.0   | 3.0   | -    | 2.7        | -                           | -     | -     | -    | -          | 1.5        |
| Trucks                  | 0                       | 2     | 0     | -    | 2          | 0                       | 0     | 9     | -    | 9          | 0                           | 0     | 0     | -    | 0          | 11         |
| % Trucks                | -                       | 0.5   | 0.0   | -    | 0.5        | -                       | 0.0   | 4.5   | -    | 4.1        | -                           | -     | -     | -    | -          | 1.7        |
| Bicycles on Crosswalk   | -                       | -     | -     | 0    | -          | -                       | -     | -     | 0    | -          | -                           | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                       | -     | -     | -    | -          | -                       | -     | -     | -    | -          | -                           | -     | -     | -    | -          | -          |
| Pedestrians             | -                       | -     | -     | 0    | -          | -                       | -     | -     | 0    | -          | -                           | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                       | -     | -     | -    | -          | -                       | -     | -     | -    | -          | -                           | -     | -     | -    | -          | -          |



## 5. Allen Road and Site Driveway - TMC

Tue Aug 2, 2022

Forced Peak (4:45 PM - 5:45 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 976150, Location: 40.649909, -74.587291, Site Code: 5

Provided by: Imperial Traffic & Data Collection  
PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                                      | Allen Road Eastbound |    |    |       |      |  | Allen Road Westbound |       |    |       |      |  | Site Driveway Northbound |       |    |       |      |     |       |
|--|----------------------|----|----|-------|------|--|----------------------|-------|----|-------|------|--|--------------------------|-------|----|-------|------|-----|-------|
| Time   | T                    | R  | U  | App   | Ped* |  | L                    | T     | U  | App   | Ped* |  | L                        | R     | U  | App   | Ped* | Int |       |
| 2022-08-02 4:45PM                                  | 62                   | 0  | 0  | 62    | 0    |  | 0                    | 73    | 0  | 73    | 0    |  | 2                        | 3     | 0  | 5     | 0    |     | 140   |
| 5:00PM   | 49                   | 0  | 0  | 49    | 0    |  | 1                    | 97    | 0  | 98    | 0    |  | 2                        | 5     | 0  | 7     | 0    |     | 154   |
| 5:15PM   | 77                   | 0  | 0  | 77    | 0    |  | 0                    | 97    | 0  | 97    | 0    |  | 1                        | 4     | 0  | 5     | 0    |     | 179   |
| 5:30PM   | 85                   | 0  | 0  | 85    | 0    |  | 3                    | 86    | 0  | 89    | 0    |  | 1                        | 1     | 0  | 2     | 0    |     | 176   |
| <b>Total</b>                                       | 273                  | 0  | 0  | 273   | 0    |  | 4                    | 353   | 0  | 357   | 0    |  | 6                        | 13    | 0  | 19    | 0    |     | 649   |
| <b>% Approach</b>                                  | 100%                 | 0% | 0% | -     | -    |  | 1.1%                 | 98.9% | 0% | -     | -    |  | 31.6%                    | 68.4% | 0% | -     | -    |     | -     |
| <b>% Total</b>                                     | 42.1%                | 0% | 0% | 42.1% | -    |  | 0.6%                 | 54.4% | 0% | 55.0% | -    |  | 0.9%                     | 2.0%  | 0% | 2.9%  | -    |     | -     |
| <b>PHF</b>   | 0.803                | -  | -  | 0.803 | -    |  | 0.333                | 0.910 | -  | 0.911 | -    |  | 0.750                    | 0.650 | -  | 0.679 | -    |     | 0.906 |
| <b>Lights</b>                                      | 270                  | 0  | 0  | 270   | -    |  | 3                    | 351   | 0  | 354   | -    |  | 6                        | 13    | 0  | 19    | -    |     | 643   |
| <b>% Lights</b>                                    | 98.9%                | 0% | 0% | 98.9% | -    |  | 75.0%                | 99.4% | 0% | 99.2% | -    |  | 100%                     | 100%  | 0% | 100%  | -    |     | 99.1% |
| <b>Articulated Trucks and Single-Unit Trucks</b>   | 3                    | 0  | 0  | 3     | -    |  | 1                    | 0     | 0  | 1     | -    |  | 0                        | 0     | 0  | 0     | -    |     | 4     |
| <b>% Articulated Trucks and Single-Unit Trucks</b> | 1.1%                 | 0% | 0% | 1.1%  | -    |  | 25.0%                | 0%    | 0% | 0.3%  | -    |  | 0%                       | 0%    | 0% | 0%    | -    |     | 0.6%  |
| <b>Buses</b>                                       | 0                    | 0  | 0  | 0     | -    |  | 0                    | 2     | 0  | 2     | -    |  | 0                        | 0     | 0  | 0     | -    |     | 2     |
| <b>% Buses</b>                                     | 0%                   | 0% | 0% | 0%    | -    |  | 0%                   | 0.6%  | 0% | 0.6%  | -    |  | 0%                       | 0%    | 0% | 0%    | -    |     | 0.3%  |
| <b>Pedestrians</b>                                 | -                    | -  | -  | -     | 0    |  | -                    | -     | -  | -     | 0    |  | -                        | -     | -  | -     | 0    |     | -     |
| <b>% Pedestrians</b>                               | -                    | -  | -  | -     | -    |  | -                    | -     | -  | -     | -    |  | -                        | -     | -  | -     | -    |     | -     |
| <b>Bicycles on Crosswalk</b>                       | -                    | -  | -  | -     | 0    |  | -                    | -     | -  | -     | 0    |  | -                        | -     | -  | -     | 0    |     | -     |
| <b>% Bicycles on Crosswalk</b>                     | -                    | -  | -  | -     | -    |  | -                    | -     | -  | -     | -    |  | -                        | -     | -  | -     | -    |     | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn





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Cherry Hill, New Jersey, United States 08034

609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.655745, -74.576435

Count Name: 3. Liberty Corner Road and Allen  
Road  
Site Code: 3  
Start Date: 08/02/2022  
Page No: 1

### Turning Movement Data

| Start Time    | Allen Road<br>Eastbound |      |       |       |      |               | Buisness Driveway<br>Westbound |      |       |       |      |               | Liberty Corner Road<br>Northbound |      |      |       |      |               | Liberty Corner Road<br>Southbound |      |      |       |      |               | Int. Total |
|---------------|-------------------------|------|-------|-------|------|---------------|--------------------------------|------|-------|-------|------|---------------|-----------------------------------|------|------|-------|------|---------------|-----------------------------------|------|------|-------|------|---------------|------------|
|               | U-Turn                  | Left | Thru  | Right | Peds | App.<br>Total | U-Turn                         | Left | Thru  | Right | Peds | App.<br>Total | U-Turn                            | Left | Thru | Right | Peds | App.<br>Total | U-Turn                            | Left | Thru | Right | Peds | App.<br>Total |            |
| 7:00 AM       | 0                       | 14   | 0     | 50    | 0    | 64            | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 39   | 86   | 1     | 0    | 126           | 0                                 | 0    | 103  | 19    | 0    | 122           | 312        |
| 7:15 AM       | 0                       | 17   | 0     | 55    | 0    | 72            | 0                              | 2    | 1     | 1     | 0    | 4             | 0                                 | 48   | 141  | 0     | 0    | 189           | 0                                 | 0    | 95   | 22    | 0    | 117           | 382        |
| 7:30 AM       | 0                       | 27   | 1     | 77    | 0    | 105           | 0                              | 4    | 0     | 4     | 0    | 8             | 0                                 | 57   | 143  | 1     | 0    | 201           | 0                                 | 0    | 145  | 28    | 0    | 173           | 487        |
| 7:45 AM       | 0                       | 21   | 0     | 49    | 0    | 70            | 0                              | 0    | 0     | 1     | 0    | 1             | 0                                 | 70   | 145  | 0     | 0    | 215           | 0                                 | 0    | 162  | 48    | 0    | 210           | 496        |
| Hourly Total  | 0                       | 79   | 1     | 231   | 0    | 311           | 0                              | 6    | 1     | 6     | 0    | 13            | 0                                 | 214  | 515  | 2     | 0    | 731           | 0                                 | 0    | 505  | 117   | 0    | 622           | 1677       |
| 8:00 AM       | 0                       | 17   | 0     | 67    | 0    | 84            | 0                              | 1    | 0     | 0     | 0    | 1             | 0                                 | 93   | 139  | 1     | 0    | 233           | 0                                 | 0    | 151  | 45    | 0    | 196           | 514        |
| 8:15 AM       | 0                       | 30   | 0     | 74    | 0    | 104           | 0                              | 1    | 0     | 0     | 0    | 1             | 0                                 | 82   | 110  | 0     | 0    | 192           | 0                                 | 1    | 174  | 48    | 0    | 223           | 520        |
| 8:30 AM       | 0                       | 33   | 0     | 95    | 0    | 128           | 0                              | 2    | 0     | 0     | 0    | 2             | 0                                 | 76   | 168  | 0     | 0    | 244           | 0                                 | 0    | 208  | 53    | 0    | 261           | 635        |
| 8:45 AM       | 0                       | 26   | 1     | 86    | 0    | 113           | 0                              | 2    | 0     | 0     | 0    | 2             | 0                                 | 70   | 146  | 1     | 0    | 217           | 0                                 | 0    | 227  | 63    | 0    | 290           | 622        |
| Hourly Total  | 0                       | 106  | 1     | 322   | 0    | 429           | 0                              | 6    | 0     | 0     | 0    | 6             | 0                                 | 321  | 563  | 2     | 0    | 886           | 0                                 | 1    | 760  | 209   | 0    | 970           | 2291       |
| *** BREAK *** | -                       | -    | -     | -     | -    | -             | -                              | -    | -     | -     | -    | -             | -                                 | -    | -    | -     | -    | -             | -                                 | -    | -    | -     | -    | -             | -          |
| 4:00 PM       | 0                       | 30   | 0     | 85    | 0    | 115           | 0                              | 1    | 0     | 0     | 0    | 1             | 0                                 | 43   | 167  | 3     | 0    | 213           | 0                                 | 1    | 161  | 21    | 0    | 183           | 512        |
| 4:15 PM       | 0                       | 33   | 0     | 83    | 0    | 116           | 0                              | 7    | 0     | 1     | 0    | 8             | 0                                 | 38   | 140  | 0     | 0    | 178           | 0                                 | 0    | 152  | 26    | 0    | 178           | 480        |
| 4:30 PM       | 0                       | 58   | 0     | 74    | 0    | 132           | 0                              | 4    | 0     | 2     | 0    | 6             | 0                                 | 61   | 135  | 2     | 1    | 198           | 0                                 | 1    | 170  | 29    | 0    | 200           | 536        |
| 4:45 PM       | 0                       | 44   | 0     | 82    | 0    | 126           | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 40   | 140  | 0     | 0    | 180           | 0                                 | 0    | 155  | 38    | 0    | 193           | 499        |
| Hourly Total  | 0                       | 165  | 0     | 324   | 0    | 489           | 0                              | 12   | 0     | 3     | 0    | 15            | 0                                 | 182  | 582  | 5     | 1    | 769           | 0                                 | 2    | 636  | 114   | 0    | 754           | 2027       |
| 5:00 PM       | 0                       | 51   | 0     | 90    | 0    | 141           | 0                              | 3    | 1     | 0     | 0    | 4             | 0                                 | 56   | 169  | 0     | 0    | 225           | 0                                 | 0    | 151  | 37    | 0    | 188           | 558        |
| 5:15 PM       | 0                       | 58   | 0     | 91    | 0    | 149           | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 66   | 149  | 0     | 0    | 215           | 0                                 | 0    | 167  | 30    | 0    | 197           | 561        |
| 5:30 PM       | 0                       | 48   | 0     | 87    | 0    | 135           | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 75   | 155  | 0     | 0    | 230           | 0                                 | 0    | 137  | 27    | 0    | 164           | 529        |
| 5:45 PM       | 0                       | 36   | 0     | 56    | 0    | 92            | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 48   | 174  | 0     | 0    | 222           | 0                                 | 0    | 134  | 23    | 0    | 157           | 471        |
| Hourly Total  | 0                       | 193  | 0     | 324   | 0    | 517           | 0                              | 3    | 1     | 0     | 0    | 4             | 0                                 | 245  | 647  | 0     | 0    | 892           | 0                                 | 0    | 589  | 117   | 0    | 706           | 2119       |
| 6:00 PM       | 0                       | 41   | 0     | 53    | 0    | 94            | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 71   | 163  | 0     | 0    | 234           | 0                                 | 0    | 101  | 26    | 0    | 127           | 455        |
| 6:15 PM       | 0                       | 32   | 0     | 51    | 0    | 83            | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 95   | 166  | 0     | 0    | 261           | 0                                 | 0    | 99   | 28    | 0    | 127           | 471        |
| 6:30 PM       | 0                       | 31   | 0     | 49    | 0    | 80            | 0                              | 0    | 0     | 0     | 0    | 0             | 0                                 | 94   | 133  | 0     | 0    | 227           | 0                                 | 0    | 87   | 29    | 0    | 116           | 423        |
| 6:45 PM       | 0                       | 20   | 0     | 47    | 0    | 67            | 0                              | 0    | 0     | 1     | 0    | 1             | 0                                 | 69   | 133  | 0     | 0    | 202           | 0                                 | 1    | 98   | 18    | 0    | 117           | 387        |
| Hourly Total  | 0                       | 124  | 0     | 200   | 0    | 324           | 0                              | 0    | 0     | 1     | 0    | 1             | 0                                 | 329  | 595  | 0     | 0    | 924           | 0                                 | 1    | 385  | 101   | 0    | 487           | 1736       |
| Grand Total   | 0                       | 667  | 2     | 1401  | 0    | 2070          | 0                              | 27   | 2     | 10    | 0    | 39            | 0                                 | 1291 | 2902 | 9     | 1    | 4202          | 0                                 | 4    | 2877 | 658   | 0    | 3539          | 9850       |
| Approach %    | 0.0                     | 32.2 | 0.1   | 67.7  | -    | -             | 0.0                            | 69.2 | 5.1   | 25.6  | -    | -             | 0.0                               | 30.7 | 69.1 | 0.2   | -    | -             | 0.0                               | 0.1  | 81.3 | 18.6  | -    | -             | -          |
| Total %       | 0.0                     | 6.8  | 0.0   | 14.2  | -    | 21.0          | 0.0                            | 0.3  | 0.0   | 0.1   | -    | 0.4           | 0.0                               | 13.1 | 29.5 | 0.1   | -    | 42.7          | 0.0                               | 0.0  | 29.2 | 6.7   | -    | 35.9          | -          |
| Lights        | 0                       | 657  | 2     | 1385  | -    | 2044          | 0                              | 22   | 2     | 9     | -    | 33            | 0                                 | 1273 | 2823 | 6     | -    | 4102          | 0                                 | 3    | 2815 | 640   | -    | 3458          | 9637       |
| % Lights      | -                       | 98.5 | 100.0 | 98.9  | -    | 98.7          | -                              | 81.5 | 100.0 | 90.0  | -    | 84.6          | -                                 | 98.6 | 97.3 | 66.7  | -    | 97.6          | -                                 | 75.0 | 97.8 | 97.3  | -    | 97.7          | 97.8       |
| Buses         | 0                       | 7    | 0     | 0     | -    | 7             | 0                              | 0    | 0     | 0     | -    | 0             | 0                                 | 1    | 22   | 0     | -    | 23            | 0                                 | 0    | 16   | 6     | -    | 22            | 52         |
| % Buses       | -                       | 1.0  | 0.0   | 0.0   | -    | 0.3           | -                              | 0.0  | 0.0   | 0.0   | -    | 0.0           | -                                 | 0.1  | 0.8  | 0.0   | -    | 0.5           | -                                 | 0.0  | 0.6  | 0.9   | -    | 0.6           | 0.5        |
| Trucks        | 0                       | 3    | 0     | 16    | -    | 19            | 0                              | 5    | 0     | 1     | -    | 6             | 0                                 | 17   | 57   | 3     | -    | 77            | 0                                 | 1    | 46   | 12    | -    | 59            | 161        |
| % Trucks      | -                       | 0.4  | 0.0   | 1.1   | -    | 0.9           | -                              | 18.5 | 0.0   | 10.0  | -    | 15.4          | -                                 | 1.3  | 2.0  | 33.3  | -    | 1.8           | -                                 | 25.0 | 1.6  | 1.8   | -    | 1.7           | 1.6        |





Imperial Traffic & Data Collection  
www.imperialtdc.com

PO BOX 4637

Cherry Hill, New Jersey, United States 08034  
609-706-6100 hfurey@imperialtdc.com

Project: Liberty Corner Road  
Municipality: Bernards Twp, Somerset County,  
NJ  
Setup: GP  
Location: 40.655745, -74.576435

Count Name: 3. Liberty Corner Road and Allen  
Road  
Site Code: 3  
Start Date: 08/02/2022  
Page No: 4

### Turning Movement Peak Hour Data (8:00 AM)

| Start Time              | Allen Road Eastbound |       |       |       |      |            | Business Driveway Westbound |       |       |       |      |            | Liberty Corner Road Northbound |       |       |       |      |            | Liberty Corner Road Southbound |       |       |       |      |            | Int. Total |
|-------------------------|----------------------|-------|-------|-------|------|------------|-----------------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|--------------------------------|-------|-------|-------|------|------------|------------|
|                         | U-Turn               | Left  | Thru  | Right | Peds | App. Total | U-Turn                      | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total | U-Turn                         | Left  | Thru  | Right | Peds | App. Total |            |
| 8:00 AM                 | 0                    | 17    | 0     | 67    | 0    | 84         | 0                           | 1     | 0     | 0     | 0    | 1          | 0                              | 93    | 139   | 1     | 0    | 233        | 0                              | 0     | 151   | 45    | 0    | 196        | 514        |
| 8:15 AM                 | 0                    | 30    | 0     | 74    | 0    | 104        | 0                           | 1     | 0     | 0     | 0    | 1          | 0                              | 82    | 110   | 0     | 0    | 192        | 0                              | 1     | 174   | 48    | 0    | 223        | 520        |
| 8:30 AM                 | 0                    | 33    | 0     | 95    | 0    | 128        | 0                           | 2     | 0     | 0     | 0    | 2          | 0                              | 76    | 168   | 0     | 0    | 244        | 0                              | 0     | 208   | 53    | 0    | 261        | 635        |
| 8:45 AM                 | 0                    | 26    | 1     | 86    | 0    | 113        | 0                           | 2     | 0     | 0     | 0    | 2          | 0                              | 70    | 146   | 1     | 0    | 217        | 0                              | 0     | 227   | 63    | 0    | 290        | 622        |
| Total                   | 0                    | 106   | 1     | 322   | 0    | 429        | 0                           | 6     | 0     | 0     | 0    | 6          | 0                              | 321   | 563   | 2     | 0    | 886        | 0                              | 1     | 760   | 209   | 0    | 970        | 2291       |
| Approach %              | 0.0                  | 24.7  | 0.2   | 75.1  | -    | -          | 0.0                         | 100.0 | 0.0   | 0.0   | -    | -          | 0.0                            | 36.2  | 63.5  | 0.2   | -    | -          | 0.0                            | 0.1   | 78.4  | 21.5  | -    | -          | -          |
| Total %                 | 0.0                  | 4.6   | 0.0   | 14.1  | -    | 18.7       | 0.0                         | 0.3   | 0.0   | 0.0   | -    | 0.3        | 0.0                            | 14.0  | 24.6  | 0.1   | -    | 38.7       | 0.0                            | 0.0   | 33.2  | 9.1   | -    | 42.3       | -          |
| PHF                     | 0.000                | 0.803 | 0.250 | 0.847 | -    | 0.838      | 0.000                       | 0.750 | 0.000 | 0.000 | -    | 0.750      | 0.000                          | 0.863 | 0.838 | 0.500 | -    | 0.908      | 0.000                          | 0.250 | 0.837 | 0.829 | -    | 0.836      | 0.902      |
| Lights                  | 0                    | 101   | 1     | 319   | -    | 421        | 0                           | 5     | 0     | 0     | -    | 5          | 0                              | 313   | 542   | 2     | -    | 857        | 0                              | 1     | 746   | 201   | -    | 948        | 2231       |
| % Lights                | -                    | 95.3  | 100.0 | 99.1  | -    | 98.1       | -                           | 83.3  | -     | -     | -    | 83.3       | -                              | 97.5  | 96.3  | 100.0 | -    | 96.7       | -                              | 100.0 | 98.2  | 96.2  | -    | 97.7       | 97.4       |
| Buses                   | 0                    | 4     | 0     | 0     | -    | 4          | 0                           | 0     | 0     | 0     | -    | 0          | 0                              | 1     | 7     | 0     | -    | 8          | 0                              | 0     | 4     | 5     | -    | 9          | 21         |
| % Buses                 | -                    | 3.8   | 0.0   | 0.0   | -    | 0.9        | -                           | 0.0   | -     | -     | -    | 0.0        | -                              | 0.3   | 1.2   | 0.0   | -    | 0.9        | -                              | 0.0   | 0.5   | 2.4   | -    | 0.9        | 0.9        |
| Trucks                  | 0                    | 1     | 0     | 3     | -    | 4          | 0                           | 1     | 0     | 0     | -    | 1          | 0                              | 7     | 14    | 0     | -    | 21         | 0                              | 0     | 10    | 3     | -    | 13         | 39         |
| % Trucks                | -                    | 0.9   | 0.0   | 0.9   | -    | 0.9        | -                           | 16.7  | -     | -     | -    | 16.7       | -                              | 2.2   | 2.5   | 0.0   | -    | 2.4        | -                              | 0.0   | 1.3   | 1.4   | -    | 1.3        | 1.7        |
| Bicycles on Crosswalk   | -                    | -     | -     | -     | 0    | -          | -                           | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Bicycles on Crosswalk | -                    | -     | -     | -     | -    | -          | -                           | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |
| Pedestrians             | -                    | -     | -     | -     | 0    | -          | -                           | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -                              | -     | -     | -     | 0    | -          | -          |
| % Pedestrians           | -                    | -     | -     | -     | -    | -          | -                           | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -                              | -     | -     | -     | -    | -          | -          |



### 3. Liberty Corner Road and Allen Road - TMC

Tue Aug 2, 2022

Forced Peak (4:45 PM - 5:45 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 976145, Location: 40.655745, -74.576435, Site Code: 3

Provided by: Imperial Traffic & Data Collection  
PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                                      | Allen Road Eastbound |    |       |    |       |      | Buisness Driveway Westbound |       |    |    |       |      | Liberty Corner Road Northbound |       |    |    |       |      | Liberty Corner Road Southbound |       |       |    |       |      |       |
|--|----------------------|----|-------|----|-------|------|-----------------------------|-------|----|----|-------|------|--------------------------------|-------|----|----|-------|------|--------------------------------|-------|-------|----|-------|------|-------|
| Time   | L                    | T  | R     | U  | App   | Ped* | L                           | T     | R  | U  | App   | Ped* | L                              | T     | R  | U  | App   | Ped* | L                              | T     | R     | U  | App   | Ped* | Int   |
| 2022-08-02 4:45PM                                  | 44                   | 0  | 82    | 0  | 126   | 0    | 0                           | 0     | 0  | 0  | 0     | 0    | 40                             | 140   | 0  | 0  | 180   | 0    | 0                              | 155   | 38    | 0  | 193   | 0    | 499   |
| 5:00PM   | 51                   | 0  | 90    | 0  | 141   | 0    | 3                           | 1     | 0  | 0  | 4     | 0    | 56                             | 169   | 0  | 0  | 225   | 0    | 0                              | 151   | 37    | 0  | 188   | 0    | 558   |
| 5:15PM   | 58                   | 0  | 91    | 0  | 149   | 0    | 0                           | 0     | 0  | 0  | 0     | 0    | 66                             | 149   | 0  | 0  | 215   | 0    | 0                              | 167   | 30    | 0  | 197   | 0    | 561   |
| 5:30PM   | 48                   | 0  | 87    | 0  | 135   | 0    | 0                           | 0     | 0  | 0  | 0     | 0    | 75                             | 155   | 0  | 0  | 230   | 0    | 0                              | 137   | 27    | 0  | 164   | 0    | 529   |
| <b>Total</b>                                       | 201                  | 0  | 350   | 0  | 551   | 0    | 3                           | 1     | 0  | 0  | 4     | 0    | 237                            | 613   | 0  | 0  | 850   | 0    | 0                              | 610   | 132   | 0  | 742   | 0    | 2147  |
| <b>% Approach</b>                                  | 36.5%                | 0% | 63.5% | 0% | -     | -    | 75.0%                       | 25.0% | 0% | 0% | -     | -    | 27.9%                          | 72.1% | 0% | 0% | -     | -    | 0%                             | 82.2% | 17.8% | 0% | -     | -    | -     |
| <b>% Total</b>                                     | 9.4%                 | 0% | 16.3% | 0% | 25.7% | -    | 0.1%                        | 0%    | 0% | 0% | 0.2%  | -    | 11.0%                          | 28.6% | 0% | 0% | 39.6% | -    | 0%                             | 28.4% | 6.1%  | 0% | 34.6% | -    | -     |
| <b>PHF</b>   | 0.866                | -  | 0.962 | -  | 0.924 | -    | 0.250                       | 0.250 | -  | -  | 0.250 | -    | 0.790                          | 0.907 | -  | -  | 0.924 | -    | -                              | 0.913 | 0.868 | -  | 0.942 | -    | 0.957 |
| <b>Lights</b>                                      | 200                  | 0  | 346   | 0  | 546   | -    | 3                           | 1     | 0  | 0  | 4     | -    | 236                            | 609   | 0  | 0  | 845   | -    | 0                              | 594   | 130   | 0  | 724   | -    | 2119  |
| <b>% Lights</b>                                    | 99.5%                | 0% | 98.9% | 0% | 99.1% | -    | 100%                        | 100%  | 0% | 0% | 100%  | -    | 99.6%                          | 99.3% | 0% | 0% | 99.4% | -    | 0%                             | 97.4% | 98.5% | 0% | 97.6% | -    | 98.7% |
| <b>Articulated Trucks and Single-Unit Trucks</b>   | 0                    | 0  | 4     | 0  | 4     | -    | 0                           | 0     | 0  | 0  | 0     | -    | 1                              | 2     | 0  | 0  | 3     | -    | 0                              | 9     | 1     | 0  | 10    | -    | 17    |
| <b>% Articulated Trucks and Single-Unit Trucks</b> | 0%                   | 0% | 1.1%  | 0% | 0.7%  | -    | 0%                          | 0%    | 0% | 0% | 0%    | -    | 0.4%                           | 0.3%  | 0% | 0% | 0.4%  | -    | 0%                             | 1.5%  | 0.8%  | 0% | 1.3%  | -    | 0.8%  |
| <b>Buses</b>                                       | 1                    | 0  | 0     | 0  | 1     | -    | 0                           | 0     | 0  | 0  | 0     | -    | 0                              | 2     | 0  | 0  | 2     | -    | 0                              | 7     | 1     | 0  | 8     | -    | 11    |
| <b>% Buses</b>                                     | 0.5%                 | 0% | 0%    | 0% | 0.2%  | -    | 0%                          | 0%    | 0% | 0% | 0%    | -    | 0%                             | 0.3%  | 0% | 0% | 0.2%  | -    | 0%                             | 1.1%  | 0.8%  | 0% | 1.1%  | -    | 0.5%  |
| <b>Pedestrians</b>                                 | -                    | -  | -     | -  | -     | 0    | -                           | -     | -  | -  | -     | 0    | -                              | -     | -  | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -     |
| <b>% Pedestrians</b>                               | -                    | -  | -     | -  | -     | -    | -                           | -     | -  | -  | -     | -    | -                              | -     | -  | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -     |
| <b>Bicycles on Crosswalk</b>                       | -                    | -  | -     | -  | -     | 0    | -                           | -     | -  | -  | -     | 0    | -                              | -     | -  | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -     |
| <b>% Bicycles on Crosswalk</b>                     | -                    | -  | -     | -  | -     | -    | -                           | -     | -  | -  | -     | -    | -                              | -     | -  | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# 1. Liberty Corner Road (CR 525) & Allen Road - TMC

Tue Jan 10, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028859, Location: 40.655722, -74.576434, Site Code: 1

Provided by: Imperial Traffic & Data Collection

PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                               | Allen Road Eastbound |      |       |    |       |      | Existing Driveway Westbound |       |       |      |       |      | Liberty Corner Road Northbound |       |       |    |       |      | Liberty Corner Road Southbound |       |       |       |       |      |       |
|---|----------------------|------|-------|----|-------|------|-----------------------------|-------|-------|------|-------|------|--------------------------------|-------|-------|----|-------|------|--------------------------------|-------|-------|-------|-------|------|-------|
| Time  | L                    | T    | R     | U  | App   | Ped* | L                           | T     | R     | U    | App   | Ped* | L                              | T     | R     | U  | App   | Ped* | L                              | T     | R     | U     | App   | Ped* | Int   |
| 2023-01-10 7:00AM                           | 36                   | 0    | 46    | 0  | 82    | 0    | 0                           | 0     | 0     | 0    | 0     | 0    | 42                             | 136   | 1     | 0  | 179   | 0    | 1                              | 97    | 10    | 0     | 108   | 0    | 369   |
| 7:15AM                                      | 35                   | 0    | 57    | 0  | 92    | 0    | 2                           | 0     | 0     | 1    | 3     | 0    | 52                             | 167   | 0     | 0  | 219   | 0    | 0                              | 161   | 18    | 0     | 179   | 0    | 493   |
| 7:30AM                                      | 13                   | 0    | 68    | 0  | 81    | 0    | 6                           | 1     | 4     | 0    | 11    | 1    | 60                             | 159   | 1     | 0  | 220   | 0    | 0                              | 187   | 37    | 0     | 224   | 1    | 536   |
| 7:45AM                                      | 28                   | 0    | 58    | 0  | 86    | 0    | 0                           | 0     | 2     | 0    | 2     | 0    | 79                             | 207   | 0     | 0  | 286   | 0    | 1                              | 205   | 45    | 0     | 251   | 0    | 625   |
| Hourly Total                                | 112                  | 0    | 229   | 0  | 341   | 0    | 8                           | 1     | 6     | 1    | 16    | 1    | 233                            | 669   | 2     | 0  | 904   | 0    | 2                              | 650   | 110   | 0     | 762   | 1    | 2023  |
| 8:00AM                                      | 21                   | 0    | 60    | 0  | 81    | 0    | 1                           | 0     | 4     | 0    | 5     | 0    | 93                             | 182   | 4     | 0  | 279   | 0    | 0                              | 248   | 35    | 1     | 284   | 0    | 649   |
| 8:15AM                                      | 22                   | 0    | 89    | 0  | 111   | 0    | 0                           | 0     | 2     | 0    | 2     | 0    | 109                            | 194   | 1     | 0  | 304   | 0    | 1                              | 212   | 45    | 0     | 258   | 0    | 675   |
| 8:30AM                                      | 24                   | 0    | 97    | 0  | 121   | 0    | 0                           | 1     | 0     | 0    | 1     | 0    | 90                             | 192   | 2     | 0  | 284   | 0    | 1                              | 200   | 32    | 1     | 234   | 0    | 640   |
| 8:45AM                                      | 17                   | 2    | 66    | 0  | 85    | 0    | 0                           | 0     | 1     | 0    | 1     | 0    | 75                             | 147   | 1     | 0  | 223   | 0    | 0                              | 239   | 46    | 2     | 287   | 0    | 596   |
| Hourly Total                                | 84                   | 2    | 312   | 0  | 398   | 0    | 1                           | 1     | 7     | 0    | 9     | 0    | 367                            | 715   | 8     | 0  | 1090  | 0    | 2                              | 899   | 158   | 4     | 1063  | 0    | 2560  |
| 4:00PM                                      | 46                   | 0    | 95    | 0  | 141   | 0    | 1                           | 0     | 0     | 0    | 1     | 0    | 94                             | 277   | 1     | 0  | 372   | 0    | 1                              | 174   | 27    | 2     | 204   | 0    | 718   |
| 4:15PM                                      | 26                   | 0    | 69    | 0  | 95    | 0    | 0                           | 0     | 1     | 0    | 1     | 1    | 81                             | 265   | 3     | 0  | 349   | 0    | 0                              | 211   | 37    | 0     | 248   | 0    | 693   |
| 4:30PM                                      | 29                   | 0    | 98    | 0  | 127   | 0    | 0                           | 1     | 2     | 0    | 3     | 3    | 72                             | 226   | 0     | 0  | 298   | 0    | 2                              | 212   | 35    | 0     | 249   | 0    | 677   |
| 4:45PM                                      | 33                   | 0    | 77    | 0  | 110   | 0    | 1                           | 1     | 0     | 0    | 2     | 3    | 81                             | 239   | 3     | 0  | 323   | 0    | 0                              | 170   | 42    | 0     | 212   | 0    | 647   |
| Hourly Total                                | 134                  | 0    | 339   | 0  | 473   | 0    | 2                           | 2     | 3     | 0    | 7     | 7    | 328                            | 1007  | 7     | 0  | 1342  | 0    | 3                              | 767   | 141   | 2     | 913   | 0    | 2735  |
| 5:00PM                                      | 33                   | 0    | 70    | 0  | 103   | 0    | 3                           | 2     | 1     | 0    | 6     | 0    | 99                             | 244   | 0     | 0  | 343   | 0    | 0                              | 165   | 40    | 0     | 205   | 0    | 657   |
| 5:15PM                                      | 40                   | 0    | 85    | 0  | 125   | 0    | 0                           | 0     | 0     | 0    | 0     | 2    | 81                             | 265   | 0     | 0  | 346   | 0    | 3                              | 187   | 37    | 0     | 227   | 0    | 698   |
| 5:30PM                                      | 43                   | 0    | 93    | 0  | 136   | 0    | 3                           | 0     | 1     | 0    | 4     | 1    | 75                             | 267   | 0     | 0  | 342   | 0    | 0                              | 191   | 29    | 0     | 220   | 0    | 702   |
| 5:45PM                                      | 28                   | 0    | 76    | 0  | 104   | 0    | 1                           | 0     | 0     | 0    | 1     | 0    | 107                            | 232   | 0     | 0  | 339   | 0    | 0                              | 143   | 34    | 0     | 177   | 0    | 621   |
| Hourly Total                                | 144                  | 0    | 324   | 0  | 468   | 0    | 7                           | 2     | 2     | 0    | 11    | 3    | 362                            | 1008  | 0     | 0  | 1370  | 0    | 3                              | 686   | 140   | 0     | 829   | 0    | 2678  |
| Total                                       | 474                  | 2    | 1204  | 0  | 1680  | 0    | 18                          | 6     | 18    | 1    | 43    | 11   | 1290                           | 3399  | 17    | 0  | 4706  | 0    | 10                             | 3002  | 549   | 6     | 3567  | 1    | 9996  |
| % Approach                                  | 28.2%                | 0.1% | 71.7% | 0% | -     | -    | 41.9%                       | 14.0% | 41.9% | 2.3% | -     | -    | 27.4%                          | 72.2% | 0.4%  | 0% | -     | -    | 0.3%                           | 84.2% | 15.4% | 0.2%  | -     | -    | -     |
| % Total                                     | 4.7%                 | 0%   | 12.0% | 0% | 16.8% | -    | 0.2%                        | 0.1%  | 0.2%  | 0%   | 0.4%  | -    | 12.9%                          | 34.0% | 0.2%  | 0% | 47.1% | -    | 0.1%                           | 30.0% | 5.5%  | 0.1%  | 35.7% | -    | -     |
| Lights                                      | 468                  | 2    | 1189  | 0  | 1659  | -    | 10                          | 6     | 13    | 0    | 29    | -    | 1266                           | 3331  | 16    | 0  | 4613  | -    | 6                              | 2927  | 539   | 1     | 3473  | -    | 9774  |
| % Lights                                    | 98.7%                | 100% | 98.8% | 0% | 98.8% | -    | 55.6%                       | 100%  | 72.2% | 0%   | 67.4% | -    | 98.1%                          | 98.0% | 94.1% | 0% | 98.0% | -    | 60.0%                          | 97.5% | 98.2% | 16.7% | 97.4% | -    | 97.8% |
| Articulated Trucks and Single-Unit Trucks   | 2                    | 0    | 10    | 0  | 12    | -    | 8                           | 0     | 5     | 1    | 14    | -    | 21                             | 50    | 1     | 0  | 72    | -    | 4                              | 44    | 7     | 4     | 59    | -    | 157   |
| % Articulated Trucks and Single-Unit Trucks | 0.4%                 | 0%   | 0.8%  | 0% | 0.7%  | -    | 44.4%                       | 0%    | 27.8% | 100% | 32.6% | -    | 1.6%                           | 1.5%  | 5.9%  | 0% | 1.5%  | -    | 40.0%                          | 1.5%  | 1.3%  | 66.7% | 1.7%  | -    | 1.6%  |
| Buses                                       | 4                    | 0    | 5     | 0  | 9     | -    | 0                           | 0     | 0     | 0    | 0     | -    | 3                              | 18    | 0     | 0  | 21    | -    | 0                              | 31    | 3     | 1     | 35    | -    | 65    |
| % Buses                                     | 0.8%                 | 0%   | 0.4%  | 0% | 0.5%  | -    | 0%                          | 0%    | 0%    | 0%   | 0%    | -    | 0.2%                           | 0.5%  | 0%    | 0% | 0.4%  | -    | 0%                             | 1.0%  | 0.5%  | 16.7% | 1.0%  | -    | 0.7%  |
| Pedestrians                                 | -                    | -    | -     | -  | -     | 0    | -                           | -     | -     | -    | -     | 11   | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -     | -     | 1    | -     |
| % Pedestrians                               | -                    | -    | -     | -  | -     | -    | -                           | -     | -     | -    | -     | 100% | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -     | -     | 100% | -     |
| Bicycles on Crosswalk                       | -                    | -    | -     | -  | -     | 0    | -                           | -     | -     | -    | -     | 0    | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -     | -     | 0    | -     |
| % Bicycles on Crosswalk                     | -                    | -    | -     | -  | -     | -    | -                           | -     | -     | -    | -     | 0%   | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -     | -     | 0%   | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# 1. Liberty Corner Road (CR 525) & Allen Road - TMC

Tue Jan 10, 2023

Forced Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028859, Location: 40.655722, -74.576434, Site Code: 1

Provided by: Imperial Traffic & Data Collection

PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg / Direction                                    | Allen Road Eastbound |       |       |    |       |      | Existing Driveway Westbound |       |       |    |       |      | Liberty Corner Road Northbound |       |       |    |       |      | Liberty Corner Road Southbound |       |       |       |       |      |       |
|--|----------------------|-------|-------|----|-------|------|-----------------------------|-------|-------|----|-------|------|--------------------------------|-------|-------|----|-------|------|--------------------------------|-------|-------|-------|-------|------|-------|
| Time   | L                    | T     | R     | U  | App   | Ped* | L                           | T     | R     | U  | App   | Ped* | L                              | T     | R     | U  | App   | Ped* | L                              | T     | R     | U     | App   | Ped* | Int   |
| 2023-01-10 8:00AM                                  | 21                   | 0     | 60    | 0  | 81    | 0    | 1                           | 0     | 4     | 0  | 5     | 0    | 93                             | 182   | 4     | 0  | 279   | 0    | 0                              | 248   | 35    | 1     | 284   | 0    | 649   |
| 8:15AM   | 22                   | 0     | 89    | 0  | 111   | 0    | 0                           | 0     | 2     | 0  | 2     | 0    | 109                            | 194   | 1     | 0  | 304   | 0    | 1                              | 212   | 45    | 0     | 258   | 0    | 675   |
| 8:30AM   | 24                   | 0     | 97    | 0  | 121   | 0    | 0                           | 1     | 0     | 0  | 1     | 0    | 90                             | 192   | 2     | 0  | 284   | 0    | 1                              | 200   | 32    | 1     | 234   | 0    | 640   |
| 8:45AM   | 17                   | 2     | 66    | 0  | 85    | 0    | 0                           | 0     | 1     | 0  | 1     | 0    | 75                             | 147   | 1     | 0  | 223   | 0    | 0                              | 239   | 46    | 2     | 287   | 0    | 596   |
| <b>Total</b>                                       | 84                   | 2     | 312   | 0  | 398   | 0    | 1                           | 1     | 7     | 0  | 9     | 0    | 367                            | 715   | 8     | 0  | 1090  | 0    | 2                              | 899   | 158   | 4     | 1063  | 0    | 2560  |
| <b>% Approach</b>                                  | 21.1%                | 0.5%  | 78.4% | 0% | -     | -    | 11.1%                       | 11.1% | 77.8% | 0% | -     | -    | 33.7%                          | 65.6% | 0.7%  | 0% | -     | -    | 0.2%                           | 84.6% | 14.9% | 0.4%  | -     | -    | -     |
| <b>% Total</b>                                     | 3.3%                 | 0.1%  | 12.2% | 0% | 15.5% | -    | 0%                          | 0%    | 0.3%  | 0% | 0.4%  | -    | 14.3%                          | 27.9% | 0.3%  | 0% | 42.6% | -    | 0.1%                           | 35.1% | 6.2%  | 0.2%  | 41.5% | -    | -     |
| <b>PHF</b>   | 0.875                | 0.250 | 0.804 | -  | 0.822 | -    | 0.250                       | 0.250 | 0.438 | -  | 0.450 | -    | 0.842                          | 0.921 | 0.500 | -  | 0.896 | -    | 0.500                          | 0.906 | 0.859 | 0.500 | 0.926 | -    | 0.948 |
| <b>Lights</b>                                      | 82                   | 2     | 308   | 0  | 392   | -    | 1                           | 1     | 6     | 0  | 8     | -    | 359                            | 693   | 8     | 0  | 1060  | -    | 2                              | 874   | 156   | 1     | 1033  | -    | 2493  |
| <b>% Lights</b>                                    | 97.6%                | 100%  | 98.7% | 0% | 98.5% | -    | 100%                        | 100%  | 85.7% | 0% | 88.9% | -    | 97.8%                          | 96.9% | 100%  | 0% | 97.2% | -    | 100%                           | 97.2% | 98.7% | 25.0% | 97.2% | -    | 97.4% |
| <b>Articulated Trucks and Single-Unit Trucks</b>   | 2                    | 0     | 2     | 0  | 4     | -    | 0                           | 0     | 1     | 0  | 1     | -    | 6                              | 19    | 0     | 0  | 25    | -    | 0                              | 12    | 2     | 2     | 16    | -    | 46    |
| <b>% Articulated Trucks and Single-Unit Trucks</b> | 2.4%                 | 0%    | 0.6%  | 0% | 1.0%  | -    | 0%                          | 0%    | 14.3% | 0% | 11.1% | -    | 1.6%                           | 2.7%  | 0%    | 0% | 2.3%  | -    | 0%                             | 1.3%  | 1.3%  | 50.0% | 1.5%  | -    | 1.8%  |
| <b>Buses</b>                                       | 0                    | 0     | 2     | 0  | 2     | -    | 0                           | 0     | 0     | 0  | 0     | -    | 2                              | 3     | 0     | 0  | 5     | -    | 0                              | 13    | 0     | 1     | 14    | -    | 21    |
| <b>% Buses</b>                                     | 0%                   | 0%    | 0.6%  | 0% | 0.5%  | -    | 0%                          | 0%    | 0%    | 0% | 0%    | -    | 0.5%                           | 0.4%  | 0%    | 0% | 0.5%  | -    | 0%                             | 1.4%  | 0%    | 25.0% | 1.3%  | -    | 0.8%  |
| <b>Pedestrians</b>                                 | -                    | -     | -     | -  | -     | 0    | -                           | -     | -     | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -     | -     | 0    | -     |
| <b>% Pedestrians</b>                               | -                    | -     | -     | -  | -     | -    | -                           | -     | -     | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -     | -     | -    | -     |
| <b>Bicycles on Crosswalk</b>                       | -                    | -     | -     | -  | -     | 0    | -                           | -     | -     | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -     | -     | 0    | -     |
| <b>% Bicycles on Crosswalk</b>                     | -                    | -     | -     | -  | -     | -    | -                           | -     | -     | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -     | -     | -    | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



# 1. Liberty Corner Road (CR 525) & Allen Road - TMC

Tue Jan 10, 2023

Forced Peak (4:45 PM - 5:45 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028859, Location: 40.655722, -74.576434, Site Code: 1

Provided by: Imperial Traffic & Data Collection

PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                                      | Allen Road Eastbound |    |       |    |       |      | Existing Driveway Westbound |       |       |    |       |      | Liberty Corner Road Northbound |       |       |    |       |      | Liberty Corner Road Southbound |       |       |    |       |      |       |
|--|----------------------|----|-------|----|-------|------|-----------------------------|-------|-------|----|-------|------|--------------------------------|-------|-------|----|-------|------|--------------------------------|-------|-------|----|-------|------|-------|
| Time   | L                    | T  | R     | U  | App   | Ped* | L                           | T     | R     | U  | App   | Ped* | L                              | T     | R     | U  | App   | Ped* | L                              | T     | R     | U  | App   | Ped* | Int   |
| 2023-01-10 4:45PM                                  | 33                   | 0  | 77    | 0  | 110   | 0    | 1                           | 1     | 0     | 0  | 2     | 3    | 81                             | 239   | 3     | 0  | 323   | 0    | 0                              | 170   | 42    | 0  | 212   | 0    | 647   |
| 5:00PM   | 33                   | 0  | 70    | 0  | 103   | 0    | 3                           | 2     | 1     | 0  | 6     | 0    | 99                             | 244   | 0     | 0  | 343   | 0    | 0                              | 165   | 40    | 0  | 205   | 0    | 657   |
| 5:15PM   | 40                   | 0  | 85    | 0  | 125   | 0    | 0                           | 0     | 0     | 0  | 0     | 2    | 81                             | 265   | 0     | 0  | 346   | 0    | 3                              | 187   | 37    | 0  | 227   | 0    | 698   |
| 5:30PM   | 43                   | 0  | 93    | 0  | 136   | 0    | 3                           | 0     | 1     | 0  | 4     | 1    | 75                             | 267   | 0     | 0  | 342   | 0    | 0                              | 191   | 29    | 0  | 220   | 0    | 702   |
| <b>Total</b>                                       | 149                  | 0  | 325   | 0  | 474   | 0    | 7                           | 3     | 2     | 0  | 12    | 6    | 336                            | 1015  | 3     | 0  | 1354  | 0    | 3                              | 713   | 148   | 0  | 864   | 0    | 2704  |
| <b>% Approach</b>                                  | 31.4%                | 0% | 68.6% | 0% | -     | -    | 58.3%                       | 25.0% | 16.7% | 0% | -     | -    | 24.8%                          | 75.0% | 0.2%  | 0% | -     | -    | 0.3%                           | 82.5% | 17.1% | 0% | -     | -    | -     |
| <b>% Total</b>                                     | 5.5%                 | 0% | 12.0% | 0% | 17.5% | -    | 0.3%                        | 0.1%  | 0.1%  | 0% | 0.4%  | -    | 12.4%                          | 37.5% | 0.1%  | 0% | 50.1% | -    | 0.1%                           | 26.4% | 5.5%  | 0% | 32.0% | -    | -     |
| <b>PHF</b>   | 0.866                | -  | 0.874 | -  | 0.871 | -    | 0.583                       | 0.375 | 0.500 | -  | 0.500 | -    | 0.848                          | 0.950 | 0.250 | -  | 0.978 | -    | 0.250                          | 0.933 | 0.881 | -  | 0.952 | -    | 0.963 |
| <b>Lights</b>                                      | 149                  | 0  | 325   | 0  | 474   | -    | 6                           | 3     | 2     | 0  | 11    | -    | 331                            | 1004  | 3     | 0  | 1338  | -    | 0                              | 706   | 147   | 0  | 853   | -    | 2676  |
| <b>% Lights</b>                                    | 100%                 | 0% | 100%  | 0% | 100%  | -    | 85.7%                       | 100%  | 100%  | 0% | 91.7% | -    | 98.5%                          | 98.9% | 100%  | 0% | 98.8% | -    | 0%                             | 99.0% | 99.3% | 0% | 98.7% | -    | 99.0% |
| <b>Articulated Trucks and Single-Unit Trucks</b>   | 0                    | 0  | 0     | 0  | 0     | -    | 1                           | 0     | 0     | 0  | 1     | -    | 5                              | 8     | 0     | 0  | 13    | -    | 3                              | 6     | 1     | 0  | 10    | -    | 24    |
| <b>% Articulated Trucks and Single-Unit Trucks</b> | 0%                   | 0% | 0%    | 0% | 0%    | -    | 14.3%                       | 0%    | 0%    | 0% | 8.3%  | -    | 1.5%                           | 0.8%  | 0%    | 0% | 1.0%  | -    | 100%                           | 0.8%  | 0.7%  | 0% | 1.2%  | -    | 0.9%  |
| <b>Buses</b>                                       | 0                    | 0  | 0     | 0  | 0     | -    | 0                           | 0     | 0     | 0  | 0     | -    | 0                              | 3     | 0     | 0  | 3     | -    | 0                              | 1     | 0     | 0  | 1     | -    | 4     |
| <b>% Buses</b>                                     | 0%                   | 0% | 0%    | 0% | 0%    | -    | 0%                          | 0%    | 0%    | 0% | 0%    | -    | 0%                             | 0.3%  | 0%    | 0% | 0.2%  | -    | 0%                             | 0.1%  | 0%    | 0% | 0.1%  | -    | 0.1%  |
| <b>Pedestrians</b>                                 | -                    | -  | -     | -  | -     | 0    | -                           | -     | -     | -  | -     | 6    | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -     |
| <b>% Pedestrians</b>                               | -                    | -  | -     | -  | -     | -    | -                           | -     | -     | -  | -     | 100% | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -     |
| <b>Bicycles on Crosswalk</b>                       | -                    | -  | -     | -  | -     | 0    | -                           | -     | -     | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -                              | -     | -     | -  | -     | 0    | -     |
| <b>% Bicycles on Crosswalk</b>                     | -                    | -  | -     | -  | -     | -    | -                           | -     | -     | -  | -     | 0%   | -                              | -     | -     | -  | -     | -    | -                              | -     | -     | -  | -     | -    | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



## 2. Allen Road & Somerville Road - TMC

Tue Jan 10, 2023

Full Length (7 AM-9 AM, 4 PM-6 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028863, Location: 40.653209, -74.59541, Site Code: 2

Provided by: Imperial Traffic & Data Collection

PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                               | Allen Road Eastbound |       |      |      |       |      |  | Allen Road Westbound |       |      |      |       |      |  | Somerville Road Northbound |       |       |    |       |      |  | Somerville Road Southbound |      |       |      |       |      |       |  |
|---|----------------------|-------|------|------|-------|------|--|----------------------|-------|------|------|-------|------|--|----------------------------|-------|-------|----|-------|------|--|----------------------------|------|-------|------|-------|------|-------|--|
| Time  | L                    | T     | R    | U    | App   | Ped* |  | L                    | T     | R    | U    | App   | Ped* |  | L                          | T     | R     | U  | App   | Ped* |  | L                          | T    | R     | U    | App   | Ped* | Int   |  |
| 2023-01-10 7:00AM                           | 69                   | 72    | 0    | 0    | 141   | 1    |  | 3                    | 10    | 3    | 1    | 17    | 0    |  | 2                          | 3     | 4     | 0  | 9     | 0    |  | 1                          | 0    | 4     | 0    | 5     | 0    | 172   |  |
| 7:15AM                                      | 61                   | 73    | 0    | 0    | 134   | 1    |  | 1                    | 12    | 0    | 0    | 13    | 0    |  | 1                          | 0     | 3     | 0  | 4     | 0    |  | 2                          | 1    | 17    | 0    | 20    | 0    | 171   |  |
| 7:30AM                                      | 13                   | 57    | 0    | 0    | 70    | 0    |  | 1                    | 39    | 6    | 0    | 46    | 0    |  | 0                          | 4     | 3     | 0  | 7     | 0    |  | 5                          | 2    | 45    | 0    | 52    | 0    | 175   |  |
| 7:45AM                                      | 18                   | 63    | 0    | 0    | 81    | 0    |  | 2                    | 42    | 11   | 0    | 55    | 0    |  | 1                          | 1     | 3     | 0  | 5     | 0    |  | 2                          | 3    | 37    | 2    | 44    | 0    | 185   |  |
| Hourly Total                                | 161                  | 265   | 0    | 0    | 426   | 2    |  | 7                    | 103   | 20   | 1    | 131   | 0    |  | 4                          | 8     | 13    | 0  | 25    | 0    |  | 10                         | 6    | 103   | 2    | 121   | 0    | 703   |  |
| 8:00AM                                      | 24                   | 76    | 0    | 0    | 100   | 0    |  | 5                    | 32    | 4    | 0    | 41    | 0    |  | 1                          | 1     | 1     | 0  | 3     | 0    |  | 11                         | 2    | 17    | 0    | 30    | 0    | 174   |  |
| 8:15AM                                      | 35                   | 84    | 0    | 0    | 119   | 0    |  | 1                    | 36    | 15   | 1    | 53    | 0    |  | 2                          | 2     | 0     | 0  | 4     | 0    |  | 20                         | 0    | 16    | 0    | 36    | 0    | 212   |  |
| 8:30AM                                      | 33                   | 75    | 0    | 1    | 109   | 0    |  | 1                    | 45    | 17   | 0    | 63    | 0    |  | 2                          | 1     | 2     | 0  | 5     | 0    |  | 23                         | 1    | 25    | 0    | 49    | 0    | 226   |  |
| 8:45AM                                      | 25                   | 72    | 0    | 2    | 99    | 1    |  | 3                    | 37    | 9    | 1    | 50    | 0    |  | 2                          | 0     | 0     | 0  | 2     | 0    |  | 19                         | 0    | 27    | 0    | 46    | 0    | 197   |  |
| Hourly Total                                | 117                  | 307   | 0    | 3    | 427   | 1    |  | 10                   | 150   | 45   | 2    | 207   | 0    |  | 7                          | 4     | 3     | 0  | 14    | 0    |  | 73                         | 3    | 85    | 0    | 161   | 0    | 809   |  |
| 4:00PM                                      | 14                   | 64    | 0    | 1    | 79    | 1    |  | 5                    | 100   | 13   | 6    | 124   | 0    |  | 2                          | 1     | 2     | 0  | 5     | 0    |  | 5                          | 1    | 33    | 0    | 39    | 0    | 247   |  |
| 4:15PM                                      | 32                   | 59    | 1    | 1    | 93    | 0    |  | 7                    | 100   | 6    | 1    | 114   | 0    |  | 4                          | 0     | 3     | 0  | 7     | 0    |  | 5                          | 3    | 42    | 0    | 50    | 0    | 264   |  |
| 4:30PM                                      | 18                   | 49    | 3    | 0    | 70    | 0    |  | 14                   | 104   | 12   | 0    | 130   | 0    |  | 14                         | 0     | 2     | 0  | 16    | 0    |  | 6                          | 0    | 39    | 2    | 47    | 0    | 263   |  |
| 4:45PM                                      | 19                   | 46    | 1    | 0    | 66    | 0    |  | 4                    | 103   | 9    | 1    | 117   | 0    |  | 7                          | 1     | 2     | 0  | 10    | 0    |  | 2                          | 0    | 51    | 0    | 53    | 0    | 246   |  |
| Hourly Total                                | 83                   | 218   | 5    | 2    | 308   | 1    |  | 30                   | 407   | 40   | 8    | 485   | 0    |  | 27                         | 2     | 9     | 0  | 38    | 0    |  | 18                         | 4    | 165   | 2    | 189   | 0    | 1020  |  |
| 5:00PM                                      | 23                   | 37    | 1    | 0    | 61    | 0    |  | 9                    | 124   | 6    | 1    | 140   | 0    |  | 6                          | 2     | 3     | 0  | 11    | 0    |  | 3                          | 2    | 34    | 0    | 39    | 0    | 251   |  |
| 5:15PM                                      | 19                   | 59    | 2    | 4    | 84    | 0    |  | 15                   | 105   | 7    | 0    | 127   | 0    |  | 8                          | 4     | 4     | 0  | 16    | 0    |  | 2                          | 3    | 63    | 1    | 69    | 0    | 296   |  |
| 5:30PM                                      | 20                   | 66    | 4    | 1    | 91    | 0    |  | 3                    | 79    | 2    | 1    | 85    | 0    |  | 4                          | 4     | 3     | 0  | 11    | 0    |  | 2                          | 4    | 48    | 1    | 55    | 0    | 242   |  |
| 5:45PM                                      | 29                   | 62    | 0    | 1    | 92    | 0    |  | 2                    | 130   | 1    | 1    | 134   | 0    |  | 4                          | 2     | 4     | 0  | 10    | 0    |  | 2                          | 3    | 58    | 0    | 63    | 0    | 299   |  |
| Hourly Total                                | 91                   | 224   | 7    | 6    | 328   | 0    |  | 29                   | 438   | 16   | 3    | 486   | 0    |  | 22                         | 12    | 14    | 0  | 48    | 0    |  | 9                          | 12   | 203   | 2    | 226   | 0    | 1088  |  |
| Total                                       | 452                  | 1014  | 12   | 11   | 1489  | 4    |  | 76                   | 1098  | 121  | 14   | 1309  | 0    |  | 60                         | 26    | 39    | 0  | 125   | 0    |  | 110                        | 25   | 556   | 6    | 697   | 0    | 3620  |  |
| % Approach                                  | 30.4%                | 68.1% | 0.8% | 0.7% | -     | -    |  | 5.8%                 | 83.9% | 9.2% | 1.1% | -     | -    |  | 48.0%                      | 20.8% | 31.2% | 0% | -     | -    |  | 15.8%                      | 3.6% | 79.8% | 0.9% | -     | -    | -     |  |
| % Total                                     | 12.5%                | 28.0% | 0.3% | 0.3% | 41.1% | -    |  | 2.1%                 | 30.3% | 3.3% | 0.4% | 36.2% | -    |  | 1.7%                       | 0.7%  | 1.1%  | 0% | 3.5%  | -    |  | 3.0%                       | 0.7% | 15.4% | 0.2% | 19.3% | -    | -     |  |
| Lights                                      | 440                  | 996   | 12   | 11   | 1459  | -    |  | 74                   | 1076  | 121  | 14   | 1285  | -    |  | 59                         | 24    | 37    | 0  | 120   | -    |  | 110                        | 25   | 549   | 6    | 690   | -    | 3554  |  |
| % Lights                                    | 97.3%                | 98.2% | 100% | 100% | 98.0% | -    |  | 97.4%                | 98.0% | 100% | 100% | 98.2% | -    |  | 98.3%                      | 92.3% | 94.9% | 0% | 96.0% | -    |  | 100%                       | 100% | 98.7% | 100% | 99.0% | -    | 98.2% |  |
| Articulated Trucks and Single-Unit Trucks   | 0                    | 7     | 0    | 0    | 7     | -    |  | 2                    | 13    | 0    | 0    | 15    | -    |  | 1                          | 2     | 2     | 0  | 5     | -    |  | 0                          | 0    | 4     | 0    | 4     | -    | 31    |  |
| % Articulated Trucks and Single-Unit Trucks | 0%                   | 0.7%  | 0%   | 0%   | 0.5%  | -    |  | 2.6%                 | 1.2%  | 0%   | 0%   | 1.1%  | -    |  | 1.7%                       | 7.7%  | 5.1%  | 0% | 4.0%  | -    |  | 0%                         | 0%   | 0.7%  | 0%   | 0.6%  | -    | 0.9%  |  |
| Buses                                       | 12                   | 11    | 0    | 0    | 23    | -    |  | 0                    | 9     | 0    | 0    | 9     | -    |  | 0                          | 0     | 0     | 0  | 0     | -    |  | 0                          | 0    | 3     | 0    | 3     | -    | 35    |  |
| % Buses                                     | 2.7%                 | 1.1%  | 0%   | 0%   | 1.5%  | -    |  | 0%                   | 0.8%  | 0%   | 0%   | 0.7%  | -    |  | 0%                         | 0%    | 0%    | 0% | 0%    | -    |  | 0%                         | 0%   | 0.5%  | 0%   | 0.4%  | -    | 1.0%  |  |
| Pedestrians                                 | -                    | -     | -    | -    | -     | 4    |  | -                    | -     | -    | -    | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -    | -     | -    | -     | 0    |       |  |
| % Pedestrians                               | -                    | -     | -    | -    | -     | 100% |  | -                    | -     | -    | -    | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -    | -     | -    | -     | -    |       |  |
| Bicycles on Crosswalk                       | -                    | -     | -    | -    | -     | 0    |  | -                    | -     | -    | -    | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -    | -     | -    | -     | 0    |       |  |
| % Bicycles on Crosswalk                     | -                    | -     | -    | -    | -     | 0%   |  | -                    | -     | -    | -    | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -    | -     | -    | -     | -    |       |  |

\*Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



## 2. Allen Road & Somerville Road - TMC

Tue Jan 10, 2023

AM Peak, Forced Peak (8 AM - 9 AM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028863, Location: 40.653209, -74.59541, Site Code: 2

Provided by: Imperial Traffic & Data Collection  
PO Box 4637, Cherry Hill, NJ, 08003, US

| Leg Direction                                      | Allen Road Eastbound |       |    |       |       |      |  | Allen Road Westbound |       |       |       |       |      |  | Somerville Road Northbound |       |       |    |       |      |  | Somerville Road Southbound |       |       |    |       |      |     |       |
|--|----------------------|-------|----|-------|-------|------|--|----------------------|-------|-------|-------|-------|------|--|----------------------------|-------|-------|----|-------|------|--|----------------------------|-------|-------|----|-------|------|-----|-------|
| Time   | L                    | T     | R  | U     | App   | Ped* |  | L                    | T     | R     | U     | App   | Ped* |  | L                          | T     | R     | U  | App   | Ped* |  | L                          | T     | R     | U  | App   | Ped* | Int |       |
| 2023-01-10 8:00AM                                  | 24                   | 76    | 0  | 0     | 100   | 0    |  | 5                    | 32    | 4     | 0     | 41    | 0    |  | 1                          | 1     | 1     | 0  | 3     | 0    |  | 11                         | 2     | 17    | 0  | 30    | 0    |     | 174   |
| 8:15AM   | 35                   | 84    | 0  | 0     | 119   | 0    |  | 1                    | 36    | 15    | 1     | 53    | 0    |  | 2                          | 2     | 0     | 0  | 4     | 0    |  | 20                         | 0     | 16    | 0  | 36    | 0    |     | 212   |
| 8:30AM   | 33                   | 75    | 0  | 1     | 109   | 0    |  | 1                    | 45    | 17    | 0     | 63    | 0    |  | 2                          | 1     | 2     | 0  | 5     | 0    |  | 23                         | 1     | 25    | 0  | 49    | 0    |     | 226   |
| 8:45AM   | 25                   | 72    | 0  | 2     | 99    | 1    |  | 3                    | 37    | 9     | 1     | 50    | 0    |  | 2                          | 0     | 0     | 0  | 2     | 0    |  | 19                         | 0     | 27    | 0  | 46    | 0    |     | 197   |
| <b>Total</b>                                       | 117                  | 307   | 0  | 3     | 427   | 1    |  | 10                   | 150   | 45    | 2     | 207   | 0    |  | 7                          | 4     | 3     | 0  | 14    | 0    |  | 73                         | 3     | 85    | 0  | 161   | 0    |     | 809   |
| <b>% Approach</b>                                  | 27.4%                | 71.9% | 0% | 0.7%  | -     | -    |  | 4.8%                 | 72.5% | 21.7% | 1.0%  | -     | -    |  | 50.0%                      | 28.6% | 21.4% | 0% | -     | -    |  | 45.3%                      | 1.9%  | 52.8% | 0% | -     | -    |     | -     |
| <b>% Total</b>                                     | 14.5%                | 37.9% | 0% | 0.4%  | 52.8% | -    |  | 1.2%                 | 18.5% | 5.6%  | 0.2%  | 25.6% | -    |  | 0.9%                       | 0.5%  | 0.4%  | 0% | 1.7%  | -    |  | 9.0%                       | 0.4%  | 10.5% | 0% | 19.9% | -    |     | -     |
| <b>PHF</b>   | 0.836                | 0.914 | -  | 0.375 | 0.897 | -    |  | 0.500                | 0.833 | 0.662 | 0.500 | 0.821 | -    |  | 0.875                      | 0.500 | 0.375 | -  | 0.700 | -    |  | 0.793                      | 0.375 | 0.787 | -  | 0.821 | -    |     | 0.895 |
| <b>Lights</b>                                      | 115                  | 303   | 0  | 3     | 421   | -    |  | 9                    | 142   | 45    | 2     | 198   | -    |  | 6                          | 4     | 3     | 0  | 13    | -    |  | 73                         | 3     | 80    | 0  | 156   | -    |     | 788   |
| <b>% Lights</b>                                    | 98.3%                | 98.7% | 0% | 100%  | 98.6% | -    |  | 90.0%                | 94.7% | 100%  | 100%  | 95.7% | -    |  | 85.7%                      | 100%  | 100%  | 0% | 92.9% | -    |  | 100%                       | 100%  | 94.1% | 0% | 96.9% | -    |     | 97.4% |
| <b>Articulated Trucks and Single-Unit Trucks</b>   | 0                    | 2     | 0  | 0     | 2     | -    |  | 1                    | 5     | 0     | 0     | 6     | -    |  | 1                          | 0     | 0     | 0  | 1     | -    |  | 0                          | 0     | 3     | 0  | 3     | -    |     | 12    |
| <b>% Articulated Trucks and Single-Unit Trucks</b> | 0%                   | 0.7%  | 0% | 0%    | 0.5%  | -    |  | 10.0%                | 3.3%  | 0%    | 0%    | 2.9%  | -    |  | 14.3%                      | 0%    | 0%    | 0% | 7.1%  | -    |  | 0%                         | 0%    | 3.5%  | 0% | 1.9%  | -    |     | 1.5%  |
| <b>Buses</b>                                       | 2                    | 2     | 0  | 0     | 4     | -    |  | 0                    | 3     | 0     | 0     | 3     | -    |  | 0                          | 0     | 0     | 0  | 0     | -    |  | 0                          | 0     | 2     | 0  | 2     | -    |     | 9     |
| <b>% Buses</b>                                     | 1.7%                 | 0.7%  | 0% | 0%    | 0.9%  | -    |  | 0%                   | 2.0%  | 0%    | 0%    | 1.4%  | -    |  | 0%                         | 0%    | 0%    | 0% | 0%    | -    |  | 0%                         | 0%    | 2.4%  | 0% | 1.2%  | -    |     | 1.1%  |
| <b>Pedestrians</b>                                 | -                    | -     | -  | -     | -     | 1    |  | -                    | -     | -     | -     | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |     | -     |
| <b>% Pedestrians</b>                               | -                    | -     | -  | -     | -     | 100% |  | -                    | -     | -     | -     | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -     | -     | -  | -     | -    |     | -     |
| <b>Bicycles on Crosswalk</b>                       | -                    | -     | -  | -     | -     | 0    |  | -                    | -     | -     | -     | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |     | -     |
| <b>% Bicycles on Crosswalk</b>                     | -                    | -     | -  | -     | -     | 0%   |  | -                    | -     | -     | -     | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -     | -     | -  | -     | -    |     | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn



## 2. Allen Road & Somerville Road - TMC

Tue Jan 10, 2023

Forced Peak (4:45 PM - 5:45 PM)

All Classes (Lights, Articulated Trucks and Single-Unit Trucks, Buses, Pedestrians, Bicycles on Crosswalk)

All Movements

ID: 1028863, Location: 40.653209, -74.59541, Site Code: 2

Provided by: Imperial Traffic & Data Collection  
PO Box 4637, Cherry Hill, NJ, 08003, US

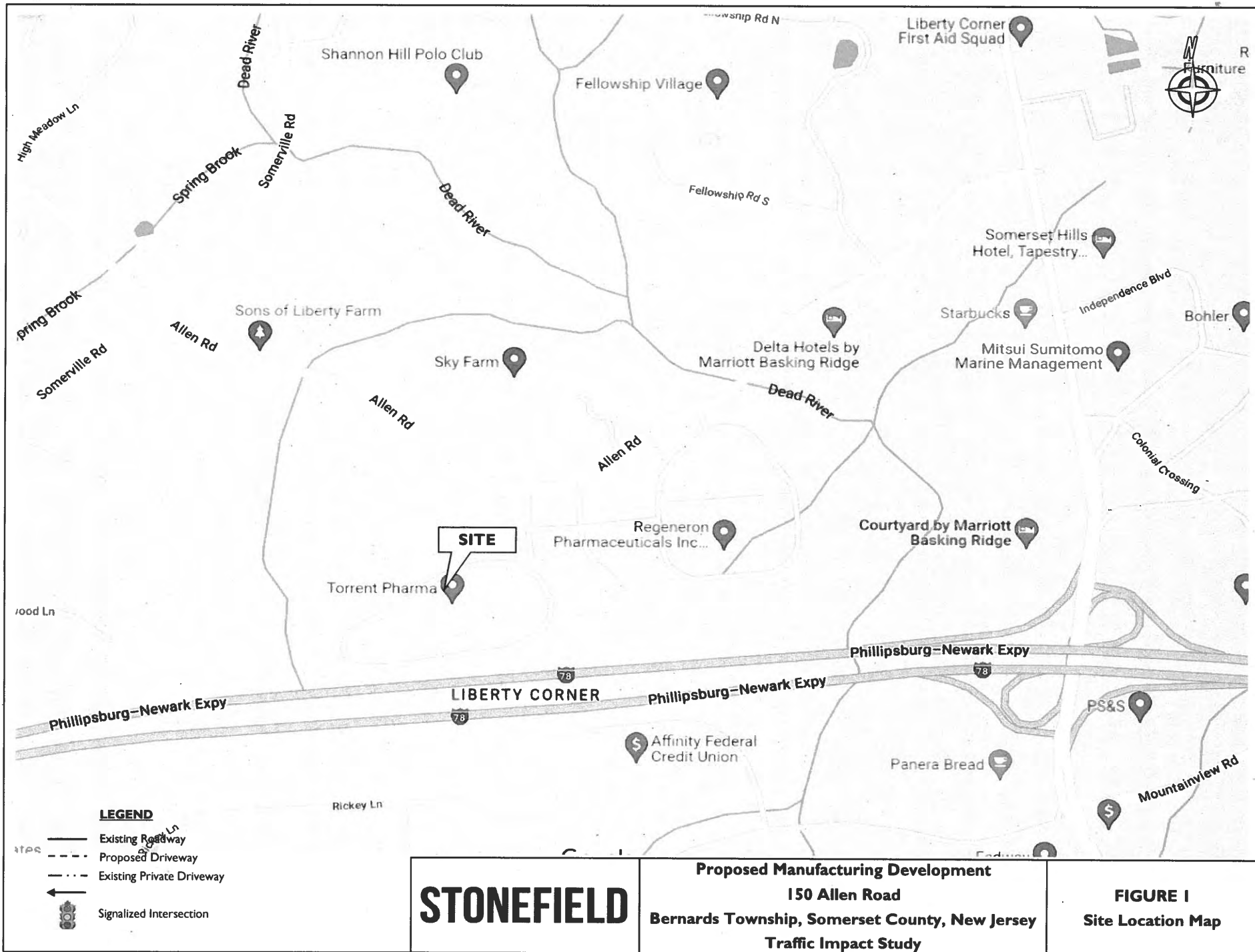
| Leg Direction                               | Allen Road Eastbound |       |       |       |       |      |  | Allen Road Westbound |       |       |       |       |      |  | Somerville Road Northbound |       |       |    |       |      |  | Somerville Road Southbound |       |       |       |       |      |     |       |
|---|----------------------|-------|-------|-------|-------|------|--|----------------------|-------|-------|-------|-------|------|--|----------------------------|-------|-------|----|-------|------|--|----------------------------|-------|-------|-------|-------|------|-----|-------|
| Time  | L                    | T     | R     | U     | App   | Ped* |  | L                    | T     | R     | U     | App   | Ped* |  | L                          | T     | R     | U  | App   | Ped* |  | L                          | T     | R     | U     | App   | Ped* | Int |       |
| 2023-01-10 4:45PM                           | 19                   | 46    | 1     | 0     | 66    | 0    |  | 4                    | 103   | 9     | 1     | 117   | 0    |  | 7                          | 1     | 2     | 0  | 10    | 0    |  | 2                          | 0     | 51    | 0     | 53    | 0    |     | 246   |
| 5:00PM                                      | 23                   | 37    | 1     | 0     | 61    | 0    |  | 9                    | 124   | 6     | 1     | 140   | 0    |  | 6                          | 2     | 3     | 0  | 11    | 0    |  | 3                          | 2     | 34    | 0     | 39    | 0    |     | 251   |
| 5:15PM                                      | 19                   | 59    | 2     | 4     | 84    | 0    |  | 15                   | 105   | 7     | 0     | 127   | 0    |  | 8                          | 4     | 4     | 0  | 16    | 0    |  | 2                          | 3     | 63    | 1     | 69    | 0    |     | 296   |
| 5:30PM                                      | 20                   | 66    | 4     | 1     | 91    | 0    |  | 3                    | 79    | 2     | 1     | 85    | 0    |  | 4                          | 4     | 3     | 0  | 11    | 0    |  | 2                          | 4     | 48    | 1     | 55    | 0    |     | 242   |
| Total                                       | 81                   | 208   | 8     | 5     | 302   | 0    |  | 31                   | 411   | 24    | 3     | 469   | 0    |  | 25                         | 11    | 12    | 0  | 48    | 0    |  | 9                          | 9     | 196   | 2     | 216   | 0    |     | 1035  |
| % Approach                                  | 26.8%                | 68.9% | 2.6%  | 1.7%  | -     | -    |  | 6.6%                 | 87.6% | 5.1%  | 0.6%  | -     | -    |  | 52.1%                      | 22.9% | 25.0% | 0% | -     | -    |  | 4.2%                       | 4.2%  | 90.7% | 0.9%  | -     | -    |     | -     |
| % Total                                     | 7.8%                 | 20.1% | 0.8%  | 0.5%  | 29.2% | -    |  | 3.0%                 | 39.7% | 2.3%  | 0.3%  | 45.3% | -    |  | 2.4%                       | 1.1%  | 1.2%  | 0% | 4.6%  | -    |  | 0.9%                       | 0.9%  | 18.9% | 0.2%  | 20.9% | -    |     | -     |
| PHF   | 0.880                | 0.788 | 0.500 | 0.313 | 0.830 | -    |  | 0.517                | 0.829 | 0.667 | 0.750 | 0.838 | -    |  | 0.781                      | 0.688 | 0.750 | -  | 0.750 | -    |  | 0.750                      | 0.563 | 0.778 | 0.500 | 0.783 | -    |     | 0.874 |
| Lights                                      | 81                   | 206   | 8     | 5     | 300   | -    |  | 31                   | 409   | 24    | 3     | 467   | -    |  | 25                         | 9     | 12    | 0  | 46    | -    |  | 9                          | 9     | 196   | 2     | 216   | -    |     | 1029  |
| % Lights                                    | 100%                 | 99.0% | 100%  | 100%  | 99.3% | -    |  | 100%                 | 99.5% | 100%  | 100%  | 99.6% | -    |  | 100%                       | 81.8% | 100%  | 0% | 95.8% | -    |  | 100%                       | 100%  | 100%  | 100%  | 100%  | -    |     | 99.4% |
| Articulated Trucks and Single-Unit Trucks   | 0                    | 2     | 0     | 0     | 2     | -    |  | 0                    | 2     | 0     | 0     | 2     | -    |  | 0                          | 2     | 0     | 0  | 2     | -    |  | 0                          | 0     | 0     | 0     | 0     | -    |     | 6     |
| % Articulated Trucks and Single-Unit Trucks | 0%                   | 1.0%  | 0%    | 0%    | 0.7%  | -    |  | 0%                   | 0.5%  | 0%    | 0%    | 0.4%  | -    |  | 0%                         | 18.2% | 0%    | 0% | 4.2%  | -    |  | 0%                         | 0%    | 0%    | 0%    | 0%    | -    |     | 0.6%  |
| Buses                                       | 0                    | 0     | 0     | 0     | 0     | -    |  | 0                    | 0     | 0     | 0     | 0     | -    |  | 0                          | 0     | 0     | 0  | 0     | -    |  | 0                          | 0     | 0     | 0     | 0     | -    |     | 0     |
| % Buses                                     | 0%                   | 0%    | 0%    | 0%    | 0%    | -    |  | 0%                   | 0%    | 0%    | 0%    | 0%    | -    |  | 0%                         | 0%    | 0%    | 0% | 0%    | -    |  | 0%                         | 0%    | 0%    | 0%    | 0%    | -    |     | 0%    |
| Pedestrians                                 | -                    | -     | -     | -     | -     | 0    |  | -                    | -     | -     | -     | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -     | -     | -     | -     | 0    |     | -     |
| % Pedestrians                               | -                    | -     | -     | -     | -     | -    |  | -                    | -     | -     | -     | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -     | -     | -     | -     | -    |     | -     |
| Bicycles on Crosswalk                       | -                    | -     | -     | -     | -     | 0    |  | -                    | -     | -     | -     | -     | 0    |  | -                          | -     | -     | -  | -     | 0    |  | -                          | -     | -     | -     | -     | 0    |     | -     |
| % Bicycles on Crosswalk                     | -                    | -     | -     | -     | -     | -    |  | -                    | -     | -     | -     | -     | -    |  | -                          | -     | -     | -  | -     | -    |  | -                          | -     | -     | -     | -     | -    |     | -     |

\* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

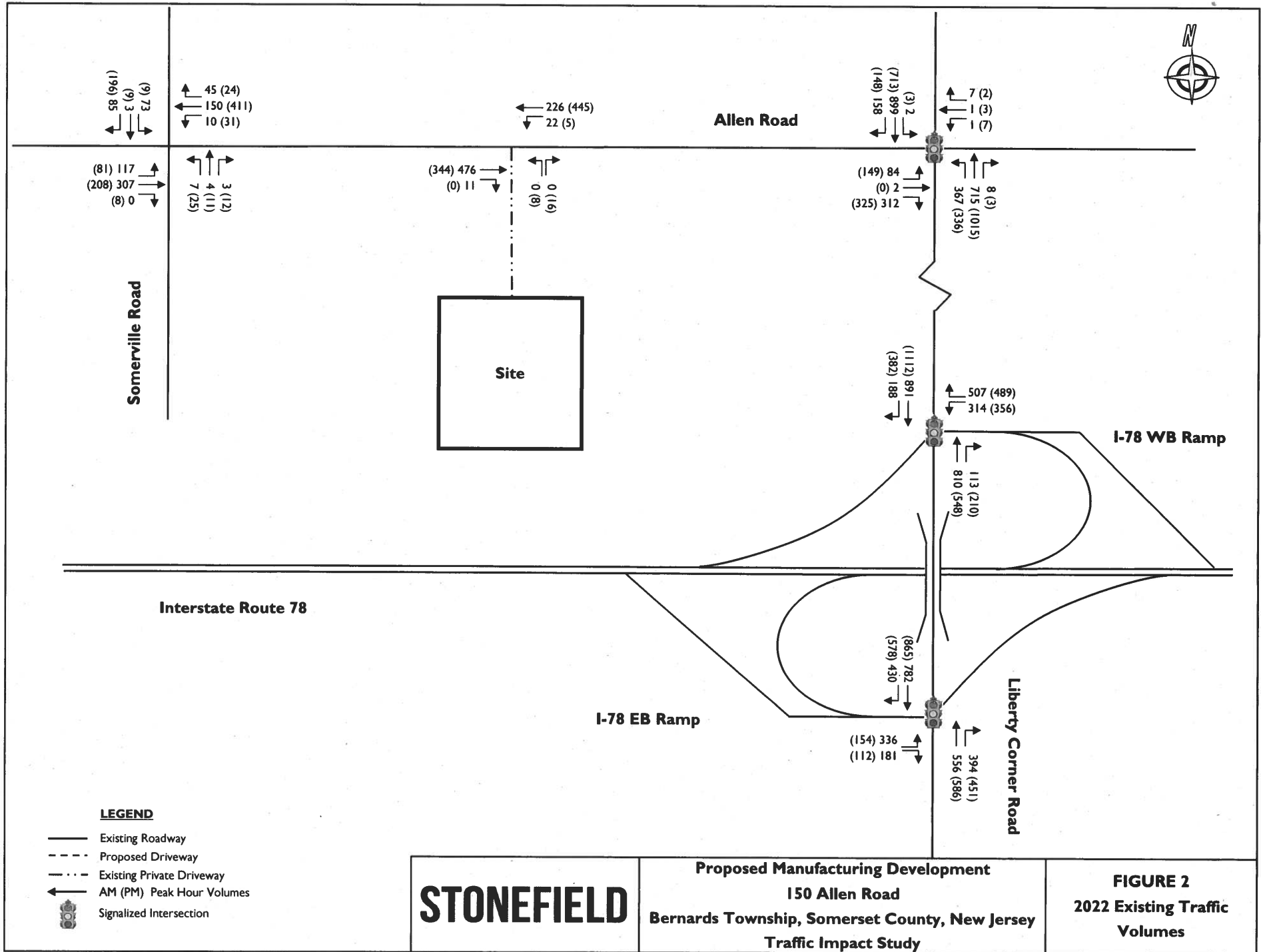


## FIGURES

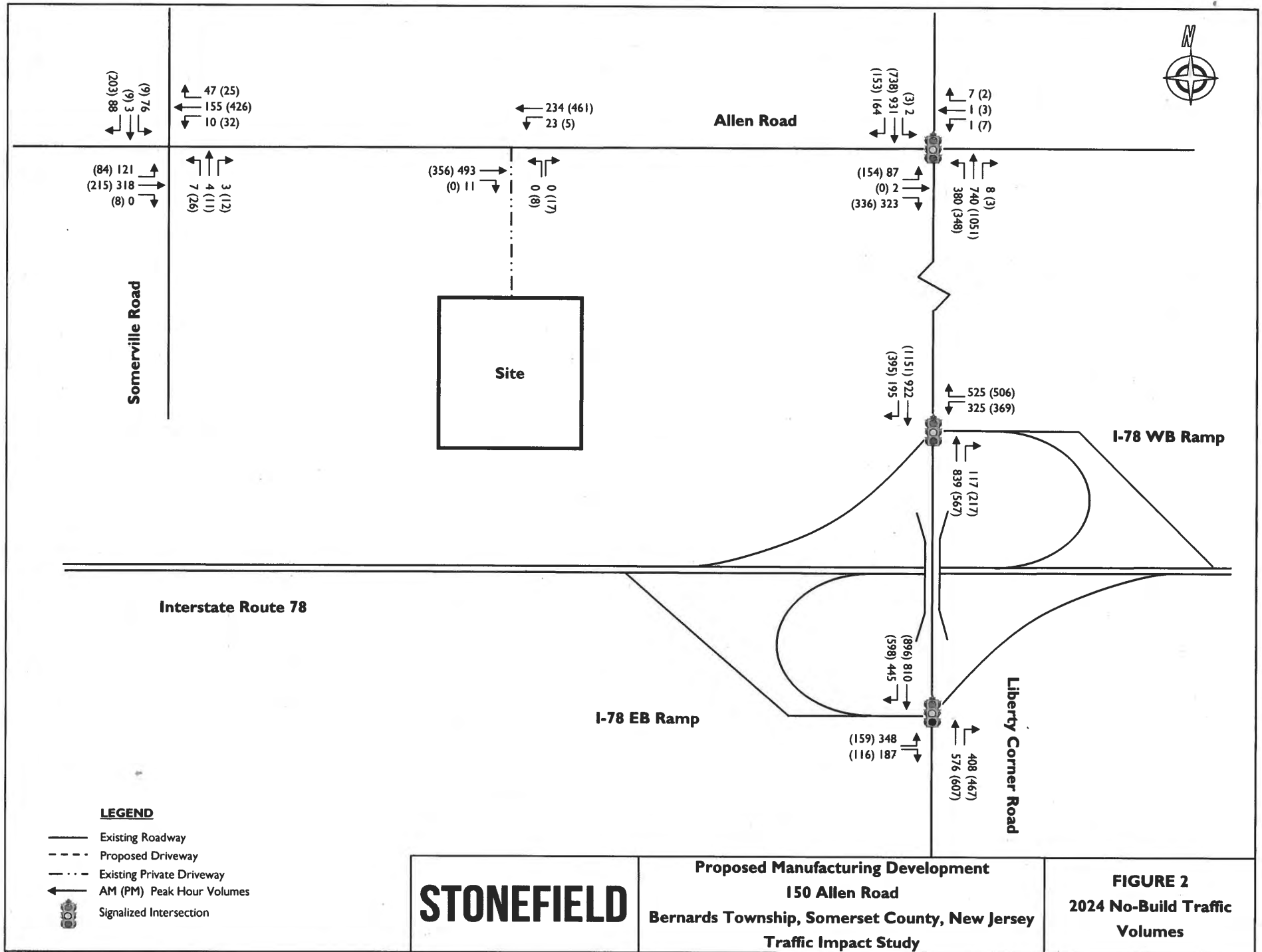




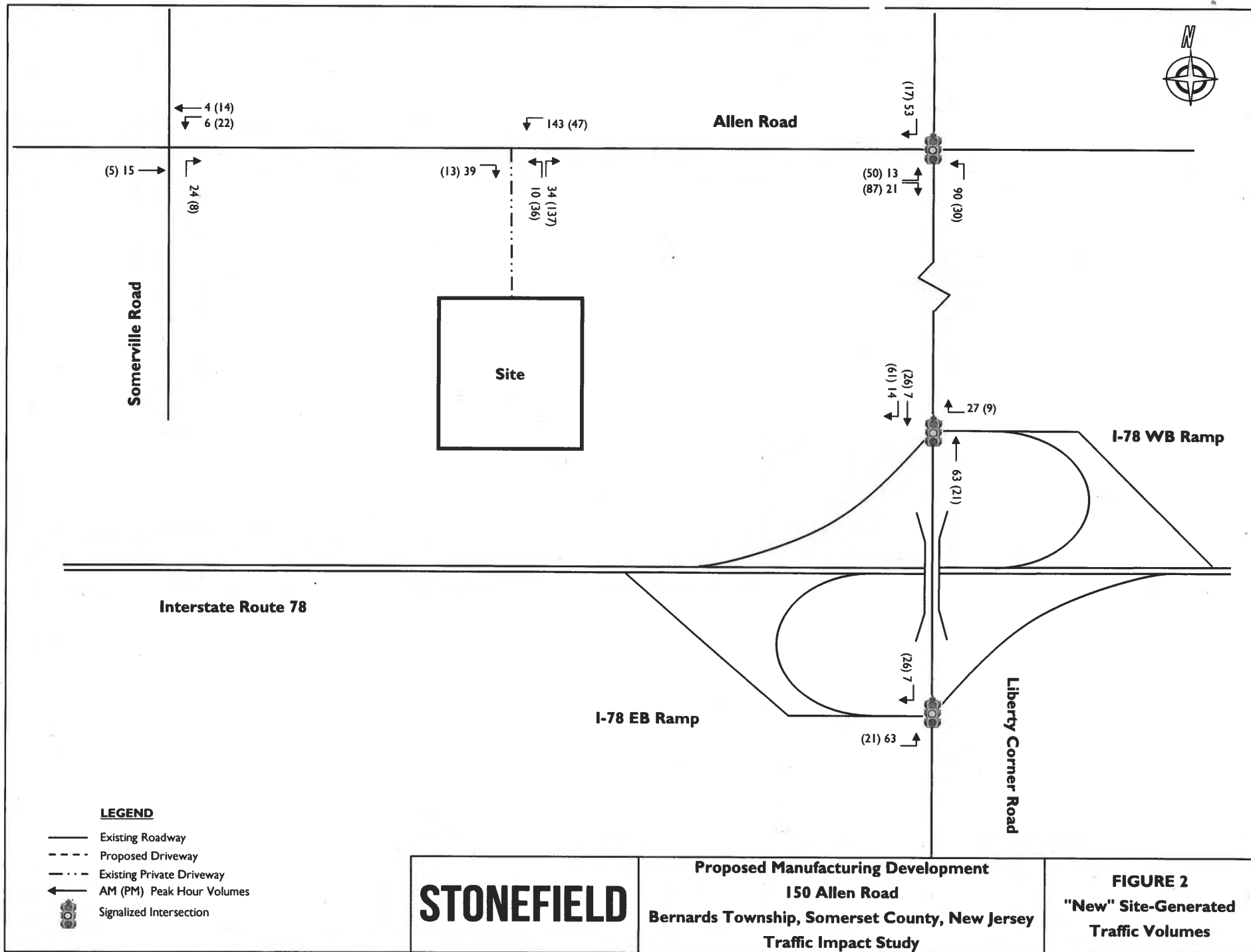




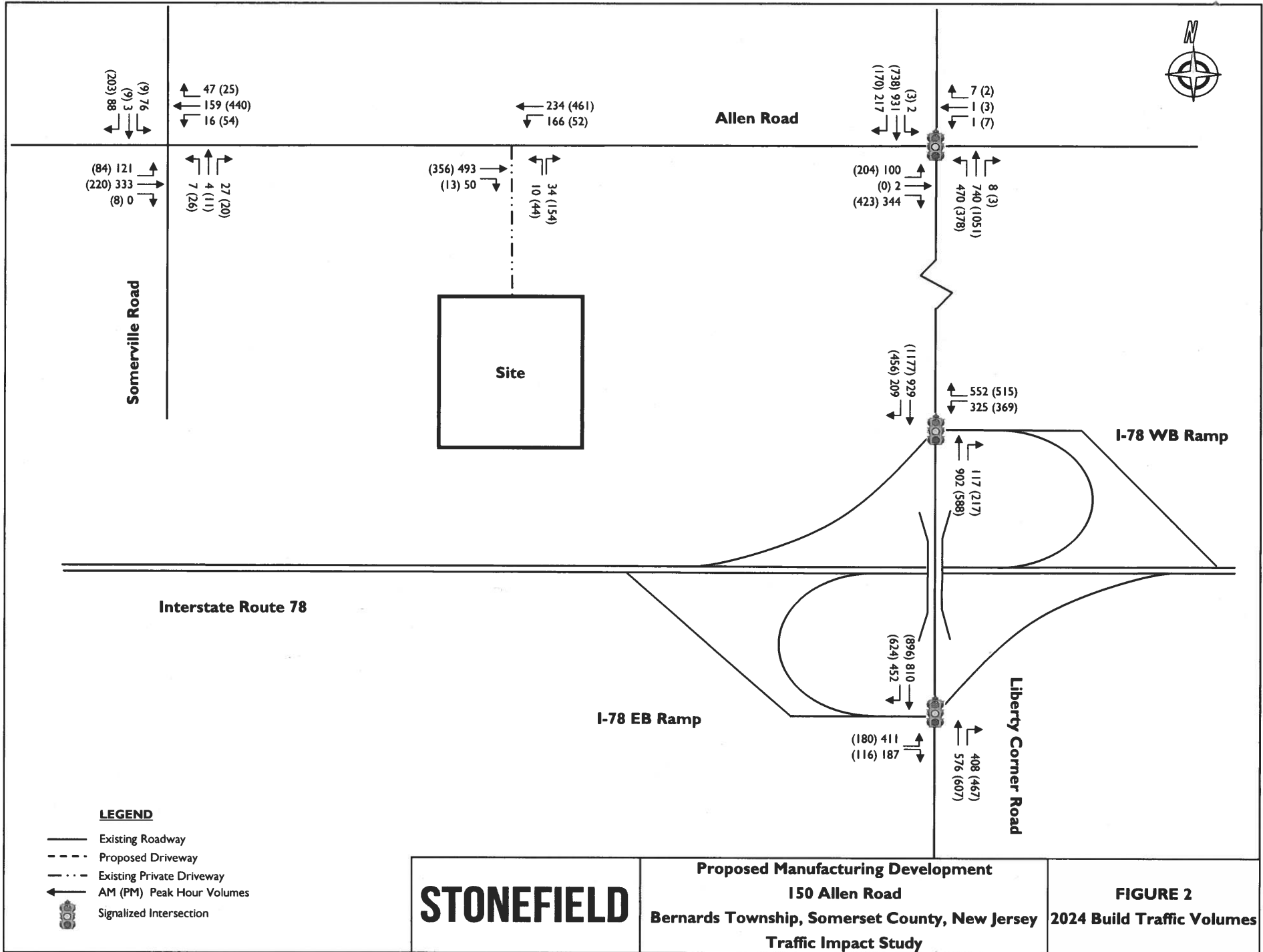














## **CAPACITY ANALYSIS DETAIL SHEETS**



HCM 6th TWSC  
1: Site Driveway & Allen Road

2022 Existing Condition  
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 0.3

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↑    |      | ↓    | ↑    | ↓    | ↓    |
| Traffic Vol, veh/h       | 476  | 11   | 22   | 226  | 0    | 0    |
| Future Vol, veh/h        | 476  | 11   | 22   | 226  | 0    | 0    |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | 125  | -    | 0    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 88   | 88   | 88   | 88   | 88   | 88   |
| Heavy Vehicles, %        | 1    | 0    | 0    | 8    | 0    | 0    |
| Mvmt Flow                | 541  | 13   | 25   | 257  | 0    | 0    |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 554    |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Critical Hdwy        | -      | -      | 4.1    |
| Critical Hdwy Stg 1  | -      | -      | -      |
| Critical Hdwy Stg 2  | -      | -      | -      |
| Follow-up Hdwy       | -      | -      | 2.2    |
| Pot Cap-1 Maneuver   | -      | -      | 1026   |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | -      | 1026   |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |

| Approach             | EB | WB  | NB |
|----------------------|----|-----|----|
| HCM Control Delay, s | 0  | 0.8 | 0  |
| HCM LOS              |    |     | A  |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | -     | -   | -   | 1026  | -   |
| HCM Lane V/C Ratio    | -     | -   | -   | 0.024 | -   |
| HCM Control Delay (s) | 0     | -   | -   | 8.6   | -   |
| HCM Lane LOS          | A     | -   | -   | A     | -   |
| HCM 95th %tile Q(veh) | -     | -   | -   | 0.1   | -   |



HCM 6th AWSC  
2: Somerville Road & Allen Road

2022 Existing Condition  
Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh 11.6  
Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↰    | ↱    |      | ↰    | ↱    |      |      | ↕    |      |      | ↱    | ↰    |
| Traffic Vol, veh/h  | 117  | 307  | 0    | 10   | 150  | 45   | 7    | 4    | 3    | 73   | 3    | 85   |
| Future Vol, veh/h   | 117  | 307  | 0    | 10   | 150  | 45   | 7    | 4    | 3    | 73   | 3    | 85   |
| Peak Hour Factor    | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, %   | 2    | 1    | 0    | 10   | 5    | 0    | 14   | 0    | 0    | 0    | 0    | 6    |
| Mvmt Flow           | 130  | 341  | 0    | 11   | 167  | 50   | 8    | 4    | 3    | 81   | 3    | 94   |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 1    |




















| Approach                   | EB   | WB | NB | SB |
|----------------------------|------|----|----|----|
| Opposing Approach          | WB   | EB | SB | NB |
| Opposing Lanes             | 2    | 2  | 2  | 1  |
| Conflicting Approach Left  | SB   | NB | EB | WB |
| Conflicting Lanes Left     | 2    | 1  | 2  | 2  |
| Conflicting Approach Right | NB   | SB | WB | EB |
| Conflicting Lanes Right    | 1    | 2  | 2  | 2  |
| HCM Control Delay          | 12.6 | 11 | 10 | 10 |
| HCM LOS                    | B    | B  | A  | A  |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 50%   | 100%  | 0%    | 100%  | 0%    | 96%   | 0%    |
| Vol Thru, %            | 29%   | 0%    | 100%  | 0%    | 77%   | 4%    | 0%    |
| Vol Right, %           | 21%   | 0%    | 0%    | 0%    | 23%   | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 14    | 117   | 307   | 10    | 195   | 76    | 85    |
| LT Vol                 | 7     | 117   | 0     | 10    | 0     | 73    | 0     |
| Through Vol            | 4     | 0     | 307   | 0     | 150   | 3     | 0     |
| RT Vol                 | 3     | 0     | 0     | 0     | 45    | 0     | 85    |
| Lane Flow Rate         | 16    | 130   | 341   | 11    | 217   | 84    | 94    |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.029 | 0.211 | 0.503 | 0.02  | 0.336 | 0.159 | 0.147 |
| Departure Headway (Hd) | 6.824 | 5.83  | 5.309 | 6.354 | 5.589 | 6.782 | 5.588 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 526   | 610   | 672   | 567   | 646   | 531   | 644   |
| Service Time           | 4.842 | 3.629 | 3.108 | 4.054 | 3.299 | 4.492 | 3.298 |
| HCM Lane V/C Ratio     | 0.03  | 0.213 | 0.507 | 0.019 | 0.336 | 0.158 | 0.146 |
| HCM Control Delay      | 10    | 10.2  | 13.5  | 9.2   | 11.1  | 10.8  | 9.3   |
| HCM Lane LOS           | A     | B     | B     | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.1   | 0.8   | 2.8   | 0.1   | 1.5   | 0.6   | 0.5   |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road

2022 Existing Condition  
Weekday Morning Peak Hour

|                              |  |  |  |  |  |  |  |  |  |   |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
| Lane Configurations          |   |  |  |   |  |   |  |  |   |  |  |   |
| Traffic Volume (veh/h)       | 84  | 2   | 312   | 1   | 1   | 7   | 367   | 715   | 8   | 2   | 899   | 158   |
| Future Volume (veh/h)        | 84  | 2   | 312   | 1   | 1   | 7   | 367   | 715   | 8   | 2   | 899   | 158   |
| Initial Q (Qb), veh          | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  | 1.00  |   | 1.00  | 1.00  |   | 1.00  | 1.00  |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Work Zone On Approach        | No  |   |   | No  |   |   | No  |   |   | No  |   |   |
| Adj Sat Flow, veh/h/ln       | 1870  | 1900  | 1885  | 1900  | 1900  | 1693  | 1870  | 1856  | 1900  | 1900  | 1856  | 1885  |
| Adj Flow Rate, veh/h         | 88  | 2   | 184   | 1   | 1   | 7   | 386   | 753   | 8   | 2   | 946   | 166   |
| Peak Hour Factor             | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  | 0.95  |
| Percent Heavy Veh, %         | 2   | 0   | 1   | 0   | 0   | 14  | 2   | 3   | 0   | 0   | 3   | 1   |
| Cap, veh/h                   | 252   | 5   | 383   | 51  | 38  | 156   | 503   | 2567  | 27  | 520   | 1814  | 318   |
| Arrive On Green              | 0.12  | 0.12  | 0.12  | 0.12  | 0.12  | 0.12  | 0.23  | 1.00  | 1.00  | 0.00  | 0.60  | 0.60  |
| Sat Flow, veh/h              | 1413  | 40  | 1598  | 54  | 311   | 1276  | 1781  | 3574  | 38  | 1810  | 2998  | 526   |
| Grp Volume(v), veh/h         | 90  | 0   | 184   | 9   | 0   | 0   | 386   | 371   | 390   | 2   | 556   | 556   |
| Grp Sat Flow(s),veh/h/ln     | 1452  | 0   | 1598  | 1640  | 0   | 0   | 1781  | 1763  | 1849  | 1810  | 1763  | 1761  |
| Q Serve(g_s), s              | 4.7   | 0.0   | 8.9   | 0.0   | 0.0   | 0.0   | 7.6   | 0.0   | 0.0   | 0.0   | 16.4  | 16.4  |
| Cycle Q Clear(g_c), s        | 5.2   | 0.0   | 8.9   | 0.4   | 0.0   | 0.0   | 7.6   | 0.0   | 0.0   | 0.0   | 16.4  | 16.4  |
| Prop In Lane                 | 0.98  |   | 1.00  | 0.11  |   | 0.78  | 1.00  |   | 0.02  | 1.00  |   | 0.30  |
| Lane Grp Cap(c), veh/h       | 257   | 0   | 383   | 245   | 0   | 0   | 503   | 1266  | 1328  | 520   | 1066  | 1065  |
| V/C Ratio(X)                 | 0.35  | 0.00  | 0.48  | 0.04  | 0.00  | 0.00  | 0.77  | 0.29  | 0.29  | 0.00  | 0.52  | 0.52  |
| Avail Cap(c_a), veh/h        | 273   | 0   | 400   | 262   | 0   | 0   | 710   | 1266  | 1328  | 935   | 1066  | 1065  |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 2.00  | 2.00  | 2.00  | 1.00  | 1.00  | 1.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  | 1.00  | 0.00  | 0.00  | 0.79  | 0.79  | 0.79  | 1.00  | 1.00  | 1.00  |
| Uniform Delay (d), s/veh     | 36.9  | 0.0   | 29.4  | 34.8  | 0.0   | 0.0   | 8.2   | 0.0   | 0.0   | 6.9   | 10.3  | 10.3  |
| Incr Delay (d2), s/veh       | 0.8   | 0.0   | 0.9   | 0.1   | 0.0   | 0.0   | 2.6   | 0.5   | 0.4   | 0.0   | 1.8   | 1.8   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 0.0   | 0.0   | 3.4   | 0.2   | 0.0   | 0.0   | 1.9   | 0.2   | 0.2   | 0.0   | 5.7   | 5.7   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |   |   |   |   |
| LnGrp Delay(d),s/veh         | 37.7  | 0.0   | 30.4  | 34.9  | 0.0   | 0.0   | 10.8  | 0.5   | 0.4   | 6.9   | 12.1  | 12.1  |
| LnGrp LOS                    | D   | A   | C   | C   | A   | A   | B   | A   | A   | A   | B   | B   |
| Approach Vol, veh/h          | 274   |   |   | 9   |   |   | 1147  |   |   | 1114  |   |   |
| Approach Delay, s/veh        | 32.8  |   |   | 34.9  |   |   | 3.9   |   |   | 12.1  |   |   |
| Approach LOS                 | C   |   |   | C   |   |   | A   |   |   | B   |   |   |
| Timer - Assigned Phs         | 1   | 2   |   | 4   | 5   | 6   |   | 8   |   |   |   |   |
| Phs Duration (G+Y+Rc), s     | 3.3   | 70.6  |   | 16.0  | 13.5  | 60.4  |   | 16.0  |   |   |   |   |
| Change Period (Y+Rc), s      | 3.0   | 6.0   |   | 5.0   | 3.0   | 6.0   |   | 5.0   |   |   |   |   |
| Max Green Setting (Gmax), s  | 43.0  |   |   | 12.0  | 21.0  | 43.0  |   | 12.0  |   |   |   |   |
| Max Q Clear Time (g_c+I), s  | 2.0   |   |   | 10.9  | 9.6   | 18.4  |   | 2.4   |   |   |   |   |
| Green Ext Time (p_c), s      | 0.0   | 4.7   |   | 0.1   | 0.9   | 7.4   |   | 0.0   |   |   |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |   |   |   |   |
| HCM 6th Ctrl Delay           | 10.7  |   |   |   |   |   |   |   |   |   |   |   |
| HCM 6th LOS                  | B   |   |   |   |   |   |   |   |   |   |   |   |
| Notes                        |   |   |   |   |   |   |   |   |   |   |   |   |



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2022 Existing Condition  
Weekday Morning Peak Hour



| Movement                     | EBL  | EBT | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|-----|-----|------|------|------|------|------|------|------|------|------|
| Lane Configurations          |      |     |     | ↰    | ↰    | ↰    |      | ↱    | ↱    |      | ↱    | ↱    |
| Traffic Volume (veh/h)       | 0    | 0   | 0   | 314  | 0    | 507  | 0    | 810  | 113  | 0    | 891  | 188  |
| Future Volume (veh/h)        | 0    | 0   | 0   | 314  | 0    | 507  | 0    | 810  | 113  | 0    | 891  | 188  |
| Initial Q (Qb), veh          |      |     |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |      |     |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |      |     |     | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |      |     |     | 2051 | 2067 | 2150 | 0    | 2051 | 1887 | 0    | 2084 | 2018 |
| Adj Flow Rate, veh/h         |      |     |     | 349  | 0    | 392  | 0    | 900  | 0    | 0    | 990  | 0    |
| Peak Hour Factor             |      |     |     | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, %         |      |     |     | 3    | 2    | 2    | 0    | 3    | 13   | 0    | 1    | 5    |
| Cap, veh/h                   |      |     |     | 951  | 0    | 444  | 0    | 2428 |      | 0    | 2467 |      |
| Arrive On Green              |      |     |     | 0.24 | 0.00 | 0.24 | 0.00 | 0.83 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h              |      |     |     | 3906 | 0    | 1822 | 0    | 3999 | 1599 | 0    | 4063 | 1710 |
| Grp Volume(v), veh/h         |      |     |     | 349  | 0    | 392  | 0    | 900  | 0    | 0    | 990  | 0    |
| Grp Sat Flow(s),veh/h/ln     |      |     |     | 1953 | 0    | 1822 | 0    | 1948 | 1599 | 0    | 1979 | 1710 |
| Q Serve(g_s), s              |      |     |     | 6.7  | 0.0  | 18.7 | 0.0  | 5.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        |      |     |     | 6.7  | 0.0  | 18.7 | 0.0  | 5.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop In Lane                 |      |     |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |      |     |     | 951  | 0    | 444  | 0    | 2428 |      | 0    | 2467 |      |
| V/C Ratio(X)                 |      |     |     | 0.37 | 0.00 | 0.88 | 0.00 | 0.37 |      | 0.00 | 0.40 |      |
| Avail Cap(c_a), veh/h        |      |     |     | 1085 | 0    | 506  | 0    | 2428 |      | 0    | 2467 |      |
| HCM Platoon Ratio            |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 2.00 | 2.00 |
| Upstream Filter(I)           |      |     |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 | 0.81 | 0.00 |
| Uniform Delay (d), s/veh     |      |     |     | 28.3 | 0.0  | 32.8 | 0.0  | 3.3  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       |      |     |     | 0.2  | 0.0  | 15.4 | 0.0  | 0.4  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |      |     |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |      |     |     | 3.1  | 0.0  | 9.9  | 0.0  | 1.5  | 0.0  | 0.0  | 0.1  | 0.0  |
| Unsig. Movement Delay, s/veh |      |     |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |      |     |     | 28.5 | 0.0  | 48.2 | 0.0  | 3.8  | 0.0  | 0.0  | 0.4  | 0.0  |
| LnGrp LOS                    |      |     |     | C    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |      |     |     |      | 741  |      |      | 900  |      |      | 990  |      |
| Approach Delay, s/veh        |      |     |     |      | 38.9 |      |      | 3.8  |      |      | 0.4  |      |
| Approach LOS                 |      |     |     |      | D    |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs         | 2    |     |     | 6    |      |      | 8    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 63.1 |     |     | 63.1 |      |      | 26.9 |      |      |      |      |      |
| Change Period (Y+Rc), s      | 7.0  |     |     | 7.0  |      |      | 5.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s  | 53.0 |     |     | 53.0 |      |      | 25.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 7.1  |     |     | 2.0  |      |      | 20.7 |      |      |      |      |      |
| Green Ext Time (p_c), s      | 6.9  |     |     | 7.9  |      |      | 1.3  |      |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 12.4  
HCM 6th LOS B

## Notes



















User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 5: Liberty Corner Road & I-78 EB Ramp

2022 Existing Condition  
Weekday Morning Peak Hour

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL   | SBT   | SBR   |
| Lane Configurations          |  |   |  |   |   |   |   |  |  |   |  |  |
| Traffic Volume (veh/h)       | 336   | 0   | 181   | 0   | 0   | 0   | 0   | 556   | 394   | 0   | 782   | 430   |
| Future Volume (veh/h)        | 336   | 0   | 181   | 0   | 0   | 0   | 0   | 556   | 394   | 0   | 782   | 430   |
| Initial Q (Qb), veh          | 0   | 0   | 0   |   |   |   | 0   | 0   | 0   | 0   | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  |   |   |   | 1.00  |   | 1.00  | 1.00  |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  |
| Work Zone On Approach        | No  |   |   |   |   |   | No  |   |   | No  |   |   |
| Adj Sat Flow, veh/h/ln       | 2034  | 0   | 2051  |   |   |   | 0   | 2034  | 2084  | 0   | 2067  | 2084  |
| Adj Flow Rate, veh/h         | 382   | 0   | 206   |   |   |   | 0   | 632   | 0   | 0   | 889   | 0   |
| Peak Hour Factor             | 0.88  | 0.88  | 0.88  |   |   |   | 0.88  | 0.88  | 0.88  | 0.88  | 0.88  | 0.88  |
| Percent Heavy Veh, %         | 4   | 0   | 3   |   |   |   | 0   | 4   | 1   | 0   | 2   | 1   |
| Cap, veh/h                   | 543   | 0   | 442   |   |   |   | 0   | 4011  |   | 0   | 2837  |   |
| Arrive On Green              | 0.14  | 0.00  | 0.14  |   |   |   | 0.00  | 0.72  | 0.00  | 0.00  | 1.00  | 0.00  |
| Sat Flow, veh/h              | 3759  | 0   | 3059  |   |   |   | 0   | 5737  | 1766  | 0   | 4031  | 1766  |
| Grp Volume(v), veh/h         | 382   | 0   | 206   |   |   |   | 0   | 632   | 0   | 0   | 889   | 0   |
| Grp Sat Flow(s),veh/h/ln     | 1879  | 0   | 1529  |   |   |   | 0   | 1851  | 1766  | 0   | 1964  | 1766  |
| Q Serve(g_s), s              | 8.7   | 0.0   | 5.6   |   |   |   | 0.0   | 3.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| Cycle Q Clear(g_c), s        | 8.7   | 0.0   | 5.6   |   |   |   | 0.0   | 3.2   | 0.0   | 0.0   | 0.0   | 0.0   |
| Prop In Lane                 | 1.00  |   | 1.00  |   |   |   | 0.00  |   | 1.00  | 0.00  |   | 1.00  |
| Lane Grp Cap(c), veh/h       | 543   | 0   | 442   |   |   |   | 0   | 4011  |   | 0   | 2837  |   |
| V/C Ratio(X)                 | 0.70  | 0.00  | 0.47  |   |   |   | 0.00  | 0.16  |   | 0.00  | 0.31  |   |
| Avail Cap(c_a), veh/h        | 1671  | 0   | 1360  |   |   |   | 0   | 4011  |   | 0   | 2837  |   |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00  | 2.00  | 2.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  |   |   |   | 0.00  | 1.00  | 0.00  | 0.00  | 0.92  | 0.00  |
| Uniform Delay (d), s/veh     | 36.7  | 0.0   | 35.3  |   |   |   | 0.0   | 3.9   | 0.0   | 0.0   | 0.0   | 0.0   |
| Incr Delay (d2), s/veh       | 1.7   | 0.0   | 0.8   |   |   |   | 0.0   | 0.1   | 0.0   | 0.0   | 0.3   | 0.0   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   |   |   |   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 1.1   | 0.0   | 2.1   |   |   |   | 0.0   | 0.8   | 0.0   | 0.0   | 0.1   | 0.0   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |   |   |   |   |
| LnGrp Delay(d),s/veh         | 38.3  | 0.0   | 36.1  |   |   |   | 0.0   | 4.0   | 0.0   | 0.0   | 0.3   | 0.0   |
| LnGrp LOS                    | D   | A   | D   |   |   |   | A   | A   |   | A   | A   |   |
| Approach Vol, veh/h          | 588   |   |   |   |   |   | 632   |   |   | 889   |   |   |
| Approach Delay, s/veh        | 37.6  |   |   |   |   |   | 4.0   |   |   | 0.3   |   |   |
| Approach LOS                 | D   |   |   |   |   |   | A   |   |   | A   |   |   |
| Timer - Assigned Phs         | 2   |   |   | 4   |   |   | 6   |   |   |   |   |   |
| Phs Duration (G+Y+Rc), s     | 72.0  |   |   | 18.0  |   |   | 72.0  |   |   |   |   |   |
| Change Period (Y+Rc), s      | 7.0   |   |   | 5.0   |   |   | 7.0   |   |   |   |   |   |
| Max Green Setting (Gmax), s  | 38.0  |   |   | 40.0  |   |   | 38.0  |   |   |   |   |   |
| Max Q Clear Time (g_c+I1), s | 5.2   |   |   | 10.7  |   |   | 2.0   |   |   |   |   |   |
| Green Ext Time (p_c), s      | 4.3   |   |   | 2.3   |   |   | 6.6   |   |   |   |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |   |   |   |   |
| HCM 6th Ctrl Delay           | 11.8  |   |   |   |   |   |   |   |   |   |   |   |
| HCM 6th LOS                  | B   |   |   |   |   |   |   |   |   |   |   |   |



HCM 6th TWSC  
1: Site Driveway & Allen Road

2022 Existing Condition  
Weekday Evening Peak Hour

| Intersection             |      |      |      |      |      |      |
|--------------------------|------|------|------|------|------|------|
| Int Delay, s/veh         | 0.4  |      |      |      |      |      |
| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
| Lane Configurations      | ↗    |      | ↖    | ↑    | ↘    |      |
| Traffic Vol, veh/h       | 344  | 0    | 5    | 445  | 8    | 16   |
| Future Vol, veh/h        | 344  | 0    | 5    | 445  | 8    | 16   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | 125  | -    | 0    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 91   | 91   | 91   | 91   | 91   | 91   |
| Heavy Vehicles, %        | 1    | 0    | 25   | 1    | 0    | 0    |
| Mvmt Flow                | 378  | 0    | 5    | 489  | 9    | 18   |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 378    |
| Stage 1              | -      | -      | 378    |
| Stage 2              | -      | -      | 499    |
| Critical Hdwy        | -      | 4.35   | 6.4    |
| Critical Hdwy Stg 1  | -      | -      | 5.4    |
| Critical Hdwy Stg 2  | -      | -      | 5.4    |
| Follow-up Hdwy       | -      | 2.425  | 3.5    |
| Pot Cap-1 Maneuver   | -      | 1065   | 322    |
| Stage 1              | -      | -      | 697    |
| Stage 2              | -      | -      | 614    |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | 1065   | 320    |
| Mov Cap-2 Maneuver   | -      | -      | 320    |
| Stage 1              | -      | -      | 697    |
| Stage 2              | -      | -      | 611    |

| Approach             | EB | WB  | NB   |
|----------------------|----|-----|------|
| HCM Control Delay, s | 0  | 0.1 | 12.7 |
| HCM LOS              | B  |     |      |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | 492   | -   | -   | 1065  | -   |
| HCM Lane V/C Ratio    | 0.054 | -   | -   | 0.005 | -   |
| HCM Control Delay (s) | 12.7  | -   | -   | 8.4   | -   |
| HCM Lane LOS          | B     | -   | -   | A     | -   |
| HCM 95th %tile Q(veh) | 0.2   | -   | -   | 0     | -   |



HCM 6th AWSC  
2: Somerville Road & Allen Road

2022 Existing Condition  
Weekday Evening Peak Hour

Intersection

Intersection Delay, s/veh 20.8

Intersection LOS C

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↰    | ↱    |      | ↰    | ↱    |      |      | ↕    |      |      | ↕    | ↰    |
| Traffic Vol, veh/h  | 81   | 208  | 8    | 31   | 411  | 24   | 25   | 11   | 12   | 9    | 9    | 196  |
| Future Vol, veh/h   | 81   | 208  | 8    | 31   | 411  | 24   | 25   | 11   | 12   | 9    | 9    | 196  |
| Peak Hour Factor    | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, %   | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 18   | 0    | 0    | 0    | 0    |
| Mvmt Flow           | 93   | 239  | 9    | 36   | 472  | 28   | 29   | 13   | 14   | 10   | 10   | 225  |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 1    |




















| Approach                   | EB | WB   | NB   | SB |
|----------------------------|----|------|------|----|
| Opposing Approach          | WB | EB   | SB   | NB |
| Opposing Lanes             | 2  | 2    | 2    | 1  |
| Conflicting Approach Left  | SB | NB   | EB   | WB |
| Conflicting Lanes Left     | 2  | 1    | 2    | 2  |
| Conflicting Approach Right | NB | SB   | WB   | EB |
| Conflicting Lanes Right    | 1  | 2    | 2    | 2  |
| HCM Control Delay          | 13 | 30.3 | 11.6 | 13 |
| HCM LOS                    | B  | D    | B    | B  |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 52%   | 100%  | 0%    | 100%  | 0%    | 50%   | 0%    |
| Vol Thru, %            | 23%   | 0%    | 96%   | 0%    | 94%   | 50%   | 0%    |
| Vol Right, %           | 25%   | 0%    | 4%    | 0%    | 6%    | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 48    | 81    | 216   | 31    | 435   | 18    | 196   |
| LT Vol                 | 25    | 81    | 0     | 31    | 0     | 9     | 0     |
| Through Vol            | 11    | 0     | 208   | 0     | 411   | 9     | 0     |
| RT Vol                 | 12    | 0     | 8     | 0     | 24    | 0     | 196   |
| Lane Flow Rate         | 55    | 93    | 248   | 36    | 500   | 21    | 225   |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.117 | 0.175 | 0.432 | 0.065 | 0.832 | 0.042 | 0.394 |
| Departure Headway (Hd) | 7.615 | 6.783 | 6.265 | 6.52  | 5.991 | 7.271 | 6.302 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 473   | 526   | 571   | 547   | 600   | 490   | 568   |
| Service Time           | 5.615 | 4.566 | 4.047 | 4.288 | 3.759 | 5.058 | 4.089 |
| HCM Lane V/C Ratio     | 0.116 | 0.177 | 0.434 | 0.066 | 0.833 | 0.043 | 0.396 |
| HCM Control Delay      | 11.6  | 11    | 13.8  | 9.7   | 31.8  | 10.4  | 13.2  |
| HCM Lane LOS           | B     | B     | B     | A     | D     | B     | B     |
| HCM 95th-tile Q        | 0.4   | 0.6   | 2.2   | 0.2   | 8.7   | 0.1   | 1.9   |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road

2022 Existing Condition  
Weekday Evening Peak Hour

|                              |   |   |   |   |   |   |   |   |  |   |   |   |
|------------------------------|---|---|---|---|---|---|---|---|--|---|---|---|
|                              |  |  |  |  |  |  |  |  |  |  |  |  |
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
| Lane Configurations          |   |  |  |   |  |   |   |  |   |   |  |  |
| Traffic Volume (veh/h)       | 149   | 0   | 325   | 7   | 3   | 2   | 336   | 1015  | 3  | 3   | 713   | 148   |
| Future Volume (veh/h)        | 149   | 0   | 325   | 7   | 3   | 2   | 336   | 1015  | 3  | 3   | 713   | 148   |
| Initial Q (Qb), veh          | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0  | 0   | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  | 1.00  |   | 1.00  | 1.00  |   | 1.00   | 1.00  |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| Work Zone On Approach        |   | No  |   |   | No  |   |   | No  |  |   | No  |   |
| Adj Sat Flow, veh/h/ln       | 1900  | 1900  | 1900  | 1693  | 1900  | 1900  | 1870  | 1885  | 1900   | 1900  | 1870  | 1885  |
| Adj Flow Rate, veh/h         | 155   | 0   | 209   | 7   | 3   | 2   | 350   | 1057  | 3  | 3   | 743   | 154   |
| Peak Hour Factor             | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96   | 0.96  | 0.96  | 0.96  |
| Percent Heavy Veh, %         | 0   | 0   | 0   | 14  | 0   | 0   | 2   | 1   | 0  | 0   | 2   | 1   |
| Cap, veh/h                   | 259   | 0   | 402   | 77  | 31  | 11  | 528   | 2582  | 7  | 392   | 1826  | 378   |
| Arrive On Green              | 0.16  | 0.00  | 0.16  | 0.16  | 0.16  | 0.16  | 0.09  | 0.70  | 0.70   | 0.01  | 0.62  | 0.62  |
| Sat Flow, veh/h              | 1194  | 0   | 1610  | 152   | 188   | 68  | 1781  | 3664  | 10   | 1810  | 2931  | 607   |
| Grp Volume(v), veh/h         | 155   | 0   | 209   | 12  | 0   | 0   | 350   | 517   | 543  | 3   | 450   | 447   |
| Grp Sat Flow(s),veh/h/ln     | 1194  | 0   | 1610  | 408   | 0   | 0   | 1781  | 1791  | 1883   | 1810  | 1777  | 1761  |
| Q Serve(g_s), s              | 0.0   | 0.0   | 12.3  | 0.1   | 0.0   | 0.0   | 7.3   | 13.2  | 13.2   | 0.1   | 14.1  | 14.1  |
| Cycle Q Clear(g_c), s        | 14.5  | 0.0   | 12.3  | 14.6  | 0.0   | 0.0   | 7.3   | 13.2  | 13.2   | 0.1   | 14.1  | 14.1  |
| Prop In Lane                 | 1.00  |   | 1.00  | 0.58  |   | 0.17  | 1.00  |   | 0.01   | 1.00  |   | 0.34  |
| Lane Grp Cap(c), veh/h       | 259   | 0   | 402   | 118   | 0   | 0   | 528   | 1262  | 1327   | 392   | 1107  | 1097  |
| V/C Ratio(X)                 | 0.60  | 0.00  | 0.52  | 0.10  | 0.00  | 0.00  | 0.66  | 0.41  | 0.41   | 0.01  | 0.41  | 0.41  |
| Avail Cap(c_a), veh/h        | 483   | 0   | 653   | 333   | 0   | 0   | 567   | 1262  | 1327   | 579   | 1107  | 1097  |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  | 1.00  | 0.00  | 0.00  | 0.87  | 0.87  | 0.87   | 1.00  | 1.00  | 1.00  |
| Uniform Delay (d), s/veh     | 44.7  | 0.0   | 35.6  | 39.6  | 0.0   | 0.0   | 7.7   | 6.7   | 6.7  | 7.7   | 10.5  | 10.5  |
| Incr Delay (d2), s/veh       | 2.2   | 0.0   | 1.0   | 0.4   | 0.0   | 0.0   | 2.3   | 0.9   | 0.8  | 0.0   | 1.1   | 1.1   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 0.0   | 0.0   | 4.8   | 0.3   | 0.0   | 0.0   | 2.4   | 4.2   | 4.5  | 0.0   | 5.1   | 5.1   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |  |   |   |   |
| LnGrp Delay(d),s/veh         | 46.9  | 0.0   | 36.6  | 40.0  | 0.0   | 0.0   | 10.0  | 7.6   | 7.6  | 7.7   | 11.6  | 11.6  |
| LnGrp LOS                    | D   | A   | D   | D   | A   | A   | B   | A   | A  | A   | B   | B   |
| Approach Vol, veh/h          | 364   |   |   | 12  |   |   | 1410  |   |  | 900   |   |   |
| Approach Delay, s/veh        | 41.0  |   |   | 40.0  |   |   | 8.2   |   |  | 11.6  |   |   |
| Approach LOS                 | D   |   |   | D   |   |   | A   |   |  | B   |   |   |
| Timer - Assigned Phs         | 1   | 2   |   | 4   | 5   | 6   |   | 8   |  |   |   |   |
| Phs Duration (G+Y+Rc), s     | 3.6   | 83.5  |   | 22.9  | 12.6  | 74.5  |   | 22.9  |  |   |   |   |
| Change Period (Y+Rc), s      | 3.0   | 6.0   |   | 5.0   | 3.0   | 6.0   |   | 5.0   |  |   |   |   |
| Max Green Setting (Gmax), s  | 12.0  | 49.0  |   | 35.0  | 12.0  | 49.0  |   | 35.0  |  |   |   |   |
| Max Q Clear Time (g_c+I), s  | 15.2  |   |   | 16.5  | 9.3   | 16.1  |   | 16.6  |  |   |   |   |
| Green Ext Time (p_c), s      | 0.0   | 7.3   |   | 1.4   | 0.3   | 5.9   |   | 0.0   |  |   |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |  |   |   |   |
| HCM 6th Ctrl Delay           | 13.9  |   |   |   |   |   |   |   |  |   |   |   |
| HCM 6th LOS                  | B   |   |   |   |   |   |   |   |  |   |   |   |
| Notes                        |   |   |   |   |   |   |   |   |  |   |   |   |



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2022 Existing Condition  
Weekday Evening Peak Hour

|                              | EBL  | EBT | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|-----|-----|------|------|------|------|------|------|------|------|------|
| Movement                     |      |     |     |      |      |      |      |      |      |      |      |      |
| Lane Configurations          |      |     |     |      |      |      |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 0    | 0   | 0   | 356  | 0    | 489  | 0    | 548  | 210  | 0    | 1112 | 382  |
| Future Volume (veh/h)        | 0    | 0   | 0   | 356  | 0    | 489  | 0    | 548  | 210  | 0    | 1112 | 382  |
| Initial Q (Qb), veh          |      |     |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |      |     |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |      |     |     | No   |      | No   |      | No   |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |      |     |     | 2034 | 2067 | 2167 | 0    | 2084 | 2067 | 0    | 2067 | 2084 |
| Adj Flow Rate, veh/h         |      |     |     | 371  | 0    | 248  | 0    | 571  | 0    | 0    | 1158 | 0    |
| Peak Hour Factor             |      |     |     | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, %         |      |     |     | 4    | 2    | 1    | 0    | 1    | 2    | 0    | 2    | 1    |
| Cap, veh/h                   |      |     |     | 635  | 0    | 301  | 0    | 2782 |      | 0    | 2760 |      |
| Arrive On Green              |      |     |     | 0.16 | 0.00 | 0.16 | 0.00 | 1.00 | 0.00 | 0.00 | 0.70 | 0.00 |
| Sat Flow, veh/h              |      |     |     | 3875 | 0    | 1836 | 0    | 4063 | 1752 | 0    | 4031 | 1766 |
| Grp Volume(v), veh/h         |      |     |     | 371  | 0    | 248  | 0    | 571  | 0    | 0    | 1158 | 0    |
| Grp Sat Flow(s),veh/h/ln     |      |     |     | 1938 | 0    | 1836 | 0    | 1979 | 1752 | 0    | 1964 | 1766 |
| Q Serve(g_s), s              |      |     |     | 8.0  | 0.0  | 11.7 | 0.0  | 0.0  | 0.0  | 0.0  | 11.2 | 0.0  |
| Cycle Q Clear(g_c), s        |      |     |     | 8.0  | 0.0  | 11.7 | 0.0  | 0.0  | 0.0  | 0.0  | 11.2 | 0.0  |
| Prop In Lane                 |      |     |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |      |     |     | 635  | 0    | 301  | 0    | 2782 |      | 0    | 2760 |      |
| V/C Ratio(X)                 |      |     |     | 0.58 | 0.00 | 0.82 | 0.00 | 0.21 |      | 0.00 | 0.42 |      |
| Avail Cap(c_a), veh/h        |      |     |     | 775  | 0    | 367  | 0    | 2782 |      | 0    | 2760 |      |
| HCM Platoon Ratio            |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           |      |     |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.99 | 0.00 | 0.00 | 0.88 | 0.00 |
| Uniform Delay (d), s/veh     |      |     |     | 34.8 | 0.0  | 36.4 | 0.0  | 0.0  | 0.0  | 0.0  | 5.6  | 0.0  |
| Incr Delay (d2), s/veh       |      |     |     | 0.9  | 0.0  | 11.9 | 0.0  | 0.2  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |      |     |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |      |     |     | 3.8  | 0.0  | 6.2  | 0.0  | 0.1  | 0.0  | 0.0  | 3.3  | 0.0  |
| Unsig. Movement Delay, s/veh |      |     |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |      |     |     | 35.6 | 0.0  | 48.3 | 0.0  | 0.2  | 0.0  | 0.0  | 6.1  | 0.0  |
| LnGrp LOS                    |      |     |     | D    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |      |     |     | 619  |      |      |      | 571  |      |      | 1158 |      |
| Approach Delay, s/veh        |      |     |     | 40.7 |      |      |      | 0.2  |      |      | 6.1  |      |
| Approach LOS                 |      |     |     | D    |      |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs         | 2    |     |     |      | 6    |      |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 70.2 |     |     |      | 70.2 |      |      | 19.8 |      |      |      |      |
| Change Period (Y+Rc), s      | 7.0  |     |     |      | 7.0  |      |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 60.0 |     |     |      | 60.0 |      |      | 18.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 2.0  |     |     |      | 13.2 |      |      | 13.7 |      |      |      |      |
| Green Ext Time (p_c), s      | 3.9  |     |     |      | 10.0 |      |      | 1.0  |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 13.8  
HCM 6th LOS B



















## Notes

User approved volume balancing among the lanes for turning movement.  
Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



HCM 6th Signalized Intersection Summary  
5: Liberty Corner Road & I-78 EB Ramp






2022 Existing Condition  
Weekday Evening Peak Hour

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|--|---|---|
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL  | SBT   | SBR   |
| Lane Configurations          |  |   |  |   |   |   |   |  |  |  |  |  |
| Traffic Volume (veh/h)       | 154   | 0   | 112   | 0   | 0   | 0   | 0   | 586   | 451   | 0  | 865   | 578   |
| Future Volume (veh/h)        | 154   | 0   | 112   | 0   | 0   | 0   | 0   | 586   | 451   | 0  | 865   | 578   |
| Initial Q (Qb), veh          | 0   | 0   | 0   |   |   |   | 0   | 0   | 0   | 0  | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  |   |   |   | 1.00  |   | 1.00  | 1.00   |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| Work Zone On Approach        | No  |   |   |   |   |   | No  |   |   | No   |   |   |
| Adj Sat Flow, veh/h/ln       | 2051  | 0   | 2100  |   |   |   | 0   | 2084  | 2084  | 0  | 2067  | 2067  |
| Adj Flow Rate, veh/h         | 162   | 0   | 118   |   |   |   | 0   | 617   | 0   | 0  | 911   | 0   |
| Peak Hour Factor             | 0.95  | 0.95  | 0.95  |   |   |   | 0.95  | 0.95  | 0.95  | 0.95   | 0.95  | 0.95  |
| Percent Heavy Veh, %         | 3   | 0   | 0   |   |   |   | 0   | 1   | 1   | 0  | 2   | 2   |
| Cap, veh/h                   | 294   | 0   | 243   |   |   |   | 0   | 4488  |   | 0  | 3099  |   |
| Arrive On Green              | 0.08  | 0.00  | 0.08  |   |   |   | 0.00  | 0.79  | 0.00  | 0.00   | 0.79  | 0.00  |
| Sat Flow, veh/h              | 3789  | 0   | 3132  |   |   |   | 0   | 5876  | 1766  | 0  | 4031  | 1752  |
| Grp Volume(v), veh/h         | 162   | 0   | 118   |   |   |   | 0   | 617   | 0   | 0  | 911   | 0   |
| Grp Sat Flow(s),veh/h/ln     | 1895  | 0   | 1566  |   |   |   | 0   | 1896  | 1766  | 0  | 1964  | 1752  |
| Q Serve(g_s), s              | 3.7   | 0.0   | 3.2   |   |   |   | 0.0   | 2.3   | 0.0   | 0.0  | 5.7   | 0.0   |
| Cycle Q Clear(g_c), s        | 3.7   | 0.0   | 3.2   |   |   |   | 0.0   | 2.3   | 0.0   | 0.0  | 5.7   | 0.0   |
| Prop In Lane                 | 1.00  |   | 1.00  |   |   |   | 0.00  |   | 1.00  | 0.00   |   | 1.00  |
| Lane Grp Cap(c), veh/h       | 294   | 0   | 243   |   |   |   | 0   | 4488  |   | 0  | 3099  |   |
| V/C Ratio(X)                 | 0.55  | 0.00  | 0.48  |   |   |   | 0.00  | 0.14  |   | 0.00   | 0.29  |   |
| Avail Cap(c_a), veh/h        | 758   | 0   | 626   |   |   |   | 0   | 4488  |   | 0  | 3099  |   |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  |   |   |   | 0.00  | 1.00  | 0.00  | 0.00   | 0.89  | 0.00  |
| Uniform Delay (d), s/veh     | 40.0  | 0.0   | 39.8  |   |   |   | 0.0   | 2.2   | 0.0   | 0.0  | 2.6   | 0.0   |
| Incr Delay (d2), s/veh       | 1.6   | 0.0   | 1.5   |   |   |   | 0.0   | 0.1   | 0.0   | 0.0  | 0.2   | 0.0   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   |   |   |   | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 1.8   | 0.0   | 1.3   |   |   |   | 0.0   | 0.4   | 0.0   | 0.0  | 1.1   | 0.0   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |   |  |   |   |
| LnGrp Delay(d),s/veh         | 41.6  | 0.0   | 41.3  |   |   |   | 0.0   | 2.3   | 0.0   | 0.0  | 2.8   | 0.0   |
| LnGrp LOS                    | D   | A   | D   |   |   |   | A   | A   |   | A  | A   |   |
| Approach Vol, veh/h          | 280   |   |   |   |   |   | 617   |   |   | 911  |   |   |
| Approach Delay, s/veh        | 41.5  |   |   |   |   |   | 2.3   |   |   | 2.8  |   |   |
| Approach LOS                 | D   |   |   |   |   |   | A   |   |   | A  |   |   |
| Timer - Assigned Phs         | 2   |   |   | 4   |   |   | 6   |   |   |  |   |   |
| Phs Duration (G+Y+Rc), s     | 78.0  |   |   | 12.0  |   |   | 78.0  |   |   |  |   |   |
| Change Period (Y+Rc), s      | 7.0   |   |   | 5.0   |   |   | 7.0   |   |   |  |   |   |
| Max Green Setting (Gmax), s  | 60.0  |   |   | 18.0  |   |   | 60.0  |   |   |  |   |   |
| Max Q Clear Time (g_c+I1), s | 4.3   |   |   | 5.7   |   |   | 7.7   |   |   |  |   |   |
| Green Ext Time (p_c), s      | 4.3   |   |   | 0.8   |   |   | 7.1   |   |   |  |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |   |  |   |   |
| HCM 6th Ctrl Delay           | 8.6   |   |   |   |   |   |   |   |   |  |   |   |
| HCM 6th LOS                  | A   |   |   |   |   |   |   |   |   |  |   |   |
| Notes                        |   |   |   |   |   |   |   |   |   |  |   |   |



HCM 6th TWSC  
1: Site Driveway & Allen Road

2024 No-Build Condition  
Weekday Morning Peak Hour

| Intersection             |   |        |   |   |   |   |
|--------------------------|---|--------|---|---|---|---|
| Int Delay, s/veh         | 0.3   |        |   |   |   |   |
| Movement                 | EBT   | EBR    | WBL   | WBT   | NBL   | NBR   |
| Lane Configurations      |  |        |  |  |  |  |
| Traffic Vol, veh/h       | 493   | 11     | 23  | 234   | 0   | 0   |
| Future Vol, veh/h        | 493   | 11     | 23  | 234   | 0   | 0   |
| Conflicting Peds, #/hr   | 0   | 0      | 0   | 0   | 0   | 0   |
| Sign Control             | Free  | Free   | Free  | Free  | Stop  | Stop  |
| RT Channelized           | -   | None   | -   | None  | -   | None  |
| Storage Length           | -   | -      | 125   | -   | 0   | -   |
| Veh in Median Storage, # | 0   | -      | -   | 0   | 0   | -   |
| Grade, %                 | 0   | -      | -   | 0   | 0   | -   |
| Peak Hour Factor         | 88  | 88     | 88  | 88  | 88  | 88  |
| Heavy Vehicles, %        | 1   | 0      | 0   | 8   | 0   | 0   |
| Mvmt Flow                | 560   | 13     | 26  | 266   | 0   | 0   |
|                          |   |        |   |   |   |   |
| Major/Minor              | Major1  | Major2 |   | Minor1  |   |   |
| Conflicting Flow All     | 0   | 0      | 573   | 0   | 885   | 567   |
| Stage 1                  | -   | -      | -   | -   | 567   | -   |
| Stage 2                  | -   | -      | -   | -   | 318   | -   |
| Critical Hdwy            | -   | -      | 4.1   | -   | 6.4   | 6.2   |
| Critical Hdwy Stg 1      | -   | -      | -   | -   | 5.4   | -   |
| Critical Hdwy Stg 2      | -   | -      | -   | -   | 5.4   | -   |
| Follow-up Hdwy           | -   | -      | 2.2   | -   | 3.5   | 3.3   |
| Pot Cap-1 Maneuver       | -   | -      | 1010  | -   | 318   | 527   |
| Stage 1                  | -   | -      | -   | -   | 572   | -   |
| Stage 2                  | -   | -      | -   | -   | 742   | -   |
| Platoon blocked, %       | -   | -      |   | -   |   |   |
| Mov Cap-1 Maneuver       | -   | -      | 1010  | -   | 310   | 527   |
| Mov Cap-2 Maneuver       | -   | -      | -   | -   | 310   | -   |
| Stage 1                  | -   | -      | -   | -   | 572   | -   |
| Stage 2                  | -   | -      | -   | -   | 723   | -   |
|                          |   |        |   |   |   |   |
| Approach                 | EB  | WB     |   | NB  |   |   |
| HCM Control Delay, s     | 0   | 0.8    |   | 0   |   |   |
| HCM LOS                  | A   |        |   |   |   |   |
|                          |   |        |   |   |   |   |
| Minor Lane/Major Mvmt    | NBLn1   | EBT    | EBR   | WBL   | WBT   |   |
| Capacity (veh/h)         | -   | -      | -   | 1010  | -   |   |
| HCM Lane V/C Ratio       | -   | -      | -   | 0.026   | -   |   |
| HCM Control Delay (s)    | 0   | -      | -   | 8.7   | -   |   |
| HCM Lane LOS             | A   | -      | -   | A   | -   |   |
| HCM 95th %tile Q(veh)    | -   | -      | -   | 0.1   | -   |   |



HCM 6th AWSC  
2: Somerville Road & Allen Road

2024 No-Build Condition  
Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh 12.1

Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↰    | ↱    |      | ↰    | ↱    |      |      | ↕    |      |      | ↱    | ↰    |
| Traffic Vol, veh/h  | 121  | 318  | 0    | 10   | 155  | 47   | 7    | 4    | 3    | 76   | 3    | 88   |
| Future Vol, veh/h   | 121  | 318  | 0    | 10   | 155  | 47   | 7    | 4    | 3    | 76   | 3    | 88   |
| Peak Hour Factor    | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, %   | 2    | 1    | 0    | 10   | 5    | 0    | 14   | 0    | 0    | 0    | 0    | 6    |
| Mvmt Flow           | 134  | 353  | 0    | 11   | 172  | 52   | 8    | 4    | 3    | 84   | 3    | 98   |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 1    |


| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 1    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 2    | 2    | 2    |
| HCM Control Delay          | 13.2 | 11.3 | 10.2 | 10.2 |
| HCM LOS                    | B    | B    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 50%   | 100%  | 0%    | 100%  | 0%    | 96%   | 0%    |
| Vol Thru, %            | 29%   | 0%    | 100%  | 0%    | 77%   | 4%    | 0%    |
| Vol Right, %           | 21%   | 0%    | 0%    | 0%    | 23%   | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 14    | 121   | 318   | 10    | 202   | 79    | 88    |
| LT Vol                 | 7     | 121   | 0     | 10    | 0     | 76    | 0     |
| Through Vol            | 4     | 0     | 318   | 0     | 155   | 3     | 0     |
| RT Vol                 | 3     | 0     | 0     | 0     | 47    | 0     | 88    |
| Lane Flow Rate         | 16    | 134   | 353   | 11    | 224   | 88    | 98    |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.03  | 0.223 | 0.535 | 0.02  | 0.351 | 0.167 | 0.153 |
| Departure Headway (Hd) | 6.907 | 5.97  | 5.449 | 6.393 | 5.637 | 6.846 | 5.65  |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 518   | 605   | 664   | 561   | 640   | 525   | 635   |
| Service Time           | 4.947 | 3.67  | 3.149 | 4.12  | 3.363 | 4.578 | 3.382 |
| HCM Lane V/C Ratio     | 0.031 | 0.221 | 0.532 | 0.02  | 0.35  | 0.168 | 0.154 |
| HCM Control Delay      | 10.2  | 10.4  | 14.2  | 9.3   | 11.4  | 11    | 9.4   |
| HCM Lane LOS           | B     | B     | B     | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.1   | 0.8   | 3.2   | 0.1   | 1.6   | 0.6   | 0.5   |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road

2024 No-Build Condition  
Weekday Morning Peak Hour

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  | ↕    | ↗    |      | ↕    |      | ↖    | ↕    |      | ↖    | ↕    |      |
| Traffic Volume (veh/h)       | 87   | 2    | 323  | 1    | 1    | 7    | 380  | 740  | 8    | 2    | 931  | 164  |
| Future Volume (veh/h)        | 87   | 2    | 323  | 1    | 1    | 7    | 380  | 740  | 8    | 2    | 931  | 164  |
| Initial Q (Qb), veh          | 0  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00   |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        | No   |      |      | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       | 1870   | 1900 | 1885 | 1900 | 1900 | 1693 | 1870 | 1856 | 1900 | 1900 | 1856 | 1885 |
| Adj Flow Rate, veh/h         | 92   | 2    | 196  | 1    | 1    | 7    | 400  | 779  | 8    | 2    | 980  | 173  |
| Peak Hour Factor             | 0.95   | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, %         | 2  | 0    | 1    | 0    | 0    | 14   | 2    | 3    | 0    | 0    | 3    | 1    |
| Cap, veh/h                   | 260  | 5    | 402  | 51   | 39   | 163  | 493  | 2549 | 26   | 501  | 1776 | 313  |
| Arrive On Green              | 0.13   | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.25 | 1.00 | 1.00 | 0.00 | 0.59 | 0.59 |
| Sat Flow, veh/h              | 1414   | 38   | 1598 | 55   | 309  | 1274 | 1781 | 3575 | 37   | 1810 | 2995 | 528  |
| Grp Volume(v), veh/h         | 94   | 0    | 196  | 9    | 0    | 0    | 400  | 384  | 403  | 2    | 576  | 577  |
| Grp Sat Flow(s),veh/h/ln     | 1451   | 0    | 1598 | 1639 | 0    | 0    | 1781 | 1763 | 1849 | 1810 | 1763 | 1760 |
| Q Serve(g_s), s              | 4.9  | 0.0  | 9.4  | 0.0  | 0.0  | 0.0  | 8.2  | 0.0  | 0.0  | 0.0  | 17.8 | 17.8 |
| Cycle Q Clear(g_c), s        | 5.4  | 0.0  | 9.4  | 0.4  | 0.0  | 0.0  | 8.2  | 0.0  | 0.0  | 0.0  | 17.8 | 17.8 |
| Prop In Lane                 | 0.98   |      | 1.00 | 0.11 |      | 0.78 | 1.00 |      | 0.02 | 1.00 |      | 0.30 |
| Lane Grp Cap(c), veh/h       | 264  | 0    | 402  | 254  | 0    | 0    | 493  | 1257 | 1318 | 501  | 1045 | 1044 |
| V/C Ratio(X)                 | 0.36   | 0.00 | 0.49 | 0.04 | 0.00 | 0.00 | 0.81 | 0.31 | 0.31 | 0.00 | 0.55 | 0.55 |
| Avail Cap(c_a), veh/h        | 273  | 0    | 411  | 263  | 0    | 0    | 688  | 1257 | 1318 | 917  | 1045 | 1044 |
| HCM Platoon Ratio            | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00   | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.76 | 0.76 | 0.76 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 36.5   | 0.0  | 28.7 | 34.4 | 0.0  | 0.0  | 9.6  | 0.0  | 0.0  | 7.3  | 11.1 | 11.1 |
| Incr Delay (d2), s/veh       | 0.8  | 0.0  | 0.9  | 0.1  | 0.0  | 0.0  | 3.9  | 0.5  | 0.5  | 0.0  | 2.1  | 2.1  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 9  | 0.0  | 3.5  | 0.2  | 0.0  | 0.0  | 2.8  | 0.2  | 0.2  | 0.0  | 6.3  | 6.3  |
| Unsig. Movement Delay, s/veh |  |      |      |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 37.4   | 0.0  | 29.7 | 34.5 | 0.0  | 0.0  | 13.6 | 0.5  | 0.5  | 7.3  | 13.2 | 13.2 |
| LnGrp LOS                    | D  | A    | C    | C    | A    | A    | B    | A    | A    | A    | B    | B    |
| Approach Vol, veh/h          | 290  |      |      | 9    |      |      | 1187 |      |      | 1155 |      |      |
| Approach Delay, s/veh        | 32.2   |      |      | 34.5 |      |      | 4.9  |      |      | 13.2 |      |      |
| Approach LOS                 | C  |      |      | C    |      |      | A    |      |      | B    |      |      |
| Timer - Assigned Phs         | 1  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 3.3  | 70.2 |      | 16.5 | 14.1 | 59.4 |      | 16.5 |      |      |      |      |
| Change Period (Y+Rc), s      | 3.0  | 6.0  |      | 5.0  | 3.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 43.0   |      |      | 12.0 | 21.0 | 43.0 |      | 12.0 |      |      |      |      |
| Max Q Clear Time (g_c+I), s  | 2.0  |      |      | 11.4 | 10.2 | 19.8 |      | 2.4  |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0  | 4.9  |      | 0.1  | 0.9  | 7.6  |      | 0.0  |      |      |      |      |
| Intersection Summary         |  |      |      |      |      |      |      |      |      |      |      |      |
| HCM 6th Ctrl Delay           | 11.6   |      |      |      |      |      |      |      |      |      |      |      |
| HCM 6th LOS                  | B  |      |      |      |      |      |      |      |      |      |      |      |



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2024 No-Build Condition  
Weekday Morning Peak Hour

| Movement                     | EBL | EBT  | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|-----|------|-----|------|------|------|------|------|------|------|------|------|
| Lane Configurations          |     |      |     |      |      |      |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 0   | 0    | 0   | 325  | 0    | 525  | 0    | 839  | 117  | 0    | 922  | 195  |
| Future Volume (veh/h)        | 0   | 0    | 0   | 325  | 0    | 525  | 0    | 839  | 117  | 0    | 922  | 195  |
| Initial Q (Qb), veh          |     |      |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |     |      |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |     |      |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |     |      |     | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |     |      |     | 2051 | 2067 | 2150 | 0    | 2051 | 1887 | 0    | 2084 | 2018 |
| Adj Flow Rate, veh/h         |     |      |     | 361  | 0    | 412  | 0    | 932  | 0    | 0    | 1024 | 0    |
| Peak Hour Factor             |     |      |     | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, %         |     |      |     | 3    | 2    | 2    | 0    | 3    | 13   | 0    | 1    | 5    |
| Cap, veh/h                   |     |      |     | 987  | 0    | 460  | 0    | 2393 |      | 0    | 2431 |      |
| Arrive On Green              |     |      |     | 0.25 | 0.00 | 0.25 | 0.00 | 0.82 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h              |     |      |     | 3906 | 0    | 1822 | 0    | 3999 | 1599 | 0    | 4063 | 1710 |
| Grp Volume(v), veh/h         |     |      |     | 361  | 0    | 412  | 0    | 932  | 0    | 0    | 1024 | 0    |
| Grp Sat Flow(s),veh/h/ln     |     |      |     | 1953 | 0    | 1822 | 0    | 1948 | 1599 | 0    | 1979 | 1710 |
| Q Serve(g_s), s              |     |      |     | 6.8  | 0.0  | 19.7 | 0.0  | 5.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        |     |      |     | 6.8  | 0.0  | 19.7 | 0.0  | 5.8  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop In Lane                 |     |      |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |     |      |     | 987  | 0    | 460  | 0    | 2393 |      | 0    | 2431 |      |
| V/C Ratio(X)                 |     |      |     | 0.37 | 0.00 | 0.90 | 0.00 | 0.39 |      | 0.00 | 0.42 |      |
| Avail Cap(c_a), veh/h        |     |      |     | 1085 | 0    | 506  | 0    | 2393 |      | 0    | 2431 |      |
| HCM Platoon Ratio            |     |      |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 2.00 | 2.00 |
| Upstream Filter(I)           |     |      |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.95 | 0.00 | 0.00 | 0.78 | 0.00 |
| Uniform Delay (d), s/veh     |     |      |     | 27.7 | 0.0  | 32.5 | 0.0  | 3.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       |     |      |     | 0.2  | 0.0  | 17.3 | 0.0  | 0.5  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |     |      |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |     |      |     | 3.2  | 0.0  | 10.6 | 0.0  | 1.7  | 0.0  | 0.0  | 0.1  | 0.0  |
| Unsig. Movement Delay, s/veh |     |      |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |     |      |     | 27.9 | 0.0  | 49.8 | 0.0  | 4.2  | 0.0  | 0.0  | 0.4  | 0.0  |
| LnGrp LOS                    |     |      |     | C    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |     |      |     |      | 773  |      |      | 932  |      |      | 1024 |      |
| Approach Delay, s/veh        |     |      |     |      | 39.6 |      |      | 4.2  |      |      | 0.4  |      |
| Approach LOS                 |     |      |     |      | D    |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs         |     | 2    |     |      |      | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     |     | 62.3 |     |      |      | 62.3 |      | 27.7 |      |      |      |      |
| Change Period (Y+Rc), s      |     | 7.0  |     |      |      | 7.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  |     | 53.0 |     |      |      | 53.0 |      | 25.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s |     | 7.8  |     |      |      | 2.0  |      | 21.7 |      |      |      |      |
| Green Ext Time (p_c), s      |     | 7.2  |     |      |      | 8.3  |      | 1.1  |      |      |      |      |
| Intersection Summary         |     |      |     |      |      |      |      |      |      |      |      |      |
| HCM 6th Ctrl Delay           |     |      |     | 12.8 |      |      |      |      |      |      |      |      |
| HCM 6th LOS                  |     |      |     | B    |      |      |      |      |      |      |      |      |

## Notes


User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 5: Liberty Corner Road & I-78 EB Ramp

2024 No-Build Condition  
Weekday Morning Peak Hour

|                              |  |      |      |      |     |     |      |      |      |      |      |      |
|------------------------------|--|------|------|------|-----|-----|------|------|------|------|------|------|
| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT | WBR | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  |      |      |      |     |     |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 348  | 0    | 187  | 0    | 0   | 0   | 0    | 576  | 408  | 0    | 810  | 445  |
| Future Volume (veh/h)        | 348  | 0    | 187  | 0    | 0   | 0   | 0    | 576  | 408  | 0    | 810  | 445  |
| Initial Q (Qb), veh          | 0  | 0    | 0    |      |     |     | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00   |      | 1.00 |      |     |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00   | 1.00 | 1.00 |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        | No   |      |      |      |     |     | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       | 2034   | 0    | 2051 |      |     |     | 0    | 2034 | 2084 | 0    | 2067 | 2084 |
| Adj Flow Rate, veh/h         | 395  | 0    | 212  |      |     |     | 0    | 655  | 0    | 0    | 920  | 0    |
| Peak Hour Factor             | 0.88   | 0.88 | 0.88 |      |     |     | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, %         | 4  | 0    | 3    |      |     |     | 0    | 4    | 1    | 0    | 2    | 1    |
| Cap, veh/h                   | 558  | 0    | 454  |      |     |     | 0    | 3989 |      | 0    | 2821 |      |
| Arrive On Green              | 0.15   | 0.00 | 0.15 |      |     |     | 0.00 | 0.72 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h              | 3759   | 0    | 3059 |      |     |     | 0    | 5737 | 1766 | 0    | 4031 | 1766 |
| Grp Volume(v), veh/h         | 395  | 0    | 212  |      |     |     | 0    | 655  | 0    | 0    | 920  | 0    |
| Grp Sat Flow(s), veh/h/ln    | 1879   | 0    | 1529 |      |     |     | 0    | 1851 | 1766 | 0    | 1964 | 1766 |
| Q Serve(g_s), s              | 9.0  | 0.0  | 5.7  |      |     |     | 0.0  | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        | 9.0  | 0.0  | 5.7  |      |     |     | 0.0  | 3.4  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop In Lane                 | 1.00   |      | 1.00 |      |     |     | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       | 558  | 0    | 454  |      |     |     | 0    | 3989 |      | 0    | 2821 |      |
| V/C Ratio(X)                 | 0.71   | 0.00 | 0.47 |      |     |     | 0.00 | 0.16 |      | 0.00 | 0.33 |      |
| Avail Cap(c_a), veh/h        | 1671   | 0    | 1360 |      |     |     | 0    | 3989 |      | 0    | 2821 |      |
| HCM Platoon Ratio            | 1.00   | 1.00 | 1.00 |      |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 |
| Upstream Filter(I)           | 1.00   | 0.00 | 1.00 |      |     |     | 0.00 | 1.00 | 0.00 | 0.00 | 0.91 | 0.00 |
| Uniform Delay (d), s/veh     | 36.5   | 0.0  | 35.1 |      |     |     | 0.0  | 4.1  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       | 1.7  | 0.0  | 0.7  |      |     |     | 0.0  | 0.1  | 0.0  | 0.0  | 0.3  | 0.0  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  |      |     |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 2  | 0.0  | 2.1  |      |     |     | 0.0  | 0.9  | 0.0  | 0.0  | 0.1  | 0.0  |
| Unsig. Movement Delay, s/veh |  |      |      |      |     |     |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 38.1   | 0.0  | 35.8 |      |     |     | 0.0  | 4.1  | 0.0  | 0.0  | 0.3  | 0.0  |
| LnGrp LOS                    | D  | A    | D    |      |     |     | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          | 607  |      |      |      |     |     | 655  |      |      | 920  |      |      |
| Approach Delay, s/veh        | 37.3   |      |      |      |     |     | 4.1  |      |      | 0.3  |      |      |
| Approach LOS                 | D  |      |      |      |     |     | A    |      |      | A    |      |      |
| Timer - Assigned Phs         | 2  |      |      | 4    |     |     | 6    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 71.6   |      |      | 18.4 |     |     | 71.6 |      |      |      |      |      |
| Change Period (Y+Rc), s      | 7.0  |      |      | 5.0  |     |     | 7.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s  | 38.0   |      |      | 40.0 |     |     | 38.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 5.4  |      |      | 11.0 |     |     | 2.0  |      |      |      |      |      |
| Green Ext Time (p_c), s      | 4.5  |      |      | 2.4  |     |     | 6.9  |      |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 11.7  
HCM 6th LOS B

## Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



HCM 6th TWSC  
1: Site Driveway & Allen Road

2024 No-Build Condition  
Weekday Evening Peak Hour

**Intersection**

Int Delay, s/veh 0.4

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↱    |      | ↱    | ↱    | ↱    | ↱    |
| Traffic Vol, veh/h       | 356  | 0    | 5    | 461  | 8    | 17   |
| Future Vol, veh/h        | 356  | 0    | 5    | 461  | 8    | 17   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | 125  | -    | 0    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 91   | 91   | 91   | 91   | 91   | 91   |
| Heavy Vehicles, %        | 1    | 0    | 25   | 1    | 0    | 0    |
| Mvmt Flow                | 391  | 0    | 5    | 507  | 9    | 19   |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 391    |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Critical Hdwy        | -      | -      | 4.35   |
| Critical Hdwy Stg 1  | -      | -      | -      |
| Critical Hdwy Stg 2  | -      | -      | -      |
| Follow-up Hdwy       | -      | -      | 2.425  |
| Pot Cap-1 Maneuver   | -      | -      | 1053   |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | -      | 1053   |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |

| Approach             | EB | WB  | NB   |
|----------------------|----|-----|------|
| HCM Control Delay, s | 0  | 0.1 | 12.9 |
| HCM LOS              |    |     | B    |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | 482   | -   | -   | 1053  | -   |
| HCM Lane V/C Ratio    | 0.057 | -   | -   | 0.005 | -   |
| HCM Control Delay (s) | 12.9  | -   | -   | 8.4   | -   |
| HCM Lane LOS          | B     | -   | -   | A     | -   |
| HCM 95th %tile Q(veh) | 0.2   | -   | -   | 0     | -   |










HCM 6th AWSC  
2: Somerville Road & Allen Road

2024 No-Build Condition  
Weekday Evening Peak Hour

Intersection

Intersection Delay, s/veh 23.3  
Intersection LOS C

| Movement            | EBL   | EBT   | EBR  | WBL   | WBT   | WBR  | NBL  | NBT   | NBR  | SBL  | SBT   | SBR   |
|---------------------|---|---|------|---|---|------|------|---|------|------|---|---|
| Lane Configurations |  |  |      |  |  |      |      |  |      |      |  |  |
| Traffic Vol, veh/h  | 84  | 215   | 8    | 32  | 426   | 25   | 26   | 11  | 12   | 9    | 9   | 203   |
| Future Vol, veh/h   | 84  | 215   | 8    | 32  | 426   | 25   | 26   | 11  | 12   | 9    | 9   | 203   |
| Peak Hour Factor    | 0.87  | 0.87  | 0.87 | 0.87  | 0.87  | 0.87 | 0.87 | 0.87  | 0.87 | 0.87 | 0.87  | 0.87  |
| Heavy Vehicles, %   | 0   | 1   | 0    | 0   | 1   | 0    | 0    | 18  | 0    | 0    | 0   | 0   |
| Mvmt Flow           | 97  | 247   | 9    | 37  | 490   | 29   | 30   | 13  | 14   | 10   | 10  | 233   |
| Number of Lanes     | 1   | 1   | 0    | 1   | 1   | 0    | 0    | 1   | 0    | 0    | 1   | 1   |




















| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 1    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 2    | 2    | 2    |
| HCM Control Delay          | 13.5 | 35.3 | 11.9 | 13.4 |
| HCM LOS                    | B    | E    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 53%   | 100%  | 0%    | 100%  | 0%    | 50%   | 0%    |
| Vol Thru, %            | 22%   | 0%    | 96%   | 0%    | 94%   | 50%   | 0%    |
| Vol Right, %           | 24%   | 0%    | 4%    | 0%    | 6%    | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 49    | 84    | 223   | 32    | 451   | 18    | 203   |
| LT Vol                 | 26    | 84    | 0     | 32    | 0     | 9     | 0     |
| Through Vol            | 11    | 0     | 215   | 0     | 426   | 9     | 0     |
| RT Vol                 | 12    | 0     | 8     | 0     | 25    | 0     | 203   |
| Lane Flow Rate         | 56    | 97    | 256   | 37    | 518   | 21    | 233   |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.122 | 0.184 | 0.453 | 0.067 | 0.873 | 0.042 | 0.415 |
| Departure Headway (Hd) | 7.78  | 6.874 | 6.356 | 6.592 | 6.062 | 7.369 | 6.4   |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 464   | 518   | 561   | 540   | 596   | 482   | 558   |
| Service Time           | 5.78  | 4.669 | 4.15  | 4.371 | 3.841 | 5.168 | 4.197 |
| HCM Lane V/C Ratio     | 0.121 | 0.187 | 0.456 | 0.069 | 0.869 | 0.044 | 0.418 |
| HCM Control Delay      | 11.9  | 11.2  | 14.4  | 9.8   | 37.1  | 10.5  | 13.7  |
| HCM Lane LOS           | B     | B     | B     | A     | E     | B     | B     |
| HCM 95th-tile Q        | 0.4   | 0.7   | 2.3   | 0.2   | 10    | 0.1   | 2     |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road


2024 No-Build Condition  
Weekday Evening Peak Hour

|                              |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|--|---|---|
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL  | SBT   | SBR   |
| Lane Configurations          |   |  |  |   |  |   |   |  |  |  |  |  |
| Traffic Volume (veh/h)       | 154   | 0   | 336   | 7   | 3   | 2   | 348   | 1051  | 3   | 3  | 738   | 153   |
| Future Volume (veh/h)        | 154   | 0   | 336   | 7   | 3   | 2   | 348   | 1051  | 3   | 3  | 738   | 153   |
| Initial Q (Qb), veh          | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0   | 0  | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  | 1.00  |   | 1.00  | 1.00  |   | 1.00  | 1.00   |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| Work Zone On Approach        |   | No  |   |   | No  |   |   | No  |   |  | No  |   |
| Adj Sat Flow, veh/h/ln       | 1900  | 1900  | 1900  | 1693  | 1900  | 1900  | 1870  | 1885  | 1900  | 1900   | 1870  | 1885  |
| Adj Flow Rate, veh/h         | 160   | 0   | 220   | 7   | 3   | 2   | 362   | 1095  | 3   | 3  | 769   | 159   |
| Peak Hour Factor             | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96  | 0.96   | 0.96  | 0.96  |
| Percent Heavy Veh, %         | 0   | 0   | 0   | 14  | 0   | 0   | 2   | 1   | 0   | 0  | 2   | 1   |
| Cap, veh/h                   | 265   | 0   | 417   | 77  | 31  | 11  | 515   | 2564  | 7   | 374  | 1800  | 372   |
| Arrive On Green              | 0.17  | 0.00  | 0.17  | 0.17  | 0.17  | 0.17  | 0.09  | 0.70  | 0.70  | 0.01   | 0.61  | 0.61  |
| Sat Flow, veh/h              | 1190  | 0   | 1610  | 149   | 183   | 66  | 1781  | 3664  | 10  | 1810   | 2932  | 606   |
| Grp Volume(v), veh/h         | 160   | 0   | 220   | 12  | 0   | 0   | 362   | 535   | 563   | 3  | 466   | 462   |
| Grp Sat Flow(s),veh/h/ln     | 1190  | 0   | 1610  | 398   | 0   | 0   | 1781  | 1791  | 1883  | 1810   | 1777  | 1761  |
| Q Serve(g_s), s              | 0.0   | 0.0   | 12.9  | 0.1   | 0.0   | 0.0   | 7.8   | 14.1  | 14.1  | 0.1  | 15.1  | 15.1  |
| Cycle Q Clear(g_c), s        | 15.0  | 0.0   | 12.9  | 15.1  | 0.0   | 0.0   | 7.8   | 14.1  | 14.1  | 0.1  | 15.1  | 15.1  |
| Prop In Lane                 | 1.00  |   | 1.00  | 0.58  |   | 0.17  | 1.00  |   | 0.01  | 1.00   |   | 0.34  |
| Lane Grp Cap(c), veh/h       | 265   | 0   | 417   | 118   | 0   | 0   | 515   | 1253  | 1318  | 374  | 1091  | 1082  |
| V/C Ratio(X)                 | 0.60  | 0.00  | 0.53  | 0.10  | 0.00  | 0.00  | 0.70  | 0.43  | 0.43  | 0.01   | 0.43  | 0.43  |
| Avail Cap(c_a), veh/h        | 481   | 0   | 659   | 325   | 0   | 0   | 547   | 1253  | 1318  | 561  | 1091  | 1082  |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  | 1.00  | 0.00  | 0.00  | 0.85  | 0.85  | 0.85  | 1.00   | 1.00  | 1.00  |
| Uniform Delay (d), s/veh     | 44.4  | 0.0   | 35.0  | 39.2  | 0.0   | 0.0   | 8.6   | 7.1   | 7.1   | 8.1  | 11.1  | 11.1  |
| Incr Delay (d2), s/veh       | 2.2   | 0.0   | 1.0   | 0.4   | 0.0   | 0.0   | 3.2   | 0.9   | 0.9   | 0.0  | 1.2   | 1.2   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 3   | 0.0   | 5.0   | 0.3   | 0.0   | 0.0   | 2.7   | 4.6   | 4.8   | 0.0  | 5.6   | 5.5   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |   |  |   |   |
| LnGrp Delay(d),s/veh         | 46.6  | 0.0   | 36.0  | 39.6  | 0.0   | 0.0   | 11.8  | 8.0   | 7.9   | 8.1  | 12.3  | 12.3  |
| LnGrp LOS                    | D   | A   | D   | D   | A   | A   | B   | A   | A   | A  | B   | B   |
| Approach Vol, veh/h          | 380   |   |   | 12  |   |   | 1460  |   |   | 931  |   |   |
| Approach Delay, s/veh        | 40.5  |   |   | 39.6  |   |   | 8.9   |   |   | 12.3   |   |   |
| Approach LOS                 | D   |   |   | D   |   |   | A   |   |   | B  |   |   |
| Timer - Assigned Phs         | 1   | 2   | 4   |   | 5   | 6   | 8   |   |   |  |   |   |
| Phs Duration (G+Y+Rc), s     | 3.6   | 83.0  | 23.4  |   | 13.0  | 73.5  | 23.4  |   |   |  |   |   |
| Change Period (Y+Rc), s      | 3.0   | 6.0   | 5.0   |   | 3.0   | 6.0   | 5.0   |   |   |  |   |   |
| Max Green Setting (Gmax), s  | 49.0  | 49.0  | 35.0  |   | 12.0  | 49.0  | 35.0  |   |   |  |   |   |
| Max Q Clear Time (g_c+I), s  | 16.1  | 16.1  | 17.0  |   | 9.8   | 17.1  | 17.1  |   |   |  |   |   |
| Green Ext Time (p_c), s      | 0.0   | 7.6   | 1.4   |   | 0.3   | 6.1   | 0.0   |   |   |  |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |   |  |   |   |
| HCM 6th Ctrl Delay           | 14.5  |   |   |   |   |   |   |   |   |  |   |   |
| HCM 6th LOS                  | B   |   |   |   |   |   |   |   |   |  |   |   |
| Notes                        |   |   |   |   |   |   |   |   |   |  |   |   |



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2024 No-Build Condition  
Weekday Evening Peak Hour

|                              |  |      |     |      |      |      |      |      |      |      |      |      |
|------------------------------|--|------|-----|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL  | EBT  | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  |      |     | ↰    | ↰    | ↰    |      | ↱    | ↱    |      | ↱    | ↱    |
| Traffic Volume (veh/h)       | 0  | 0    | 0   | 369  | 0    | 506  | 0    | 567  | 217  | 0    | 1151 | 395  |
| Future Volume (veh/h)        | 0  | 0    | 0   | 369  | 0    | 506  | 0    | 567  | 217  | 0    | 1151 | 395  |
| Initial Q (Qb), veh          |  |      |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |  |      |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |  |      |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |  |      |     | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |  |      |     | 2034 | 2067 | 2167 | 0    | 2084 | 2067 | 0    | 2067 | 2084 |
| Adj Flow Rate, veh/h         |  |      |     | 384  | 0    | 266  | 0    | 591  | 0    | 0    | 1199 | 0    |
| Peak Hour Factor             |  |      |     | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, %         |  |      |     | 4    | 2    | 1    | 0    | 1    | 2    | 0    | 2    | 1    |
| Cap, veh/h                   |  |      |     | 668  | 0    | 316  | 0    | 2749 |      | 0    | 2727 |      |
| Arrive On Green              |  |      |     | 0.17 | 0.00 | 0.17 | 0.00 | 1.00 | 0.00 | 0.00 | 0.69 | 0.00 |
| Sat Flow, veh/h              |  |      |     | 3875 | 0    | 1836 | 0    | 4063 | 1752 | 0    | 4031 | 1766 |
| Grp Volume(v), veh/h         |  |      |     | 384  | 0    | 266  | 0    | 591  | 0    | 0    | 1199 | 0    |
| Grp Sat Flow(s),veh/h/ln     |  |      |     | 1938 | 0    | 1836 | 0    | 1979 | 1752 | 0    | 1964 | 1766 |
| Q Serve(g_s), s              |  |      |     | 8.2  | 0.0  | 12.6 | 0.0  | 0.0  | 0.0  | 0.0  | 12.1 | 0.0  |
| Cycle Q Clear(g_c), s        |  |      |     | 8.2  | 0.0  | 12.6 | 0.0  | 0.0  | 0.0  | 0.0  | 12.1 | 0.0  |
| Prop In Lane                 |  |      |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |  |      |     | 668  | 0    | 316  | 0    | 2749 |      | 0    | 2727 |      |
| V/C Ratio(X)                 |  |      |     | 0.58 | 0.00 | 0.84 | 0.00 | 0.21 |      | 0.00 | 0.44 |      |
| Avail Cap(c_a), veh/h        |  |      |     | 775  | 0    | 367  | 0    | 2749 |      | 0    | 2727 |      |
| HCM Platoon Ratio            |  |      |     | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           |  |      |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.99 | 0.00 | 0.00 | 0.86 | 0.00 |
| Uniform Delay (d), s/veh     |  |      |     | 34.2 | 0.0  | 36.1 | 0.0  | 0.0  | 0.0  | 0.0  | 6.1  | 0.0  |
| Incr Delay (d2), s/veh       |  |      |     | 0.8  | 0.0  | 14.2 | 0.0  | 0.2  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |  |      |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |  |      |     | 3.9  | 0.0  | 6.8  | 0.0  | 0.1  | 0.0  | 0.0  | 3.7  | 0.0  |
| Unsig. Movement Delay, s/veh |  |      |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |  |      |     | 35.0 | 0.0  | 50.3 | 0.0  | 0.2  | 0.0  | 0.0  | 6.5  | 0.0  |
| LnGrp LOS                    |  |      |     | D    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |  |      |     |      | 650  |      |      | 591  |      |      | 1199 |      |
| Approach Delay, s/veh        |  |      |     |      | 41.3 |      |      | 0.2  |      |      | 6.5  |      |
| Approach LOS                 |  |      |     |      | D    |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs         |  | 2    |     |      |      | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     |  | 69.5 |     |      |      | 69.5 |      | 20.5 |      |      |      |      |
| Change Period (Y+Rc), s      |  | 7.0  |     |      |      | 7.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  |  | 60.0 |     |      |      | 60.0 |      | 18.0 |      |      |      |      |
| Max Q Clear Time (g_c+I1), s |  | 2.0  |     |      |      | 14.1 |      | 14.6 |      |      |      |      |
| Green Ext Time (p_c), s      |  | 4.1  |     |      |      | 10.5 |      | 0.9  |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 14.2  
HCM 6th LOS B

## Notes

























User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 5: Liberty Corner Road & I-78 EB Ramp

2024 No-Build Condition  
Weekday Evening Peak Hour

|                              |   |   |   |   |   |   |   |   |  |   |   |   |
|------------------------------|---|---|---|---|---|---|---|---|--|---|---|---|
|                              |    |  |    |  |  |  |  |    |  |  |    |  |
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR  | SBL   | SBT   | SBR   |
| Lane Configurations          |   |   |   |   |   |   |   |     |  |   |   |  |
| Traffic Volume (veh/h)       | 159   | 0   | 116   | 0   | 0   | 0   | 0   | 607   | 467  | 0   | 896   | 598   |
| Future Volume (veh/h)        | 159   | 0   | 116   | 0   | 0   | 0   | 0   | 607   | 467  | 0   | 896   | 598   |
| Initial Q (Qb), veh          | 0   | 0   | 0   |   |   |   | 0   | 0   | 0  | 0   | 0   | 0   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  |   |   |   | 1.00  |   | 1.00   | 1.00  |   | 1.00  |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| Work Zone On Approach        |   | No  |   |   |   |   |   | No  |  |   | No  |   |
| Adj Sat Flow, veh/h/ln       | 2051  | 0   | 2100  |   |   |   | 0   | 2084  | 2084   | 0   | 2067  | 2067  |
| Adj Flow Rate, veh/h         | 167   | 0   | 122   |   |   |   | 0   | 639   | 0  | 0   | 943   | 0   |
| Peak Hour Factor             | 0.95  | 0.95  | 0.95  |   |   |   | 0.95  | 0.95  | 0.95   | 0.95  | 0.95  | 0.95  |
| Percent Heavy Veh, %         | 3   | 0   | 0   |   |   |   | 0   | 1   | 1  | 0   | 2   | 2   |
| Cap, veh/h                   | 295   | 0   | 243   |   |   |   | 0   | 4488  |  | 0   | 3099  |   |
| Arrive On Green              | 0.08  | 0.00  | 0.08  |   |   |   | 0.00  | 0.79  | 0.00   | 0.00  | 0.79  | 0.00  |
| Sat Flow, veh/h              | 3789  | 0   | 3132  |   |   |   | 0   | 5876  | 1766   | 0   | 4031  | 1752  |
| Grp Volume(v), veh/h         | 167   | 0   | 122   |   |   |   | 0   | 639   | 0  | 0   | 943   | 0   |
| Grp Sat Flow(s),veh/h/ln     | 1895  | 0   | 1566  |   |   |   | 0   | 1896  | 1766   | 0   | 1964  | 1752  |
| Q Serve(g_s), s              | 3.8   | 0.0   | 3.4   |   |   |   | 0.0   | 2.4   | 0.0  | 0.0   | 6.0   | 0.0   |
| Cycle Q Clear(g_c), s        | 3.8   | 0.0   | 3.4   |   |   |   | 0.0   | 2.4   | 0.0  | 0.0   | 6.0   | 0.0   |
| Prop In Lane                 | 1.00  |   | 1.00  |   |   |   | 0.00  |   | 1.00   | 0.00  |   | 1.00  |
| Lane Grp Cap(c), veh/h       | 295   | 0   | 243   |   |   |   | 0   | 4488  |  | 0   | 3099  |   |
| V/C Ratio(X)                 | 0.57  | 0.00  | 0.50  |   |   |   | 0.00  | 0.14  |  | 0.00  | 0.30  |   |
| Avail Cap(c_a), veh/h        | 758   | 0   | 626   |   |   |   | 0   | 4488  |  | 0   | 3099  |   |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  | 1.00  |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  |   |   |   | 0.00  | 1.00  | 0.00   | 0.00  | 0.88  | 0.00  |
| Uniform Delay (d), s/veh     | 40.0  | 0.0   | 39.8  |   |   |   | 0.0   | 2.3   | 0.0  | 0.0   | 2.6   | 0.0   |
| Incr Delay (d2), s/veh       | 1.7   | 0.0   | 1.6   |   |   |   | 0.0   | 0.1   | 0.0  | 0.0   | 0.2   | 0.0   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   |   |   |   | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   | 0.0   |
| %ile BackOfQ(50%),veh/ln     | 1.8   | 0.0   | 1.3   |   |   |   | 0.0   | 0.4   | 0.0  | 0.0   | 1.1   | 0.0   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |  |   |   |   |
| LnGrp Delay(d),s/veh         | 41.8  | 0.0   | 41.4  |   |   |   | 0.0   | 2.3   | 0.0  | 0.0   | 2.9   | 0.0   |
| LnGrp LOS                    | D   | A   | D   |   |   |   | A   | A   |  | A   | A   |   |
| Approach Vol, veh/h          | 289   |   |   |   |   |   | 639   |   |  | 943   |   |   |
| Approach Delay, s/veh        | 41.6  |   |   |   |   |   | 2.3   |   |  | 2.9   |   |   |
| Approach LOS                 | D   |   |   |   |   |   | A   |   |  | A   |   |   |
| Timer - Assigned Phs         | 2   |   |   | 4   |   |   | 6   |   |  |   |   |   |
| Phs Duration (G+Y+Rc), s     | 78.0  |   |   | 12.0  |   |   | 78.0  |   |  |   |   |   |
| Change Period (Y+Rc), s      | 7.0   |   |   | 5.0   |   |   | 7.0   |   |  |   |   |   |
| Max Green Setting (Gmax), s  | 60.0  |   |   | 18.0  |   |   | 60.0  |   |  |   |   |   |
| Max Q Clear Time (g_c+I1), s | 4.4   |   |   | 5.8   |   |   | 8.0   |   |  |   |   |   |
| Green Ext Time (p_c), s      | 4.5   |   |   | 0.8   |   |   | 7.4   |   |  |   |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |  |   |   |   |
| HCM 6th Ctrl Delay           | 8.7   |   |   |   |   |   |   |   |  |   |   |   |
| HCM 6th LOS                  | A   |   |   |   |   |   |   |   |  |   |   |   |



HCM 6th TWSC  
1: Site Driveway & Allen Road

2024 Build Condition  
Weekday Morning Peak Hour

Intersection

Int Delay, s/veh 2.4

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↱    |      | ↱    | ↱    | ↱    | ↱    |
| Traffic Vol, veh/h       | 493  | 50   | 166  | 234  | 10   | 34   |
| Future Vol, veh/h        | 493  | 50   | 166  | 234  | 10   | 34   |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | 125  | -    | 0    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 88   | 88   | 88   | 88   | 88   | 88   |
| Heavy Vehicles, %        | 1    | 0    | 0    | 8    | 0    | 0    |
| Mvmt Flow                | 560  | 57   | 189  | 266  | 11   | 39   |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 617    |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Critical Hdwy        | -      | -      | 4.1    |
| Critical Hdwy Stg 1  | -      | -      | -      |
| Critical Hdwy Stg 2  | -      | -      | -      |
| Follow-up Hdwy       | -      | -      | 2.2    |
| Pot Cap-1 Maneuver   | -      | -      | 973    |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | -      | 973    |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |

| Approach             | EB | WB | NB   |
|----------------------|----|----|------|
| HCM Control Delay, s | 0  | 4  | 17.4 |
| HCM LOS              |    |    | C    |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | 340   | -   | -   | 973   | -   |
| HCM Lane V/C Ratio    | 0.147 | -   | -   | 0.194 | -   |
| HCM Control Delay (s) | 17.4  | -   | -   | 9.6   | -   |
| HCM Lane LOS          | C     | -   | -   | A     | -   |
| HCM 95th %tile Q(veh) | 0.5   | -   | -   | 0.7   | -   |



HCM 6th AWSC  
2: Somerville Road & Allen Road

2024 Build Condition  
Weekday Morning Peak Hour

Intersection

Intersection Delay, s/veh 12.7  
Intersection LOS B

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↰    | ↱    |      | ↰    | ↱    |      |      | ↕    |      |      | ↱    | ↰    |
| Traffic Vol, veh/h  | 121  | 333  | 0    | 16   | 159  | 47   | 7    | 4    | 27   | 76   | 3    | 88   |
| Future Vol, veh/h   | 121  | 333  | 0    | 16   | 159  | 47   | 7    | 4    | 27   | 76   | 3    | 88   |
| Peak Hour Factor    | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Heavy Vehicles, %   | 2    | 1    | 0    | 10   | 5    | 0    | 14   | 0    | 0    | 0    | 0    | 6    |
| Mvmt Flow           | 134  | 370  | 0    | 18   | 177  | 52   | 8    | 4    | 30   | 84   | 3    | 98   |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 1    |


| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 1    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 2    | 2    | 2    |
| HCM Control Delay          | 14.2 | 11.7 | 10.3 | 10.4 |
| HCM LOS                    | B    | B    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 18%   | 100%  | 0%    | 100%  | 0%    | 96%   | 0%    |
| Vol Thru, %            | 11%   | 0%    | 100%  | 0%    | 77%   | 4%    | 0%    |
| Vol Right, %           | 71%   | 0%    | 0%    | 0%    | 23%   | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 38    | 121   | 333   | 16    | 206   | 79    | 88    |
| LT Vol                 | 7     | 121   | 0     | 16    | 0     | 76    | 0     |
| Through Vol            | 4     | 0     | 333   | 0     | 159   | 3     | 0     |
| RT Vol                 | 27    | 0     | 0     | 0     | 47    | 0     | 88    |
| Lane Flow Rate         | 42    | 134   | 370   | 18    | 229   | 88    | 98    |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.078 | 0.227 | 0.572 | 0.032 | 0.368 | 0.171 | 0.158 |
| Departure Headway (Hd) | 6.649 | 6.084 | 5.562 | 6.544 | 5.789 | 7.002 | 5.805 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 538   | 592   | 651   | 548   | 623   | 513   | 618   |
| Service Time           | 4.694 | 3.81  | 3.288 | 4.277 | 3.523 | 4.739 | 3.541 |
| HCM Lane V/C Ratio     | 0.078 | 0.226 | 0.568 | 0.033 | 0.368 | 0.172 | 0.159 |
| HCM Control Delay      | 10.3  | 10.6  | 15.5  | 9.5   | 11.9  | 11.2  | 9.6   |
| HCM Lane LOS           | B     | B     | C     | A     | B     | B     | A     |
| HCM 95th-tile Q        | 0.3   | 0.9   | 3.6   | 0.1   | 1.7   | 0.6   | 0.6   |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road

2024 Build Condition  
Weekday Morning Peak Hour

|                              |  |      |      |      |      |      |      |      |      |      |      |      |
|------------------------------|--|------|------|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  | ↰    | ↱    |      | ↰    | ↱    |      | ↰    | ↱    |      | ↰    | ↱    |
| Traffic Volume (veh/h)       | 100  | 2    | 344  | 1    | 1    | 7    | 470  | 740  | 8    | 2    | 931  | 217  |
| Future Volume (veh/h)        | 100  | 2    | 344  | 1    | 1    | 7    | 470  | 740  | 8    | 2    | 931  | 217  |
| Initial Q (Qb), veh          | 0  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00   |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        | No   |      |      | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       | 1870   | 1900 | 1885 | 1900 | 1900 | 1693 | 1870 | 1856 | 1900 | 1900 | 1856 | 1885 |
| Adj Flow Rate, veh/h         | 105  | 2    | 218  | 1    | 1    | 7    | 495  | 779  | 8    | 2    | 980  | 228  |
| Peak Hour Factor             | 0.95   | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Percent Heavy Veh, %         | 2  | 0    | 1    | 0    | 0    | 14   | 2    | 3    | 0    | 0    | 3    | 1    |
| Cap, veh/h                   | 267  | 4    | 483  | 52   | 41   | 169  | 521  | 2531 | 26   | 466  | 1541 | 358  |
| Arrive On Green              | 0.13   | 0.13 | 0.13 | 0.13 | 0.13 | 0.13 | 0.34 | 1.00 | 1.00 | 0.00 | 0.54 | 0.54 |
| Sat Flow, veh/h              | 1417   | 33   | 1598 | 56   | 307  | 1273 | 1781 | 3575 | 37   | 1810 | 2840 | 659  |
| Grp Volume(v), veh/h         | 107  | 0    | 218  | 9    | 0    | 0    | 495  | 384  | 403  | 2    | 607  | 601  |
| Grp Sat Flow(s), veh/h/ln    | 1450   | 0    | 1598 | 1636 | 0    | 0    | 1781 | 1763 | 1849 | 1810 | 1763 | 1737 |
| Q Serve(g_s), s              | 5.7  | 0.0  | 9.9  | 0.0  | 0.0  | 0.0  | 12.3 | 0.0  | 0.0  | 0.0  | 21.6 | 21.8 |
| Cycle Q Clear(g_c), s        | 6.2  | 0.0  | 9.9  | 0.4  | 0.0  | 0.0  | 12.3 | 0.0  | 0.0  | 0.0  | 21.6 | 21.8 |
| Prop In Lane                 | 0.98   |      | 1.00 | 0.11 |      | 0.78 | 1.00 |      | 0.02 | 1.00 |      | 0.38 |
| Lane Grp Cap(c), veh/h       | 272  | 0    | 483  | 261  | 0    | 0    | 521  | 1248 | 1309 | 466  | 956  | 942  |
| V/C Ratio(X)                 | 0.39   | 0.00 | 0.45 | 0.03 | 0.00 | 0.00 | 0.95 | 0.31 | 0.31 | 0.00 | 0.64 | 0.64 |
| Avail Cap(c_a), veh/h        | 273  | 0    | 484  | 263  | 0    | 0    | 635  | 1248 | 1309 | 881  | 956  | 942  |
| HCM Platoon Ratio            | 1.00   | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00   | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.72 | 0.72 | 0.72 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 36.5   | 0.0  | 25.4 | 34.0 | 0.0  | 0.0  | 11.7 | 0.0  | 0.0  | 9.3  | 14.4 | 14.4 |
| Incr Delay (d2), s/veh       | 0.9  | 0.0  | 0.7  | 0.1  | 0.0  | 0.0  | 17.5 | 0.5  | 0.4  | 0.0  | 3.2  | 3.3  |
| Initial Q Delay(d3), s/veh   | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%), veh/ln    | 2.2  | 0.0  | 3.7  | 0.2  | 0.0  | 0.0  | 6.7  | 0.2  | 0.2  | 0.0  | 8.1  | 8.1  |
| Unsig. Movement Delay, s/veh |  |      |      |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d), s/veh        | 37.4   | 0.0  | 26.0 | 34.1 | 0.0  | 0.0  | 29.2 | 0.5  | 0.4  | 9.3  | 17.6 | 17.7 |
| LnGrp LOS                    | D  | A    | C    | C    | A    | A    | C    | A    | A    | A    | B    | B    |
| Approach Vol, veh/h          | 325  |      |      | 9    |      |      | 1282 |      |      | 1210 |      |      |
| Approach Delay, s/veh        | 29.8   |      |      | 34.1 |      |      | 11.5 |      |      | 17.6 |      |      |
| Approach LOS                 | C  |      |      | C    |      |      | B    |      |      | B    |      |      |
| Timer - Assigned Phs         | 1  | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 3.3  | 69.7 |      | 16.9 | 18.3 | 54.8 |      | 16.9 |      |      |      |      |
| Change Period (Y+Rc), s      | 3.0  | 6.0  |      | 5.0  | 3.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 43.0   | 43.0 |      | 12.0 | 21.0 | 43.0 |      | 12.0 |      |      |      |      |
| Max Q Clear Time (g_c+I), s  | 2.0  | 2.0  |      | 11.9 | 14.3 | 23.8 |      | 2.4  |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0  | 4.9  |      | 0.0  | 0.9  | 7.5  |      | 0.0  |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 16.3  
HCM 6th LOS B


## Notes

User approved pedestrian interval to be less than phase max green.



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2024 Build Condition  
Weekday Morning Peak Hour

|                              |  |     |     |      |      |      |      |      |      |      |      |      |
|------------------------------|--|-----|-----|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL  | EBT | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  |     |     |      |      |      |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 0  | 0   | 0   | 325  | 0    | 552  | 0    | 902  | 117  | 0    | 929  | 209  |
| Future Volume (veh/h)        | 0  | 0   | 0   | 325  | 0    | 552  | 0    | 902  | 117  | 0    | 929  | 209  |
| Initial Q (Qb), veh          |  |     |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |  |     |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |  |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |  |     |     | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |  |     |     | 2051 | 2067 | 2150 | 0    | 2051 | 1887 | 0    | 2084 | 2018 |
| Adj Flow Rate, veh/h         |  |     |     | 361  | 0    | 442  | 0    | 1002 | 0    | 0    | 1032 | 0    |
| Peak Hour Factor             |  |     |     | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 | 0.90 |
| Percent Heavy Veh, %         |  |     |     | 3    | 2    | 2    | 0    | 3    | 13   | 0    | 1    | 5    |
| Cap, veh/h                   |  |     |     | 1035 | 0    | 483  | 0    | 2344 |      | 0    | 2382 |      |
| Arrive On Green              |  |     |     | 0.27 | 0.00 | 0.27 | 0.00 | 0.80 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h              |  |     |     | 3906 | 0    | 1822 | 0    | 3999 | 1599 | 0    | 4063 | 1710 |
| Grp Volume(v), veh/h         |  |     |     | 361  | 0    | 442  | 0    | 1002 | 0    | 0    | 1032 | 0    |
| Grp Sat Flow(s),veh/h/ln     |  |     |     | 1953 | 0    | 1822 | 0    | 1948 | 1599 | 0    | 1979 | 1710 |
| Q Serve(g_s), s              |  |     |     | 6.7  | 0.0  | 21.2 | 0.0  | 7.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s        |  |     |     | 6.7  | 0.0  | 21.2 | 0.0  | 7.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop In Lane                 |  |     |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |  |     |     | 1035 | 0    | 483  | 0    | 2344 |      | 0    | 2382 |      |
| V/C Ratio(X)                 |  |     |     | 0.35 | 0.00 | 0.92 | 0.00 | 0.43 |      | 0.00 | 0.43 |      |
| Avail Cap(c_a), veh/h        |  |     |     | 1085 | 0    | 506  | 0    | 2344 |      | 0    | 2382 |      |
| HCM Platoon Ratio            |  |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.33 | 1.33 | 1.00 | 2.00 | 2.00 |
| Upstream Filter(I)           |  |     |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.93 | 0.00 | 0.00 | 0.73 | 0.00 |
| Uniform Delay (d), s/veh     |  |     |     | 26.8 | 0.0  | 32.1 | 0.0  | 4.3  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh       |  |     |     | 0.2  | 0.0  | 20.9 | 0.0  | 0.5  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |  |     |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |  |     |     | 3.1  | 0.0  | 11.8 | 0.0  | 2.0  | 0.0  | 0.0  | 0.1  | 0.0  |
| Unsig. Movement Delay, s/veh |  |     |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |  |     |     | 27.0 | 0.0  | 53.0 | 0.0  | 4.8  | 0.0  | 0.0  | 0.4  | 0.0  |
| LnGrp LOS                    |  |     |     | C    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |  |     |     | 803  |      |      | 1002 |      |      | 1032 |      |      |
| Approach Delay, s/veh        |  |     |     | 41.3 |      |      | 4.8  |      |      | 0.4  |      |      |
| Approach LOS                 |  |     |     | D    |      |      | A    |      |      | A    |      |      |
| Timer - Assigned Phs         | 2  |     |     | 6    |      |      | 8    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 61.1   |     |     | 61.1 |      |      | 28.9 |      |      |      |      |      |
| Change Period (Y+Rc), s      | 7.0  |     |     | 7.0  |      |      | 5.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s  | 53.0   |     |     | 53.0 |      |      | 25.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 9.0  |     |     | 2.0  |      |      | 23.2 |      |      |      |      |      |
| Green Ext Time (p_c), s      | 8.0  |     |     | 8.4  |      |      | 0.7  |      |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 13.5  
HCM 6th LOS B

## Notes

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 5: Liberty Corner Road & I-78 EB Ramp

2024 Build Condition  
Weekday Morning Peak Hour

|   | EBL  | EBT  | EBR  | WBL  | WBT | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---|------|------|------|------|-----|------|------|------|------|------|------|------|
| Movement  | EBL  | EBT  | EBR  | WBL  | WBT | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations   | ↰    | →    | ↱    | ↰    | →   | ↱    | ↰    | →    | ↱    | ↰    | →    | ↱    |
| Traffic Volume (veh/h)  | 411  | 0    | 187  | 0    | 0   | 0    | 0    | 576  | 408  | 0    | 810  | 452  |
| Future Volume (veh/h)   | 411  | 0    | 187  | 0    | 0   | 0    | 0    | 576  | 408  | 0    | 810  | 452  |
| Initial Q (Qb), veh   | 0    | 0    | 0    |      |     |      | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)   | 1.00 |      | 1.00 |      |     |      | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj  | 1.00 | 1.00 | 1.00 |      |     |      | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach   | No   |      |      |      |     |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln  | 2034 | 0    | 2051 |      |     |      | 0    | 2034 | 2084 | 0    | 2067 | 2084 |
| Adj Flow Rate, veh/h  | 467  | 0    | 212  |      |     |      | 0    | 655  | 0    | 0    | 920  | 0    |
| Peak Hour Factor  | 0.88 | 0.88 | 0.88 |      |     |      | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 | 0.88 |
| Percent Heavy Veh, %  | 4    | 0    | 3    |      |     |      | 0    | 4    | 1    | 0    | 2    | 1    |
| Cap, veh/h  | 638  | 0    | 519  |      |     |      | 0    | 3871 |      | 0    | 2738 |      |
| Arrive On Green   | 0.17 | 0.00 | 0.17 |      |     |      | 0.00 | 0.70 | 0.00 | 0.00 | 1.00 | 0.00 |
| Sat Flow, veh/h   | 3759 | 0    | 3059 |      |     |      | 0    | 5737 | 1766 | 0    | 4031 | 1766 |
| Grp Volume(v), veh/h  | 467  | 0    | 212  |      |     |      | 0    | 655  | 0    | 0    | 920  | 0    |
| Grp Sat Flow(s), veh/h/ln   | 1879 | 0    | 1529 |      |     |      | 0    | 1851 | 1766 | 0    | 1964 | 1766 |
| Q Serve(g_s), s   | 10.6 | 0.0  | 5.6  |      |     |      | 0.0  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| Cycle Q Clear(g_c), s   | 10.6 | 0.0  | 5.6  |      |     |      | 0.0  | 3.6  | 0.0  | 0.0  | 0.0  | 0.0  |
| Prop In Lane  | 1.00 |      | 1.00 |      |     |      | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h  | 638  | 0    | 519  |      |     |      | 0    | 3871 |      | 0    | 2738 |      |
| V/C Ratio(X)  | 0.73 | 0.00 | 0.41 |      |     |      | 0.00 | 0.17 |      | 0.00 | 0.34 |      |
| Avail Cap(c_a), veh/h   | 1671 | 0    | 1360 |      |     |      | 0    | 3871 |      | 0    | 2738 |      |
| HCM Platoon Ratio   | 1.00 | 1.00 | 1.00 |      |     |      | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 |
| Upstream Filter(I)  | 1.00 | 0.00 | 1.00 |      |     |      | 0.00 | 1.00 | 0.00 | 0.00 | 0.91 | 0.00 |
| Uniform Delay (d), s/veh  | 35.4 | 0.0  | 33.3 |      |     |      | 0.0  | 4.7  | 0.0  | 0.0  | 0.0  | 0.0  |
| Incr Delay (d2), s/veh  | 1.6  | 0.0  | 0.5  |      |     |      | 0.0  | 0.1  | 0.0  | 0.0  | 0.3  | 0.0  |
| Initial Q Delay(d3),s/veh   | 0.0  | 0.0  | 0.0  |      |     |      | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln  | 4.9  | 0.0  | 2.1  |      |     |      | 0.0  | 1.0  | 0.0  | 0.0  | 0.1  | 0.0  |
| Unsig. Movement Delay, s/veh  |      |      |      |      |     |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh  | 37.1 | 0.0  | 33.9 |      |     |      | 0.0  | 4.8  | 0.0  | 0.0  | 0.3  | 0.0  |
| LnGrp LOS   | D    | A    | C    |      |     |      | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h   |      | 679  |      |      |     |      |      | 655  |      |      | 920  |      |
| Approach Delay, s/veh   |      | 36.1 |      |      |     |      |      | 4.8  |      |      | 0.3  |      |
| Approach LOS  |      | D    |      |      |     |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs  |      | 2    |      | 4    |     | 6    |      |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s  |      | 69.7 |      | 20.3 |     | 69.7 |      |      |      |      |      |      |
| Change Period (Y+Rc), s   |      | 7.0  |      | 5.0  |     | 7.0  |      |      |      |      |      |      |
| Max Green Setting (Gmax), s   |      | 38.0 |      | 40.0 |     | 38.0 |      |      |      |      |      |      |
| Max Q Clear Time (g_c+I1), s  |      | 5.6  |      | 12.6 |     | 2.0  |      |      |      |      |      |      |
| Green Ext Time (p_c), s   |      | 4.5  |      | 2.7  |     | 6.9  |      |      |      |      |      |      |
| Intersection Summary  |      |      |      |      |     |      |      |      |      |      |      |      |
| HCM 6th Ctrl Delay  |      |      | 12.4 |      |     |      |      |      |      |      |      |      |
| HCM 6th LOS   |      |      | B    |      |     |      |      |      |      |      |      |      |
| Notes   |      |      |      |      |     |      |      |      |      |      |      |      |
| Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay. |      |      |      |      |     |      |      |      |      |      |      |      |



HCM 6th TWSC  
1: Site Driveway & Allen Road

2024 Build Condition  
Weekday Evening Peak Hour

Intersection

Int Delay, s/veh 3.8

| Movement                 | EBT  | EBR  | WBL  | WBT  | NBL  | NBR  |
|--------------------------|------|------|------|------|------|------|
| Lane Configurations      | ↶    |      | ↷    | ↶    | ↷    |      |
| Traffic Vol, veh/h       | 356  | 13   | 52   | 461  | 44   | 154  |
| Future Vol, veh/h        | 356  | 13   | 52   | 461  | 44   | 154  |
| Conflicting Peds, #/hr   | 0    | 0    | 0    | 0    | 0    | 0    |
| Sign Control             | Free | Free | Free | Free | Stop | Stop |
| RT Channelized           | -    | None | -    | None | -    | None |
| Storage Length           | -    | -    | 125  | -    | 0    | -    |
| Veh in Median Storage, # | 0    | -    | -    | 0    | 0    | -    |
| Grade, %                 | 0    | -    | -    | 0    | 0    | -    |
| Peak Hour Factor         | 91   | 91   | 91   | 91   | 91   | 91   |
| Heavy Vehicles, %        | 1    | 0    | 25   | 1    | 0    | 0    |
| Mvmt Flow                | 391  | 14   | 57   | 507  | 48   | 169  |

| Major/Minor          | Major1 | Major2 | Minor1 |
|----------------------|--------|--------|--------|
| Conflicting Flow All | 0      | 0      | 405    |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Critical Hdwy        | -      | -      | 4.35   |
| Critical Hdwy Stg 1  | -      | -      | -      |
| Critical Hdwy Stg 2  | -      | -      | -      |
| Follow-up Hdwy       | -      | -      | 2.425  |
| Pot Cap-1 Maneuver   | -      | -      | 1040   |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |
| Platoon blocked, %   | -      | -      | -      |
| Mov Cap-1 Maneuver   | -      | -      | 1040   |
| Mov Cap-2 Maneuver   | -      | -      | -      |
| Stage 1              | -      | -      | -      |
| Stage 2              | -      | -      | -      |

| Approach             | EB | WB  | NB   |
|----------------------|----|-----|------|
| HCM Control Delay, s | 0  | 0.9 | 18.5 |
| HCM LOS              |    |     | C    |

| Minor Lane/Major Mvmt | NBLn1 | EBT | EBR | WBL   | WBT |
|-----------------------|-------|-----|-----|-------|-----|
| Capacity (veh/h)      | 482   | -   | -   | 1040  | -   |
| HCM Lane V/C Ratio    | 0.451 | -   | -   | 0.055 | -   |
| HCM Control Delay (s) | 18.5  | -   | -   | 8.7   | -   |
| HCM Lane LOS          | C     | -   | -   | A     | -   |
| HCM 95th %tile Q(veh) | 2.3   | -   | -   | 0.2   | -   |



HCM 6th AWSC  
2: Somerville Road & Allen Road

2024 Build Condition  
Weekday Evening Peak Hour

| Intersection              |      |
|---------------------------|------|
| Intersection Delay, s/veh | 27.3 |
| Intersection LOS          | D    |

| Movement            | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|---------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations | ↰    | ↱    |      | ↰    | ↱    |      |      | ↕    |      |      | ↱    | ↰    |
| Traffic Vol, veh/h  | 84   | 220  | 8    | 54   | 440  | 25   | 26   | 11   | 20   | 9    | 9    | 203  |
| Future Vol, veh/h   | 84   | 220  | 8    | 54   | 440  | 25   | 26   | 11   | 20   | 9    | 9    | 203  |
| Peak Hour Factor    | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 | 0.87 |
| Heavy Vehicles, %   | 0    | 1    | 0    | 0    | 1    | 0    | 0    | 18   | 0    | 0    | 0    | 0    |
| Mvmt Flow           | 97   | 253  | 9    | 62   | 506  | 29   | 30   | 13   | 23   | 10   | 10   | 233  |
| Number of Lanes     | 1    | 1    | 0    | 1    | 1    | 0    | 0    | 1    | 0    | 0    | 1    | 1    |

| Approach                   | EB   | WB   | NB   | SB   |
|----------------------------|------|------|------|------|
| Opposing Approach          | WB   | EB   | SB   | NB   |
| Opposing Lanes             | 2    | 2    | 2    | 1    |
| Conflicting Approach Left  | SB   | NB   | EB   | WB   |
| Conflicting Lanes Left     | 2    | 1    | 2    | 2    |
| Conflicting Approach Right | NB   | SB   | WB   | EB   |
| Conflicting Lanes Right    | 1    | 2    | 2    | 2    |
| HCM Control Delay          | 14.3 | 42.5 | 12.2 | 14.1 |
| HCM LOS                    | B    | E    | B    | B    |

| Lane                   | NBLn1 | EBLn1 | EBLn2 | WBLn1 | WBLn2 | SBLn1 | SBLn2 |
|------------------------|-------|-------|-------|-------|-------|-------|-------|
| Vol Left, %            | 46%   | 100%  | 0%    | 100%  | 0%    | 50%   | 0%    |
| Vol Thru, %            | 19%   | 0%    | 96%   | 0%    | 95%   | 50%   | 0%    |
| Vol Right, %           | 35%   | 0%    | 4%    | 0%    | 5%    | 0%    | 100%  |
| Sign Control           | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  | Stop  |
| Traffic Vol by Lane    | 57    | 84    | 228   | 54    | 465   | 18    | 203   |
| LT Vol                 | 26    | 84    | 0     | 54    | 0     | 9     | 0     |
| Through Vol            | 11    | 0     | 220   | 0     | 440   | 9     | 0     |
| RT Vol                 | 20    | 0     | 8     | 0     | 25    | 0     | 203   |
| Lane Flow Rate         | 66    | 97    | 262   | 62    | 534   | 21    | 233   |
| Geometry Grp           | 6     | 7     | 7     | 7     | 7     | 7     | 7     |
| Degree of Util (X)     | 0.143 | 0.191 | 0.481 | 0.117 | 0.927 | 0.044 | 0.431 |
| Departure Headway (Hd) | 7.833 | 7.132 | 6.613 | 6.773 | 6.244 | 7.615 | 6.643 |
| Convergence, Y/N       | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   | Yes   |
| Cap                    | 457   | 505   | 548   | 531   | 583   | 470   | 541   |
| Service Time           | 5.893 | 4.848 | 4.329 | 4.484 | 3.954 | 5.357 | 4.385 |
| HCM Lane V/C Ratio     | 0.144 | 0.192 | 0.478 | 0.117 | 0.916 | 0.045 | 0.431 |
| HCM Control Delay      | 12.2  | 11.5  | 15.3  | 10.4  | 46.2  | 10.7  | 14.4  |
| HCM Lane LOS           | B     | B     | C     | B     | E     | B     | B     |
| HCM 95th-tile Q        | 0.5   | 0.7   | 2.6   | 0.4   | 11.8  | 0.1   | 2.2   |



# HCM 6th Signalized Intersection Summary 3: Liberty Corner Road & Allen Road

2024 Build Condition  
Weekday Evening Peak Hour

| Movement                     | EBL  | EBT  | EBR  | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
|------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Lane Configurations          |      | ↖    | ↗    |      | ↖    | ↗    |      | ↖    | ↗    |      | ↖    | ↗    |
| Traffic Volume (veh/h)       | 204  | 0    | 423  | 7    | 3    | 2    | 378  | 1051 | 3    | 3    | 738  | 170  |
| Future Volume (veh/h)        | 204  | 0    | 423  | 7    | 3    | 2    | 378  | 1051 | 3    | 3    | 738  | 170  |
| Initial Q (Qb), veh          | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        | No   |      |      | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       | 1900 | 1900 | 1900 | 1693 | 1900 | 1900 | 1870 | 1885 | 1900 | 1900 | 1870 | 1885 |
| Adj Flow Rate, veh/h         | 212  | 0    | 311  | 7    | 3    | 2    | 394  | 1095 | 3    | 3    | 769  | 177  |
| Peak Hour Factor             | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, %         | 0    | 0    | 0    | 14   | 0    | 0    | 2    | 1    | 0    | 0    | 2    | 1    |
| Cap, veh/h                   | 311  | 0    | 518  | 73   | 29   | 10   | 489  | 2399 | 7    | 340  | 1581 | 364  |
| Arrive On Green              | 0.21 | 0.00 | 0.21 | 0.21 | 0.21 | 0.21 | 0.11 | 0.65 | 0.65 | 0.01 | 0.55 | 0.55 |
| Sat Flow, veh/h              | 1155 | 0    | 1610 | 99   | 136  | 47   | 1781 | 3664 | 10   | 1810 | 2868 | 660  |
| Grp Volume(v), veh/h         | 212  | 0    | 311  | 12   | 0    | 0    | 394  | 535  | 563  | 3    | 476  | 470  |
| Grp Sat Flow(s), veh/h/ln    | 1155 | 0    | 1610 | 282  | 0    | 0    | 1781 | 1791 | 1883 | 1810 | 1777 | 1752 |
| Q Serve(g_s), s              | 0.0  | 0.0  | 17.9 | 0.2  | 0.0  | 0.0  | 10.0 | 16.2 | 16.2 | 0.1  | 18.1 | 18.1 |
| Cycle Q Clear(g_c), s        | 20.3 | 0.0  | 17.9 | 20.5 | 0.0  | 0.0  | 10.0 | 16.2 | 16.2 | 0.1  | 18.1 | 18.1 |
| Prop In Lane                 | 1.00 |      | 1.00 | 0.58 |      | 0.17 | 1.00 |      | 0.01 | 1.00 |      | 0.38 |
| Lane Grp Cap(c), veh/h       | 311  | 0    | 518  | 112  | 0    | 0    | 489  | 1172 | 1233 | 340  | 979  | 965  |
| V/C Ratio(X)                 | 0.68 | 0.00 | 0.60 | 0.11 | 0.00 | 0.00 | 0.81 | 0.46 | 0.46 | 0.01 | 0.49 | 0.49 |
| Avail Cap(c_a), veh/h        | 462  | 0    | 688  | 249  | 0    | 0    | 489  | 1172 | 1233 | 528  | 979  | 965  |
| HCM Platoon Ratio            | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           | 1.00 | 0.00 | 1.00 | 1.00 | 0.00 | 0.00 | 0.84 | 0.84 | 0.84 | 1.00 | 1.00 | 1.00 |
| Uniform Delay (d), s/veh     | 42.1 | 0.0  | 31.4 | 36.0 | 0.0  | 0.0  | 12.8 | 9.4  | 9.4  | 10.9 | 15.1 | 15.1 |
| Incr Delay (d2), s/veh       | 1.0  | 0.0  | 0.4  | 0.2  | 0.0  | 0.0  | 7.6  | 1.1  | 1.0  | 0.0  | 1.7  | 1.8  |
| Initial Q Delay(d3),s/veh    | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     | 6.5  | 0.0  | 6.8  | 0.3  | 0.0  | 0.0  | 4.2  | 5.7  | 5.9  | 0.0  | 7.1  | 7.0  |
| Unsig. Movement Delay, s/veh |      |      |      |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         | 43.1 | 0.0  | 31.8 | 36.1 | 0.0  | 0.0  | 20.4 | 10.4 | 10.4 | 10.9 | 16.9 | 16.9 |
| LnGrp LOS                    | D    | A    | C    | D    | A    | A    | C    | B    | B    | B    | B    | B    |
| Approach Vol, veh/h          | 523  |      |      | 12   |      |      | 1492 |      |      | 949  |      |      |
| Approach Delay, s/veh        | 36.4 |      |      | 36.1 |      |      | 13.0 |      |      | 16.9 |      |      |
| Approach LOS                 | D    |      |      | D    |      |      | B    |      |      | B    |      |      |
| Timer - Assigned Phs         | 1    | 2    |      | 4    | 5    | 6    |      | 8    |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 3.6  | 78.0 |      | 28.4 | 15.0 | 66.6 |      | 28.4 |      |      |      |      |
| Change Period (Y+Rc), s      | 3.0  | 6.0  |      | 5.0  | 3.0  | 6.0  |      | 5.0  |      |      |      |      |
| Max Green Setting (Gmax), s  | 49.0 |      |      | 35.0 | 12.0 | 49.0 |      | 35.0 |      |      |      |      |
| Max Q Clear Time (g_c+I), s  | 18.2 |      |      | 22.3 | 12.0 | 20.1 |      | 22.5 |      |      |      |      |
| Green Ext Time (p_c), s      | 0.0  | 4.3  |      | 1.1  | 0.0  | 3.6  |      | 0.0  |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 18.4  
HCM 6th LOS B


## Notes

User approved pedestrian interval to be less than phase max green.



# HCM 6th Signalized Intersection Summary 4: Liberty Corner Road & I-78 WB Ramp

2024 Build Condition  
Weekday Evening Peak Hour

|                              |  |     |     |      |      |      |      |      |      |      |      |      |
|------------------------------|--|-----|-----|------|------|------|------|------|------|------|------|------|
| Movement                     | EBL  | EBT | EBR | WBL  | WBT  | WBR  | NBL  | NBT  | NBR  | SBL  | SBT  | SBR  |
| Lane Configurations          |  |     |     |      |      |      |      |      |      |      |      |      |
| Traffic Volume (veh/h)       | 0  | 0   | 0   | 369  | 0    | 515  | 0    | 588  | 217  | 0    | 1177 | 456  |
| Future Volume (veh/h)        | 0  | 0   | 0   | 369  | 0    | 515  | 0    | 588  | 217  | 0    | 1177 | 456  |
| Initial Q (Qb), veh          |  |     |     | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| Ped-Bike Adj(A_pbT)          |  |     |     | 1.00 |      | 1.00 | 1.00 |      | 1.00 | 1.00 |      | 1.00 |
| Parking Bus, Adj             |  |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Work Zone On Approach        |  |     |     | No   |      |      | No   |      |      | No   |      |      |
| Adj Sat Flow, veh/h/ln       |  |     |     | 2034 | 2067 | 2167 | 0    | 2084 | 2067 | 0    | 2067 | 2084 |
| Adj Flow Rate, veh/h         |  |     |     | 384  | 0    | 275  | 0    | 612  | 0    | 0    | 1226 | 0    |
| Peak Hour Factor             |  |     |     | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 | 0.96 |
| Percent Heavy Veh, %         |  |     |     | 4    | 2    | 1    | 0    | 1    | 2    | 0    | 2    | 1    |
| Cap, veh/h                   |  |     |     | 683  | 0    | 324  | 0    | 2733 |      | 0    | 2712 |      |
| Arrive On Green              |  |     |     | 0.18 | 0.00 | 0.18 | 0.00 | 1.00 | 0.00 | 0.00 | 0.69 | 0.00 |
| Sat Flow, veh/h              |  |     |     | 3875 | 0    | 1836 | 0    | 4063 | 1752 | 0    | 4031 | 1766 |
| Grp Volume(v), veh/h         |  |     |     | 384  | 0    | 275  | 0    | 612  | 0    | 0    | 1226 | 0    |
| Grp Sat Flow(s),veh/h/ln     |  |     |     | 1938 | 0    | 1836 | 0    | 1979 | 1752 | 0    | 1964 | 1766 |
| Q Serve(g_s), s              |  |     |     | 8.2  | 0.0  | 13.1 | 0.0  | 0.0  | 0.0  | 0.0  | 12.6 | 0.0  |
| Cycle Q Clear(g_c), s        |  |     |     | 8.2  | 0.0  | 13.1 | 0.0  | 0.0  | 0.0  | 0.0  | 12.6 | 0.0  |
| Prop In Lane                 |  |     |     | 1.00 |      | 1.00 | 0.00 |      | 1.00 | 0.00 |      | 1.00 |
| Lane Grp Cap(c), veh/h       |  |     |     | 683  | 0    | 324  | 0    | 2733 |      | 0    | 2712 |      |
| V/C Ratio(X)                 |  |     |     | 0.56 | 0.00 | 0.85 | 0.00 | 0.22 |      | 0.00 | 0.45 |      |
| Avail Cap(c_a), veh/h        |  |     |     | 775  | 0    | 367  | 0    | 2733 |      | 0    | 2712 |      |
| HCM Platoon Ratio            |  |     |     | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 |
| Upstream Filter(I)           |  |     |     | 1.00 | 0.00 | 1.00 | 0.00 | 0.98 | 0.00 | 0.00 | 0.80 | 0.00 |
| Uniform Delay (d), s/veh     |  |     |     | 33.9 | 0.0  | 35.9 | 0.0  | 0.0  | 0.0  | 0.0  | 6.3  | 0.0  |
| Incr Delay (d2), s/veh       |  |     |     | 0.7  | 0.0  | 15.5 | 0.0  | 0.2  | 0.0  | 0.0  | 0.4  | 0.0  |
| Initial Q Delay(d3),s/veh    |  |     |     | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  | 0.0  |
| %ile BackOfQ(50%),veh/ln     |  |     |     | 3.8  | 0.0  | 7.1  | 0.0  | 0.1  | 0.0  | 0.0  | 3.9  | 0.0  |
| Unsig. Movement Delay, s/veh |  |     |     |      |      |      |      |      |      |      |      |      |
| LnGrp Delay(d),s/veh         |  |     |     | 34.6 | 0.0  | 51.4 | 0.0  | 0.2  | 0.0  | 0.0  | 6.7  | 0.0  |
| LnGrp LOS                    |  |     |     | C    | A    | D    | A    | A    |      | A    | A    |      |
| Approach Vol, veh/h          |  |     |     |      | 659  |      |      | 612  |      |      | 1226 |      |
| Approach Delay, s/veh        |  |     |     |      | 41.6 |      |      | 0.2  |      |      | 6.7  |      |
| Approach LOS                 |  |     |     |      | D    |      |      | A    |      |      | A    |      |
| Timer - Assigned Phs         | 2  |     |     | 6    |      |      | 8    |      |      |      |      |      |
| Phs Duration (G+Y+Rc), s     | 69.1   |     |     | 69.1 |      |      | 20.9 |      |      |      |      |      |
| Change Period (Y+Rc), s      | 7.0  |     |     | 7.0  |      |      | 5.0  |      |      |      |      |      |
| Max Green Setting (Gmax), s  | 60.0   |     |     | 60.0 |      |      | 18.0 |      |      |      |      |      |
| Max Q Clear Time (g_c+I1), s | 2.0  |     |     | 14.6 |      |      | 15.1 |      |      |      |      |      |
| Green Ext Time (p_c), s      | 4.2  |     |     | 10.9 |      |      | 0.8  |      |      |      |      |      |

## Intersection Summary

HCM 6th Ctrl Delay 14.3  
HCM 6th LOS B

## Notes






















User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



# HCM 6th Signalized Intersection Summary 5: Liberty Corner Road & I-78 EB Ramp

2024 Build Condition  
Weekday Evening Peak Hour

|                              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|------------------------------|---|---|---|---|---|---|---|---|---|--|---|---|---|---|---|
| Movement                     | EBL   | EBT   | EBR   | WBL   | WBT   | WBR   | NBL   | NBT   | NBR   | SBL  | SBT   | SBR   |   |   |   |
| Lane Configurations          |  |   |  |   |   |   |   |  |  |  |  |  |   |   |   |
| Traffic Volume (veh/h)       | 180   | 0   | 116   | 0   | 0   | 0   | 0   | 607   | 467   | 0  | 896   | 624   |   |   |   |
| Future Volume (veh/h)        | 180   | 0   | 116   | 0   | 0   | 0   | 0   | 607   | 467   | 0  | 896   | 624   |   |   |   |
| Initial Q (Qb), veh          | 0   | 0   | 0   |   |   |   | 0   | 0   | 0   | 0  | 0   | 0   |   |   |   |
| Ped-Bike Adj(A_pbT)          | 1.00  |   | 1.00  |   |   |   | 1.00  |   | 1.00  | 1.00   |   | 1.00  |   |   |   |
| Parking Bus, Adj             | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |   |   |   |
| Work Zone On Approach        | No  |   |   |   |   |   | No  |   |   | No   |   |   |   |   |   |
| Adj Sat Flow, veh/h/ln       | 2051  | 0   | 2100  |   |   |   | 0   | 2084  | 2084  | 0  | 2067  | 2067  |   |   |   |
| Adj Flow Rate, veh/h         | 189   | 0   | 122   |   |   |   | 0   | 639   | 0   | 0  | 943   | 0   |   |   |   |
| Peak Hour Factor             | 0.95  | 0.95  | 0.95  |   |   |   | 0.95  | 0.95  | 0.95  | 0.95   | 0.95  | 0.95  |   |   |   |
| Percent Heavy Veh, %         | 3   | 0   | 0   |   |   |   | 0   | 1   | 1   | 0  | 2   | 2   |   |   |   |
| Cap, veh/h                   | 304   | 0   | 251   |   |   |   | 0   | 4474  |   | 0  | 3089  |   |   |   |   |
| Arrive On Green              | 0.08  | 0.00  | 0.08  |   |   |   | 0.00  | 0.79  | 0.00  | 0.00   | 0.79  | 0.00  |   |   |   |
| Sat Flow, veh/h              | 3789  | 0   | 3132  |   |   |   | 0   | 5876  | 1766  | 0  | 4031  | 1752  |   |   |   |
| Grp Volume(v), veh/h         | 189   | 0   | 122   |   |   |   | 0   | 639   | 0   | 0  | 943   | 0   |   |   |   |
| Grp Sat Flow(s),veh/h/ln     | 1895  | 0   | 1566  |   |   |   | 0   | 1896  | 1766  | 0  | 1964  | 1752  |   |   |   |
| Q Serve(g_s), s              | 4.3   | 0.0   | 3.4   |   |   |   | 0.0   | 2.4   | 0.0   | 0.0  | 6.1   | 0.0   |   |   |   |
| Cycle Q Clear(g_c), s        | 4.3   | 0.0   | 3.4   |   |   |   | 0.0   | 2.4   | 0.0   | 0.0  | 6.1   | 0.0   |   |   |   |
| Prop In Lane                 | 1.00  |   | 1.00  |   |   |   | 0.00  |   | 1.00  | 0.00   |   | 1.00  |   |   |   |
| Lane Grp Cap(c), veh/h       | 304   | 0   | 251   |   |   |   | 0   | 4474  |   | 0  | 3089  |   |   |   |   |
| V/C Ratio(X)                 | 0.62  | 0.00  | 0.49  |   |   |   | 0.00  | 0.14  |   | 0.00   | 0.31  |   |   |   |   |
| Avail Cap(c_a), veh/h        | 758   | 0   | 626   |   |   |   | 0   | 4474  |   | 0  | 3089  |   |   |   |   |
| HCM Platoon Ratio            | 1.00  | 1.00  | 1.00  |   |   |   | 1.00  | 1.00  | 1.00  | 1.00   | 1.00  | 1.00  |   |   |   |
| Upstream Filter(I)           | 1.00  | 0.00  | 1.00  |   |   |   | 0.00  | 1.00  | 0.00  | 0.00   | 0.88  | 0.00  |   |   |   |
| Uniform Delay (d), s/veh     | 40.1  | 0.0   | 39.6  |   |   |   | 0.0   | 2.3   | 0.0   | 0.0  | 2.7   | 0.0   |   |   |   |
| Incr Delay (d2), s/veh       | 2.1   | 0.0   | 1.5   |   |   |   | 0.0   | 0.1   | 0.0   | 0.0  | 0.2   | 0.0   |   |   |   |
| Initial Q Delay(d3),s/veh    | 0.0   | 0.0   | 0.0   |   |   |   | 0.0   | 0.0   | 0.0   | 0.0  | 0.0   | 0.0   |   |   |   |
| %ile BackOfQ(50%),veh/ln     | 2.1   | 0.0   | 1.3   |   |   |   | 0.0   | 0.5   | 0.0   | 0.0  | 1.2   | 0.0   |   |   |   |
| Unsig. Movement Delay, s/veh |   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |
| LnGrp Delay(d),s/veh         | 42.2  | 0.0   | 41.1  |   |   |   | 0.0   | 2.4   | 0.0   | 0.0  | 2.9   | 0.0   |   |   |   |
| LnGrp LOS                    | D   | A   | D   |   |   |   | A   | A   |   | A  | A   |   |   |   |   |
| Approach Vol, veh/h          | 311   |   |   |   |   |   | 639   |   |   | 943  |   |   |   |   |   |
| Approach Delay, s/veh        | 41.7  |   |   |   |   |   | 2.4   |   |   | 2.9  |   |   |   |   |   |
| Approach LOS                 | D   |   |   |   |   |   | A   |   |   | A  |   |   |   |   |   |
| Timer - Assigned Phs         | 2   |   |   | 4   |   |   | 6   |   |   |  |   |   |   |   |   |
| Phs Duration (G+Y+Rc), s     | 77.8  |   |   | 12.2  |   |   | 77.8  |   |   |  |   |   |   |   |   |
| Change Period (Y+Rc), s      | 7.0   |   |   | 5.0   |   |   | 7.0   |   |   |  |   |   |   |   |   |
| Max Green Setting (Gmax), s  | 60.0  |   |   | 18.0  |   |   | 60.0  |   |   |  |   |   |   |   |   |
| Max Q Clear Time (g_c+I1), s | 4.4   |   |   | 6.3   |   |   | 8.1   |   |   |  |   |   |   |   |   |
| Green Ext Time (p_c), s      | 4.5   |   |   | 0.9   |   |   | 7.4   |   |   |  |   |   |   |   |   |
| Intersection Summary         |   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |
| HCM 6th Ctrl Delay           | 9.1   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |
| HCM 6th LOS                  | A   |   |   |   |   |   |   |   |   |  |   |   |   |   |   |

## Notes

Unsignalized Delay for [NBR, SBR] is excluded from calculations of the approach delay and intersection delay.



## **TRAFFIC SIGNAL TIMING DIRECTIVE**



Martinsville-Liberty Corner Road (County Route 525) and Allen Road (County Route 652)  
Bernards Township

**TIMING SCHEDULE**  
**WITHOUT PEDESTRIAN ACTUATION**

| PHASE               |   | INDICATION # |            |            |             |              |                    |              |              | TIMING       |              |              |              |
|---------------------|---|--------------|------------|------------|-------------|--------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                     |   | <u>1-3</u>   | <u>4,5</u> | <u>6-8</u> | <u>9,10</u> | <u>11,12</u> | <u>13,14</u>       | <u>15,16</u> | <u>P1-P4</u> | <u>P5,P6</u> | <u>MAX 1</u> | <u>MAX 2</u> | <u>MAX 3</u> |
| A                   | MARTINSVILLE-LIBERTY CORNER ROAD LEAD LEFTS | ←G/R         | R          | ←G/R       | R           | R            | R/G→               | R            | DW           | DW           | 7 - 21       | 7 - 12       | 7 - 15       |
|                     | CHANGE                                      | ←Y/R         | R          | ←Y/R       | R           | R            | R/Y→               | R            | DW           | DW           | 3            | 3            | 3            |
| B                   | MARTINSVILLE-LIBERTY CORNER ROAD NB/SB ROW  | G            | G          | G          | G           | R            | R                  | R            | DW           | DW           | 62 - 43      | 82 - 49      | 46           |
|                     | CHANGE                                      | Y            | Y          | Y          | Y           | R            | R                  | R            | DW           | DW           | 4            | 4            | 4            |
|                     | CLEARANCE                                   | R            | R          | R          | R           | R            | R                  | R            | DW           | DW           | 2            | 2            | 2            |
| C                   | ALLEN ROAD EB/WB ROW                        | R            | R          | R          | R           | G            | G/G→               | G            | DW           | DW           | 7 - 12       | 7 - 35       | 7 - 25       |
|                     | CHANGE                                      | R            | R          | R          | R           | Y            | Y/G→ <sup>12</sup> | Y            | DW           | DW           | 3            | 3            | 3            |
|                     | CLEARANCE                                   | R            | R          | R          | R           | R            | R/G→ <sup>12</sup> | R            | DW           | DW           | 2            | 2            | 2            |
| EMERGENCY FLASH     |   | Y            | Y          | Y          | Y           | R            | R                  | R            | DARK         | DARK         | -            | -            | -            |
| OFFSET <sup>3</sup> |   |              |            |            |             |              |                    |              |              |              | 29.0         | 110          | -            |

**WITH PEDESTRIAN ACTUATION**

| PHASE               |   | INDICATION # |            |            |             |              |                    |              |              | TIMING       |              |              |              |
|---------------------|---|--------------|------------|------------|-------------|--------------|--------------------|--------------|--------------|--------------|--------------|--------------|--------------|
|                     |   | <u>1-3</u>   | <u>4,5</u> | <u>6-8</u> | <u>9,10</u> | <u>11,12</u> | <u>13,14</u>       | <u>15,16</u> | <u>P1-P4</u> | <u>P5,P6</u> | <u>MAX 1</u> | <u>MAX 2</u> | <u>MAX 3</u> |
| A                   | MARTINSVILLE-LIBERTY CORNER ROAD LEAD LEFTS | ←G/R         | R          | ←G/R       | R           | R            | R/G→               | R            | DW           | DW           | 7-21         | 7-12         | 7-15         |
|                     | CHANGE                                      | ←Y/R         | R          | ←Y/R       | R           | R            | R/Y→               | R            | DW           | DW           | 3            | 3            | 3            |
| B                   | MARTINSVILLE-LIBERTY CORNER ROAD NB/SB ROW  | G            | G          | G          | G           | R            | R                  | R            | W            | DW           | 34 - 20      | 54 - 36      | 33           |
|                     | PEDESTRIAN CLEARANCE                        | G            | G          | G          | G           | R            | R                  | R            | FDW          | DW           | 13           | 13           | 13           |
|                     | CHANGE                                      | Y            | Y          | Y          | Y           | R            | R                  | R            | DW           | DW           | 4            | 4            | 4            |
|                     | CLEARANCE                                   | R            | R          | R          | R           | R            | R                  | R            | DW           | DW           | 2            | 2            | 2            |
| C                   | ALLEN ROAD EB/WB ROW                        | R            | R          | R          | R           | G            | G/G→               | G            | DW           | W            | 7            | 7            | 7            |
|                     | PEDESTRIAN CLEARANCE                        | R            | R          | R          | R           | G            | G/G→               | G            | DW           | FDW          | 15           | 15           | 15           |
|                     | VEHICLE EXTENSION                           | R            | R          | R          | R           | G            | G/G→               | G            | DW           | DW           | 0            | 0-13         | 0-3          |
|                     | CHANGE                                      | R            | R          | R          | R           | Y            | Y/G→ <sup>12</sup> | Y            | DW           | DW           | 3            | 3            | 3            |
|                     | CLEARANCE                                   | R            | R          | R          | R           | R            | R/G→ <sup>12</sup> | R            | DW           | DW           | 2            | 2            | 2            |
| EMERGENCY FLASH     |   | Y            | Y          | Y          | Y           | R            | R                  | R            | DARK         | DARK         | -            | -            | -            |
| OFFSET <sup>3</sup> |   |              |            |            |             |              |                    |              |              |              | 29.0         | 110          | -            |

**SIGNAL SEQUENCE NOTES**

- Manual control and memory circuits shall be disconnected.
- Vehicle extension is to be set at 2 seconds.
- The offsets are measured from the beginning of yellow (change) for Phase B - Martinsville-Liberty Corner Road NB/SB ROW at this intersection to the beginning of yellow (change) for Phase B - Mount Airy Road NB/SB ROW at this intersection of Mount Airy Road (County Route 525) and Valley Road (County Route 512). For these coordinated periods, the signal shall operate with a 90 sec. background cycle during MAX 1 and a 110 sec. background cycle during MAX 3.
- The Martinsville-Liberty Corner Road Left-Turn lanes are to operate independently but concurrently if actuation occurs on both approaches. Each left turn lane shall be capable of extending or terminating separately. If one of the left turn lanes terminates, the non-conflicting through movement shall be initiated prior to Phase B - Martinsville-Liberty Corner Road NB/SB ROW.
- The signal shall rest in Phase B - Martinsville-Liberty Corner Road NB/SB ROW.
- Phase A - Martinsville-Liberty Corner Road Lead Lefts may be skipped in absence of demand.
- Phase A shall only follow Phase C.
- Phase A must be followed by Phase B.
- Phases C can be skipped in the absence of demand.
- The loops for the right-turn lane on Allen Road EB shall have delay unit set to 5 seconds.
- The signal will be set to "free" operation and shall rest in Phase B - Martinsville-Liberty Corner Road NB/SB ROW during MAX 3.
- The signal shall display a yellow ball ("Y") and red ball ("R") only if Phase A is skipped.

**HOURS OF OPERATION**

- MAX 1 TO OPERATE MONDAY - FRIDAY, 7:00AM TO 9:00AM
- MAX 2 TO OPERATE MONDAY - FRIDAY, 4:00PM TO 6:00PM
- MAX 3 TO OPERATE AT ALL OTHER TIMES



I-78 EB Ramps and Martinsville Road  
Bernards & Warren Townships, Somerset County

**60 and 90 Second Background and 48-59 Seconds Variable Cycle**

| <u>Phase</u>             | <u>Signal Indications</u> |             | <u>Time</u>           |                        |                         |           |
|--------------------------|---------------------------|-------------|-----------------------|------------------------|-------------------------|-----------|
|                          | <u>1-8</u>                | <u>9-14</u> | <u>I</u><br>(60 sec.) | <u>II</u><br>(90 sec.) | <u>III</u><br>(90 sec.) | <u>IV</u> |
| A. Martinsville Road ROW | G                         | R           | 41-30                 | 71-38                  | 71-60                   | 29        |
| Change                   | Y                         | R           | 5*                    | 5**                    | 5***                    | 5         |
| Clearance                | R                         | R           | 2                     | 2                      | 2                       | 2         |
| B. I-78 EB Exit Ramp     | R                         | G           | 7-18                  | 7-40                   | 7-18                    | 7-18      |
| Change                   | R                         | Y           | 3                     | 3                      | 3                       | 3         |
| Clearance                | R                         | R           | 2                     | 2                      | 2                       | 2         |
| Emergency Flash          | Y                         | R           | -                     | -                      | -                       | -         |

**NOTES:**

1. The manual control cord is to be removed.
2. The memory circuit is to be off and the vehicle extension interval is to be set at 2 seconds for Phase B.

\* An Offsets of 34 seconds is to be measured from the beginning of yellow to Martinsville Road at the I-78 WB Ramp.

\*\* An Offsets of 45 seconds is to be measured from the beginning of yellow to Martinsville Road at I-78 WB Ramp.

\*\*\* An Offsets of 37 seconds is to be measured from the beginning of yellow to Martinsville Road at I-78 WB Ramp.

**Hours of Operation**

- Plan I     9:00 AM – 4:00 PM, Monday- Friday
- Plan II    6:30 AM – 9:00 AM, Monday- Friday
- Plan III    4:00 PM – 6:00 PM, Monday- Friday
- Plan IV    48-59 seconds Variable Cycle at all other times.



I-78 WB Ramps and Martinsville Road  
Bernards & Warren Townships, Somerset County

**60 and 90 Seconds Background & 48-59 Seconds Variable Cycle**

| <u>Phase</u>             | <u>Signal Indications</u> |             | <u>Time</u>           |                        |                         |           |
|--------------------------|---------------------------|-------------|-----------------------|------------------------|-------------------------|-----------|
|                          | <u>1-7</u>                | <u>8-12</u> | <u>I</u><br>(60 sec.) | <u>II</u><br>(90 sec.) | <u>III</u><br>(90 sec.) | <u>IV</u> |
| A. Martinsville Road ROW | G                         | R           | 41-30                 | 71-53                  | 71-60                   | 29        |
| Change                   | Y                         | R           | 5*                    | 5*                     | 5*                      | 5         |
| Clearance                | R                         | R           | 2                     | 2                      | 2                       | 2         |
| B. I-78 WB Exit Ramp     | R                         | G           | 7-18                  | 7-25                   | 7-18                    | 7-18      |
| Change                   | R                         | Y           | 3                     | 3                      | 3                       | 3         |
| Clearance                | R                         | R           | 2                     | 2                      | 2                       | 2         |
| Emergency Flash          | Y                         | R           | -                     | -                      | -                       | -         |

**NOTES:**

1. The manual control cord is to be removed.
2. The memory circuit is to be off and the vehicle extension interval is to be set at 2 seconds for Phase B.

\* An Offsets of 0 seconds is to be measured from the beginning of yellow to Martinsville Road traffic at I-78 WB Ramp.

**Hours of Operation**

- Plan I     9:00 AM – 4:00 PM, Monday- Friday
- Plan II    6:30 AM – 9:00 AM, Monday- Friday
- Plan III   4:00 PM – 6:00 PM, Monday- Friday
- Plan IV    48-59 seconds Variable Cycle at all other times.