April 15, 2021

Dear P&ZC Commissioner,

The opponents of the Slate Upper School have prepared the reports in this book, using data that was available to us as of April 14, 2021. There was not sufficient time for us to review the mass of new data the applicant has since submitted for the April 19, 2021 P&ZC Public Hearing and meet the deadline for submitting the data in this book. We will be reviewing the applicant's new submissions and submitting additional or revised data, but not until after the April 19 hearing. Thank you.

Tab	Subject	Pages	Status	Comment
1-1	Agenda	2		
2-1	John A Opening Statement	1		Placeholder
2-2	POCD	8		Not Included
3-1	John P Opening Statement	1		
3-2	Colored Site Map	1	Done	
3-3	Mansfield Quotes	7		
3-4	Mansfield Transcripts	27	Done	
3-5	Mansfield 111317 Transc.	6	Done	
4-1	Brian Miller Opening	1		Placeholder
4-2	Brian Miller Report			Not Included
5-1	Joel Baker Opening	1		Placeholder
5-2	Joel Baker Report			Not Included
6-1	Jim Bubaris Opening	2		
6-2	Jim Bubaris Report	5	Done	Double Sided
7-1	Dan O'Neill Opening	1		Placeholder
7-2	Dan O'Neill Report			Not Included
8-1	John Lo Monte Cover Sheet	1		
8-2	Mansfield vs Ridge Table			Not Included
8-3	John Lo Monte Summary			Not Included
8-4	Market Value Table	1	Done	Not Included
8-5	5060 & 5200 Appraisal	18	Done	Not Included
8-6	5036 Appraisal			Not Included
8-7	5051 Appraisal			Not Included
8-8	5061 Appraisal			Not Included
9-1	Environmental Intro	1		
9-2	LEA 1/25/21	3	Done	Double Sided
9-3	Clint Brown Bio	2	Done	Double Sided
9-4	LEA Report 2/23/21	2	Done	Double Sided
9-5	LEA Report 2/23/21	24	Done	Double Sided
9-6	REMA Report 1/25/21	16	Done	Double Sided
9-7	REMA Report 2/23/21	38	Done	Double Sided
9-8	Phoenix Lab Report	11	Done	Double Sided
9-9	Sigrun Letter	2	Done	Double Sided
10-1	Opposition Petition Intro	1	Done	
10-2	Sample Petition	1	Done	
10-3	List of Petition Signers	3	Done	
10-4	First Group of Petitions	19	Done	
10-5	Second Group of Petitions	3	Done	
10-6	Online Petition Signers	1	Done	
10-7	Letter to V. Carlson Jan 2021	1	Done	

10-8	Letter to M. Freda 3/18/21	1	Done	
10-9	Hal Kaplan Letter 3/27/21	2	Done	Double Sided
10-10	Chart	1	Done	
11-1	Supporter Analysis Intro	2	Done	
11-2	Supporter Data Sheet	1	Done	
11-3	Supporter Graphs	2	Done	
12-1	P&Z Regulations Intro	1	Done	
12-2	P&ZC Tables	16		Placeholder
13-1	Closing Statements	1		Placeholder

Pages Submiteed 4/12/21	238
# Tabs Needed	13

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Rev 1.0

Slate Upper School Opposition P&ZC Hearing Outline

- Opening Statements
- Reports – Land Use, Lighting, Traffic, Appraisal
- Environmental Issues
- Opposition Petitions
- Analysis of Support Letters
- P&Z Requirements Analysis
- Closing Statements
- Comments from Opponents

Rev 1.0

North Haven P&ZC Hearing April 19, 2021

Opposition to Slate Upper School

John Acampora Opening Statement

Evidence of Non-Compliance with North Haven Plan of Conservation and Development (POCD) and Impacts on the Neighborhood

INTRODUCTION: "The purpose of this Plan of Conservation and Development (POCD) is to set forth an official account of the conditions in the municipality and to pout forward the goals and aspirations of the community for its future land use, development, and environmental conservation."

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Maintain and enhance a range of housing options in and around the Town Center. POCD, page 12	Encourage the conservation of the residential neighborhoods surrounding the Center Block and **resist actions to convert residential structures to commercial uses** which would compete with the Center Block's existing commercial space.	The proposed project would convert a small church into a massive campus on the scale of a commercial development. It is too intense a development on too small a site, and completely out of character with the rural nature of the neighborhood.	Applicant site plans Opponents' colored version of applicant's site plan The Miller Planning Group report, April 15, 2021

North Haven POCD Category	POCD Examples	Impact on Neighborhood	References
Institutional Land Use Category. POCD, page 13	Private institutional uses, such as places of worship, private schools, state or private universities, museums, daycare, and other nonprofit facilities.	"As North Haven matures, the community's shrinking inventory of vacant land and open space parcels must be carefully examined to determine how they can best serve the needs of the community in the future." The proposed project does not serve the needs of the larger community. It is a small independent school that would serve the needs of 100 students at the expense of the surrounding neighborhood and its residents.	POCD, page 13, first paragraph Slate Upper School website. Opponents' presentations at P&ZC public hearings.

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Protect high quality wetlands and their ecosystem services while encouraging appropriate use. POCD, page 20	Develop a strategy to identify high quality wetlands and explore mitigation measures to allow for future economic development along the Quinnipiac River corridor.	The proposed project will have significant, adverse impacts on the pristine watercourses and early successional wetlands downgradient from the site. The project is too large for this site.	REMA Ecological Services report to North Haven IWC. SleepingGiantNeighbors.net

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Manage sewer expansion areas POCD, page 33	The area south of Mt. Carmel Avenue was identified as a sewer avoidance area. Development in this area is recommended to be limited to preserve the rural and pastoral nature of the area, which is also slated for future scenic road status.	Proposed septic system will discharge 32.4 mg/l of nitrogen into wetlands (over 3x safe limit). 40 mature trees and shrubs are slated for removal to accommodate the project. The massive size of this project is intrusive and inconsistent with the character of the neighborhood.	Louriero Engineering Associates report to North Haven IWC, January 25 & February 23, 2021 LEA Report, April 14, 2021 Application Removal Plan, Sheet EX-1 Opponents' Colored site plan

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Meet DEEP MS4 requirements to reduce connected impervious surfaces. POCD, page 36	Take needed steps to comply with DEEP MS4 Permit mapping requirement, including mapping and calculation of impervious coverage and connectivity to outfalls and impaired waters, and documenting disconnection of impervious surfaces in 2020 and 2021	The proposed project will disturb 87% of the site area and will increase impervious area from 0.40 acres to 1.21 acres (out of 2.97 acres)	Milone and MacBroom Drainage Report, October 27, 2020

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Enhance the safety and smooth flow of traffic in residential areas, commercial corridors, and arterials. POCD, page 37	Evaluate traffic calming techniques and enhanced enforcement efforts to reduce the adverse impact of vehicular traffic on residential neighborhoods, especially in the following areas: Montowese Avenue, Buell Street, Spring Rd, Kings Highway, **Blue Hills Road**, Sackett Point Road, **Mount Carmel Avenue**, **Outer Ridge Road**, Dixwell Ave, State St, Pool Road and its side streets, and Hartford Turnpike.	Peak traffic to the proposed site is projected to increase from 35-50 cars/hour to 137-192 cars/hour, completely inconsistent with this POCD strategy. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.). This is equivalent to 582 14-cu. yd. dump trucks and the roads are not suited to this kind of traffic.	Milone & MacBroom Traffic Study and Frederick P. Clark Traffic Access & Impact Study LEA Report, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Protect scenic roads that contribute to the Town's character. POCD, page 38	Convene a committee to study adoption of a Scenic Road ordinance to protect views along roadways that contribute to the Town's character, such as Upper State Street, **Outer Ridge Road**, and Kings Highway.	Only 18'-20' wide in places, Outer Ridge Road is very narrow & winding, and it undulates as it descends to the proposed site. The plans call for localized widening of the road which is insufficient. There isn't sufficient room to widen the road any further within the limits of the available rights of way. And, widening the road to accommodate more traffic is inconsistent with the pastoral character of the neighborhood. The roads leading to the site are not designed to handle the volume of construction vehicles.	Bubaris Traffic Associates report, April 15, 2021 Vliet & O'Neill Traffic Study Report, April 14, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Reduce storm water impacts of new development through land use regulations. POCD, page 49	Revise land use regulations to encourage or require low-impact development techniques, such as impervious surface reductions and on-site retention/detention, where feasible. Consider specifying a goal of one regulatory revision per year to ensure progress is made. Review and enhance the regulatory standards for BMPs in the general review of zoning regulations to **avoid significant adverse impacts on water quality**. Review and revise storm water drainage provisions in the zoning regulations to require "best practice" methods be utilized in site design.	Impervious surface area will triple from 0.40 acres to 1.21 acres (out of 2.97 acres) Septic system discharge will raise nitrogen levels in adjacent watercourses by a factor of 29x over current, measured levels (to 32.4 mg/l from 1.1 mg/l). This is a significant, adverse impact on water quality. Storm water discharge is calculated to be almost twice as high as recommended levels (4.5 cfs calculated vs. 2.35 cfs recommended)	Milone & MacBroom Drainage Report, October 27, 2020 Louriero Engineering Associates report to North Haven IWC, January 25 & February 23, 2021 REMA Ecological Services report to North Haven IWC, January 25 & February 23, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Protect sensitive habitats and natural resources. POCD, page 49	Continue to protect water quality by preserving watercourses, wetlands, and aquifers.	The proposed project will cause several significant, adverse impacts to the adjacent wetlands, watercourses, and aquifers.	Louriero Engineering Associates report; REMA Ecological Services report; SleepingGiantNeighbor.net

LOW IMPACT DEVELOPMENT (LID), **page 53**: Nationwide, there is a growing understanding that land development methods have an enormous impact on the health of the environment; North Haven is no different. The implementation of LID techniques is a method designed to minimize the environmental impact associated with land development. Techniques include minimizing site disturbances, reducing impervious surfaces, and installing bio-retention ponds. Through ongoing updates to zoning and subdivision regulations, North Haven may **promote these techniques and ensure that new development occurs with reduced environmental impacts.**

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Reduce storm water impacts through LID. POCD, page 54	Revise land use regulations to encourage or require LID techniques, such as impervious surface reductions and on-site retention/detention, where feasible.	Impervious surface area will triple from 0.40 acres. to 1.21 acres (out of 2.97 acres)	Milone & MacBroom Drainage Report, October 27, 2020 LEA Report February 23, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Reduce storm water impacts of new development through land use regulations. POCD, page 60	Revise land use regulations to encourage or require LID techniques, such as impervious surface reductions and on-site retention/detention, where feasible. Consider specifying a goal of one regulatory revision per year to ensure progress is made. Review and revise surface and ground water protection standards based on LID techniques in the general review of zoning regulations.	Impervious surface area will triple from 0.40 acres to 1.21 acres (out of 2.97 acres)	Milone & MacBroom Drainage Report, October 27, 2020 LEA Report February 23, 2021 The Miller Planning Group report, April 15, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Reduce storm water impacts of new development through land use regulations. POCD, page 61	Periodically review existing development regulations and standards for opportunities to reduce or eliminate impervious surface requirements.	Storm water discharge is calculated to be almost twice as high as recommended levels (4.5 cfs calculated vs. 2.35 cfs recommended)	REMA Ecological Services report to North Haven IWC, January 25, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Protect high-quality wetlands and their ecosystem services while encouraging appropriate use. POCD, page 62	Develop a strategy to identify high-quality wetlands and explore mitigation measures to allow for future economic development along the Quinnipiac River corridor.	The proposed project will have significant, adverse impacts on the pristine watercourses and early successional wetlands downgradient from the site.	REMA Ecological Services report to North Haven IWC. SleepingGiantNeighbors.net

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Meet DEEP MS4 requirements to reduce connected impervious surfaces. POCD, page 63	Take needed steps to comply with DEEP MS4 Permit mapping requirement, including mapping and calculation of impervious coverage and connectivity to outfalls and impaired waters, and documenting disconnection of impervious surfaces in 2020 and 2021	The proposed project will disturb 87% of the site area and will triple impervious area from 0.40 acres to 1.21 acres	Milone & MacBroom Drainage Report, October 27, 2020 LEA Letter to IWC January 25, 2021

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Enhance the safety and smooth flow of traffic in residential areas, commercial corridors, and arterials. POCD, page 67	Conduct ongoing access management planning and implementation in an effort to promote traffic safety and maintenance of the "carrying capacity" of North Haven's arterial streets. Techniques such as combining driveways and/or restricting turning movements should be evaluated as opportunities arise.	Peak traffic to the proposed site is projected to increase from 35-50 cars/hour to 137-192 cars/hour, completely inconsistent with this POCD strategy. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.). This is equivalent to 582 14-cu. yd. dump trucks and the roads are not suited to this kind of traffic.	Milone & MacBroom Traffic Study and Frederick P. Clark Traffic Access & Impact Study LEA Report, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven POCD Goal	POCD Strategies	Impact on Neighborhood	References
Protect scenic roads that contribute to the Town's character. POCD, page 67	Convene a committee to study adoption of a Scenic Road ordinance to protect views along roadways that contribute to the Town's character, such as Upper State Street, **Outer Ridge Road**, and Kings Highway.	Only 18'-20' wide in places, Outer Ridge Road is very narrow & winding, and it undulates as it descends to the proposed site. The plans call for localized widening of the road which is insufficient. There isn't sufficient room to widen the road any further within the limits of the available rights of way. And, widening the road to accommodate more traffic is inconsistent with the pastoral character of the neighborhood. The roads leading to the site are not designed to handle the volume and size of construction vehicles.	Bubaris Traffic Associates report, April 15, 2021 Vliet & O'Neill Traffic Study Report, April 14, 2021

Rev 1.0

North Haven P&ZC Hearing April 19, 2021

Opposition to Slate Upper School

John Parese Opening Statement

Rev 1.0

Slate Upper School Opposition Site Plan

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- Jennifer Clark, August 7, 2017:
- "As an independent school, there are no outside constraints such as things like common core…" – page 8
- In response to Commissioner Giulietti's questions about whether the school is accredited or not, Mrs. Clark replied, "No. The State of Connecticut's requirements for a school are actually fairly limited. It's actually submitting attendance records. But, there is a separate organization, a separate entity that accredits schools, specifically independent schools; that accreditation process happens after four full years of the school in operation. So we will be working towards that formal accreditation process by this separate entity. Many of the independent schools operate without that formal entity accrediting them." – pages 60-61

Rev 1.0

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- "Twenty-three of the twenty-five acres will remain undeveloped and preserved as a nature conservancy…With Slate School, ninety percent of the property will remain open and preserved, and that's at no cost to the North Haven taxpayers." – Jennifer Clark, 8/7/17, page 9
- "The property is about 24 acres; there's about eight acres of wetlands on the property; that's going to restrict the development potential of the property…So, although there is not a deed restriction per se, and the Wetlands Commission did not ask us to deed-restrict the property, as a practical matter the wetlands on the property and the layout of the property will restrict any future development." – Tim Lee, 8/7/17, page 65
- In response to Commissioner Giulietti asking "…what would stop you from using that part of the property?", Mr. Lee replied, "…it would be an onerous process; and any development would have to go back to the Wetlands Commission and would have to go back to Planning and Zoning. Quite frankly, I'm not sure the Clarks have – this is their first time through the system. They're not anxious, quite frankly, to come back and go through the wetlands process, or the planning and zoning process again; so I think that's going to be a de facto (inaudible)." – Tim Lee, 8/7/17, pages 65-66

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- Tim Lee: "Well at this point in time we're not offering a conservation easement over that portion of the property. But, any future development, if there is any, and it's not our intention to develop the property in the future, would require applications to the Wetlands and the Planning and Zoning Commission. I think my client is willing to say that there will not be a restriction on the property. At this point in time we're not offering a restriction on the property." 8/7/17, page 72
- Tim Lee: "…the Applicant is agreeable to a conservation easement over the wetlands portion of the property." 10/2/17, page 26
- Tim Lee: "The Clarks were agreeable to a restriction that they would not seek any residential development of the 24-acres of the property during the existence of the school. It's not our intention to put the school on one portion of the property and subdivide to put houses on another portion of the property." – 10/2/17, page 26
- Tim Lee: "…the Clarks are willing to agree to a restriction that the property will not be put to – for use for University purposes, if it gives the Commission some peace of mind." 10/2/17, pages 26-27

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- Tim Lee: "Once again, the property is about 25-acres. We are utilizing for school purposes about two acres; the remaining portion of the property is going to be undeveloped at this time. We are not offering a restriction over the entire 25-acres of the property, the remaining 23-acres of the property. However, we are agreeing that that portion of the property will never be used for residential development. We're not going to subdivide it. We're not going to split it off and sell it to a developer." 10/2/17, page 28

Rev 1.0

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- Tim Hollister, August 7, 2017:
- “The general principles are that very application is different, every application that comes before you depends on facts, studies, impacts, such as what you’ve heard here tonight. Every parcel of land and its surroundings is different. That is especially true with uses that you have already classified as special permit uses.” Page 53
- “So to say that approval of one special permit application implies or binds you to approval of another is just simply inconsistent with the nature of the application and the use. Approving one application does not bind this Commission to grant any other application, even if it’s for the same use in the same zone.” Pages 53-54

Rev 1.0

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- Tim Hollister, August 7, 2017:
- "I think you know even without us explaining that an elementary school is a fundamentally different use from anything that might be associated with a college or university; most notably because elementary school students, they don't drive, they are always under the supervision of parents or administrators or teachers. Zoning regulations routinely differentiate between colleges and universities, high schools, elementary schools. Your regulations do and you would too in reviewing any specific application." Page 54
- "So there is nothing in this application that should give you pause as to some future application, whether by Quinnipiac or any other use." Page 55

Slate Upper School Opposition

Please Refer to Mansfield Slate School 2017 P&ZC Hearing Transcripts

- MR. PENTION: "The traffic? We've never had an application with so many traffic reports. We usually get one at the most. We had three or four or five on this one. And, as Jim said, it's not the ideal road. There's many roads in North Haven and every town in Connecticut that are far from ideal. But, likewise, regardless of what goes in that site, unless it was another single-family dwelling, which is unlikely, there's going to be a change in traffic in that road. And, there would be nothing we could do about another application coming in, either. So, although in a perfect world I'd like to see that road safer, I don't think that the Courts would agree if we use that as a reason to object." 11/13/17, page 7
- MR. CARLSON: "I know. I'll get there. I just want to mention that if this were denied, it doesn't mean that that piece of property, the 24-acres, is going to remain vacant. They're going to do something with that property, whether it be the family that wants to put a school in there now, or someone else that wants to put housing in there. We could very well have someone come straight in here with an 8-30g from under the State and bring in thirty, forty, perhaps more apartments; and the burden fall on the Zoning Commission to deny that. If in fact we were to deny it, they would go to the State and we have never ever won anything on an 8-30g in this town. I don't think there has been very many, if any, 8-30g's won by the local zoning commission over the -." 11/13/17, pages 7-8
- MR. SOLIMENE: "As Jim and Ron both alluded to, it seems that the main opposition relates to traffic. The issue with traffic, I would agree with both Ron and Jim, that the road is what it is; and whether this gets approved or denied, if that parcel of land gets developed we have the same issues coming before us as far as traffic goes." 11/13/17, pages 9-10

PLANNING & ZONING COMMISSION
NORTH HAVEN, CONNECTICUT

PUBLIC HEARING
AND
SITE PLAN

AUGUST 7, 2017

<u>#P17-16S</u>

Special Permit Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

<u>#P17-16</u>

Site Plan Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

<u>BOARD MEMBERS</u>

VERN E. CARLSON, CHAIRMAN
RONALD PENTON, VICE CHAIRMAN
JAMES J. GIULIETTI, REGULAR MEMBER
JOSEPH M. SOLIMENT, ACTING SECRETARY
RICHARD E. WILSON, ALTERNATE

MARYLEE RYDZEWSKI
COURT REPORTER

In her outreach, Jennifer also learned of concerns raised by people regarding the impact of the school on their property values. Based on that we have retained the services of Bruce Hunter. Bruce Hunter is an MAI Certified Real Estate Appraiser. He has conducted a neighborhood impact to determine whether the school will have any impact on the surrounding property values. Mr. Hunter will share his report with you tonight.

Finally, you'll hear from Attorney Tim Hollister. Tim is an attorney with the law firm of Shipman & Goodwin in Hartford. Tim is one of, if not the foremost expert in land use law in the State of Connecticut. Tim will discuss how this particular application complies with the special permit and site plan regulations for the Town of North Haven as it applies to schools.

So without any further adieu, I will now turn the microphone over to Jennifer Clark.

MS. CLARK: Good evening. Thank you so much. It's a pleasure to speak before you. As Tim Lee mentioned, my husband and I live at 7 Woodmere Circle with our young children.

As a way of background, I am a former teacher and come from a family of teachers. I now lead Unite for Sight, which is a 501(c)(3) non-profit organization that I founded as a college student seventeen years ago at Elon University. Unite for Sight has provided – I care for more than two million people in developing countries, including more than a hundred thousand sight-restoring surgeries for people who had previously been blind. And so, we have a passion for philanthropic endeavors and for making impacts both locally and globally.

Thank you so much to the Planning and Zoning Commission for holding tonight's public hearing and giving us this opportunity to provide information on Slate School's vision and mission. We feel that Slate School will be a tremendous asset for North Haven and also a wonderful neighbor for our community.

I'd like to briefly provide an overview about Slate School and also discuss our sense of community outreach efforts. The community outreach efforts have focused on sharing information about Slate School's plans, and answering questions, and addressing concerns; and also engaging experts as Tim Lee had described, to address any concerns that we had heard along the way as we had reached out to so many people.

Slate School is a small nature-based K through 6 elementary school. It's a 501(c)(3) non-profit organization. The intention is to open in the Fall of 2018 with twenty students total. And as the first graders become second graders, and become third graders, and so on, eventually we will reach a total enrollment of seventy students from K through 6 in 2023.

The Slate School's mission is to infuse creativity and curiosity and nature into everyday learning, to really teaching the children how to think and not what to think; and this is being done with incurring-based learning, so that each child's innate love and curiosity and joyful learning can be involved with everything that they're doing during their learning.

As an independent school, there are no outside constraints such as things like common core, so that we can focus on this creativity and having students exceed learning goals based on a very hands-on approach.

Some of the benefits that we have identified for North Haven community members is this will actually be the first independent school within North Haven. And in contrast to many other neighboring towns which have at least one other independent school that provides options for the families in the town, North Haven currently doesn't have any independent schools, so this would be a new option then for North Haven families.

The closest comparable model that we've identified for schools is actually in Lincoln, Massachusetts; and of course, that not being within easy driving distance for anyone locally. The school is called Birches School, and it similarly located on a nature conservancy, and actually is the only school in the country that is located on a nature conservancy; and that's exactly what we're working to create here in North Haven. This school similarly infuses this nature, curiosity and creativity into their everyday learning.

Moving on to some land-focused benefits, Slate School will provide open-spaced conservation and preservation with no cost to North

The septic system has been designed, and if you install septic systems, you know that the system that's designed is roughly the similar size to what a single-family home is. That complies with the State Health Code as administered by QVHD.

MR. CARLSON: Is this going through Quinnipiac Health?

MR. LEE: It does; and we do have an approval letter from QVHD for the septic system.

MR. CARLSON: Okay. Very good.

MR. PENTON: Thank you.

MR. GIULIETTI: Let me follow up to that question, because that was one of the things – you said there was no food service. I'm kind of trying to get a handle on the way this school will work. Are kids going to have – do they have lunch there?

MR. LEE: The kids will eat, yes. There will be no food preparation there. The kids will bring their own lunch. There will be a cafeteria or an area where they would eat their lunch there.

MR. GIULIETTI: But there would be no prepared food there? They've got to bring their lunch? That's the way the school works?

MR. LEE: That is the way the school would work, correct.

MR. GIULIETTI: Okay. Kind of along the same lines, I'm just trying to understand how the school works; and if you're the right person or the Applicant.

When you tell me there's no constraints such as common core, because this is an independent school, I guess I don't really know exactly what that means. Is this an accredited school? Will children go here, and are there State Law requirements that this makes it a real school? And that they go from there to whatever middle school they would go to?

MR. LEE: Yes, it is a real school. It gets approved by the Department of Education in Connecticut.

MR. GIULIETTI: Okay.

MR. LEE: I'm not sure there is a formal accreditation or not, but it –

MR. GIULIETTI: Is there?

MS. CLARK: No.

MR. LEE: Why don't I have Jennifer come up and answer that question.

MR. CARLSON: Yes, please.

MS. CLARK: The State of Connecticut's requirements for a school are actually fairly minimal. It's actually submitting attendance records.

MR. GIULIETTI: Okay.

MS. CLARK: But there is a separate organization, a separate entity that accredits schools, specifically independent schools; that accreditation process happens after four full years of the school in operation. So we will be working towards that formal accreditation process by this separate entity. Many of the independent schools operate without that formal entity accrediting them.

MR. GIULIETTI: So are there required courses in a grammar school or could you teach whatever you want? That's kind of what I'm getting at. Is it a structure/non-structure environment? How does the school work?

MS. CLARK: All the students will be learning essentially the same material that a child in any school would learn; so in terms of learning goals or age-appropriate goals. The way of achieving those goals will be different.

For example, for public schools there are requirements for things like common core; whereas independent schools are not required to follow that specific requirement of something like common core.

But a child, for example, if they're in first grade here at Slate School and perhaps their family moves to California for second grade, they will have learned everything that any first grader should learn and be able to transfer to whatever school in second grade where ever it might be in the country; but it will be through a much more creative process.

For example, with learning – and I don't know if this – does that answer your question or should I go on?

MR. GIULIETTI: No, but you're getting there. For example, they learn math and they learn reading and they learn –

MS. CLARK: Exactly. So if they're learning math for example, and perhaps they're learning addition, so instead of having a worksheet that says what is five-plus-three equals eight, they can have rocks or sticks and not (inaudible) –

MR. GIULIETTI: Trees.

MS. CLARK: Like not plastic toys or plastic pieces trying to learn out of worksheets.

MR. GIULIETTI: Okay.

MS. CLARK: But here's five rocks, here are three rocks. Let's count how many there are; or there's five turkeys outside – oh look, there's three more. How many total do we have?

So it's learning the same learning goals as any child in any particular grade, but doing it in a more unique way. That's just one of many, many examples.

MR. GIULIETTI: Okay. Fair enough.

MR. CARLSON: Do you get the same answer?

MS. CLARK: I hope so.

MR. CARLSON: There is no answer, but do you get the right answer?

MS. CLARK: Yes.

MR. CARLSON: Thank you.

MR. GIULIETTI: As long as I have you up here, tell me how do you get students for this school? I don't know if this is out of line, how expensive is this school? How is that going to work? How do you solicit students?

MS. CLARK: I'll answer your first question first. Part of the mission and vision of Slate School, including in our application, for example, to the IRS, is to make sure that it's financially accessible and affordable to families. In that way, we'll be using a sliding scale, so that it will be less expensive than a more typical independent school, so that it is accessible and affordable to families; specifically to North Haven families.

We're finding, for example, on Facebook, where we now have more than two-thousand likes and followers, most of them being North Haven families, who are really flocking to us. So many who are very excited about this style of education for their children. We're seeing so much interest just very organically, just growing through this network that's developed over the past couple of months.

MR. GIULIETTI: Will people from North Haven have an advantage in getting into the school? Do you understand what I'm asking?

MS. CLARK: Yes.

MR. GIULIETTI: In your admissions process, who is going to do the admissions process? Would that be you?

MS. CLARK: The teachers actually will, as opposed to having something like a standardized test for admissions.

MR. GIULIETTI: All right.

MS. CLARK: It will actually be watching the kids play, making sure they're the right fit for the purpose of the school. That will be (inaudible) of the admissions enrollment process.

What was your other question? Oh, the North Haven residents.

MR. GIULIETTI: Right.

MS. CLARK: As an independent school, it's not specific to a particular town, so it's not restricted in that way, that it's requiring particular residency; but typically independent schools generally draw most from a small radius, so we're expecting that most will probably be from North Haven.

MR. GIULIETTI: From the area.

MS. CLARK: Exactly.

MR. GIULIETTI: Okay, that's good to know. One of the things that you guys went out of your way to say is that ninety percent of this property will be preserved, like you're only using ten percent for the buildings. How do we know it stays preserved? What I'm asking is are you doing any conservation easements? You're only using the back part of the property. Is the front part of the property going to be kept so that it can't be

Record Item #13

PLANNING & ZONING COMMISSION
NORTH HAVEN, CONNECTICUT

PUBLIC HEARING
AND
SITE PLAN

AUGUST 7, 2017

#P17-16S

Special Permit Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

#P17-16

Site Plan Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

BOARD MEMBERS

VERN E. CARLSON, CHAIRMAN
RONALD PENTON, VICE CHAIRMAN
JAMES J. GIULIETTI, REGULAR MEMBER
JOSEPH M. SOLIMENT, ACTING SECRETARY
RICHARD E. WILSON, ALTERNATE

MARYLEE RYDZEWSKI
COURT REPORTER

Haven taxpayers. Twenty-three of the twenty-five acres will remain undeveloped and preserved as a nature conservancy. The Town of North Haven had explored the possibility of purchasing this particular property from the current owner, but the current owner's asking price was much higher than the town could afford, so wasn't able to do so. With Slate School, ninety percent of the property will remain open and preserved, and that's at no cost to the North Haven taxpayers.

Slate School also focuses on making sure that the – for example, you can see the prior 1982 house that had previously been on this property and was demolished a number of years ago by the current owner, the footprint is the same within one-hundred feet from the proposed Slate School; and you can see the comparative maps from the 1982 house on one side, to the proposed Slate School on the other; and also making use of most of the driveway as well.

We specifically placed the school in that same footprint so that there would be no impact to the other areas of the property, to keep that preserved and usable for the children to learn from nature.

This is the zoomed-in area. The 2 ½ story single-family residence that had previously been in that footprint was 2 ½ stories, and therefore visible from the road. In contrast, Slate School will be one story and therefore not visible from the road.

an expected enrollment of seventy students in grades kindergarten through sixth grade.

The Clark's have a contract to purchase the property at 124 Mansfield Road from Sweet Meadow Farm Associates. The property itself is 24.16 acres and sits in an R-40 Zone. Under the North Haven Zoning Regulations, schools are an allowed use in the R-40 Zone, subject to the Special Permit and Site Plan Approval.

As you will see from our presentation tonight, we believe that we have satisfied each and every criteria under the zoning regulations, and are entitled to a permit to operate the school.

We believe that the application provides a unique opportunity for an alternative educational experience in North Haven, while maintaining the vast majority of the 24-acres as undeveloped open space.

As you are also aware, North Haven is one of the oldest demographics in Connecticut. A new school will attract younger families into North Haven, which in conjunction with other recent developments and additions to the town, will increase the vitality and the desirability of North Haven as a place to live and work.

I am pleased to report to the Commission that we did receive unanimous approval from the North Haven Inland Wetlands Commission at its meeting of July 26, 2017.

developed, not by you or by anybody else, or is there going to be a restriction on the land records?

MR. LEE: There's not a specific restriction on the land records. The property is about 24 acres; there's about eight acres of wetlands on the property; that's going to restrict –

MR. GIULIETTI: Right.

MR. LEE: – the development potential of the property. We spent three nights in front of the Wetlands Commission, so we know how seriously they took the potential development of the property. So although there is not a deed restriction per se, and the Wetlands Commission did not ask us to deed-restrict the property, as a practical matter the wetlands on the property and the layout of the property will restrict any future development.

MR GIULIETTI: Okay, I'm confused about that, because on your maps there was a big portion of non-wetlands with a meadow, I think, was one of the big – so what would stop you from using that part of the property?

MR. LEE: There's some crossing over the wetlands that you have to do; you'd have to put in a new septic system, you'd have to – it would an onerous process; and any development would have to go back to the Wetlands Commission and would have to go back to Planning and Zoning. Quite frankly, I'm not sure after the Clark's have – this is their first time through the system. They're not anxious, quite frankly, to come back and go through the wetlands process or the the planning and zoning process again; so I think that's going to be a de facto (inaudible) –

MR. GIULIETTI: I hear what you're saying, but that doesn't make me very comfortable, to be honest with you. I would like to know that (inaudible). You're representing to us it's going to be preserved, but you're not doing the thing that would make it preserved, to me. I'm only one voice, but that's one of the things that hit me.

If you're going to come here and tell me that ninety percent of this will be preserved, then do something to make the ninety percent preserved. That's the way I see it.

Along those lines, the architects told me that they'll be no fertilizer and they'll be no – how do we know that will continue? My concern is – and I hope the Clark's are involved with this forever – And let me commend you for reaching out to the community. You did a really good job reaching out to the community and you're trying to address all of their problems.

But when you tell me something is going to happen, we get told a lot of things are going to happen up here; and they do at the beginning, and then they may not later on. How do we know it will be later on?

MR. SULLIVAN: Yes.

MR. GIULIETTI: Okay. That's all I have.

MR. CARLSON: Good. Tim, maybe I missed it or it just wasn't clear to me, when Jim asked you about the remaining property, is there going to be a safeguard there that is not going to be developed? From what I understand, your answer was no, but it was very vague. I'm not sure what you really meant.

MR. LEE: Well at this point in time we're not offering a conservation easement over that portion of the property.

MR. CARLSON: Okay, so at this time –

MR. LEE: But any future development, if there is any, and it's not our intention to develop the property in the future, would require applications to the Wetlands Commission and the Planning and Zoning Commission.

MR. CARLSON: I understand that. That's what I was trying to get at here. So you're not willing to say there will be no other development on that property? Is you client willing to say that?

MR. LEE: I think my client is willing to say that there will not be a restriction on the property. At this point in time we're not offering a restriction on the property.

MR. CARLSON: Okay, so no matter what, that's it. Okay, very good.

is to demonstrate zoning compliance and the other to demonstrate the adverse – the absence of any adverse impacts.

So the applicable zoning regulation is 2.1.1.5, which allows specified uses "when approved by the Commission after hearing" and subject to the conditions that the Commission may impose. That wording strongly implies a special permit process which is what we're operating under. Then Section 2.1.1.5 Sub (a) allows schools, whether operated by the government or a non-profit; and Slate School is a non-profit operated school.

The basic special permit law that we're dealing with is that if the Applicant complies with the objective standards in the zoning regulations, then as a matter of law it is entitled to an approval; but the Commission in that situation may impose conditions on the approval to mitigate any adverse impacts or eliminate them based on the evidence received at the public hearing. Typical special permit conditions would be things like screening, buffering, lighting, hours of operation, and so forth.

The compliance chart that I just handed out basically is to show you that it complied with the regulations in every respect. I've set it up in a two-column format. The left-hand column is your special permit and site plan criteria; and then we have documented in the right-hand column sections 10 and 11 of the Zoning Regulations that all the information requested has been provided. I do note that Mr. Fredricksen has issued a comment memo, which I assume will be introduced into the record; and I did not, that I saw, disagree or identify any non-compliance with the regulations; and so I think we have a consensus on that point.

I will also say that hopefully that you are persuaded – it is within your discretion – but you will come to the conclusion that the designers here have worked very hard to think of everything to try to make sure that there are no adverse impacts; and if there was any, that it was either eliminated or mitigated during the design process to the maximum extent possible.

This so-called Quinnipiac precedent argument, the general principles that I'd like to – and I realize the argument has not been made, but I think anyone who is involved in the community has heard the argument. The general principles are that every application is different, every application that comes before you depends on facts, studies, impacts, such as what you've heard here tonight. Every parcel of land and its surroundings is different. That is especially true with uses that you have already classified as special permit uses. That's why you call them special permit uses. You say that generically or conceptually they're okay in the neighborhood, but we want to understand the specifics, we want to understand the impact.

So to say that approval of one special permit application implies or binds you to approval of another is just simply inconsistent with the nature of the application and the use. Approving one application does not bind this Commission to grant any other application, even if it's for the same use in the same zone. I could be a little more direct and say it is somewhat insulting to this Commission for people to say that approving one application will bind you to another. That's like saying you won't do your job with a future application. This Applicant has greater faith in the Commission doing its job.

So this said, the Slate School application is for a special permit and site plan with the existing zoning regulations. We are not asking for a zone change, we are not asking for a text amendment, we are not opening any use that is not allowed or disallowed under the existing rules.

I think you know even without us explaining that an elementary school is a fundamentally different use from anything that might be associated with a college or university; most notably because elementary school students, they don't drive, they are always under the supervision of parents or administrators or teachers. Zoning regulations routinely differentiate between colleges and universities, high schools, elementary schools. Your regulations do and you would too in reviewing any specific application.

And then finally, even if Quinnipiac or any other college or university were to come before you with an application that on paper met your zoning regulations, you have your power to impose conditions and to mitigate impacts. So there is absolutely nothing in this application that should give you pause as to some future application, whether by Quinnipiac or any other use.

The Slate School, in my opinion, I've been doing this for a long time. Like many members of the development team, they have spent a lot of time, more time than you would ever realize or even expect, to try to think of everything. Jennifer Clark's outreach to the neighbors has been nothing short of extraordinary. The design team has taken the time, not just to make a great environment for the students, but to make sure that this fits on the property on Mansfield Road.

Thank you very much.

MR. CARLSON: Thank you.

MR. LEE: Mr. Chairman, I would conclude our presentation this evening. We're available to answer any questions that the Commission may have.

MR. CARLSON: We're going to take a ten-minute break.

Okay, we're back. The break is over. We're going to continue along with the Commission at this point having any questions to do with the Applicant here. And so we're going to start with the Commission and we're going to go right along with that. With that, Ron, do you want to start with the Commission?

Record Item #20

PLANNING & ZONING COMMISSION
NORTH HAVEN, CONNECTICUT

PUBLIC HEARING
AND
SITE PLAN

SEPTEMBER 11, 2017

#P17-16S

Continuation of the Special Permit Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

#P17-16

Continuation of the Site Plan Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

BOARD MEMBERS

VERN E. CARLSON, CHAIRMAN
RONALD PENTON, VICE CHAIRMAN
JAMES J. GIULIETTI, REGULAR MEMBER
JOSEPH M. SOLIMENE, ACTING SECRETARY

MARYLEE RYDZEWSKI
COURT REPORTER

MR. CARLSON: Okay. Before we get going here, last month we had heard all the people in favor of it; presumably, all the people. This month we're going to hear from all the people who are in opposition of it.

Before I get into that, Mr. Lambert, I suppose, is going to be up first. Tim, is there anything that you want to address before we go into this?

MR. LEE: Good evening, Mr. Chairman and members of the Commission. My name is Timothy Lee. I am the attorney for Alexander and Jennifer Clark with respect to this application.

We presented our application to the Commission last month. There was a number of comments and questions from the Commission; and also some comments and questions referred in the last month from people in the neighborhood.

So in order to try to address some of those concerns, my clients have agreed to several stipulations with regard to this application.

One, they would agree to provide the Town with a conservation easement over the wetlands area, so that that portion of the property could never be developed.

They would also agree to a stipulation that as long as the school is in existence we would not seek any residential development, or subdivision for residential development of the property.

We had received a concern that hey, you're spending a lot of money to buy this property. How are you going to fund this? We think you're going to block off fifteen acres and put houses on those fifteen acres. So we are unequivocally saying that is not our intention and we would agree to such a stipulation with the Planning and Zoning Commission.

The final concern we've heard was that either we're a front for Quinnipiac University; or if we get approved, Quinnipiac would ultimately take over the property. For the record, the Clark's have absolutely no interest in Quinnipiac taking over this property. They have no interest in selling the property to Quinnipiac and they are not a front for Quinnipiac University. They are willing to consider any reasonable stipulation that the Commission would impose to state that this property would not be used for University purposes.

MR. CARLSON: Okay, so these are the things that we did discuss last month.

MR. LEE: Correct.

MR. CARLSON: Okay. Thank you. Is there anything else that you'd like to add?

MR. LEE: Not at this point in time. Certainly we reserve the

Record Item #35

PLANNING & ZONING COMMISSION
NORTH HAVEN, CONNECTICUT

PUBLIC HEARING
AND
SITE PLAN

OCTOBER 2, 2017

#P17-16S

Continuation of the Special Permit Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

#P17-16

Continuation of the Site Plan Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

BOARD MEMBERS

VERN E. CARLSON, CHAIRMAN
RONALD PENTON, VICE CHAIRMAN
JAMES J. GIULIETTI, ACTINV SECRETARY
JOSEPH M. SOLIMENE, ALTERNATE
RICHARD E. WILSON, ALTERNATE

MARYLEE RYDZEWSKI
COURT REPORTER

MR. LEE: I would also point out that both Mr. Galante and Mr. Sullivan are here tonight, as are the rest of the development team. If the Commission has any questions for them, I can certainly have them come up to address those questions.

Next, before the hearing – at the inception of the hearing last month, I got up and I stated that the Applicant was willing to agree to certain conditions of approval; and they're still willing to agree to those certain conditions of approval. For the purposes of the record, I would just like to reiterate that the Applicant is agreeable to a conservation easement over the wetlands portion of the property. Tom Daly of Milone & MacBroom has submitted a map to you, which was in your packet, that indicated the portion of the conservation easement area.

Two: The Clarks were agreeable to a restriction that they would not seek any residential development of the 24-acres of the property during the existence of the school. It's not our intention to put the school on one portion of the property and subdivide to put houses on another portion of the property. We are willing to accept that as a condition of approval.

Thirdly: All along, until last month, we had heard that there was a great concern that hey, if you can put a school there, you're going to open the door for Quinnipiac University. Last month they said that was not the case, but no matter what the situation is, the Clarks are willing to agree to a restriction that the property will not be put to – for a use for University purposes, if it gives the Commission some peace of mind.

I saw tonight that Mr. Colleran has also put together his own conditions of approval. A number of those conditions of approval are things that are a part of our application. We agreed to no more than seventy students as part of this application. We agreed that the application does not show any athletic fields; nor is there going to be any athletic baseball fields, soccer fields, football fields on the property.

As part of our application to the State for the septic system, we show that there's going to be no showers, no kitchen, and no food preparation. Once again, that is part of our application.

We also, as part of our presentation, said there would be no buses. If the Commission wants us to – We heard a lot of different things about buses last week. Some people wanted buses because they think it keeps cars off the road. Other people said they didn't want buses. We had always said no buses, because that's what we had heard from the public. We'll leave it to the Commission's discretion as to whether they want buses or not. I will say buses currently travel the road for the public schools. I don't see the difference between a public school bus and a private school bus would be; but if that's something that's important to the Commission, we're certainly willing to agree to that.

Next was that Mr. Colleran had asked for the 22-acres to be preserved as a nature conservancy with a restriction approved by the Town Attorney. Once again, the property is about 25-acres. We are utilizing for school purposes about two acres; the remaining portion of the property is going to be undeveloped at this time. We are not offering a restriction over the entire 25-acres of the property, the remaining 23-acres of the property.

However, we are agreeing that that portion of the property will never be used for residential development. We're not going to subdivide it. We're not going to split it off and sell it to a developer.

The next proposal from Mr. Colleran was that the school be limited to 188 days a year. This is going to be a school. It's going to be grades K-through-6, five or six. We're going to be open during normal school days. I don't know if that's 180, 100; I'm not sure of the exact number, but we are willing to be operational during normal school times.

With regard to the use of fertilizers, we already struck that agreement with the Wetlands Commission regarding what types of fertilizers can be used and what cannot be used.

The next proposal was mowing the site lines west of the driveway. I think we had a discussion about that the first night, how it was important to mow that, to preserve the site lines, especially in light of our request to waive the sidewalks. Once again, it would be our intention to

Record Item #47

PLANNING & ZONING COMMISSION
NORTH HAVEN, CONNECTICUT

PUBLIC HEARING
AND
SITE PLAN

DELIBERATIONS

NOVEMBER 13, 2017

#P17-16S

Continuation of the Special Permit Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

#P17-16

Continuation of the Site Plan Application of Alexander Clark, Applicant, Sweet Meadow Farm Associates, LLC, Owner, relative to 124 Mansfield Road, (Map 77, Lot 17). Plan Entitled: Slate School, 124 Mansfield Road, North Haven, Connecticut. Prepared by: Milone & MacBroom. Dated May 08, 2017. Scale 1"= 50'. R-40 Zoning District.

BOARD MEMBERS

VERN E. CARLSON, CHAIRMAN
RONALD PENTON, VICE CHAIRMAN
THERESA RANCIATO-VIELE, SECRETARY
JAMES J. GIULIETTI, REGULAR MEMBER
JOSEPH M. SOLIMENE, ALTERNATE
RICHARD E. WILSON, ALTERNATE
EDWARD M. HOMA, ALTERNATE

MARYLEE RYDZEWSKI
COURT REPORTER

the Commission six or seven years now, and this has been by far the largest application I've ever sat on; the most amount of interest; gotten the most letters, over two hundred, and I've read every single one of them.

MR. GIULIETTI: Let me add that I've read them, too.

MR. CARLSON: Well, we all –

MR. PENTON: Yes, and they're all very well written. Nobody was crazy. They all spoke to the issue, so it was encouraging to know that we have so many people in North Haven who care about the Town. Too many of our applications nobody seems to care about, so it was nice to see.

There were questions raised about do we need another school in North Haven? My daughter went to – not Ridge Road, Green Acres School; and she now is a teacher at school; and I'm very proud of that – in North Haven. I think the public schools are great.

But I also think the whole country has a reputation of welcoming different people who want different things; and there's always been lots of private schools in Connecticut. If somebody wants to send their child to a private school, I think that should be their choice. People shouldn't be forced to go to a public school if they want something different for their child. So I don't have a problem with a private school, regardless of its location.

The traffic? We've never had an application with so many traffic reports. We usually get one at the most. We had three or four or five on this one. As Jim said, it's not the ideal road. There's many roads in North Haven and in every town in Connecticut that are far from ideal.

But likewise, regardless of what goes in that site, unless it was another single-family dwelling, which is unlikely, there's going to be a change to the traffic in that road. And there would be nothing we could do about another application coming in, either.

So although in a perfect world I'd like to see that road safer, I don't think that the Courts would agree if we use that as a reason to object.

I have a number of suggested alternate or conditions to any potential approval, some of which Jim has already mentioned. Some are a few other minor things that were mentioned during the application, which if when we get to the point to made a formal motion, I will add it in there for everybody to do. But right now I am also inclined to vote in favor.

MR. CARLSON: Okay. Let me say a few words in respect to the approval or the denial of –

MR. PENTON: Don't forget Joe.

MR. CARLSON: Say again?

MR. PENTON: Don't forget Joe.

MR. CARLSON: I know. I'll get there. I just want to mention that if this were denied, it doesn't mean that that piece of property, the 24-acres, is going to remain vacant. They're going to do something with that property, whether it be the family that wants to put a school in there now, or someone else that wants to put housing in there.

We could very well have someone come straight in here with an 8-30g from under the State, and bring in thirty, forty, perhaps more apartments; and the burden falls on the Zoning Commission to deny that. If in fact we were to deny it, they would go to the State and we have never ever won anything on an 8-30g in this town. I don't think there has been very many, if any, 8-30g's won by the local zoning commission over the –

I just want you folks to know that the Commission – it certainly sounds like it's leaning for "in favor" of that; but I want you to think about what could be there if this didn't go.

You going to pick that up there, Joe? I'm all set. Thank you. Go ahead.

MR. GIULIETTI: (inaudible) Rich?

MR. FREDRICKSEN: Rich isn't sitting on this, so we go right to Joe.

MR. GIULIETTI: Oh, sorry. Okay.

MR. SOLIMENE: First, I'm the newest member on this Commission, so I'm impressed by – and a little bit overwhelmed by the amount of people that came out in force in support and in opposition to the application. Sitting here and only being here about a year, to see this many people involved in town government and take a vested interest in something, it's impressive; and I'm glad to have seen so many people have an interest in this, and to come before us and speak before us, and spend plenty of nights here where you're here until eleven o'clock at night just like we were, listening to everybody and being respectful of other people's opinions. I, too, have read every single word of every single letter and email that's been submitted.

As far as the application goes, I'd like to commend the Applicant for making herself so available to the public. I think it's impressive that you spent so much time sitting down and listening to people, and trying to address their concerns.

Coming in here tonight, I had no preconceived ideas of which way I was going to go or how I would vote. I think both the Applicant and the opposition have both done a very good job of putting forth their arguments and their points.

As Jim and as Ron both alluded to, it seems that the main opposition relates to traffic. The issue with traffic, I would agree with both Ron and Jim, that the road is what it is; and whether this gets approved or denied, if that parcel of land gets developed we have the same issues coming before us as far as traffic goes.

So then I looked to what are the requirements for a special permit and for a site plan. It appears to me that this application meets the requirements for a special permit. It's a permitted use and it meets the site plan requirements.

I am slightly concerned or disappointed with the Applicant in the aspect of an environmental or conservation easement. I know it's been relatively limited. I would have liked to have seen that to be more; but I don't know if that, at the end of the day, has an impact on whether it's a permitted use, and whether its site plan meets all the requirements.

So at this point, I too think I would be leaning to vote in favor of the application.

MR. CARLSON: Okay. Hearing that, we have made some notes here – which Jim had made some notes and I have made some notes and Ron had made some notes; everybody has made notes throughout this meeting, as to which way things might go.

So whatever we so choose to do here, we're going to try to put some conditions on this. I'd like to get a motion –

MR. GIULIETTI: (inaudible) –

MR. CARLSON: You want to make the motion?

MR. GIULIETTI: Well, Ron should make the motion, or

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Brian Miller Land Use Report

Land Use Report Summary

- This is a rural area composed of low-density, single-family, multi-acre lots
- The area is serviced by narrow, 2-lane roads with steep grades, sharp curves, and no on-street parking
- The proposed school will have intense activity which is incompatible with the rural residential environment
- The plans call for the removal of almost all natural vegetation with no real vegetative buffer
- 36 parking spaces are proposed
  - This is barely adequate during normal business hours
  - Parking may spill over onto the street
- The applicant needs to demonstrate that there will not be any offensive glare or light trespass from the site
- The average impervious surface percentage of neighboring properties is 5.5%
- The impervious surface percentage of the proposed school is 26%
- The site is too small to accommodate the proposed use

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

George Andrews Lighting Report

Lighting/Photometric Plan Comments

- **From:** George F. Andrews <gfandrews@loureiro.com>
  Sent: Thursday, April 15, 2021 9:08:27 AM
  To: John A. Acampora <JAcampora@uks.com>; Maria Acampora <MAcampora@uks.com>
  Cc: Clinton S. Brown <csbrown@loureiro.com>
  Subject: Slate School
-
- EXTERNAL: Do not click links or open attachments unless you recognize the sender and know the content is safe.
-
- John/Maria,
-
- The current plan set for the above project dated March 25, 2021 includes a Site Plan, which includes the location, type, and a detail of the pole mounted light foundation. In order to review the plan properly, we need to understand the mounting height, fixture types, direction of the projection and the photometric values throughout the site. This information is critical to evaluate the potential for light trespass to determine if spill light is projecting off of the applicant's parcel. This information is typically included on a Photometric Plan, which is required to properly design the exterior lighting facilities, similar to the plan that was previously submitted by the applicant dated November 11, 2020.
-
- The Photometric Plan needs to include the design, mounting height and direction of the luminaires as required under 10.1.3.27 of the Town of North Haven Zoning Regulations.
-
- Thanks,
-
- **George Andrews Jr., PE, LEP**
  Vice President, Civil/Survey
- **Loureiro Engineering Associates, Inc.** | An Employee Owned Company
  100 Northwest Drive, Plainville, CT 06062 | **D:** 860.410.2906 | **C:** 860.729.6460

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

James Bubaris Traffic Report

Slate Upper School Opposition

Bubaris Traffic Review Summary & Conclusions

- M&M Traffic Study did not assess the impact of the roadway's narrow, undulating characteristics
- Outer Ridge Road was not engineered or designed to any recent roadway standard (required minimum width 24'-30')
- Unable to widen the road further within the limits of available rights-of-way
- Increases in traffic volumes will impact neighbors' quality of life
- An institutional, non-residential school works against the objectives in the POCD
- Anticipated trip distribution of 30% from north is unsubstantiated and too low
- Available sight lines at intersection of Ridge & Mt Carmel are quite restricted
- Outer Ridge Road is too narrow to handle more two-way traffic, especially following snow plowing events that will narrow the roadway further
- Outer Ridge Road experiences high usage by pedestrians, joggers, bicyclists; serious safety concerns with increased traffic

Rev 1.0

North Haven P&ZC Hearing April 19, 2021

Opposition to Slate Upper School

James Bubaris Traffic Report

Slate Upper School Opposition

Bubaris Traffic Review Summary & Conclusions

- M&M Traffic Study did not assess the impact of the roadway's narrow, undulating characteristics
- Outer Ridge Road was not engineered or designed to any recent roadway standard (required minimum width 24'-30')
- Unable to widen the road further within the limits of available rights-of-way
- Increases in traffic volumes will impact neighbors' quality of life
- An institutional, non-residential school works against the objectives in the POCD
- Anticipated trip distribution of 30% from north is unsubstantiated and too low
- Available sight lines at intersection of Ridge & Mt Carmel are quite restricted
- Outer Ridge Road is too narrow to handle more two-way traffic, especially following snow plowing events that will narrow the roadway further
- Outer Ridge Road experiences high usage by pedestrians, joggers, bicyclists; serious safety concerns with increased traffic

Bubaris Traffic
ASSOCIATES
Planning • Engineering • Design

April 15, 2021

Mr. Vern Carlson, Chairman
Planning and Zoning Commission
c/o Mr. Alan Fredricksen, Land Use Administrator
North Haven, CT 06473

RE: Traffic Review
Proposed Slate Upper School
5100 Outer Ridge Road
North Haven, Connecticut

Dear Mr. Carlson:

At the request of neighboring property owners, we have reviewed the proposal to develop a 90-student private Grade 7 to Grade 12 school, with the potential to add a pre-Kindergarten program consisting of 10 additional students, on the site formerly occupied by the Mount Carmel Christian Church, at no. 5100 on the west side of Outer Ridge Road, south of Mount Carmel Avenue, in the Town of North Haven.

We understand the school will be served by one access/egress site drive to be located on Outer Ridge road, and that all students travelling to and from the site will be transported by private automobiles. Eventually, some of the older students will drive themselves.

In conducting our review:

- we have familiarized ourselves with the site;
- have reviewed the Traffic Study prepared for this development by Milone and MacBroom, Inc., dated November 5, 2020;
- have reviewed the Traffic Access and Impact Study prepared for this development by Frederick P. Clark Associates, dated November 2020;
- have reviewed the Town of North Haven Plan of Conservation and Development, 2017-2027, adopted July 24, 2017, effective September 1, 2017;
- and have had conversations with neighboring property owners to consider neighborhood concerns.

We offer the following comments regarding the traffic operations and traffic safety aspects of the subject development:

1. We find that the traffic studies prepared for the developer do not go far enough in evaluating the characteristics of Outer Ridge Road or the other nearby streets which will serve the subject development. In the developer's traffic studies, only level of service analyses were conducted which evaluate traffic volume levels, and in that ONLY the proposed site drive intersection, but have not provided any assessments of roadway characteristics.

405 Main Street (Yalesville) • Wallingford, CT 06292 • Telephone: 203-265-8086 • Cell: 203-606-4742
JimBubaris@hotmail.com

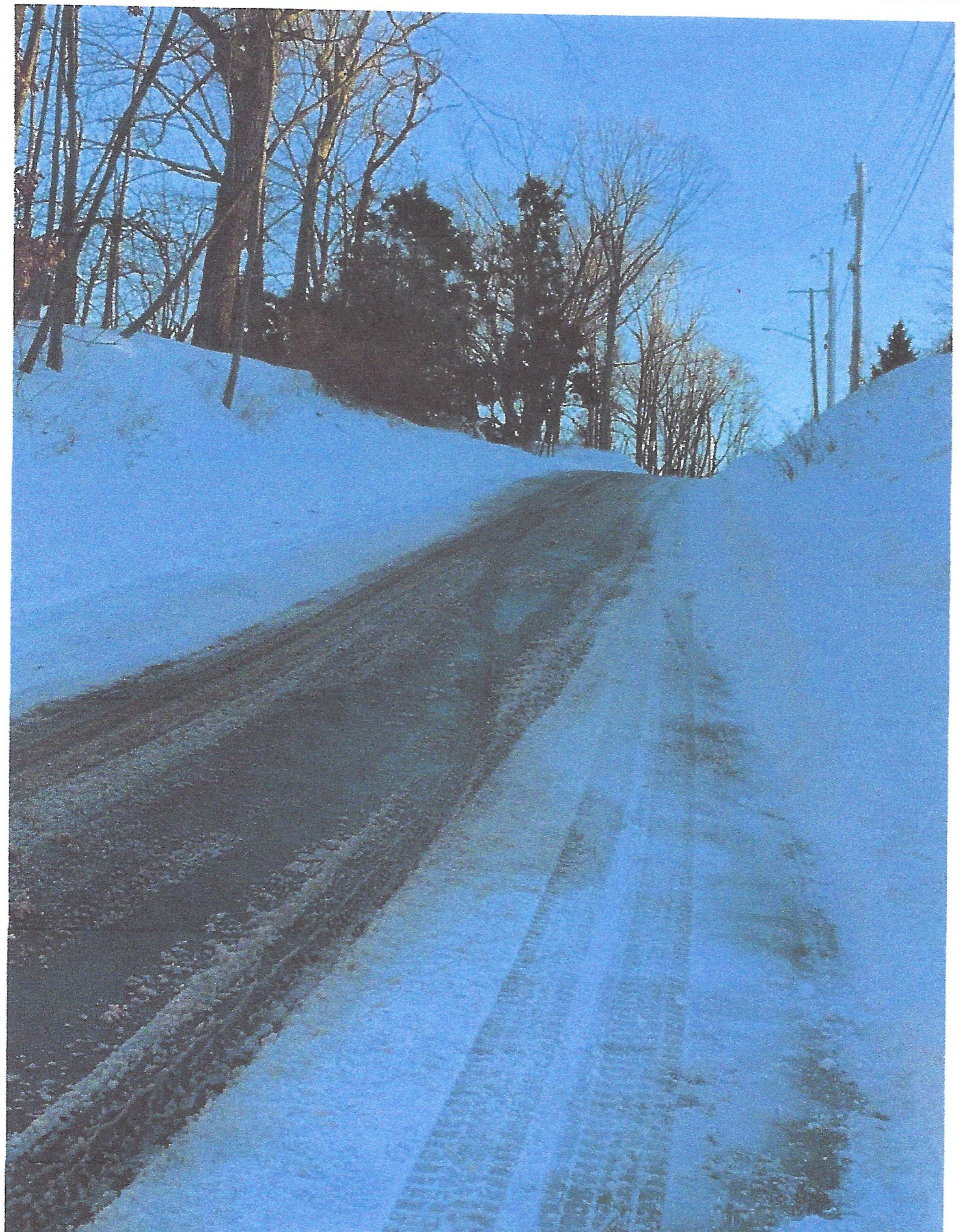
2. It is obvious that Outer Ridge Road was not engineered or designed to be built to any recent roadway standard, but has evolved over time to serve the primarily residential developments that have been built on each side of it. Outer Ridge Road is a narrow, two-lane road, with very narrow pavement widths, with no shoulders, and its alignment is undulating both horizontally and vertically. Current standards suggest a desirable minimum roadway width of 24 feet, and the addition of an institutional use such as the subject school suggests that the road should be widened from its current condition if it is to support increased traffic of a non-residential nature as proposed. Although there are proposals to spot widen Outer Ridge Road at two problem spots, one directly north and one directly south of the proposed site drive, there is nothing presented assessing the other narrow locations requiring improvement both north and south of the proposed facility.

3. The road is very narrow, winding and undulating in nature, with the edge of the road very close to utility poles, trees and embankments, providing very little recovery areas and a difficult situation to traverse, particularly for inexperienced drivers as proposed to be added to the system by the proposed development. Unfortunately, it does not appear that there is an established right-of-way to make many roadway improvements possible, and given the narrowness of Outer Ridge Road and its extension to the south (Ridge Road) and the inability to widen them within the limits of the available rights-of-way, adding more traffic to Outer Ridge Road would create a potentially unsafe situation.

4. It is interesting to note that the operations analyses of peak hour conditions of the proposed site drive on Outer Ridge Road compute to very good levels of service A, which are considered excellent, and the developer's traffic study concludes that the subject development will therefore not have an adverse impact. However, these operational analyses do not consider or account for the deficiencies in the road, and these levels of service do not truly evaluate the situation at hand. Consider that from our review of the projected combined peak hour traffic volumes at the proposed site drive intersection, a comparison of pre-development to post-development values show that volumes would be 2.1 to 2.5 times what they are today to the north of the site, and would be 3.1 to 4.6 times what they are today to the south of the site. Admittedly, these volumes would still be in the level of service A range, but these increases in volumes would certainly have an impact on the quality of life for the residents of the immediate area who either live nearby or routinely travel this road.

5. A review of the Town's Plan of Conservation and Development cites various goals, objectives, and strategies, and one of these is for the preservation of various scenic roads, specifically including Outer Ridge Road. An institutional, non-residential development as proposed would certainly work against this objective as it relates to Outer Ridge Road.

6. It is stated in the subject traffic studies that the anticipated trip distribution for the subject development orients site-generated traffic 30 percent to and from the north of the site and 70 percent to and from the south of the site, but shows no data to substantiate this estimate. Distribution would likely favor more to the north than stated, and an assessment of the operation of the Mount Carmel Avenue at Outer Ridge Road is recommended, including an evaluation of available sight lines at THAT intersection which appear restricted to and from both directions (i.e., east and west).



7. Outer Ridge Road is too narrow a road to be handling more two-way vehicles passing each other at the same time which would become more of an occurrence with the introduction of additional traffic volumes as suggested. The potential for side-swipe crashes would increase, and the impact of the road's narrowness would be further exacerbated during inclement weather, and particularly in the winter months following snow plowing events when roads are further narrowed.

8. Given the rural nature of the subject area and its proximity to Sleeping Giant State Park and Quinnipiac University, Outer Ridge Road experiences use by pedestrians, joggers and bicyclists who enjoy the peace, serenity, and safety of this area, and such would certainly be jeopardized by an increase in the amount of traffic traversing this relatively quiet street.

9. A review of the subject study area indicates that traffic signing of a warning and advisory nature is severely lacking given the poor conditions of the subject roadway network. It is recommended that the subject developer conduct a review and make recommendations as to how to rectify this situation.

10. Finally, a picture is usually worth a thousand words, and to that end we refer to the previous page which is a reprint of a picture taken looking south on Outer Ridge Road in the vicinity of no. 5060 showing not only the narrowness of the road, the limited sight distance as one approaches one of the road's many hills, but specifically the potential for serious crashes following a recent snowstorm which only served to exacerbate the poor roadway conditions even further.

Please let us know if you have any questions or if you require additional information regarding this matter.

Very truly yours,
Bubaris Traffic Associates

James G. Bubaris

James G. Bubaris, P.E.
Conn. Reg. No. 9203
Principal

STATE OF CONNECTICUT
JAMES G. BUBARIS
No. 9203
LICENSED
PROFESSIONAL ENGINEER

cc: Mr. John A. Acampora, Esq.

Bubaris Traffic
ASSOCIATES
Planning • Engineering • Design

James G. Bubaris, P.E.

EDUCATION

- B. S. IN CIVIL ENGINEERING, CORNELL UNIVERSITY
- M.E. IN TRAFFIC ENGINEERING, PENNSYLVANIA STATE UNIVERSITY

PROFESSIONAL REGISTRATION

- REGISTERED PROFESSIONAL ENGINEER:
    - CONNECTICUT, NO. 9203
    - PENNSYLVANIA, NO. 10956-E
    - FLORIDA, NO. 77781

PROFESSIONAL AFFILIATIONS

- FELLOW, INSTITUTE OF TRANSPORTATION ENGINEERS (ITE)
- MEMBER, AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)
- FORMER PRESIDENT, VICE PRESIDENT AND DIRECTOR
  NEW ENGLAND SECTION OF INSTITUTE OF TRANSPORTATION ENGINEERS
- FORMER PRESIDENT AND VICE PRESIDENT
  CONNECTICUT CHAPTER OF INSTITUTE OF TRANSPORTATION ENGINEERS
- FORMER TECHNICAL MEMBER
  NATIONAL COMMITTEE ON UNIFORM TRAFFIC CONTROL DEVICES
- FORMER DISTRICT 1 DIRECTOR
  URBAN TRAFFIC ENGINEERS' COUNCIL, ITE
- MEMBER, FORMER ITE TECHNICAL COUNCIL COMMITTEE 6Y-35
  ROLE OF TRAFFIC ENGINEER IN PRIVATE DEVELOPMENT
- CHAIRMAN, FORMER ITE TECHNICAL COUNCIL COMMITTEE 4A-15
  PEDESTRIAN CONTROL AT SIGNALIZED INTERSECTIONS

PROFESSIONAL EXPERIENCE

- FIVE YEARS TRAFFIC ENGINEERING/PLANNING/DESIGN EXPERIENCE
  PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (1968-1973)
- THREE YEARS AS HEAD TRAFFIC ENGINEER
  KEYES ASSOCIATES, ARCHITECTS / ENGINEERS / PLANNERS
  WETHERSFIELD, CONNECTICUT (1973-1976)
- ELEVEN YEARS AS TRAFFIC AND TRANSPORTATION MANAGER
  TOWN OF WEST HARTFORD, CONNECTICUT
  TRAFFIC ENGINEERING / PLANNING / DESIGN / MAINTENANCE (1976-1987)
- PRINCIPAL OF BUBARIS TRAFFIC ASSOCIATES, INC.
  WALLINGFORD (YALESVILLE), CONNECTICUT
  TRAFFIC PLANNING / ENGINEERING / DESIGN (1987 TO PRESENT)

405 Main Street (Yalesville) • Wallingford, CT 06492 • Cell: (203) 606-4742
• JimBubaris@hotmail.com •

Maria V. Acampora
5060 Ridge Road
North Haven, CT 06473

March 30, 2021

Sent via U.S. First Class Mail and
Sent via email: *Fredricksen.alan@northhaven-ct.gov*

Alan A. Fredricksen
Land Use Administrator, Zoning
Town of North Haven
Memorial Town Hall
18 Church Street
North Haven, CT 06473

Re: Application for Slate School 5100 Ridge Road, North Haven

Dear Mr. Fredricksen:

We have reviewed the plans at the church property and see that the plans show road widening along Ridge Road. We are concerned. There is a very tight right of way in this area. We would like you to have the developer stake / flag the ROW so we can see what the impact may be. We are not sure if the road can be widened without requiring grading or grading rights, either from our adjacent properties or other abutters in the proposed work.

Please advise when this can be done.

Very truly yours,

Maria V. Acampora

Maria V. Acampora

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Daniel O'Neill Traffic Report

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Daniel O'Neill Traffic Report

Rev 1.0

Slate Upper School Opposition

Vliet & O'Neill Traffic Review Summary & Conclusions

- A Site Investigation, Turning Movement Counts, & Speed Studies Were Conducted Between March 23 and April 12, 2021
  - Sight lines at the intersection of Ridge Road and Mount Carmel are deficient:
    - Looking west, need 375', have 204'
    - Looking east, need 320', have 254'
  - 85^{th} percentile measured traffic speed on Mount Carmel is 34mph from the west and 29mph from the east
  - Approximately 90% of the traffic to the site is likely to use the Mount Carmel/Ridge Road intersection, as opposed to 30% presented by the applicant
  - Due to the geometry and deficient sight line distances, the added traffic due to the school will increase the number of accidents at this intersection
- M&M Traffic Report does not quantify sight line distances to the south of the site ("Looking to the right, the sight distance for the 85^{th} percentile speed is also achievable.")
  - Looking south, need 370', currently have 327'
- The M&M Traffic Report does not quantify how much the embankment to the south of the site will have to be cut back to achieve a 370' sight line distance
  - Road widening to obtain the sight distance from the south will require grading the top of the existing embankment further back from the road to maintain the existing slope. This will require an easement from the property owner.
  - Alternatively, a retaining wall could be built, which would introduce a hazardous fixed object in the road which would also impede snow removal.

VLIET & O'NEILL, LLC
CRASH RECONSTRUCTION
TRAFFIC ENGINEERING

41 PROSPECT STREET
MANCHESTER, CT 06040-5801
TELEPHONE 860-533-1210
FACSIMILE 860-533-1374

April 14, 2021

John A. Parese, Esq.
PPP&C
2319 Whitney Avenue, Suite 1-D
Hamden, CT 06518

Re: Traffic Study
Slate Upper School

Dear Mr. Parese,

I have reviewed the traffic studies by Milone & McBroom and by Frederick P. Clark Associates. I visited the site and took sight distance measurements from the proposed driveway and from Outer Ridge Road at its intersection with Mount Carmel Avenue. And I had speed studies and turning movement counts done at the Mount Carmel Avenue/Outer Ridge Road intersection. After reviewing the information from the traffic studies and analyzing the traffic data (attached), I offer the following issues and comments.

Site Driveway – Intersection Sight Distance

The traffic studies provide the 85th percentile speeds and corresponding ISDs of approximately 370 feet. The sight distance looking north currently exists, however the sight line to the south is blocked by an embankment on the west side of the road and is limited to approximately 327 feet. It appears that the necessary sight line can be achieved with the proposed roadway widening, as shown in the M&M study (Fig. 6).

The embankment as it exists today is very steep and likely cannot be made any steeper. Therefore, any widening to the roadway at the bottom of the embankment would require that the top of the embankment be graded further back from the road, to maintain the existing degree of slope. From Fig. 6 and my field review, it appears that this would require at least a construction easement and possibly a permanent slope easement from the adjacent property.

An alternative could be to construct a retaining wall to allow for the road widening without having to move the top of the slope. Depending on the type of wall, this still may require a temporary construction easement from the adjacent property. The drawback to this solution is that it would introduce a hazardous fixed object to a narrow (even with the widening) road. Consideration would have to be given to proper setbacks, end treatments, and even such issues as snow removal.

Trip Distribution

The two studies use a trip distribution with 70% of the site generated traffic coming from and returning to the south, and 30% coming from and returning to the north. This is based on “a review of the surrounding roadway network as well as expected student demographics” (M&M), and “an evaluation of current traffic patterns and the anticipation of where students may reside” (FPC).

A review of the existing traffic volumes on Outer Ridge Road, as provided in the studies, reflects a split of about 60% to the south and 40% to the north. No detail was provided concerning where the students will live and how that affects the splits.

Outer Ridge Road is a rural road and is almost exclusively residential. It is bounded to the north by a mountain, to the east and south by the Wilbur Cross Parkway and I-91, and to the west by Route 10 and various collector roads. Its major population densities are to the south and northeast, with Quinnipiac University to the northwest. It is very narrow, and not conducive to efficient speeds, and as such is not a convenient cut-through route for traffic. As a result, the vehicle trips are very low, likely mostly residential, and oriented to the south, where the major traffic draws are.

Given these conditions, it is not appropriate to use the current split of traffic on Outer Ridge Road to project the trip distribution for the proposed school. A more appropriate analysis would consider the trip distribution at the Mount Carmel Avenue/Outer Ridge Road intersection. This intersection includes the access to the area from the east and west (Mount Carmel Avenue), as well as a regional draw (Quinnipiac).

Using the turning movement counts at this intersection, I determined that approximately 50% of the traffic comes from and returns to the east (Mount Carmel Avenue), 40% west (Mount Carmel Avenue), and 10% south (Outer Ridge Road). Following this pattern, 10% of the site generated traffic would utilize Outer Ridge Road to the south and 90% to the north.

The M&M study projects that 51 site generated trips will use Mount Carmel Avenue in the morning peak hour and 47 in the afternoon peak hour. The FPC study projects 57 in the morning and 41 in the afternoon. Using the 90% split to the north, these numbers would change to: M&M, 153 a.m. and 139 p.m.; FPC 173 a.m. and 123 p.m.

Note that currently the Mount Carmel Avenue/Outer Ridge Road services of total of 127 trips in the morning peak and 206 in the afternoon, on all approaches combined.

Mount Carmel Avenue/Outer Ridge Road – Intersection Sight Distance.

The speed study at this intersection indicates that the 85th percentile speed for vehicles approaching from the west is 34 mph and from the east is 29 mph. These speeds correspond to ISDs of 375 feet and 320 feet, respectively.

On March 23, 2021 I measured the sight distances at this intersection. There was no foliage on the trees and any plant growth on the ground was very low and/or without leaves. I measured the sight distance to the west to be approximately 204 feet. I measured along the edge of the plant growth to demonstrate what the sight line would be like once the leaves grew in. This growth could be cut back to achieve an improved sight line but may involve work on private property. The two photos below show the view from Outer Ridge Road, and from Mount Carmel Road at a point 204 feet from the intersection. The vehicle in the first photograph is approximately 204 feet away.

Looking West from Outer Ridge Road

Looking East Approaching Outer Ridge Road

The sight distance to the east is approximately 254 feet. The sight line obstructions are embankments to the left and right, and possibly the crest vertical curve of the roadway. The view from Outer Ridge Road threads the needle between the embankments to see the approaching vehicle. Any growth of the vegetation on the embankments will significantly reduce this sight distance. The following two photos show the view from Outer Ridge Road, and from Mount Carmel Avenue from approximately 254 feet away.

Any road work done to alleviate this problem may involve private property. It should also be noted that part of this intersection is in the Town of Hamden and would require permits for any road work.

Looking East from Outer Ridge Road

Looking West Approaching Outer Ridge Road

Accident Experience

My inspection of the Mount Carmel Avenue/Outer Ridge Road intersection led me to expect a significant accident experience. Mount Carmel Avenue is narrow and twisting which would lead to vehicles crossing the center of the road. The intersection sight distances are far below what they should be, which would lead to drivers pulling out just as an approaching vehicle comes into view, leaving them little time to avoid a collision.

However, as noted in both studies, and as I found in my own review, there is not a significant accident problem at this intersection. This is due to the very low volume of traffic that uses this intersection. It is unlikely that two vehicles will be in the same wrong place at the same wrong time.

When looking at an intersection that does not have any operational or geometric problems, the lack of an accident experience can be used to infer that simply adding more vehicles will not cause the roadway to become dangerous. In this case, adding more traffic to a deficient intersection will increase the likelihood that accidents will occur during the morning and afternoon peak hours.

Besides adding the volume of site generated traffic noted above, if vehicles leaving Outer Ridge Road are queued up waiting to get out, drivers may get impatient and pull out before they are sure the roadway is clear. A better understanding of this possibility can be gained by conducting a capacity analysis. This will also provide information on how far back vehicles may line up and if they will block access to the nearest residential driveway.

In conclusion, it is my opinion that barring compelling information on the travel routes of students, much more traffic will use the Mount Carmel Avenue/Outer Ridge Road intersection than has been projected. This has the potential to be a safety problem because of the geometry and poor sight distances at the intersection. Mitigating measures such as signing and geometric improvements should be investigated. Also, the proposed road widening south of the site driveway may involve the use of adjacent property, and/or introduce a new roadway hazard.

I hope this information is helpful to you. Please contact me if you wish to discuss these issues in further detail.

Sincerely,

Daniel W. O'Neill

Daniel W. O'Neill, P.E.

STATE OF CONNECTICUT
DANIEL W. O'NEILL
No. 16469
LICENSED
PROFESSIONAL ENGINEER

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue at Ridge Road
North Haven, Connecticut

File Name : 21698
Site Code : 21698
Start Date : 4/1/2021
Page No : 1

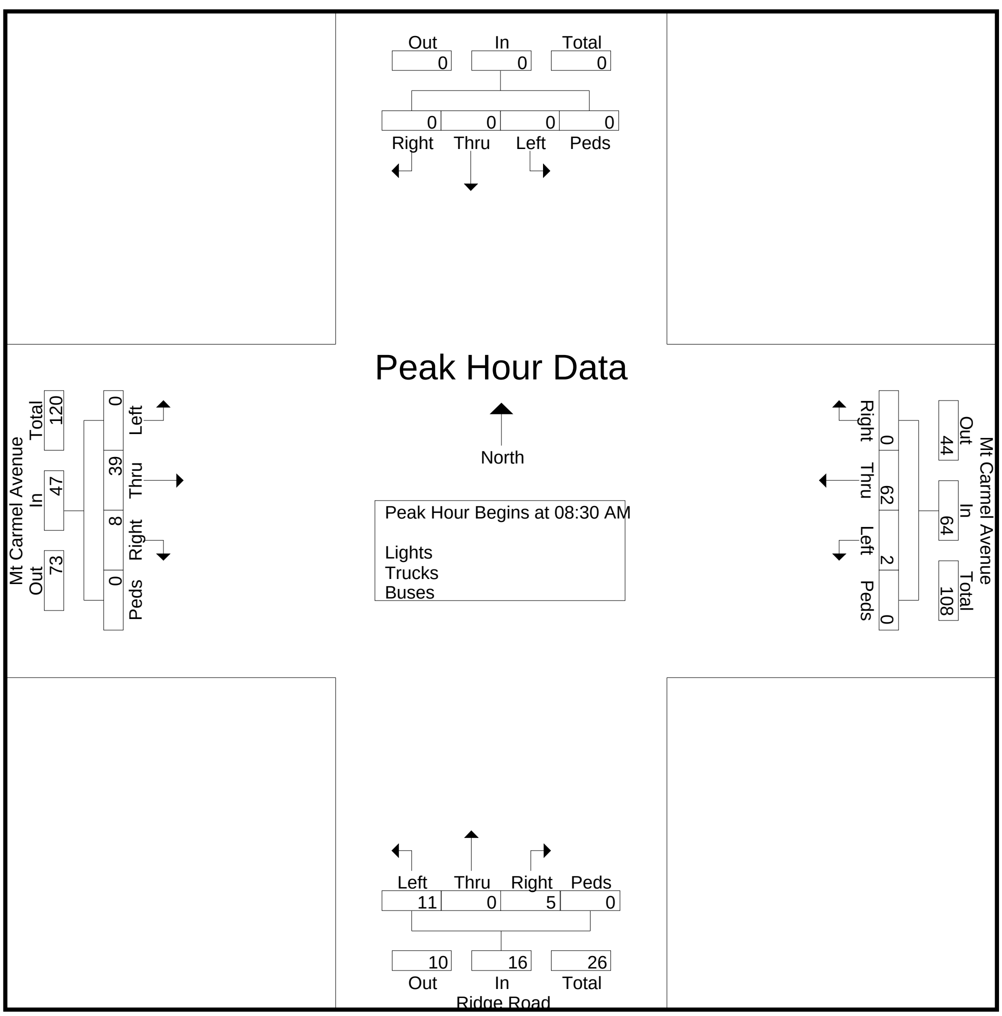
Groups Printed- Lights - Trucks - Buses

	From North					Mt Carmel Avenue From East					Ridge Road From South					Mt Carmel Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	11	2	0	13	0	0	1	0	1	1	7	0	0	8	22
07:15 AM	0	0	0	0	0	0	12	0	0	12	0	0	2	0	2	1	8	0	0	9	23
07:30 AM	0	0	0	0	0	0	16	1	0	17	0	0	7	0	7	2	13	0	0	15	39
07:45 AM	0	0	0	0	0	0	18	0	0	18	0	0	2	0	2	3	14	0	0	17	37
Total	0	0	0	0	0	0	57	3	0	60	0	0	12	0	12	7	42	0	0	49	121
08:00 AM	0	0	0	0	0	0	10	0	0	10	1	0	2	0	3	2	7	0	0	9	22
08:15 AM	0	0	0	0	0	0	10	2	0	12	0	0	1	0	1	0	12	0	0	12	25
08:30 AM	0	0	0	0	0	0	18	0	0	18	4	0	3	0	7	3	9	0	0	12	37
08:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	2	0	3	1	10	0	0	11	19
Total	0	0	0	0	0	0	43	2	0	45	6	0	8	0	14	6	38	0	0	44	103
09:00 AM	0	0	0	0	0	0	19	2	0	21	0	0	0	0	0	2	9	0	0	11	32
09:15 AM	0	0	0	0	0	0	20	0	0	20	0	0	6	0	6	2	11	0	0	13	39
Grand Total	0	0	0	0	0	0	139	7	0	146	6	0	26	0	32	17	100	0	0	117	295
Apprch %	0	0	0	0		0	95.2	4.8	0		18.8	0	81.2	0		14.5	85.5	0	0		
Total %	0	0	0	0	0	0	47.1	2.4	0	49.5	2	0	8.8	0	10.8	5.8	33.9	0	0	39.7	
Lights	0	0	0	0	0	0	137	6	0	143	6	0	26	0	32	14	96	0	0	110	285
% Lights	0	0	0	0	0	0	98.6	85.7	0	97.9	100	0	100	0	100	82.4	96	0	0	94	96.6
Trucks	0	0	0	0	0	0	1	1	0	2	0	0	0	0	0	3	3	0	0	6	8
% Trucks	0	0	0	0	0	0	0.7	14.3	0	1.4	0	0	0	0	0	17.6	3	0	0	5.1	2.7
Buses	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% Buses	0	0	0	0	0	0	0.7	0	0	0.7	0	0	0	0	0	0	1	0	0	0.9	0.7

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

File Name : 21698
Site Code : 21698
Start Date : 4/1/2021
Page No : 2

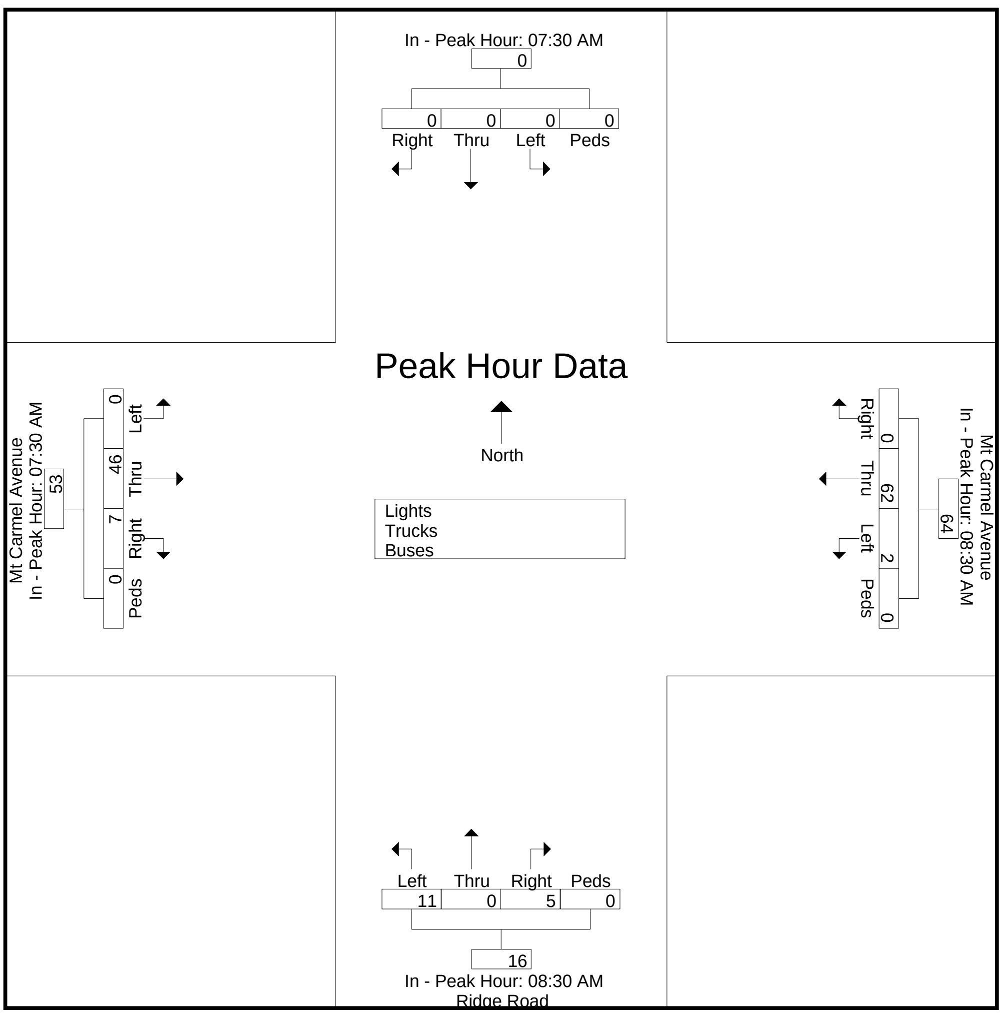
	From North					Mt Carmel Avenue From East					Ridge Road From South					Mt Carmel Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:30 AM																					
08:30 AM	0	0	0	0	0	0	18	0	0	18	4	0	3	0	7	3	9	0	0	12	37
08:45 AM	0	0	0	0	0	0	5	0	0	5	1	0	2	0	3	1	10	0	0	11	19
09:00 AM	0	0	0	0	0	0	19	2	0	21	0	0	0	0	0	2	9	0	0	11	32
09:15 AM	0	0	0	0	0	0	20	0	0	20	0	0	6	0	6	2	11	0	0	13	39
Total Volume	0	0	0	0	0	0	62	2	0	64	5	0	11	0	16	8	39	0	0	47	127
% App. Total	0	0	0	0		0	96.9	3.1	0		31.2	0	68.8	0		17	83	0	0		
PHF	.000	.000	.000	.000	.000	.000	.775	.250	.000	.762	.313	.000	.458	.000	.571	.667	.886	.000	.000	.904	.814



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

File Name : 21698
Site Code : 21698
Start Date : 4/1/2021
Page No : 3

	From North					Mt Carmel Avenue From East					Ridge Road From South					Mt Carmel Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	07:30 AM					08:30 AM					08:30 AM					07:30 AM					
+0 mins.	0	0	0	0	0	0	18	0	0	18	4	0	3	0	7	2	13	0	0	15	
+15 mins.	0	0	0	0	0	0	5	0	0	5	1	0	2	0	3	3	14	0	0	17	
+30 mins.	0	0	0	0	0	0	19	2	0	21	0	0	0	0	0	2	7	0	0	9	
+45 mins.	0	0	0	0	0	0	20	0	0	20	0	0	6	0	6	0	12	0	0	12	
Total Volume	0	0	0	0	0	0	62	2	0	64	5	0	11	0	16	7	46	0	0	53	
% App. Total	0	0	0	0		0	96.9	3.1	0		31.2	0	68.8	0		13.2	86.8	0	0		
PHF	.000	.000	.000	.000	.000	.000	.775	.250	.000	.762	.313	.000	.458	.000	.571	.583	.821	.000	.000	.779	



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue at Outer Ridge Road
North Haven, Connecticut

File Name : 21699
Site Code : 21699
Start Date : 4/1/2021
Page No : 1

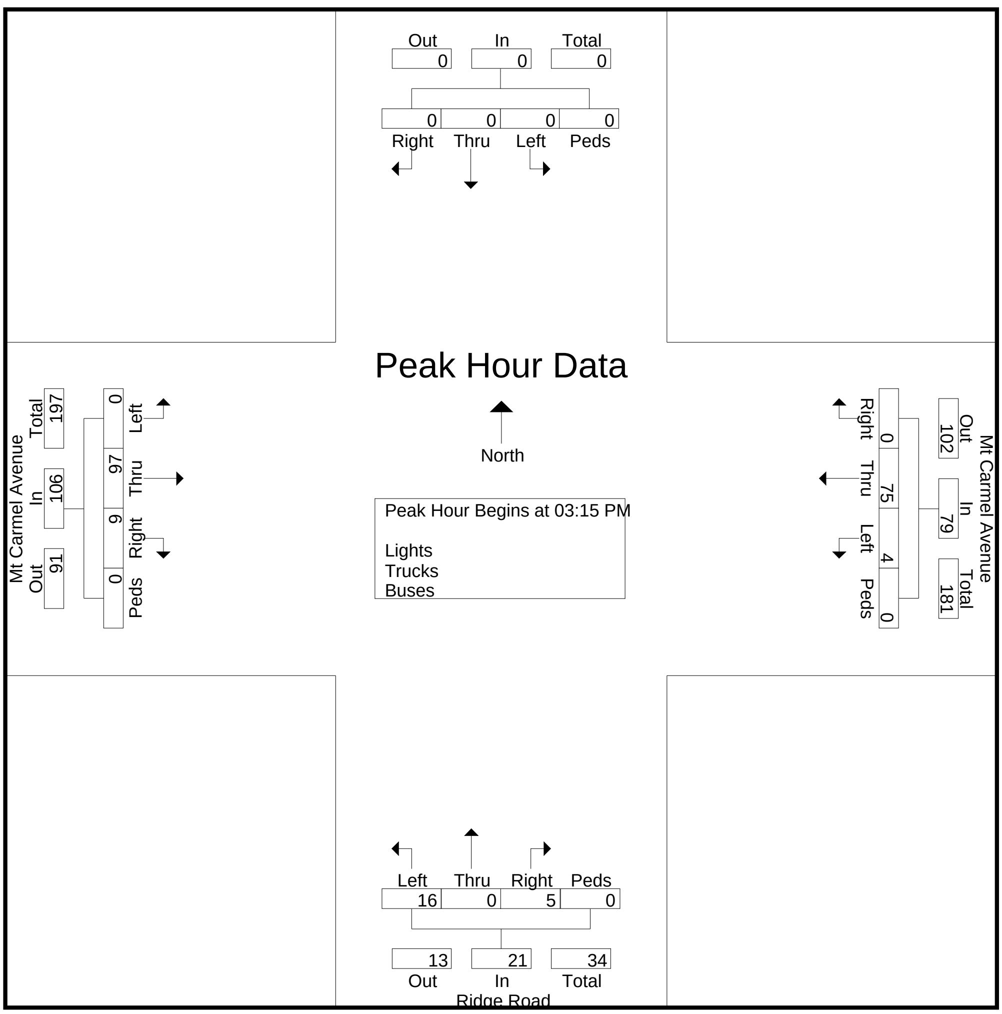
Groups Printed- Lights - Trucks - Buses

						Mt Carmel Avenue					Ridge Road					Mt Carmel Avenue					
	From North					From East					From South					From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
02:30 PM	0	0	0	0	0	0	15	1	0	16	1	0	3	0	4	7	24	0	0	31	51
02:45 PM	0	0	0	0	0	0	17	1	0	18	0	0	3	0	3	0	21	0	0	21	42
Total	0	0	0	0	0	0	32	2	0	34	1	0	6	0	7	7	45	0	0	52	93
03:00 PM	0	0	0	0	0	0	18	0	0	18	0	0	3	0	3	3	16	0	0	19	40
03:15 PM	0	0	0	0	0	0	17	2	0	19	2	0	2	0	4	5	26	0	0	31	54
03:30 PM	0	0	0	0	0	0	16	0	0	16	0	0	5	0	5	2	29	0	0	31	52
03:45 PM	0	0	0	0	0	0	24	1	0	25	1	0	5	0	6	0	18	0	0	18	49
Total	0	0	0	0	0	0	75	3	0	78	3	0	15	0	18	10	89	0	0	99	195
04:00 PM	0	0	0	0	0	0	18	1	0	19	2	0	4	0	6	2	24	0	0	26	51
04:15 PM	0	0	0	0	0	0	23	0	0	23	0	0	3	0	3	0	23	0	0	23	49
04:30 PM	0	0	0	0	0	0	32	0	0	32	0	0	1	1	2	3	18	0	0	21	55
04:45 PM	0	0	0	0	0	0	21	0	0	21	0	0	1	1	2	2	28	0	0	30	53
Total	0	0	0	0	0	0	94	1	0	95	2	0	9	2	13	7	93	0	0	100	208
05:00 PM	0	0	0	0	0	0	19	2	0	21	0	0	1	0	1	5	19	0	0	24	46
05:15 PM	0	0	0	0	0	0	21	1	0	22	1	0	4	0	5	5	21	0	0	26	53
05:30 PM	0	0	0	0	0	0	24	1	0	25	0	0	2	0	2	7	21	0	0	28	55
05:45 PM	0	0	0	0	0	0	23	0	0	23	0	0	1	0	1	1	17	0	0	18	42
Total	0	0	0	0	0	0	87	4	0	91	1	0	8	0	9	18	78	0	0	96	196
Grand Total	0	0	0	0	0	0	288	10	0	298	7	0	38	2	47	42	305	0	0	347	692
Apprch %	0	0	0	0		0	96.6	3.4	0		14.9	0	80.9	4.3		12.1	87.9	0	0		
Total %	0	0	0	0	0	0	41.6	1.4	0	43.1	1	0	5.5	0.3	6.8	6.1	44.1	0	0	50.1	
Lights	0	0	0	0	0	0	288	10	0	298	7	0	38	2	47	42	299	0	0	341	686
% Lights	0	0	0	0	0	0	100	100	0	100	100	0	100	100	100	100	98	0	0	98.3	99.1
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	5	5
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.6	0	0	1.4	0.7
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
% Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0	0	0.3	0.1

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

File Name : 21699
Site Code : 21699
Start Date : 4/1/2021
Page No : 2

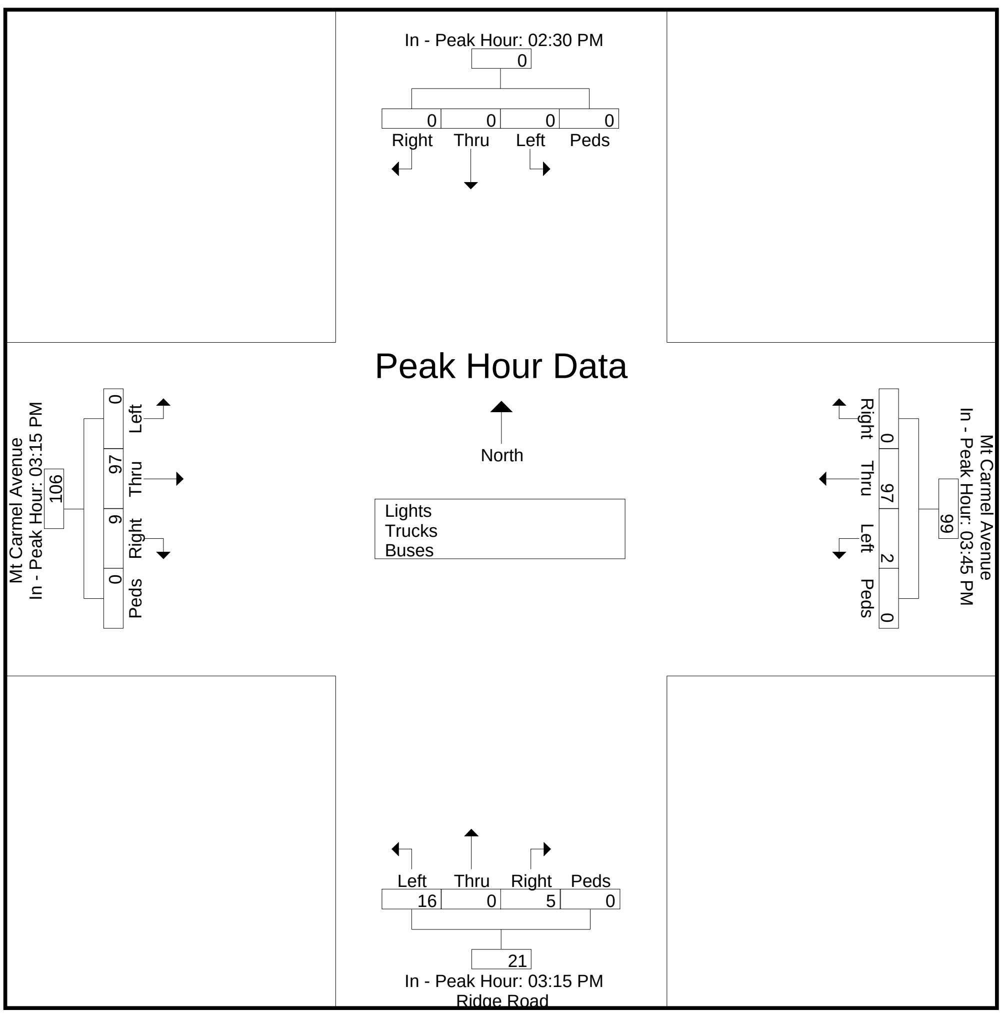
	From North					Mt Carmel Avenue From East					Ridge Road From South					Mt Carmel Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 04:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:15 PM																					
03:15 PM	0	0	0	0	0	0	17	2	0	19	2	0	2	0	4	5	26	0	0	31	54
03:30 PM	0	0	0	0	0	0	16	0	0	16	0	0	5	0	5	2	29	0	0	31	52
03:45 PM	0	0	0	0	0	0	24	1	0	25	1	0	5	0	6	0	18	0	0	18	49
04:00 PM	0	0	0	0	0	0	18	1	0	19	2	0	4	0	6	2	24	0	0	26	51
Total Volume	0	0	0	0	0	0	75	4	0	79	5	0	16	0	21	9	97	0	0	106	206
% App. Total	0	0	0	0		0	94.9	5.1	0		23.8	0	76.2	0		8.5	91.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.781	.500	.000	.790	.625	.000	.800	.000	.875	.450	.836	.000	.000	.855	.954



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

File Name : 21699
Site Code : 21699
Start Date : 4/1/2021
Page No : 3

	From North					Mt Carmel Avenue From East					Ridge Road From South					Mt Carmel Avenue From West					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:30 PM to 04:30 PM - Peak 1 of 1																					
Peak Hour for Each Approach Begins at:																					
	02:30 PM					03:45 PM					03:15 PM					03:15 PM					
+0 mins.	0	0	0	0	0	0	24	1	0	25	2	0	2	0	4	5	26	0	0	31	
+15 mins.	0	0	0	0	0	0	18	1	0	19	0	0	5	0	5	2	29	0	0	31	
+30 mins.	0	0	0	0	0	0	23	0	0	23	1	0	5	0	6	0	18	0	0	18	
+45 mins.	0	0	0	0	0	0	32	0	0	32	2	0	4	0	6	2	24	0	0	26	
Total Volume	0	0	0	0	0	0	97	2	0	99	5	0	16	0	21	9	97	0	0	106	
% App. Total	0	0	0	0		0	98	2	0		23.8	0	76.2	0		8.5	91.5	0	0		
PHF	.000	.000	.000	.000	.000	.000	.758	.500	.000	.773	.625	.000	.800	.000	.875	.450	.836	.000	.000	.855	



Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/05/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	0	70	23	0	16	0	0	2	0	0	0	0	0	0	111
15:00	0	70	22	0	12	0	0	1	0	0	0	0	0	0	105
16:00	2	74	29	0	11	0	0	2	0	0	0	0	0	0	118
17:00	2	71	19	0	6	0	0	3	1	0	0	0	0	0	102
18:00	1	46	16	0	8	1	0	2	0	0	0	0	0	0	74
19:00	0	27	19	0	3	0	0	0	0	0	0	0	0	0	49
20:00	0	19	4	0	1	0	0	0	0	0	0	0	0	0	24
21:00	0	19	8	0	2	0	0	0	0	0	0	0	0	0	29
22:00	0	8	3	0	1	0	0	0	0	0	0	0	0	0	12
23:00	0	2	4	0	1	0	0	0	0	0	0	0	0	0	7
Total	5	406	147	0	61	1	0	10	1	0	0	0	0	0	631
Percent	0.8%	64.3%	23.3%	0.0%	9.7%	0.2%	0.0%	1.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak															
Vol.															
PM Peak	16:00	16:00	16:00		14:00	18:00		17:00	17:00						
Vol.	2	74	29		16	1		3	1						

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/06/21	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	4	1	0	2	0	0	0	0	0	0	0	0	0	7
06:00	0	21	12	0	3	0	0	0	0	0	0	0	0	0	36
07:00	0	57	15	1	3	0	0	0	0	0	0	0	0	0	76
08:00	1	26	8	0	3	0	0	2	0	0	0	0	0	0	40
09:00	0	29	19	1	4	0	1	2	0	0	0	0	0	0	56
10:00	0	38	19	1	4	0	0	3	0	0	0	0	0	0	65
11:00	0	55	18	0	8	0	0	1	0	0	0	0	0	0	82
12 PM	0	43	14	0	4	0	0	2	0	0	0	0	0	0	63
13:00	1	56	26	0	5	1	0	2	0	0	0	0	0	0	91
14:00	1	49	24	0	9	0	0	3	0	0	0	0	0	0	86
15:00	3	59	18	1	15	0	0	0	0	0	0	0	0	0	96
16:00	3	70	37	0	5	1	0	2	0	0	0	0	0	0	118
17:00	3	72	21	0	7	0	0	2	0	1	0	0	0	0	106
18:00	0	52	31	0	5	0	0	1	0	0	0	0	0	0	89
19:00	0	37	9	0	5	0	0	0	0	0	0	0	0	0	51
20:00	0	17	10	0	2	0	0	1	0	0	0	0	0	0	30
21:00	0	10	1	0	2	0	0	1	0	0	0	0	0	0	14
22:00	0	12	3	0	1	0	0	0	0	0	0	0	0	0	16
23:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
Total	12	715	291	4	88	2	1	22	0	1	0	0	0	0	1136
Percent	1.1%	62.9%	25.6%	0.4%	7.7%	0.2%	0.1%	1.9%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	09:00	07:00	11:00		09:00	10:00							
Vol.	1	57	19	1	8		1	3							
PM Peak	15:00	17:00	16:00	15:00	15:00	13:00		14:00		17:00					
Vol.	3	72	37	1	15	1		3		1					

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/07/21	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
04:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	6	2	1	0	0	0	0	0	0	0	0	0	0	9
06:00	0	20	11	0	4	0	0	1	0	0	0	0	0	0	36
07:00	0	42	9	1	2	0	0	0	0	0	0	0	0	0	54
08:00	0	26	14	0	4	1	0	2	0	0	0	0	0	0	47
09:00	0	45	19	0	3	1	0	3	0	0	0	0	0	0	71
10:00	0	58	21	0	9	0	0	2	0	0	0	0	0	0	90
11:00	0	85	27	1	7	0	0	0	0	0	0	0	0	0	120
12 PM	0	65	33	0	5	1	0	1	0	0	0	0	0	0	105
13:00	0	87	20	0	2	0	0	6	0	0	1	0	0	0	116
14:00	2	79	38	0	7	1	0	0	1	0	0	0	0	0	128
15:00	2	88	37	1	12	0	0	0	0	0	0	1	0	0	141
16:00	4	71	31	0	10	0	0	0	0	0	0	0	1	0	117
17:00	1	90	22	0	9	0	0	1	0	0	0	0	0	0	123
18:00	1	59	22	0	6	0	0	0	0	0	0	0	0	0	88
19:00	0	41	17	0	5	0	0	0	0	0	0	0	0	0	63
20:00	0	23	10	0	4	0	0	0	0	0	0	0	0	0	37
21:00	0	13	5	0	0	0	0	0	0	0	0	0	0	0	18
22:00	0	11	5	0	0	0	0	0	0	0	0	0	0	0	16
23:00	0	2	3	0	1	0	0	0	0	0	0	0	0	0	6
Total	10	916	350	4	91	4	0	16	1	0	1	1	1	0	1395
Percent	0.7%	65.7%	25.1%	0.3%	6.5%	0.3%	0.0%	1.1%	0.1%	0.0%	0.1%	0.1%	0.1%	0.0%	
AM Peak		11:00	11:00	05:00	10:00	08:00		09:00							
Vol.		85	27	1	9	1		3							
PM Peak	16:00	17:00	14:00	15:00	15:00	12:00		13:00	14:00		13:00	15:00	16:00		
Vol.	4	90	38	1	12	1		6	1		1	1	1		

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/08/21	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	3	2	0	0	0	0	0	0	0	0	0	0	0	5
05:00	0	5	2	0	0	0	0	1	0	0	0	0	0	0	8
06:00	0	11	13	0	5	0	0	0	0	0	0	0	0	0	29
07:00	0	32	11	0	6	1	0	0	0	0	0	0	0	0	50
08:00	0	33	24	0	8	0	0	1	0	0	0	0	0	0	66
09:00	0	32	6	0	9	0	0	1	1	0	0	0	0	0	49
10:00	1	35	12	0	7	0	0	0	0	0	0	0	0	0	55
11:00	0	63	35	1	4	0	0	1	0	0	0	0	0	0	104
12 PM	0	61	27	0	7	0	0	4	0	0	0	0	0	0	99
13:00	1	62	38	1	9	0	0	2	0	0	0	0	0	0	113
14:00	2	64	25	0	11	0	0	1	1	1	1	0	0	0	106
15:00	3	86	32	2	13	0	0	2	0	0	0	0	0	0	138
16:00	3	102	41	0	9	0	0	4	0	0	0	0	0	0	159
17:00	4	74	29	0	8	0	0	3	0	0	0	0	0	0	118
18:00	0	71	19	1	7	1	0	2	0	0	0	0	0	0	101
19:00	0	26	19	0	10	0	0	0	0	0	0	0	0	0	55
20:00	0	20	5	0	1	0	0	0	0	0	0	0	0	0	26
21:00	0	18	7	0	0	0	0	0	0	0	0	0	0	0	25
22:00	0	16	3	0	1	0	0	0	0	0	0	0	0	0	20
23:00	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
Total	14	828	355	5	115	2	0	22	2	1	1	0	0	0	1345
Percent	1.0%	61.6%	26.4%	0.4%	8.6%	0.1%	0.0%	1.6%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00	11:00	09:00	07:00		05:00	09:00						
Vol.	1	63	35	1	9	1		1	1						
PM Peak	17:00	16:00	16:00	15:00	15:00	18:00		12:00	14:00	14:00	14:00				
Vol.	4	102	41	2	13	1		4	1	1	1				

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/09/21	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
05:00	0	7	3	0	1	0	0	0	0	0	0	0	0	0	11
06:00	0	22	14	0	4	0	0	0	0	0	0	0	0	0	40
07:00	0	46	16	1	5	0	0	1	0	0	0	0	0	0	69
08:00	0	30	15	4	9	1	1	1	0	0	0	0	0	0	61
09:00	0	40	6	1	6	0	0	2	0	0	0	0	0	0	55
10:00	0	33	13	0	5	1	0	1	0	0	0	0	0	0	53
11:00	1	69	27	1	8	0	0	1	0	0	0	0	0	0	107
12 PM	1	56	19	0	4	0	0	0	0	0	0	0	1	0	81
13:00	2	44	26	0	3	0	0	1	0	0	0	0	0	0	76
14:00	1	68	36	1	6	1	0	1	0	0	0	0	0	0	114
15:00	1	81	30	1	14	1	0	2	0	0	0	0	0	0	130
16:00	2	80	22	0	6	0	0	2	0	0	0	0	0	0	112
17:00	4	81	24	0	5	0	0	1	0	1	0	0	0	0	116
18:00	0	51	17	0	3	0	1	3	0	0	0	0	0	0	75
19:00	0	30	11	0	3	0	0	0	0	0	0	0	0	0	44
20:00	0	22	9	0	2	0	0	0	0	0	0	0	0	0	33
21:00	0	16	10	0	2	0	0	0	0	0	0	0	0	0	28
22:00	1	21	6	0	3	0	0	0	0	0	0	0	0	0	31
23:00	0	9	1	0	2	0	0	0	0	0	0	0	0	0	12
Total	13	814	308	9	92	4	2	16	0	1	0	0	1	0	1260
Percent	1.0%	64.6%	24.4%	0.7%	7.3%	0.3%	0.2%	1.3%	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%	
AM Peak	11:00	11:00	11:00	08:00	08:00	08:00	08:00	09:00							
Vol.	1	69	27	4	9	1	1	2							
PM Peak	17:00	15:00	14:00	14:00	15:00	14:00	18:00	18:00		17:00			12:00		
Vol.	4	81	36	1	14	1	1	3		1			1		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/10/21	0	10	0	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
04:00	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
05:00	0	2	1	0	0	1	0	0	0	0	0	0	0	0	4
06:00	0	7	5	0	4	0	0	0	0	0	0	0	0	0	16
07:00	0	18	9	0	4	0	0	1	0	0	0	0	0	0	32
08:00	0	33	11	0	6	0	0	1	0	0	0	0	0	0	51
09:00	3	41	15	0	8	0	0	2	0	0	0	0	0	0	69
10:00	0	56	24	0	2	0	0	3	0	0	0	0	0	0	85
11:00	2	52	29	0	5	0	0	0	0	0	0	0	0	0	88
12 PM	2	66	24	0	7	1	0	3	0	1	0	0	0	0	104
13:00	4	78	28	0	14	0	0	1	0	1	0	0	0	0	126
14:00	3	67	43	0	11	0	0	1	0	0	0	0	0	0	125
15:00	7	60	27	0	7	0	0	2	0	0	0	0	0	0	103
16:00	2	68	20	0	6	0	0	1	0	0	0	0	0	0	97
17:00	4	59	22	0	4	0	0	0	0	0	0	0	0	0	89
18:00	0	42	17	0	5	0	0	3	0	0	0	1	0	0	68
19:00	1	30	21	0	6	0	0	0	0	0	0	0	0	0	58
20:00	0	29	11	0	3	0	0	0	0	0	0	0	0	0	43
21:00	0	14	8	0	3	0	0	0	0	0	0	0	0	0	25
22:00	0	16	6	0	1	0	0	1	0	0	0	0	0	0	24
23:00	0	10	4	0	0	0	0	0	0	0	0	0	0	0	14
Total	28	764	326	0	98	3	0	19	0	2	0	1	0	0	1241
Percent	2.3%	61.6%	26.3%	0.0%	7.9%	0.2%	0.0%	1.5%	0.0%	0.2%	0.0%	0.1%	0.0%	0.0%	
AM Peak	09:00	10:00	11:00		09:00	03:00		10:00							
Vol.	3	56	29		8	1		3							
PM Peak	15:00	13:00	14:00		13:00	12:00		12:00		12:00		18:00			
Vol.	7	78	43		14	1		3		1		1			

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/11/21	0	6	6	0	0	0	0	0	0	0	0	0	0	0	12
01:00	0	0	2	0	2	0	0	1	0	0	0	0	0	0	5
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	2	0	0	2	0	0	0	0	0	0	0	0	0	4
06:00	0	4	7	0	1	0	0	0	0	0	0	0	0	0	12
07:00	0	12	6	0	2	0	0	0	0	0	0	0	0	0	20
08:00	0	19	6	0	3	0	0	0	0	0	0	0	0	0	28
09:00	1	38	16	0	5	0	0	1	0	0	0	0	0	0	61
10:00	2	41	14	0	3	0	0	0	0	0	0	0	0	0	60
11:00	0	52	18	0	7	0	0	0	0	0	0	0	0	0	77
12 PM	2	43	18	0	3	0	0	1	0	0	0	0	0	0	67
13:00	0	46	34	0	2	0	0	1	0	0	0	0	0	0	83
14:00	0	42	26	1	6	0	0	2	0	0	0	0	0	0	77
15:00	0	43	16	0	5	0	0	1	0	0	0	0	0	0	65
16:00	1	44	13	0	2	0	0	1	0	0	0	0	0	0	61
17:00	1	30	13	0	1	0	0	0	0	0	0	0	0	0	45
18:00	0	30	8	0	2	0	0	1	0	0	0	0	0	0	41
19:00	0	27	6	0	4	0	0	0	0	0	0	0	0	0	37
20:00	0	16	5	0	0	0	0	0	0	0	0	0	0	0	21
21:00	0	6	7	0	0	0	0	0	0	0	0	0	0	0	13
22:00	0	11	5	0	0	0	0	0	0	0	0	0	0	0	16
23:00	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
Total	7	524	228	1	50	0	0	9	0	0	0	0	0	0	819
Percent	0.9%	64.0%	27.8%	0.1%	6.1%	0.0%	0.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00		11:00			01:00							
Vol.	2	52	18		7			1							
PM Peak	12:00	13:00	13:00	14:00	14:00			14:00							
Vol.	2	46	34	1	6			2							

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/12/21	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
01:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
05:00	1	6	0	0	2	0	0	0	0	0	0	0	0	0	9
06:00	0	14	15	2	4	0	0	0	0	0	0	0	0	0	35
07:00	0	31	12	1	0	0	0	1	0	0	0	0	0	0	45
08:00	0	27	20	0	5	1	0	2	0	0	0	0	0	0	55
09:00	0	32	19	0	5	2	0	0	0	0	0	0	0	0	58
10:00	0	45	14	1	9	0	0	1	0	0	0	0	0	0	70
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	1	158	84	4	25	3	0	4	0	0	0	0	0	0	279
Percent	0.4%	56.6%	30.1%	1.4%	9.0%	1.1%	0.0%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	05:00	10:00	08:00	06:00	10:00	09:00		08:00							
Vol.	1	45	20	2	9	2		2							
PM Peak															
Vol.															
Grand Total	90	5125	2089	27	620	19	3	118	4	5	2	2	2	0	8106
Percent	1.1%	63.2%	25.8%	0.3%	7.6%	0.2%	0.0%	1.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/05/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	0	104	15	0	3	0	0	1	0	0	1	0	0	0	124
15:00	1	78	13	0	5	0	0	3	0	0	0	0	0	0	100
16:00	2	97	14	0	2	1	0	3	0	0	0	0	0	0	119
17:00	1	88	13	0	1	0	0	0	0	0	0	0	0	0	103
18:00	0	58	6	0	1	0	0	0	0	0	0	0	0	0	65
19:00	0	43	6	0	2	0	0	0	0	0	0	0	0	0	51
20:00	0	32	4	0	1	0	0	0	0	0	0	0	0	0	37
21:00	0	17	4	0	0	0	0	0	0	0	0	0	0	0	21
22:00	0	10	0	0	1	0	0	0	0	0	0	0	0	0	11
23:00	0	8	2	0	1	0	0	0	0	0	0	0	0	0	11
Total	4	535	77	0	17	1	0	7	0	0	1	0	0	0	642
Percent	0.6%	83.3%	12.0%	0.0%	2.6%	0.2%	0.0%	1.1%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	
AM Peak															
Vol.															
PM Peak	16:00	14:00	14:00		15:00	16:00		15:00			14:00				
Vol.	2	104	15		5	1		3			1				

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/06/21	0	5	2	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	9	7	0	0	0	0	0	0	0	0	0	0	0	16
06:00	0	19	10	0	2	0	0	0	0	0	0	0	0	0	31
07:00	0	46	14	1	2	0	0	0	0	0	0	0	0	0	63
08:00	0	69	14	0	1	0	0	1	0	0	0	0	0	0	85
09:00	0	63	7	0	5	1	0	1	0	0	0	0	0	0	77
10:00	0	60	9	0	0	0	0	0	0	0	0	0	1	0	70
11:00	0	83	8	0	3	0	0	1	0	0	0	0	0	0	95
12 PM	0	65	16	0	2	0	0	2	0	0	0	0	0	0	85
13:00	1	96	7	0	4	0	0	1	0	0	0	0	0	0	109
14:00	1	85	13	1	0	0	0	2	0	1	0	0	0	0	103
15:00	2	91	21	0	2	0	0	1	0	1	0	1	0	0	119
16:00	1	88	11	0	4	0	0	1	0	1	0	0	0	0	106
17:00	1	89	21	0	2	0	0	1	0	0	0	0	0	0	114
18:00	2	75	9	0	1	0	0	2	0	0	0	0	0	0	89
19:00	0	46	11	0	0	0	0	1	0	0	0	0	0	0	58
20:00	0	23	3	0	0	0	0	1	0	0	0	0	0	0	27
21:00	0	17	1	0	0	0	0	0	0	0	0	0	0	0	18
22:00	0	17	2	0	0	0	0	0	0	0	0	0	0	0	19
23:00	0	3	3	0	0	0	0	0	0	0	0	0	0	0	6
Total	8	1056	189	2	28	1	0	15	0	3	0	1	1	0	1304
Percent	0.6%	81.0%	14.5%	0.2%	2.1%	0.1%	0.0%	1.2%	0.0%	0.2%	0.0%	0.1%	0.1%	0.0%	
AM Peak		11:00	07:00	07:00	09:00	09:00		08:00					10:00		
Vol.		83	14	1	5	1		1					1		
PM Peak	15:00	13:00	15:00	14:00	13:00			12:00		14:00		15:00			
Vol.	2	96	21	1	4			2		1		1			

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/07/21	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
05:00	0	5	4	0	0	0	0	0	0	0	0	0	0	0	9
06:00	1	18	9	0	1	0	0	0	0	0	0	0	0	0	29
07:00	1	43	13	0	2	0	0	1	0	0	0	0	0	0	60
08:00	0	69	14	0	4	0	0	0	0	0	0	0	0	0	87
09:00	0	85	12	2	4	0	0	1	0	0	0	1	1	0	106
10:00	1	97	10	1	3	0	1	2	0	1	0	0	0	0	116
11:00	0	76	8	0	3	0	1	2	0	0	0	0	0	0	90
12 PM	1	101	9	0	2	0	0	1	0	1	0	0	0	0	115
13:00	2	84	15	1	4	0	1	0	0	0	0	0	0	0	107
14:00	2	119	15	1	2	0	0	4	0	0	0	0	0	0	143
15:00	5	119	21	0	3	0	0	2	1	0	0	0	0	0	151
16:00	2	115	16	0	5	0	0	2	0	1	0	0	0	0	141
17:00	0	113	12	0	3	0	1	2	0	0	0	0	0	0	131
18:00	1	52	10	0	0	0	1	2	0	0	0	0	0	0	66
19:00	0	46	10	0	1	0	0	0	0	0	0	0	0	0	57
20:00	0	29	4	0	0	0	0	0	0	0	0	0	0	0	33
21:00	0	19	2	0	0	0	0	0	0	0	0	0	0	0	21
22:00	0	9	1	0	0	0	0	0	0	0	0	0	0	0	10
23:00	0	10	1	0	0	0	0	0	0	0	0	0	0	0	11
Total	16	1224	188	5	37	0	5	19	1	3	0	1	1	0	1500
Percent	1.1%	81.6%	12.5%	0.3%	2.5%	0.0%	0.3%	1.3%	0.1%	0.2%	0.0%	0.1%	0.1%	0.0%	
AM Peak	06:00	10:00	08:00	09:00	08:00		10:00	10:00		10:00		09:00	09:00		
Vol.	1	97	14	2	4		1	2		1		1	1		
PM Peak	15:00	14:00	15:00	13:00	16:00		13:00	14:00	15:00	12:00					
Vol.	5	119	21	1	5		1	4	1	1					

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/08/21	1	3	1	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	9	5	0	0	0	0	0	0	0	0	0	0	0	14
06:00	0	22	13	0	3	0	0	0	0	0	0	0	0	0	38
07:00	0	62	13	0	5	0	1	0	0	0	0	0	0	0	81
08:00	2	61	8	0	2	0	0	0	0	0	0	0	0	0	73
09:00	0	63	10	1	5	0	0	1	0	0	0	0	0	0	80
10:00	1	73	10	0	1	0	0	2	0	0	0	0	0	0	87
11:00	1	86	12	0	5	0	0	1	1	0	0	1	0	0	107
12 PM	5	96	13	0	5	1	1	2	0	0	0	0	0	0	123
13:00	1	81	14	1	3	0	0	3	1	0	0	0	0	0	104
14:00	1	98	12	1	3	0	0	1	0	0	0	0	0	0	116
15:00	1	115	15	0	3	0	0	3	1	0	0	0	1	0	139
16:00	3	87	12	0	2	0	0	1	0	0	0	0	0	0	105
17:00	2	91	4	1	1	0	0	1	0	0	0	0	0	0	100
18:00	0	70	8	0	1	0	1	0	0	0	0	0	0	0	80
19:00	0	44	5	0	2	0	0	1	0	0	0	0	0	0	52
20:00	0	31	5	0	0	0	0	0	0	0	0	0	0	0	36
21:00	2	13	2	0	0	0	0	0	0	0	0	0	0	0	17
22:00	0	13	2	0	0	0	0	0	0	0	0	0	0	0	15
23:00	0	12	0	0	0	0	0	0	0	0	0	0	0	0	12
Total	20	1138	164	4	41	1	3	16	3	0	0	1	1	0	1392
Percent	1.4%	81.8%	11.8%	0.3%	2.9%	0.1%	0.2%	1.1%	0.2%	0.0%	0.0%	0.1%	0.1%	0.0%	
AM Peak	08:00	11:00	06:00	09:00	07:00		07:00	10:00	11:00			11:00			
Vol.	2	86	13	1	5		1	2	1			1			
PM Peak	12:00	15:00	15:00	13:00	12:00	12:00	12:00	13:00	13:00				15:00		
Vol.	5	115	15	1	5	1	1	3	1				1		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/09/21	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	6	5	0	0	0	0	0	0	0	0	0	0	0	11
06:00	1	23	11	0	2	0	0	1	0	0	0	0	0	0	38
07:00	1	48	9	0	2	0	0	1	0	1	0	0	0	0	62
08:00	0	64	17	1	1	0	0	2	0	0	0	0	0	0	85
09:00	1	67	13	1	7	0	0	3	0	0	0	0	0	0	92
10:00	2	56	11	3	7	0	1	0	0	0	0	0	0	0	80
11:00	3	105	9	0	2	0	1	1	0	0	0	0	0	0	121
12 PM	1	83	11	0	6	0	0	0	0	0	0	1	0	0	102
13:00	1	110	12	1	1	0	1	0	0	0	0	0	0	0	126
14:00	3	87	15	1	2	0	1	1	0	0	0	0	0	0	110
15:00	1	89	21	0	3	0	1	2	0	1	0	0	0	0	118
16:00	1	85	14	0	2	0	0	2	0	0	0	0	1	0	105
17:00	6	92	13	1	4	1	1	1	0	0	0	0	0	0	119
18:00	0	71	8	0	1	0	0	0	0	0	0	0	0	0	80
19:00	0	45	3	0	2	0	0	0	0	0	0	0	0	0	50
20:00	0	28	2	0	1	0	0	0	0	0	0	0	0	0	31
21:00	0	29	5	0	0	0	0	1	0	0	0	0	0	0	35
22:00	0	21	1	0	0	0	0	0	0	0	0	0	0	0	22
23:00	0	10	3	0	0	0	0	0	0	0	0	0	0	0	13
Total	21	1131	183	8	43	1	6	15	0	2	0	1	1	0	1412
Percent	1.5%	80.1%	13.0%	0.6%	3.0%	0.1%	0.4%	1.1%	0.0%	0.1%	0.0%	0.1%	0.1%	0.0%	
AM Peak	11:00	11:00	08:00	10:00	09:00		10:00	09:00		07:00					
Vol.	3	105	17	3	7		1	3		1					
PM Peak	17:00	13:00	15:00	13:00	12:00	17:00	13:00	15:00		15:00		12:00	16:00		
Vol.	6	110	21	1	6	1	1	2		1		1	1		

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/10/21	0	10	3	0	0	0	0	0	0	0	0	0	0	0	13
01:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	6	1	0	0	0	0	0	0	0	0	0	0	0	7
06:00	0	15	5	0	0	0	0	0	0	0	0	0	0	0	20
07:00	1	41	8	0	1	0	0	1	0	0	0	0	0	0	52
08:00	1	54	12	0	2	0	0	1	0	0	0	0	0	0	70
09:00	0	70	14	0	4	0	0	0	0	0	0	1	0	0	89
10:00	2	83	18	0	7	0	0	2	0	0	0	0	0	0	112
11:00	4	95	17	0	4	0	0	5	0	1	0	0	0	0	126
12 PM	0	109	12	0	6	1	0	0	0	1	0	0	0	0	129
13:00	1	88	11	0	4	0	0	6	0	0	0	0	0	0	110
14:00	2	114	12	0	1	0	0	3	0	0	0	1	0	0	133
15:00	1	87	10	0	3	0	0	0	0	0	0	0	0	0	101
16:00	1	87	12	0	1	1	0	0	0	0	0	0	0	0	102
17:00	3	66	13	0	0	0	0	0	0	0	0	0	0	0	82
18:00	0	76	8	0	1	0	0	0	0	0	0	0	0	0	85
19:00	1	55	5	0	0	0	0	0	0	0	0	0	0	0	61
20:00	0	38	2	0	2	0	0	0	0	0	0	0	0	0	42
21:00	0	27	4	0	0	0	0	0	0	0	0	0	0	0	31
22:00	0	20	0	0	1	0	0	0	0	0	0	0	0	0	21
23:00	0	12	2	0	0	0	0	0	0	0	0	0	0	0	14
Total	17	1159	172	0	37	2	0	18	0	2	0	2	0	0	1409
Percent	1.2%	82.3%	12.2%	0.0%	2.6%	0.1%	0.0%	1.3%	0.0%	0.1%	0.0%	0.1%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		10:00			11:00		11:00		09:00			
Vol.	4	95	18		7			5		1		1			
PM Peak	17:00	14:00	17:00		12:00	12:00		13:00		12:00		14:00			
Vol.	3	114	13		6	1		6		1		1			

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/11/21	0	6	3	0	0	1	0	0	0	0	0	0	0	0	10
01:00	0	7	0	0	0	0	0	0	0	0	0	0	0	0	7
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
06:00	0	12	1	0	0	0	0	0	0	0	0	0	0	0	13
07:00	0	27	3	0	0	0	0	0	0	0	0	0	0	0	30
08:00	0	40	7	0	0	0	0	0	0	0	0	0	0	0	47
09:00	0	52	13	0	5	0	0	3	0	0	0	0	0	0	73
10:00	3	60	13	0	3	0	0	0	0	0	0	0	0	0	79
11:00	1	80	12	0	0	0	0	0	0	0	0	0	0	0	93
12 PM	1	54	7	0	1	0	0	1	0	0	0	0	0	0	64
13:00	2	71	11	0	2	0	0	1	0	0	1	0	0	0	88
14:00	0	80	8	0	1	0	0	1	0	0	0	0	0	0	90
15:00	0	55	7	0	1	0	2	0	0	0	0	0	0	0	65
16:00	0	56	5	0	0	0	0	0	0	0	0	0	0	0	61
17:00	3	33	6	0	1	0	0	0	0	0	0	0	0	0	43
18:00	0	43	1	0	0	0	0	0	0	0	0	0	0	0	44
19:00	0	25	1	0	0	0	0	0	0	0	0	0	0	0	26
20:00	0	22	3	0	1	0	0	0	0	0	0	0	0	0	26
21:00	0	22	1	0	0	0	0	0	0	0	0	0	0	0	23
22:00	0	10	1	0	0	0	0	0	0	0	0	0	0	0	11
23:00	0	8	4	0	1	0	0	0	0	0	0	0	0	0	13
Total	10	771	108	0	16	1	2	6	0	0	1	0	0	0	915
Percent	1.1%	84.3%	11.8%	0.0%	1.7%	0.1%	0.2%	0.7%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	09:00		09:00	00:00		09:00							
Vol.	3	80	13		5	1		3							
PM Peak	17:00	14:00	13:00		13:00		15:00	12:00			13:00				
Vol.	3	80	11		2		2	1			1				

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Ave West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8	Class 9	Class 10	Class 11	Class 12	Class 13	Class 14	Total
04/12/21	0	4	3	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	6	7	0	0	0	0	0	0	0	0	0	0	0	13
06:00	0	15	9	3	2	0	0	0	0	0	0	0	0	0	29
07:00	0	59	16	0	3	0	0	0	1	0	0	0	0	0	79
08:00	0	57	9	0	1	0	0	2	0	0	0	0	0	0	69
09:00	0	54	11	0	3	0	0	1	0	0	0	0	0	0	69
10:00	0	72	12	0	5	0	0	0	0	0	0	0	0	0	89
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	0	275	67	3	15	0	0	3	1	0	0	0	0	0	364
Percent	0.0%	75.5%	18.4%	0.8%	4.1%	0.0%	0.0%	0.8%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		10:00	07:00	06:00	10:00			08:00	07:00						
Vol.		72	16	3	5			2	1						
PM Peak															
Vol.															
Grand Total	96	7289	1148	22	234	7	16	99	5	10	2	6	4	0	8938
Percent	1.1%	81.6%	12.8%	0.2%	2.6%	0.1%	0.2%	1.1%	0.1%	0.1%	0.0%	0.1%	0.0%	0.0%	

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/05/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	**2**	1	7	46	43	11	1	0	0	0	0	0	0	0	111	26-35	89
15:00	0	0	7	37	**49**	11	0	**1**	0	0	0	0	0	0	105	26-35	86
16:00	2	0	**10**	**50**	40	**14**	2	0	0	0	0	0	0	0	**118**	26-35	90
17:00	0	0	7	39	41	13	2	0	0	0	0	0	0	0	102	26-35	80
18:00	1	**2**	6	36	15	14	0	0	0	0	0	0	0	0	74	26-35	51
19:00	0	1	3	25	12	8	0	0	0	0	0	0	0	0	49	26-35	37
20:00	0	1	3	8	9	2	1	0	0	0	0	0	0	0	24	26-35	17
21:00	0	1	2	9	7	7	**3**	0	0	0	0	0	0	0	29	26-35	16
22:00	0	0	1	2	2	6	1	0	0	0	0	0	0	0	12	31-40	8
23:00	0	0	4	0	1	2	0	0	0	0	0	0	0	0	7	21-30	4
Total	5	6	50	252	219	88	10	1	0	0	0	0	0	0	631		
Percent	0.8%	1.0%	7.9%	39.9%	34.7%	13.9%	1.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak Vol.																	
PM Peak	14:00	18:00	16:00	16:00	15:00	16:00	21:00	15:00							16:00		
Vol.	2	2	10	50	49	14	3	1							118		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start	0	16	21	26	31	36	41	46	51	56	61	66	71	76		Pace	Number
Time	15	20	25	30	35	40	45	50	55	60	65	70	75	9999	Total	Speed	in Pace
04/06/21	0	0	0	0	2	1	1	0	0	0	0	0	0	0	4	29-38	3
01:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	24-33	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
04:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	29-38	2
05:00	**1**	0	1	0	3	1	1	0	0	0	0	0	0	0	7	31-40	4
06:00	1	0	0	12	14	7	**2**	0	0	0	0	0	0	0	36	26-35	26
07:00	0	**1**	3	28	30	13	1	0	0	0	0	0	0	0	76	26-35	58
08:00	0	1	2	8	16	12	1	0	0	0	0	0	0	0	40	31-40	28
09:00	1	1	2	16	25	9	2	0	0	0	0	0	0	0	56	26-35	41
10:00	0	1	**4**	16	**32**	10	2	0	0	0	0	0	0	0	65	26-35	48
11:00	1	0	3	**29**	31	**18**	1	0	0	0	0	0	0	0	**83**	26-35	60
12 PM	0	0	2	13	30	**18**	0	0	0	0	0	0	0	0	63	31-40	48
13:00	**3**	0	8	35	31	11	1	**1**	0	0	0	0	0	0	90	26-35	66
14:00	2	1	6	29	35	11	1	0	**1**	0	0	0	0	0	86	26-35	64
15:00	1	1	7	41	33	11	1	0	0	0	0	0	**1**	0	96	26-35	74
16:00	1	0	**15**	46	**42**	12	**2**	0	0	0	0	0	0	0	**118**	26-35	88
17:00	0	**3**	9	**53**	29	11	1	0	0	0	0	0	0	0	106	26-35	82
18:00	2	1	4	33	40	10	0	0	0	0	0	0	0	0	90	26-35	73
19:00	1	0	2	30	13	5	0	0	0	0	0	0	0	0	51	26-35	43
20:00	0	1	1	12	12	4	0	0	0	0	0	0	0	0	30	26-35	24
21:00	0	0	3	2	3	6	0	0	0	0	0	0	0	0	14	31-40	9
22:00	0	0	3	7	2	3	1	0	0	0	0	0	0	0	16	21-30	10
23:00	0	0	0	3	1	0	0	0	0	0	0	0	0	0	4	24-33	4
Total	14	11	75	416	426	174	18	1	1	0	0	0	1	0	1137		
Percent	1.2%	1.0%	6.6%	36.6%	37.5%	15.3%	1.6%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%			
AM Peak	05:00	07:00	10:00	11:00	10:00	11:00	06:00								11:00		
Vol.	1	1	4	29	32	18	2								83		
PM Peak	13:00	17:00	16:00	17:00	16:00	12:00	16:00	13:00	14:00				15:00		16:00		
Vol.	3	3	15	53	42	18	2	1	1				1		118		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/07/21	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
01:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	19-28	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	1	0	1	0	0	0	0	0	0	0	0	0	2	14-23	1
04:00	0	0	0	0	2	1	0	0	0	0	0	0	0	0	3	29-38	3
05:00	0	0	2	3	2	1	1	0	0	0	0	0	0	0	9	26-35	5
06:00	1	0	3	10	15	7	0	0	0	0	0	0	0	0	36	26-35	25
07:00	2	0	4	17	23	8	1	0	0	0	0	0	0	0	55	26-35	40
08:00	2	0	4	13	18	9	1	**1**	0	0	0	0	0	0	48	26-35	31
09:00	**3**	0	11	20	30	7	0	0	0	0	0	0	0	0	71	26-35	50
10:00	2	**1**	**12**	31	30	11	**3**	0	0	0	0	0	0	0	90	26-35	61
11:00	1	1	7	**39**	**45**	**26**	1	0	0	0	0	0	0	0	**120**	26-35	84
12 PM	1	**3**	3	41	45	11	1	0	0	0	0	0	0	0	105	26-35	86
13:00	3	0	**17**	41	38	15	0	**1**	**1**	0	0	0	0	0	116	26-35	79
14:00	2	1	8	**55**	43	14	**4**	1	0	0	0	0	0	0	128	26-35	98
15:00	**5**	0	12	51	**54**	**16**	3	0	0	0	0	0	0	0	**141**	26-35	105
16:00	4	1	5	46	49	12	0	0	0	0	0	0	0	0	117	26-35	95
17:00	0	1	9	52	45	12	3	1	0	0	0	0	0	0	123	26-35	97
18:00	1	0	8	39	29	11	1	0	0	0	0	0	0	0	89	26-35	68
19:00	0	0	7	21	20	12	3	0	0	0	0	0	0	0	63	26-35	41
20:00	0	0	2	22	6	7	0	0	0	0	0	0	0	0	37	26-35	28
21:00	0	0	0	2	10	5	1	0	0	0	0	0	0	0	18	31-40	15
22:00	0	1	0	3	6	6	0	0	0	0	0	0	0	0	16	31-40	12
23:00	0	0	0	2	3	0	0	1	0	0	0	0	0	0	6	26-35	5
Total	27	9	117	510	515	191	23	5	1	0	0	0	0	0	1398		
Percent	1.9%	0.6%	8.4%	36.5%	36.8%	13.7%	1.6%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	10:00	11:00	11:00	11:00	10:00	08:00							11:00		
Vol.	3	1	12	39	45	26	3	1							120		
PM Peak	15:00	12:00	13:00	14:00	15:00	15:00	14:00	13:00	13:00						15:00		
Vol.	5	3	17	55	54	16	4	1	1						141		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/08/21	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	14-23	1
01:00	0	0	0	0	1	2	1	0	0	0	0	0	0	0	4	30-39	3
02:00	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2	29-38	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	1	0	0	1	2	1	0	0	0	0	0	0	0	0	5	31-40	3
05:00	0	0	1	3	3	1	0	0	0	0	0	0	0	0	8	26-35	6
06:00	0	0	1	9	9	10	0	0	0	0	0	0	0	0	29	29-38	19
07:00	1	0	2	15	27	4	0	**1**	0	0	0	0	0	0	50	26-35	42
08:00	0	0	**6**	20	30	9	1	0	0	0	0	0	0	0	66	26-35	50
09:00	0	0	2	14	22	**11**	0	0	0	0	0	0	0	0	49	26-35	36
10:00	**2**	0	1	20	27	4	1	0	0	0	0	0	0	0	55	26-35	47
11:00	1	**1**	5	**38**	**45**	9	**5**	0	0	0	0	0	0	0	**104**	26-35	83
12 PM	1	1	6	36	44	10	1	0	0	0	0	0	0	0	99	26-35	80
13:00	**3**	0	8	47	42	**14**	0	0	0	0	0	0	0	0	114	26-35	89
14:00	2	0	9	33	48	12	2	0	0	0	0	0	0	0	106	26-35	81
15:00	0	0	16	47	**60**	12	3	0	0	0	0	0	0	0	138	26-35	107
16:00	3	0	**18**	**66**	57	11	**4**	0	0	0	0	0	0	0	**159**	26-35	123
17:00	1	1	13	53	38	11	1	0	0	0	0	0	0	0	118	26-35	91
18:00	1	1	9	36	44	6	3	0	0	0	0	0	0	0	100	26-35	80
19:00	1	1	12	18	16	7	0	0	0	0	0	0	0	0	55	26-35	34
20:00	0	1	2	14	5	4	0	0	0	0	0	0	0	0	26	26-35	19
21:00	0	**2**	4	12	4	1	1	**1**	0	0	0	0	0	0	25	21-30	16
22:00	0	0	5	8	4	3	0	0	0	0	0	0	0	0	20	21-30	13
23:00	0	0	2	5	2	1	0	0	0	0	0	0	0	0	10	26-35	7
Total	17	8	123	495	531	145	23	2	0	0	0	0	0	0	1344		
Percent	1.3%	0.6%	9.2%	36.8%	39.5%	10.8%	1.7%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	08:00	11:00	11:00	09:00	11:00	07:00							11:00		
Vol.	2	1	6	38	45	11	5	1							104		
PM Peak	13:00	21:00	16:00	16:00	15:00	13:00	16:00	21:00							16:00		
Vol.	3	2	18	66	60	14	4	1							159		

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/09/21	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4	21-30	4
01:00	0	0	0	0	2	0	0	**1**	0	0	0	0	0	0	3	25-34	2
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	**1**	0	0	2	0	0	0	0	0	0	0	0	0	0	3	26-35	2
05:00	0	0	0	3	6	2	0	0	0	0	0	0	0	0	11	26-35	9
06:00	0	0	2	8	22	8	0	0	0	0	0	0	0	0	40	31-40	30
07:00	0	0	5	22	32	9	**1**	0	0	0	0	0	0	0	69	26-35	54
08:00	0	0	4	22	25	10	0	0	0	0	0	0	0	0	61	26-35	47
09:00	1	**1**	**6**	20	20	7	0	0	0	0	0	0	0	0	55	26-35	40
10:00	1	0	1	21	18	12	0	0	0	0	0	0	0	0	53	26-35	39
11:00	1	0	6	**37**	**44**	**19**	0	0	0	0	0	0	0	0	**107**	26-35	81
12 PM	1	0	5	32	30	10	**3**	0	0	0	0	0	0	0	81	26-35	62
13:00	2	1	4	36	29	4	0	0	0	0	0	0	0	0	76	26-35	65
14:00	0	0	11	**59**	31	13	0	0	0	0	0	0	0	0	114	26-35	90
15:00	1	0	**17**	57	**41**	13	1	0	0	0	0	0	0	0	**130**	26-35	98
16:00	**3**	**4**	9	47	40	9	0	0	0	0	0	0	0	0	112	26-35	87
17:00	3	4	10	50	32	**16**	0	**1**	0	0	0	0	0	0	116	26-35	82
18:00	1	0	9	25	25	11	3	1	0	0	0	0	0	0	75	26-35	50
19:00	0	2	5	18	13	5	1	0	0	0	0	0	0	0	44	26-35	31
20:00	0	0	4	7	17	5	0	0	0	0	0	0	0	0	33	26-35	24
21:00	0	0	2	8	9	8	1	0	0	0	0	0	0	0	28	26-35	17
22:00	0	0	4	7	9	8	3	0	0	0	0	0	0	0	31	29-38	17
23:00	0	0	0	1	8	2	1	0	0	0	0	0	0	0	12	29-38	10
Total	15	12	104	488	453	171	14	3	0	0	0	0	0	0	1260		
Percent	1.2%	1.0%	8.3%	38.7%	36.0%	13.6%	1.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	04:00	09:00	09:00	11:00	11:00	11:00	07:00	01:00							11:00		
Vol.	1	1	6	37	44	19	1	1							107		
PM Peak	16:00	16:00	15:00	14:00	15:00	17:00	12:00	17:00							15:00		
Vol.	3	4	17	59	41	16	3	1							130		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/10/21	0	0	3	4	2	1	0	0	0	0	0	0	0	0	10	21-30	7
01:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	19-28	3
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	25-34	2
03:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	31-40	1
04:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	19-28	2
05:00	1	0	0	0	1	1	1	0	0	0	0	0	0	0	4	36-45	2
06:00	0	0	2	5	5	4	0	0	0	0	0	0	0	0	16	26-35	10
07:00	2	0	1	9	13	6	1	0	0	0	0	0	0	0	32	26-35	22
08:00	1	0	3	19	21	7	0	0	0	0	0	0	0	0	51	26-35	40
09:00	**3**	**2**	8	16	28	**12**	0	0	0	0	0	0	0	0	69	26-35	44
10:00	1	0	**12**	28	34	7	**3**	0	0	0	0	0	0	0	85	26-35	62
11:00	0	1	6	**31**	**37**	12	1	0	0	0	0	0	0	0	**88**	26-35	68
12 PM	4	2	7	**53**	30	7	1	0	0	0	0	0	0	0	104	26-35	83
13:00	5	**5**	**16**	48	48	6	0	0	0	0	0	0	0	0	**128**	26-35	96
14:00	4	1	10	47	**49**	**13**	2	0	0	0	0	0	0	0	126	26-35	96
15:00	**6**	0	9	47	33	7	1	0	0	0	0	0	0	0	103	26-35	80
16:00	1	2	16	35	28	13	1	**1**	0	0	0	0	0	0	97	26-35	63
17:00	0	2	6	37	33	11	1	0	0	0	0	0	0	0	90	26-35	70
18:00	1	1	15	21	19	8	**3**	0	0	0	0	0	0	0	68	26-35	40
19:00	0	0	8	19	24	6	0	1	0	0	0	0	0	0	58	26-35	43
20:00	0	2	5	16	13	5	2	0	0	0	0	0	0	0	43	26-35	29
21:00	0	0	5	10	6	4	0	0	0	0	0	0	0	0	25	24-33	16
22:00	0	3	5	7	6	3	0	0	0	0	0	0	0	0	24	24-33	13
23:00	0	0	4	3	7	0	0	0	0	0	0	0	0	0	14	26-35	10
Total	30	21	144	457	441	133	17	2	0	0	0	0	0	0	1245		
Percent	2.4%	1.7%	11.6%	36.7%	35.4%	10.7%	1.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	10:00	11:00	11:00	09:00	10:00								11:00		
Vol.	3	2	12	31	37	12	3								88		
PM Peak	15:00	13:00	13:00	12:00	14:00	14:00	18:00	16:00							13:00		
Vol.	6	5	16	53	49	13	3	1							128		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/11/21	0	0	0	8	4	0	0	0	0	0	0	0	0	0	12	26-35	12
01:00	0	**1**	0	2	1	1	0	0	0	0	0	0	0	0	5	26-35	3
02:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	14-23	1
03:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	24-33	1
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
05:00	0	0	1	1	2	0	0	0	0	0	0	0	0	0	4	24-33	3
06:00	0	0	1	3	4	3	1	0	0	0	0	0	0	0	12	26-35	7
07:00	0	0	**7**	7	5	0	1	0	0	0	0	0	0	0	20	21-30	14
08:00	0	1	3	10	11	3	0	0	0	0	0	0	0	0	28	26-35	21
09:00	0	0	3	27	20	**10**	1	0	0	0	0	0	0	0	61	26-35	47
10:00	**2**	1	3	21	**27**	5	1	0	0	0	0	0	0	0	60	26-35	48
11:00	0	0	6	**33**	27	8	**3**	0	0	0	0	0	0	0	**77**	26-35	60
12 PM	**1**	2	3	26	26	6	**3**	0	0	0	0	0	0	0	67	26-35	52
13:00	0	1	5	**35**	**31**	10	1	0	0	0	0	0	0	0	**83**	26-35	66
14:00	1	2	**8**	33	21	**11**	1	0	0	0	0	0	0	0	77	26-35	54
15:00	0	3	6	27	22	7	0	0	0	0	0	0	0	0	65	26-35	49
16:00	1	2	7	20	21	9	1	0	0	0	0	0	0	0	61	26-35	41
17:00	1	1	2	19	15	7	0	0	0	0	0	0	0	0	45	26-35	34
18:00	0	0	4	13	19	3	2	0	0	0	0	0	0	0	41	26-35	32
19:00	0	**4**	5	17	7	4	0	0	0	0	0	0	0	0	37	26-35	24
20:00	0	0	3	10	6	2	0	0	0	0	0	0	0	0	21	26-35	16
21:00	0	0	1	4	4	3	1	0	0	0	0	0	0	0	13	26-35	8
22:00	0	1	3	7	3	2	0	0	0	0	0	0	0	0	16	26-35	10
23:00	0	0	1	5	2	1	1	0	0	0	0	0	0	0	10	26-35	7
Total	6	19	74	328	279	96	17	0	0	0	0	0	0	0	819		
Percent	0.7%	2.3%	9.0%	40.0%	34.1%	11.7%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	01:00	07:00	11:00	10:00	09:00	11:00								11:00		
Vol.	2	1	7	33	27	10	3								77		
PM Peak	12:00	19:00	14:00	13:00	13:00	14:00	12:00								13:00		
Vol.	1	4	8	35	31	11	3								83		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/12/21	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
01:00	0	**1**	0	0	1	0	0	0	0	0	0	0	0	0	2	9-18	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
04:00	**1**	0	0	0	1	1	0	0	0	0	0	0	0	0	3	31-40	2
05:00	0	0	0	3	6	0	0	0	0	0	0	0	0	0	9	26-35	9
06:00	0	0	0	13	14	5	**3**	0	0	0	0	0	0	0	35	26-35	27
07:00	0	0	4	14	20	7	0	0	0	0	0	0	0	0	45	26-35	34
08:00	1	0	**5**	22	14	**12**	1	0	0	0	0	0	0	0	55	26-35	36
09:00	1	0	4	24	24	4	1	0	0	0	0	0	0	0	58	26-35	48
10:00	0	0	4	**26**	**28**	10	1	0	0	0	**1**	0	0	0	**70**	26-35	54
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	3	1	17	104	108	39	6	0	0	0	1	0	0	0	279		
Percent	1.1%	0.4%	6.1%	37.3%	38.7%	14.0%	2.2%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%			
AM Peak	04:00	01:00	08:00	10:00	10:00	08:00	06:00				10:00				10:00		
Vol.	1	1	5	26	28	12	3				1				70		
PM Peak																	
Vol.																	
Total	117	87	704	3050	2972	1037	128	14	2	0	1	0	1	0	8113		
Percent	1.4%	1.1%	8.7%	37.6%	36.6%	12.8%	1.6%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	25 MPH
	50th Percentile :	30 MPH
	85th Percentile :	34 MPH
	95th Percentile :	38 MPH
Stats	10 MPH Pace Speed :	26-35 MPH
	Number in Pace :	6027
	Percent in Pace :	74.3%
	Number of Vehicles > 25 MPH :	7205
	Percent of Vehicles > 25 MPH :	88.8%
	Mean Speed(Average) :	31 MPH

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/05/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	0	0	**16**	**62**	38	7	**1**	0	0	0	0	0	0	0	**124**	26-35	100
15:00	**1**	0	3	49	40	7	0	0	0	0	0	0	0	0	100	26-35	89
16:00	0	**1**	14	41	**52**	**11**	0	0	0	0	0	0	0	0	119	26-35	93
17:00	0	0	9	55	33	7	0	0	0	0	0	0	0	0	104	26-35	88
18:00	0	0	12	35	14	3	0	0	0	0	0	0	0	0	64	26-35	49
19:00	0	0	3	28	19	1	0	0	0	0	0	0	0	0	51	26-35	47
20:00	0	0	6	19	6	5	0	**1**	0	0	0	0	0	0	37	26-35	25
21:00	0	0	3	8	8	2	0	0	0	0	0	0	0	0	21	26-35	16
22:00	0	0	0	3	3	5	0	0	0	0	0	0	0	0	11	30-39	8
23:00	0	0	3	6	2	0	0	0	0	0	0	0	0	0	11	21-30	9
Total	1	1	69	306	215	48	1	1	0	0	0	0	0	0	642		
Percent	0.2%	0.2%	10.7%	47.7%	33.5%	7.5%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak																	
Vol.																	
PM Peak	15:00	16:00	14:00	14:00	16:00	16:00	14:00	20:00							14:00		
Vol.	1	1	16	62	52	11	1	1							124		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/06/21	1	0	0	6	0	0	0	0	0	0	0	0	0	0	7	26-35	6
01:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	25-34	2
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
04:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	24-33	2
05:00	1	**1**	3	8	3	0	0	0	0	0	0	0	0	0	16	26-35	11
06:00	2	0	6	8	12	3	0	0	0	0	0	0	0	0	31	26-35	20
07:00	0	0	4	27	27	5	0	0	0	0	0	0	0	0	63	26-35	54
08:00	0	0	6	36	34	9	0	0	0	0	0	0	0	0	85	26-35	70
09:00	0	1	4	26	34	11	**1**	0	0	0	0	0	0	0	77	26-35	60
10:00	**4**	0	**11**	26	25	4	0	0	0	0	0	0	0	0	70	26-35	51
11:00	0	0	2	**42**	**38**	**12**	1	0	0	0	0	0	0	0	**95**	26-35	80
12 PM	1	**2**	12	34	26	10	0	0	0	0	0	0	0	0	85	26-35	60
13:00	1	1	11	38	**43**	**15**	0	0	0	0	0	0	0	0	109	26-35	81
14:00	1	0	14	53	33	1	**2**	0	0	0	0	0	0	0	104	26-35	86
15:00	2	1	**17**	54	37	8	0	0	0	0	0	0	0	0	**119**	26-35	91
16:00	3	0	13	57	26	8	1	0	0	0	0	0	0	0	108	26-35	83
17:00	**6**	2	7	**65**	29	5	0	0	**1**	0	0	0	0	0	115	26-35	94
18:00	5	1	12	48	21	2	1	0	0	0	0	0	0	0	90	26-35	69
19:00	6	0	16	25	8	3	0	0	0	0	0	0	0	0	58	21-30	41
20:00	0	0	3	13	8	2	1	0	0	0	0	0	0	0	27	26-35	21
21:00	0	0	3	10	4	1	0	0	0	0	0	0	0	0	18	24-33	14
22:00	0	0	2	8	7	2	0	0	0	0	0	0	0	0	19	26-35	15
23:00	0	0	1	3	1	1	0	0	0	0	0	0	0	0	6	26-35	4
Total	33	9	149	589	419	102	7	0	1	0	0	0	0	0	1309		
Percent	2.5%	0.7%	11.4%	45.0%	32.0%	7.8%	0.5%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	05:00	10:00	11:00	11:00	11:00	09:00								11:00		
Vol.	4	1	11	42	38	12	1								95		
PM Peak	17:00	12:00	15:00	17:00	13:00	13:00	14:00		17:00						15:00		
Vol.	6	2	17	65	43	15	2		1						119		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/07/21	0	0	0	2	2	1	0	0	0	0	0	0	0	0	5	26-35	4
01:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	24-33	1
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	25-34	2
03:00	0	0	2	1	1	0	0	0	0	0	0	0	0	0	4	19-28	3
04:00	0	0	1	1	2	1	0	0	0	0	0	0	0	0	5	31-40	3
05:00	0	2	0	3	4	0	0	0	0	0	0	0	0	0	9	26-35	7
06:00	2	0	3	11	10	2	1	0	0	0	0	0	0	0	29	26-35	21
07:00	2	1	5	33	16	4	0	0	0	0	0	0	0	0	61	26-35	49
08:00	1	0	4	44	32	5	1	0	0	0	0	0	0	0	87	26-35	76
09:00	**3**	0	12	41	**44**	5	1	0	0	0	0	0	0	0	106	26-35	85
10:00	2	**5**	7	**48**	42	**12**	0	0	0	0	0	0	0	0	**116**	26-35	90
11:00	3	1	**13**	37	28	7	**2**	0	0	0	0	0	0	0	91	26-35	65
12 PM	5	2	16	50	37	6	0	0	0	0	0	0	0	0	116	26-35	87
13:00	4	**3**	12	48	33	7	1	0	0	0	0	0	0	0	108	26-35	81
14:00	4	1	**21**	72	41	5	1	0	0	0	0	0	0	0	145	26-35	113
15:00	**10**	2	16	65	**45**	**13**	0	0	0	0	0	0	0	0	**151**	26-35	110
16:00	5	1	8	**74**	43	10	**2**	0	0	0	0	0	0	0	143	26-35	117
17:00	3	3	16	69	34	4	1	0	0	0	0	0	0	0	130	26-35	103
18:00	4	1	18	30	11	1	1	0	0	0	0	0	0	0	66	21-30	48
19:00	1	1	10	36	8	1	0	0	0	0	0	0	0	0	57	21-30	46
20:00	0	0	7	17	5	3	0	**1**	0	0	0	0	0	0	33	21-30	24
21:00	0	0	4	6	7	3	1	0	0	0	0	0	0	0	21	26-35	13
22:00	0	0	0	4	4	1	1	0	0	0	0	0	0	0	10	26-35	8
23:00	0	0	4	2	4	1	0	0	0	0	0	0	0	0	11	26-35	6
Total	49	23	179	694	456	92	13	1	0	0	0	0	0	0	1507		
Percent	3.3%	1.5%	11.9%	46.1%	30.3%	6.1%	0.9%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	11:00	10:00	09:00	10:00	11:00								10:00		
Vol.	3	5	13	48	44	12	2								116		
PM Peak	15:00	13:00	14:00	16:00	15:00	15:00	16:00	20:00							15:00		
Vol.	10	3	21	74	45	13	2	1							151		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/08/21	2	0	2	0	1	0	0	0	0	0	0	0	0	0	5	21-30	2
01:00	2	0	3	0	1	0	0	0	0	0	0	0	0	0	6	21-30	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
05:00	1	**1**	2	7	3	0	0	0	0	0	0	0	0	0	14	26-35	10
06:00	1	0	6	10	20	1	0	0	0	0	0	0	0	0	38	26-35	30
07:00	1	1	4	31	39	5	0	0	0	0	0	0	0	0	81	26-35	70
08:00	**4**	0	4	31	29	5	0	0	0	0	0	0	0	0	73	26-35	60
09:00	1	0	**7**	37	31	4	0	0	0	0	0	0	0	0	80	26-35	68
10:00	0	0	5	44	32	**6**	0	0	0	0	0	0	0	0	87	26-35	76
11:00	3	0	6	**56**	**41**	1	0	0	0	0	0	0	0	0	**107**	26-35	97
12 PM	8	**4**	11	50	38	**11**	**1**	0	0	0	0	0	0	0	123	26-35	88
13:00	4	1	16	46	31	6	0	0	0	0	0	0	0	0	104	26-35	77
14:00	2	1	11	47	**47**	8	0	0	0	0	0	0	0	0	116	26-35	94
15:00	**10**	2	19	**63**	39	6	0	0	0	0	0	0	0	0	**139**	26-35	102
16:00	5	0	12	48	36	5	0	0	0	0	0	0	0	0	106	26-35	84
17:00	3	1	16	39	40	4	0	0	0	0	0	0	0	0	103	26-35	79
18:00	4	2	**21**	35	14	3	1	0	0	0	0	0	0	0	80	21-30	56
19:00	1	2	11	22	14	2	0	0	0	0	0	0	0	0	52	26-35	36
20:00	0	2	2	14	17	1	0	0	0	0	0	0	0	0	36	26-35	31
21:00	2	0	3	4	8	0	0	0	0	0	0	0	0	0	17	26-35	12
22:00	0	0	1	9	2	2	0	**1**	0	0	0	0	0	0	15	26-35	11
23:00	0	0	4	6	2	0	0	0	0	0	0	0	0	0	12	21-30	10
Total	54	17	168	600	485	70	2	1	0	0	0	0	0	0	1397		
Percent	3.9%	1.2%	12.0%	42.9%	34.7%	5.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	05:00	09:00	11:00	11:00	10:00									11:00		
Vol.	4	1	7	56	41	6									107		
PM Peak	15:00	12:00	18:00	15:00	14:00	12:00	12:00	22:00							15:00		
Vol.	10	4	21	63	47	11	1	1							139		

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/09/21	0	0	0	2	1	2	0	0	0	0	0	0	0	0	5	24-33	3
01:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
04:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	19-28	2
05:00	0	2	2	4	3	0	0	0	0	0	0	0	0	0	11	24-33	7
06:00	3	0	7	18	9	2	0	0	0	0	0	0	0	0	39	26-35	27
07:00	1	1	8	27	19	5	**1**	0	0	0	0	0	0	0	62	26-35	46
08:00	2	2	9	50	19	3	0	0	0	0	0	0	0	0	85	26-35	69
09:00	1	**6**	**14**	45	23	4	0	0	0	0	0	0	0	0	93	26-35	68
10:00	1	2	8	32	31	4	1	**1**	0	0	0	0	0	0	80	26-35	63
11:00	**4**	0	6	**61**	**41**	**8**	0	0	0	**1**	0	0	0	0	**121**	26-35	102
12 PM	3	2	14	42	35	5	0	0	0	0	0	0	0	0	101	26-35	77
13:00	3	**3**	13	**68**	**36**	3	0	0	0	0	0	0	0	0	**126**	26-35	104
14:00	5	2	11	61	28	4	0	0	0	0	0	0	0	0	111	26-35	89
15:00	5	2	**20**	51	34	**6**	0	0	0	0	0	0	0	0	118	26-35	85
16:00	1	0	15	53	31	4	**1**	0	0	0	0	0	0	0	105	26-35	84
17:00	**8**	1	20	52	36	3	0	0	0	0	0	0	0	0	120	26-35	88
18:00	1	1	13	32	26	6	1	0	0	0	0	0	0	0	80	26-35	58
19:00	1	2	4	27	12	3	1	0	0	0	0	0	0	0	50	26-35	39
20:00	0	1	9	13	8	0	0	0	0	0	0	0	0	0	31	21-30	22
21:00	1	0	8	11	10	5	0	0	0	0	0	0	0	0	35	26-35	21
22:00	0	0	4	8	10	0	0	0	0	0	0	0	0	0	22	26-35	18
23:00	0	0	0	7	5	1	0	0	0	0	0	0	0	0	13	26-35	12
Total	40	27	188	667	418	68	5	1	0	1	0	0	0	0	1415		
Percent	2.8%	1.9%	13.3%	47.1%	29.5%	4.8%	0.4%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	09:00	09:00	11:00	11:00	11:00	07:00	10:00		11:00					11:00		
Vol.	4	6	14	61	41	8	1	1		1					121		
PM Peak	17:00	13:00	15:00	13:00	13:00	15:00	16:00								13:00		
Vol.	8	3	20	68	36	6	1								126		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/10/21	0	0	1	6	2	4	0	0	0	0	0	0	0	0	13	24-33	8
01:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	20-29	4
02:00	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	24-33	2
03:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8-17	1
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
05:00	1	0	2	2	1	1	0	0	0	0	0	0	0	0	7	21-30	4
06:00	0	0	4	11	3	2	0	0	0	0	0	0	0	0	20	21-30	15
07:00	3	0	3	28	16	2	0	0	0	0	0	0	0	0	52	26-35	44
08:00	1	0	8	36	19	**6**	0	0	0	0	0	0	0	0	70	26-35	55
09:00	1	1	12	47	24	4	0	0	0	0	0	0	0	0	89	26-35	71
10:00	**6**	**5**	11	51	38	1	0	0	0	0	0	0	0	0	112	26-35	89
11:00	2	1	**15**	**63**	**43**	2	0	0	0	0	0	0	0	0	**126**	26-35	106
12 PM	**8**	1	16	73	31	1	0	0	0	0	0	0	0	0	130	26-35	104
13:00	2	1	17	53	**32**	**6**	0	0	0	0	0	0	0	0	111	26-35	85
14:00	8	2	20	**74**	27	2	0	0	0	0	0	0	0	0	**133**	26-35	101
15:00	8	**5**	18	44	23	4	**1**	0	0	0	0	0	0	0	103	26-35	67
16:00	3	3	**29**	38	23	5	1	0	0	0	0	0	0	0	102	21-30	67
17:00	4	3	12	39	19	5	0	0	0	0	0	0	0	0	82	26-35	58
18:00	1	1	18	46	13	5	0	0	0	**1**	0	0	0	0	85	21-30	64
19:00	1	3	11	27	15	4	0	0	0	0	0	0	0	0	61	26-35	42
20:00	0	1	6	21	13	1	0	0	0	0	0	0	0	0	42	26-35	34
21:00	0	1	6	13	8	3	0	0	0	0	0	0	0	0	31	25-34	21
22:00	0	0	7	7	6	0	1	0	0	0	0	0	0	0	21	21-30	14
23:00	1	0	2	6	4	1	0	0	0	0	0	0	0	0	14	26-35	10
Total	52	28	221	688	361	59	3	0	0	1	0	0	0	0	1413		
Percent	3.7%	2.0%	15.6%	48.7%	25.5%	4.2%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	11:00	11:00	11:00	08:00									11:00		
Vol.	6	5	15	63	43	6									126		
PM Peak	12:00	15:00	16:00	14:00	13:00	13:00	15:00			18:00					14:00		
Vol.	8	5	29	74	32	6	1			1					133		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/11/21	0	0	1	5	4	0	0	0	0	0	0	0	0	0	10	26-35	9
01:00	0	0	0	2	3	**2**	0	0	0	0	0	0	0	0	7	31-40	5
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
03:00	0	0	0	0	2	0	0	0	0	0	0	0	0	0	2	25-34	2
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
05:00	0	0	4	1	0	0	0	0	0	0	0	0	0	0	5	19-28	5
06:00	1	0	4	5	2	2	0	0	0	0	0	0	0	0	14	21-30	9
07:00	0	0	2	17	10	1	0	0	0	0	0	0	0	0	30	26-35	27
08:00	0	1	6	20	18	2	0	0	0	0	0	0	0	0	47	26-35	38
09:00	**3**	**2**	**15**	27	**24**	2	0	0	0	0	0	0	0	0	73	26-35	51
10:00	3	0	7	45	22	2	0	0	0	0	0	0	0	0	79	26-35	67
11:00	3	0	13	**52**	24	2	0	0	0	0	0	0	0	0	**94**	26-35	76
12 PM	3	0	12	35	11	2	**1**	0	0	0	0	0	0	0	64	21-30	47
13:00	4	**1**	8	42	**26**	**6**	0	0	0	0	0	0	0	0	87	26-35	68
14:00	2	1	11	**47**	26	4	0	0	0	0	0	0	0	0	**91**	26-35	73
15:00	3	1	8	34	15	4	0	0	0	0	0	0	0	0	65	26-35	49
16:00	1	1	**17**	25	12	5	0	0	0	0	0	0	0	0	61	21-30	42
17:00	**8**	0	4	10	19	3	0	0	0	0	0	0	0	0	44	26-35	29
18:00	0	0	7	23	13	1	0	0	0	0	0	0	0	0	44	26-35	36
19:00	0	1	0	12	10	3	0	0	0	0	0	0	0	0	26	26-35	22
20:00	0	0	6	14	4	2	0	0	0	0	0	0	0	0	26	21-30	20
21:00	0	1	4	10	6	2	0	0	0	0	0	0	0	0	23	25-34	16
22:00	0	0	3	5	1	1	1	0	0	0	0	0	0	0	11	21-30	8
23:00	0	0	1	8	4	0	0	0	0	0	0	0	0	0	13	26-35	12
Total	31	9	134	440	256	46	2	0	0	0	0	0	0	0	918		
Percent	3.4%	1.0%	14.6%	47.9%	27.9%	5.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	09:00	09:00	11:00	09:00	01:00									11:00		
Vol.	3	2	15	52	24	2									94		
PM Peak	17:00	13:00	16:00	14:00	13:00	13:00	12:00								14:00		
Vol.	8	1	17	47	26	6	1								91		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	0 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 9999	Total	Pace Speed	Number in Pace
04/12/21	0	0	1	4	2	0	0	0	0	0	0	0	0	0	7	24-33	6
01:00	0	0	1	2	0	0	0	0	0	0	0	0	0	0	3	20-29	3
02:00	0	0	0	1	0	1	0	0	0	0	0	0	0	0	2	19-28	1
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3	21-30	3
05:00	0	1	4	6	2	0	0	0	0	0	0	0	0	0	13	21-30	10
06:00	1	0	4	14	7	2	**1**	0	0	0	0	0	0	0	29	26-35	21
07:00	1	**2**	**10**	38	22	5	1	0	0	0	0	0	0	0	79	26-35	60
08:00	**3**	1	8	31	24	3	0	0	0	0	0	0	0	0	70	26-35	55
09:00	3	1	6	32	23	4	1	0	0	0	0	0	0	0	70	26-35	55
10:00	0	1	5	**44**	**31**	**7**	1	0	0	0	0	0	0	0	**89**	26-35	75
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
16:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
17:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
18:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
19:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
20:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
22:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
23:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Total	8	6	40	175	111	22	4	0	0	0	0	0	0	0	366		
Percent	2.2%	1.6%	10.9%	47.8%	30.3%	6.0%	1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	07:00	07:00	10:00	10:00	10:00	06:00								10:00		
Vol.	3	2	10	44	31	7	1								89		
PM Peak																	
Vol.																	
Total	268	120	1148	4159	2721	507	37	4	1	2	0	0	0	0	8967		
Percent	3.0%	1.3%	12.8%	46.4%	30.3%	5.7%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

	15th Percentile :	24 MPH
	50th Percentile :	28 MPH
	85th Percentile :	33 MPH
	95th Percentile :	36 MPH
Stats	10 MPH Pace Speed :	26-35 MPH
	Number in Pace :	6893
	Percent in Pace :	76.9%
	Number of Vehicles > 25 MPH :	7431
	Percent of Vehicles > 25 MPH :	82.9%
	Mean Speed(Average) :	29 MPH

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Start	05-Apr-21		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	Eastbound	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou
12:00 AM	*	*	4	7	2	5	2	5	4	5	10	13	12	10	6	8
01:00	*	*	2	2	3	1	4	6	3	2	3	4	5	7	3	4
02:00	*	*	0	1	0	2	2	0	2	0	2	2	2	1	1	1
03:00	*	*	2	2	2	4	0	1	0	2	2	2	1	2	1	2
04:00	*	*	2	2	3	5	5	2	3	3	3	1	1	1	3	2
05:00	*	*	7	16	9	9	8	14	11	11	4	7	4	5	7	10
06:00	*	*	36	31	36	29	29	38	40	39	16	20	12	14	28	28
07:00	*	*	76	63	55	61	50	81	69	62	32	52	20	30	50	58
08:00	*	*	40	85	48	87	66	73	61	85	51	70	28	47	49	74
09:00	*	*	56	77	71	106	49	80	55	93	69	89	61	73	60	86
10:00	*	*	65	70	90	**116**	55	87	53	80	85	112	60	79	68	91
11:00	*	*	**83**	**95**	**120**	91	**104**	**107**	**107**	**121**	**88**	**126**	**77**	**94**	**96**	**106**
12:00 PM	*	*	63	85	105	116	99	123	81	101	104	130	67	64	86	103
01:00	*	*	90	109	116	108	114	104	76	**126**	**128**	111	**83**	87	101	108
02:00	111	**124**	86	104	128	145	106	116	114	111	126	**133**	77	**91**	107	**118**
03:00	105	100	96	**119**	**141**	**151**	138	**139**	**130**	118	103	103	65	65	111	114
04:00	**118**	119	**118**	108	117	143	**159**	106	112	105	97	102	61	61	**112**	106
05:00	102	104	106	115	123	130	118	103	116	120	90	82	45	44	100	100
06:00	74	64	90	90	89	66	100	80	75	80	68	85	41	44	77	73
07:00	49	51	51	58	63	57	55	52	44	50	58	61	37	26	51	51
08:00	24	37	30	27	37	33	26	36	33	31	43	42	21	26	31	33
09:00	29	21	14	18	18	21	25	17	28	35	25	31	13	23	22	24
10:00	12	11	16	19	16	10	20	15	31	22	24	21	16	11	19	16
11:00	7	11	4	6	6	11	10	12	12	13	14	14	10	13	9	11
Lane	631	642	1137	1309	1398	1507	1344	1397	1260	1415	1245	1413	819	918	1198	1327
Day	1273		2446		2905		2741		2675		2658		1737		2525	
AM Peak	-	-	11:00	11:00	11:00	10:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	-	83	95	120	116	104	107	107	121	88	126	77	94	96	106
PM Peak	16:00	14:00	16:00	15:00	15:00	15:00	16:00	15:00	15:00	13:00	13:00	14:00	13:00	14:00	16:00	14:00
Vol.	118	124	118	119	141	151	159	139	130	126	128	133	83	91	112	118

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue West of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5392

Latitude: 0' 0.0000 Undefined

Start	12-Apr-21		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	Eastbound	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou
12:00 AM	1	7	*	*	*	*	*	*	*	*	*	*	*	*	1	7
01:00	2	3	*	*	*	*	*	*	*	*	*	*	*	*	2	3
02:00	0	2	*	*	*	*	*	*	*	*	*	*	*	*	0	2
03:00	1	1	*	*	*	*	*	*	*	*	*	*	*	*	1	1
04:00	3	3	*	*	*	*	*	*	*	*	*	*	*	*	3	3
05:00	9	13	*	*	*	*	*	*	*	*	*	*	*	*	9	13
06:00	35	29	*	*	*	*	*	*	*	*	*	*	*	*	35	29
07:00	45	79	*	*	*	*	*	*	*	*	*	*	*	*	45	79
08:00	55	70	*	*	*	*	*	*	*	*	*	*	*	*	55	70
09:00	58	70	*	*	*	*	*	*	*	*	*	*	*	*	58	70
10:00	**70**	**89**	*	*	*	*	*	*	*	*	*	*	*	*	**70**	**89**
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12:00 PM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Lane	279	366	0	0	0	0	0	0	0	0	0	0	0	0	279	366
Day	645		0		0		0		0		0		0		645	
AM Peak	10:00	10:00	-	-	-	-	-	-	-	-	-	-	-	-	10:00	10:00
Vol.	70	89	-	-	-	-	-	-	-	-	-	-	-	-	70	89
PM Peak	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vol.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Comb. Total	1918		2446		2905		2741		2675		2658		1737		3170	

ADT ADT 2,692 AADT 2,692

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
03/31/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	72	10	0	9	0	0	0	0	0	0	0	0	0	91
11:00	0	79	16	0	9	0	0	0	0	0	0	0	0	0	104
12 PM	0	79	18	1	7	0	0	0	0	0	0	0	0	0	105
13:00	0	91	12	0	4	1	0	0	0	0	0	0	0	0	108
14:00	0	105	18	0	7	0	0	0	0	0	0	0	0	0	130
15:00	1	78	19	0	7	0	0	1	0	0	0	0	0	0	106
16:00	0	75	13	1	10	0	0	0	0	0	0	0	0	0	99
17:00	0	67	9	0	6	0	0	0	0	0	0	0	0	0	82
18:00	0	50	6	0	3	0	0	0	0	0	0	0	0	0	59
19:00	0	19	4	0	3	0	0	0	0	0	0	0	0	0	26
20:00	0	34	5	0	1	0	0	0	0	0	0	0	0	0	40
21:00	0	21	4	0	1	0	0	0	0	0	0	0	0	0	26
22:00	0	13	0	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total	1	789	134	2	67	1	0	1	0	0	0	0	0	0	995
Percent	0.1%	79.3%	13.5%	0.2%	6.7%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00		10:00										
Vol.		79	16		9										
PM Peak	15:00	14:00	15:00	12:00	16:00	13:00		15:00							
Vol.	1	105	19	1	10	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/01/21	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	0	0	1	0	0	0	0	0	0	0	0	0	3
06:00	1	15	5	2	4	0	0	0	0	0	0	0	0	0	27
07:00	0	29	7	0	4	0	0	0	0	0	0	0	0	0	40
08:00	0	31	9	1	6	0	0	0	0	0	0	0	0	0	47
09:00	0	37	8	0	4	1	0	0	1	0	0	0	0	0	51
10:00	0	32	9	0	3	0	0	0	0	0	0	0	0	0	44
11:00	0	47	11	0	4	0	0	0	0	0	0	0	0	0	62
12 PM	0	56	11	2	5	0	0	0	0	0	0	0	0	0	74
13:00	0	64	16	2	4	0	0	0	0	0	0	0	0	0	86
14:00	0	61	15	1	8	0	0	0	0	0	0	0	0	0	85
15:00	0	65	19	1	6	0	0	0	0	0	0	0	0	0	91
16:00	1	64	20	0	12	0	0	0	0	0	0	0	0	0	97
17:00	0	54	15	1	9	1	0	1	0	0	0	0	0	0	81
18:00	0	65	9	0	3	0	0	0	0	0	0	0	0	0	77
19:00	0	27	9	0	2	0	0	0	0	0	0	0	0	0	38
20:00	0	26	6	0	3	0	0	0	0	0	0	0	0	0	35
21:00	0	30	3	0	0	0	0	0	0	0	0	0	0	0	33
22:00	0	12	1	0	1	0	0	0	0	0	0	0	0	0	14
23:00	0	7	1	0	0	0	0	0	0	0	0	0	0	0	8
Total	2	735	175	10	79	2	0	1	1	0	0	0	0	0	1005
Percent	0.2%	73.1%	17.4%	1.0%	7.9%	0.2%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	11:00	11:00	06:00	08:00	09:00			09:00						
Vol.	1	47	11	2	6	1			1						
PM Peak	16:00	15:00	16:00	12:00	16:00	17:00		17:00							
Vol.	1	65	20	2	12	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/02/21	0	9	2	0	0	0	0	0	0	0	0	0	0	0	11
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
05:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	6	4	0	0	0	0	0	0	0	0	0	0	0	10
07:00	0	28	8	0	3	0	0	0	0	0	0	0	0	0	39
08:00	0	38	7	0	4	1	0	0	0	0	0	0	0	0	50
09:00	0	40	9	0	6	0	0	0	0	0	0	0	0	0	55
10:00	1	58	8	0	5	0	0	0	0	0	0	0	0	0	72
11:00	0	55	15	0	6	1	0	0	0	0	0	0	0	0	77
12 PM	0	65	11	1	4	0	0	2	0	0	0	0	0	0	83
13:00	0	61	9	0	5	1	0	0	0	0	0	0	0	0	76
14:00	0	62	19	1	12	0	0	0	0	0	0	0	0	0	94
15:00	0	55	12	0	9	0	0	0	0	0	0	0	0	0	76
16:00	1	59	14	0	4	0	0	0	0	0	0	0	0	0	78
17:00	0	63	8	0	5	0	0	0	0	0	0	0	0	0	76
18:00	0	35	5	0	4	0	0	0	0	0	0	0	0	0	44
19:00	0	31	5	0	1	0	0	0	0	0	0	0	0	0	37
20:00	0	14	3	0	0	0	0	0	0	0	0	0	0	0	17
21:00	0	19	3	0	0	0	0	0	0	0	0	0	0	0	22
22:00	0	13	3	0	0	0	0	0	0	0	0	0	0	0	16
23:00	0	8	1	0	1	0	0	0	0	0	0	0	0	0	10
Total	2	727	149	2	69	3	0	2	0	0	0	0	0	0	954
Percent	0.2%	76.2%	15.6%	0.2%	7.2%	0.3%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00		09:00	08:00									
Vol.	1	58	15		6	1									
PM Peak	16:00	12:00	14:00	12:00	14:00	13:00		12:00							
Vol.	1	65	19	1	12	1		2							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/03/21	0	2	3	0	1	0	0	0	0	0	0	0	0	0	6
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
04:00	0	1	1	0	1	0	0	0	0	0	0	0	0	0	3
05:00	0	4	0	1	0	0	0	0	0	0	0	0	0	0	5
06:00	0	4	3	0	0	0	0	0	0	0	0	0	0	0	7
07:00	0	14	4	0	1	0	0	1	0	0	0	0	0	0	20
08:00	0	17	13	0	1	0	0	0	0	0	0	0	0	0	31
09:00	0	36	16	0	5	0	0	0	0	0	0	0	0	0	57
10:00	1	46	11	0	4	0	0	0	0	0	0	0	0	0	62
11:00	2	49	9	1	5	0	0	0	0	0	0	0	0	0	66
12 PM	1	62	11	0	7	1	0	0	0	0	0	0	0	0	82
13:00	2	72	16	0	5	0	0	0	0	0	0	0	0	0	95
14:00	5	61	9	0	8	0	0	0	0	0	0	0	0	0	83
15:00	3	74	23	0	6	0	0	0	0	0	0	0	0	0	106
16:00	3	64	7	0	4	1	0	1	0	0	0	0	0	0	80
17:00	0	65	4	0	3	0	0	0	0	0	0	0	0	0	72
18:00	0	36	3	0	4	0	0	0	0	0	0	0	0	0	43
19:00	2	34	5	0	5	0	0	0	0	0	0	0	0	0	46
20:00	0	21	6	0	1	0	0	0	0	0	0	0	0	0	28
21:00	0	25	3	0	1	0	0	0	0	0	0	0	0	0	29
22:00	0	20	4	0	1	0	0	0	0	0	0	0	0	0	25
23:00	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	19	719	152	2	64	2	0	2	0	0	0	0	0	0	960
Percent	2.0%	74.9%	15.8%	0.2%	6.7%	0.2%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	09:00	05:00	09:00			07:00							
Vol.	2	49	16	1	5			1							
PM Peak	14:00	15:00	15:00		14:00	12:00		16:00							
Vol.	5	74	23		8	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/04/21	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
06:00	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
07:00	0	11	1	0	0	0	0	0	0	0	0	0	0	0	12
08:00	0	12	3	0	2	0	0	0	0	0	0	0	0	0	17
09:00	0	18	4	0	3	0	0	0	0	0	0	0	0	0	25
10:00	1	32	7	0	1	0	0	0	0	0	0	0	0	0	41
11:00	0	42	8	0	4	0	0	0	0	0	0	0	0	0	54
12 PM	3	60	5	0	6	0	0	0	0	0	0	0	0	0	74
13:00	3	48	13	0	2	0	0	1	0	0	0	0	0	0	67
14:00	0	49	5	0	6	1	0	0	0	0	0	0	0	0	61
15:00	1	47	7	0	2	0	0	0	0	0	0	0	0	0	57
16:00	1	49	10	0	2	0	0	0	0	0	0	0	0	0	62
17:00	1	31	12	0	2	0	0	0	0	0	0	0	0	0	46
18:00	1	53	12	0	6	0	0	0	0	0	0	0	0	0	72
19:00	0	44	7	0	5	0	0	0	0	0	0	0	0	0	56
20:00	0	24	5	0	0	0	0	0	0	0	0	0	0	0	29
21:00	0	15	1	0	1	0	0	0	0	0	0	0	0	0	17
22:00	0	9	2	0	0	0	0	0	0	0	0	0	0	0	11
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	11	562	107	0	42	1	0	1	0	0	0	0	0	0	724
Percent	1.5%	77.6%	14.8%	0.0%	5.8%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	11:00		11:00										
Vol.	1	42	8		4										
PM Peak	12:00	12:00	13:00		12:00	14:00		13:00							
Vol.	3	60	13		6	1		1							

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/05/21	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	1	0	1	0	0	0	0	0	0	0	0	0	4
06:00	0	25	0	0	3	0	0	0	0	0	0	0	0	0	28
07:00	0	35	8	0	2	0	0	0	0	0	0	0	0	0	45
08:00	0	31	6	0	5	0	0	0	0	0	0	0	0	0	42
09:00	0	35	8	0	2	0	0	0	0	0	0	0	0	0	45
10:00	0	48	10	2	8	1	0	0	0	0	0	0	0	0	69
11:00	1	57	10	0	2	0	0	0	0	0	0	0	0	0	70
12 PM	0	56	13	0	3	1	0	0	0	0	0	0	0	0	73
13:00	0	66	4	0	5	0	0	0	0	0	0	0	0	0	75
14:00	0	62	13	0	13	0	0	0	0	0	0	0	0	0	88
15:00	0	60	16	0	4	0	0	0	0	0	0	0	0	0	80
16:00	1	89	16	0	9	0	0	0	0	0	0	0	0	0	115
17:00	1	84	11	0	6	0	0	0	1	0	0	0	0	0	103
18:00	2	58	3	0	6	0	0	0	0	0	0	0	0	0	69
19:00	0	34	6	0	2	0	0	0	0	0	0	0	0	0	42
20:00	0	26	4	0	2	0	0	0	0	0	0	0	0	0	32
21:00	0	25	4	0	2	0	0	0	0	0	0	0	0	0	31
22:00	0	10	2	0	0	0	0	0	0	0	0	0	0	0	12
23:00	0	3	1	0	1	0	0	0	0	0	0	0	0	0	5
Total	5	812	137	2	76	2	0	0	1	0	0	0	0	0	1035
Percent	0.5%	78.5%	13.2%	0.2%	7.3%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00	10:00	10:00	10:00									
Vol.	1	57	10	2	8	1									
PM Peak	18:00	16:00	15:00		14:00	12:00			17:00						
Vol.	2	89	16		13	1			1						

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/06/21	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
05:00	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
06:00	0	17	2	0	2	0	0	0	0	0	0	0	0	0	21
07:00	0	48	12	0	6	1	0	0	0	0	0	0	0	0	67
08:00	0	38	6	0	3	1	0	0	0	0	0	0	0	0	48
09:00	2	29	12	0	5	0	0	0	0	0	0	0	0	0	48
10:00	1	46	9	0	2	0	0	1	0	0	0	0	0	0	59
11:00	1	44	11	0	7	0	0	0	0	0	0	0	0	0	63
12 PM	0	58	12	0	3	0	0	0	0	0	0	0	0	0	73
13:00	0	62	10	0	4	0	0	0	0	0	0	0	0	0	76
14:00	0	47	12	0	8	0	0	0	0	0	0	0	0	0	67
15:00	1	60	14	0	8	0	0	0	0	0	0	0	0	0	83
16:00	4	79	14	0	7	0	0	0	0	0	0	0	0	0	104
17:00	5	78	11	0	5	0	0	0	0	0	0	0	0	0	99
18:00	0	76	15	0	2	0	0	0	0	0	0	0	0	0	93
19:00	0	38	5	0	5	0	0	0	0	0	0	0	0	0	48
20:00	0	24	6	0	2	0	0	0	0	0	0	0	0	0	32
21:00	0	11	1	0	1	0	0	0	0	0	0	0	0	0	13
22:00	0	13	1	0	1	0	0	0	0	0	0	0	0	0	15
23:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	14	781	158	0	73	2	0	1	0	0	0	0	0	0	1029
Percent	1.4%	75.9%	15.4%	0.0%	7.1%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	07:00		11:00	07:00		10:00							
Vol.	2	48	12		7	1		1							
PM Peak	17:00	16:00	18:00		14:00										
Vol.	5	79	15		8										

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/07/21	0	3	1	0	0	0	0	0	0	0	0	0	0	0	4
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
05:00	0	3	3	1	0	0	0	0	0	0	0	0	0	0	7
06:00	0	21	4	0	5	0	0	0	0	0	0	0	0	0	30
07:00	0	38	3	0	0	1	0	0	0	0	0	0	0	0	42
08:00	0	36	5	0	5	0	0	0	0	0	0	0	0	0	46
09:00	2	44	12	0	4	0	0	0	0	0	0	0	0	0	62
10:00	0	68	10	0	7	1	0	1	0	0	0	0	0	0	87
11:00	0	85	13	0	4	0	0	0	0	0	0	0	0	0	102
12 PM	0	76	17	0	2	0	0	0	0	0	0	0	0	0	95
13:00	0	81	7	0	2	0	0	0	0	0	0	0	0	0	90
14:00	0	107	18	0	3	0	0	0	0	0	0	0	0	0	128
15:00	2	84	19	1	8	0	0	0	0	0	0	0	0	0	114
16:00	7	80	13	0	8	0	0	0	0	0	0	0	0	0	108
17:00	1	95	13	0	10	0	0	0	0	0	0	0	0	0	119
18:00	3	70	10	0	5	0	0	0	0	0	0	0	0	0	88
19:00	0	49	7	0	3	1	0	0	0	0	0	0	0	0	60
20:00	0	33	6	0	3	0	0	0	0	0	0	0	0	0	42
21:00	0	15	2	0	1	0	0	0	0	0	0	0	0	0	18
22:00	0	22	0	0	0	0	0	0	0	0	0	0	0	0	22
23:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2
Total	15	1012	165	2	71	3	0	1	0	0	0	0	0	0	1269
Percent	1.2%	79.7%	13.0%	0.2%	5.6%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	05:00	10:00	07:00		10:00							
Vol.	2	85	13	1	7	1		1							
PM Peak	16:00	14:00	15:00	15:00	17:00	19:00									
Vol.	7	107	19	1	10	1									

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/08/21	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	3	3	0	1	0	0	0	0	0	0	0	0	0	7
06:00	0	12	7	0	1	0	0	0	0	0	0	0	0	0	20
07:00	0	31	7	0	6	0	0	0	0	0	0	0	0	0	44
08:00	0	42	9	0	5	0	0	0	0	0	0	0	0	0	56
09:00	0	30	7	0	5	0	0	0	0	0	0	0	0	0	42
10:00	0	37	5	0	5	0	0	0	0	0	0	0	0	0	47
11:00	1	60	16	0	6	0	0	0	0	0	0	0	0	0	83
12 PM	1	82	9	0	4	0	0	0	0	0	0	0	0	0	96
13:00	0	76	16	2	5	0	0	0	0	0	0	0	0	0	99
14:00	2	75	18	0	8	1	0	0	0	0	0	0	0	0	104
15:00	4	75	20	2	8	0	0	0	0	0	0	0	0	0	109
16:00	1	106	14	0	7	0	0	0	0	0	0	0	0	0	128
17:00	5	92	23	0	7	0	0	0	0	0	0	0	0	0	127
18:00	1	80	10	0	6	0	0	0	0	0	0	0	0	0	97
19:00	0	46	5	0	8	0	0	0	0	0	0	0	0	0	59
20:00	0	30	5	0	2	0	0	0	0	0	0	0	0	0	37
21:00	0	16	4	0	0	0	0	0	0	0	0	0	0	0	20
22:00	0	13	1	0	1	0	0	0	0	0	0	0	0	0	15
23:00	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	15	924	181	4	85	1	0	0	0	0	0	0	0	0	1210
Percent	1.2%	76.4%	15.0%	0.3%	7.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00		07:00										
Vol.	1	60	16		6										
PM Peak	17:00	16:00	17:00	13:00	14:00	14:00									
Vol.	5	106	23	2	8	1									

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/09/21	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
05:00	0	3	2	0	1	0	0	0	0	0	0	0	0	0	6
06:00	0	23	7	0	2	0	0	0	0	0	0	0	0	0	32
07:00	0	43	9	1	6	1	0	0	0	0	0	0	0	0	60
08:00	0	39	8	2	8	1	0	0	0	0	0	0	0	0	58
09:00	0	38	5	0	7	0	0	0	0	0	0	0	0	0	50
10:00	0	33	4	0	4	0	0	0	0	0	0	0	0	0	41
11:00	0	67	12	0	3	0	0	0	0	0	0	0	0	0	82
12 PM	1	69	10	1	6	1	0	0	0	0	0	0	0	0	88
13:00	1	50	11	0	5	0	0	0	0	0	0	0	0	0	67
14:00	1	74	17	0	2	0	0	0	0	0	0	0	0	0	94
15:00	1	80	15	2	7	1	0	0	0	0	0	0	0	0	106
16:00	4	87	14	0	7	0	0	0	0	0	0	0	0	0	112
17:00	4	77	8	0	7	0	0	1	0	0	0	0	0	0	97
18:00	0	75	10	0	3	0	0	0	0	0	0	0	0	0	88
19:00	0	29	3	0	2	0	0	0	0	0	0	0	0	0	34
20:00	0	23	3	0	1	0	0	0	0	0	0	0	0	0	27
21:00	0	22	7	0	2	0	0	0	0	0	0	0	0	0	31
22:00	0	23	6	0	1	0	0	0	0	0	0	0	0	0	30
23:00	0	10	2	0	1	0	0	0	0	0	0	0	0	0	13
Total	12	874	153	6	76	4	0	1	0	0	0	0	0	0	1126
Percent	1.1%	77.6%	13.6%	0.5%	6.7%	0.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00	08:00	08:00	07:00									
Vol.		67	12	2	8	1									
PM Peak	16:00	16:00	14:00	15:00	15:00	12:00		17:00							
Vol.	4	87	17	2	7	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/10/21	0	9	0	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
02:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
05:00	0	5	2	0	0	0	0	0	0	0	0	0	0	0	7
06:00	0	3	3	0	2	0	0	0	0	0	0	0	0	0	8
07:00	0	16	12	0	1	0	0	0	0	0	0	0	0	0	29
08:00	0	28	4	0	3	0	0	0	0	0	0	0	0	0	35
09:00	1	41	7	0	6	0	0	0	0	0	0	0	0	0	55
10:00	0	64	10	0	7	0	0	0	0	0	0	0	0	0	81
11:00	2	73	9	0	4	0	0	0	0	0	0	0	0	0	88
12 PM	1	70	12	0	4	0	0	0	0	0	0	0	0	0	87
13:00	3	80	6	0	11	0	0	0	0	0	0	0	0	0	100
14:00	3	94	17	0	10	0	0	0	0	0	0	0	0	0	124
15:00	6	67	13	1	4	0	0	0	0	0	0	0	0	0	91
16:00	3	75	12	0	5	0	0	0	0	0	0	0	0	0	95
17:00	1	72	8	0	2	0	0	0	0	0	0	0	0	0	83
18:00	3	55	12	0	4	0	0	0	0	0	0	0	0	0	74
19:00	1	36	13	0	3	0	0	0	0	0	0	0	0	0	53
20:00	2	27	9	0	3	0	0	0	0	0	0	0	0	0	41
21:00	0	20	6	0	2	0	0	0	0	0	0	0	0	0	28
22:00	0	15	2	0	2	0	0	0	0	0	0	0	0	0	19
23:00	0	16	2	0	0	0	0	0	0	0	0	0	0	0	18
Total	26	871	159	1	74	0	0	0	0	0	0	0	0	0	1131
Percent	2.3%	77.0%	14.1%	0.1%	6.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	07:00		10:00										
Vol.	2	73	12		7										
PM Peak	15:00	14:00	14:00	15:00	13:00										
Vol.	6	94	17	1	11										
Grand Total	122	8806	1670	31	776	21	0	10	2	0	0	0	0	0	11438
Percent	1.1%	77.0%	14.6%	0.3%	6.8%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
03/31/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	70	11	0	7	0	0	0	0	0	0	0	0	0	88
11:00	0	71	18	0	4	0	0	0	0	0	0	0	0	0	93
12 PM	0	75	15	0	7	0	0	0	0	0	0	0	0	0	97
13:00	0	88	11	0	4	0	0	0	0	0	0	0	0	0	103
14:00	0	97	11	0	7	0	0	0	0	0	0	0	0	0	115
15:00	0	86	9	0	2	0	0	0	0	0	0	0	0	0	97
16:00	0	96	11	0	2	1	0	0	0	0	0	0	0	0	110
17:00	0	74	16	0	1	0	0	0	0	0	0	0	0	0	91
18:00	0	44	9	0	0	0	0	0	0	0	0	0	0	0	53
19:00	0	27	5	0	0	0	0	0	0	0	0	0	0	0	32
20:00	0	18	3	0	1	0	0	0	0	0	0	0	0	0	22
21:00	1	20	5	0	1	0	0	0	0	0	0	0	0	0	27
22:00	0	12	3	0	0	0	0	0	0	0	0	0	0	0	15
23:00	0	10	2	0	0	0	0	0	0	0	0	0	0	0	12
Total	1	788	129	0	36	1	0	0	0	0	0	0	0	0	955
Percent	0.1%	82.5%	13.5%	0.0%	3.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		11:00	11:00		10:00										
Vol.		71	18		7										
PM Peak	21:00	14:00	17:00		12:00	16:00									
Vol.	1	97	16		7	1									

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/01/21	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2
05:00	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
06:00	1	13	6	0	1	1	0	0	0	0	0	0	0	0	22
07:00	0	37	18	0	5	0	0	0	0	0	0	0	0	0	60
08:00	0	34	11	1	3	1	0	0	0	0	0	0	0	0	50
09:00	1	49	13	0	5	0	0	0	0	0	0	0	0	0	68
10:00	0	44	5	0	5	0	1	0	0	0	0	0	0	0	55
11:00	0	44	9	0	3	0	0	0	0	0	0	0	0	0	56
12 PM	0	64	6	0	3	1	0	0	0	0	0	0	0	0	74
13:00	0	57	11	1	3	0	0	0	1	0	0	0	0	0	73
14:00	0	68	9	1	3	0	0	0	0	0	0	0	0	0	81
15:00	0	68	10	0	3	0	0	0	0	0	0	0	0	0	81
16:00	0	82	17	0	9	0	0	0	0	0	0	0	0	0	108
17:00	0	76	12	0	4	0	0	0	0	0	0	0	0	0	92
18:00	0	59	9	0	5	0	0	0	0	0	0	0	0	0	73
19:00	0	30	6	0	4	0	0	0	0	0	0	0	0	0	40
20:00	0	25	3	0	3	1	0	0	0	0	0	0	0	0	32
21:00	0	19	4	0	2	0	0	0	0	0	0	0	0	0	25
22:00	0	11	4	0	0	0	0	0	0	0	0	0	0	0	15
23:00	0	12	4	0	0	0	0	0	0	0	0	0	0	0	16
Total	2	805	157	3	62	4	1	0	1	0	0	0	0	0	1035
Percent	0.2%	77.8%	15.2%	0.3%	6.0%	0.4%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	09:00	07:00	08:00	07:00	06:00	10:00								
Vol.	1	49	18	1	5	1	1								
PM Peak		16:00	16:00	13:00	16:00	12:00			13:00						
Vol.		82	17	1	9	1			1						

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/02/21	0	2	3	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	5	0	0	0	0	0	0	0	0	0	0	0	0	5
06:00	0	4	5	0	0	0	0	0	0	0	0	0	0	0	9
07:00	0	24	11	0	2	0	0	0	0	0	0	0	0	0	37
08:00	0	43	11	0	7	0	0	0	0	0	0	0	0	0	61
09:00	2	47	11	0	1	0	0	0	0	0	0	0	0	0	61
10:00	1	60	9	1	8	1	0	0	0	0	0	0	0	0	80
11:00	1	69	13	1	5	0	0	0	0	0	0	0	0	0	89
12 PM	0	75	9	0	7	1	0	0	0	0	0	0	0	0	92
13:00	1	66	10	0	2	0	0	0	0	0	0	0	0	0	79
14:00	0	70	14	1	6	0	0	1	0	0	0	0	0	0	92
15:00	0	71	8	0	2	1	0	1	0	0	0	0	0	0	83
16:00	0	54	10	0	2	0	0	0	0	0	0	0	0	0	66
17:00	0	57	8	0	2	1	0	0	0	0	0	0	0	0	68
18:00	0	39	4	0	3	0	0	0	0	0	0	0	0	0	46
19:00	1	34	7	0	0	0	0	0	0	0	0	0	0	0	42
20:00	0	18	2	0	0	0	0	0	0	0	0	0	0	0	20
21:00	0	17	2	0	0	0	0	0	0	0	0	0	0	0	19
22:00	0	14	5	0	0	0	0	0	0	0	0	0	0	0	19
23:00	0	9	2	0	1	0	0	0	0	0	0	0	0	0	12
Total	6	785	144	3	48	4	0	2	0	0	0	0	0	0	992
Percent	0.6%	79.1%	14.5%	0.3%	4.8%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	11:00	11:00	10:00	10:00	10:00									
Vol.	2	69	13	1	8	1									
PM Peak	13:00	12:00	14:00	14:00	12:00	12:00		14:00							
Vol.	1	75	14	1	7	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/03/21	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
01:00	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	4	2	0	0	0	0	0	0	0	0	0	0	0	6
07:00	0	28	5	0	0	0	0	0	0	0	0	0	0	0	33
08:00	0	23	8	0	2	0	0	0	0	0	0	0	0	0	33
09:00	0	41	5	0	6	1	0	1	0	0	0	0	0	0	54
10:00	1	66	8	0	6	0	0	0	0	0	0	0	0	0	81
11:00	0	66	17	0	6	0	0	0	0	0	0	0	0	0	89
12 PM	1	85	12	0	2	0	0	1	0	0	0	0	0	0	101
13:00	0	62	16	0	1	0	0	0	0	0	0	0	0	0	79
14:00	0	75	19	0	4	0	0	0	0	0	0	0	0	0	98
15:00	2	74	5	0	1	0	0	0	0	0	0	0	0	0	82
16:00	0	57	5	0	2	0	0	0	0	0	0	0	0	0	64
17:00	1	49	7	0	1	0	0	0	0	0	0	0	0	0	58
18:00	1	51	7	0	1	0	0	0	0	0	0	0	0	0	60
19:00	0	41	9	0	0	0	0	0	0	0	0	0	0	0	50
20:00	0	21	2	0	2	0	0	0	0	0	0	0	0	0	25
21:00	0	12	3	0	1	0	0	0	0	0	0	0	0	0	16
22:00	0	18	3	0	0	0	0	0	0	0	0	0	0	0	21
23:00	1	12	3	0	0	0	0	0	0	0	0	0	0	0	16
Total	7	800	141	0	35	1	0	2	0	0	0	0	0	0	986
Percent	0.7%	81.1%	14.3%	0.0%	3.5%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	11:00		09:00	09:00		09:00							
Vol.	1	66	17		6	1		1							
PM Peak	15:00	12:00	14:00		14:00			12:00							
Vol.	2	85	19		4			1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/04/21	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
06:00	0	4	1	0	1	0	0	0	0	0	0	0	0	0	6
07:00	0	15	2	0	1	0	0	0	0	0	0	0	0	0	18
08:00	0	24	5	0	1	0	0	0	0	0	0	0	0	0	30
09:00	0	21	5	0	3	0	0	0	0	0	0	0	0	0	29
10:00	0	47	10	0	3	0	0	0	0	0	0	0	0	0	60
11:00	1	58	5	0	2	0	0	0	0	0	0	0	0	0	66
12 PM	1	69	12	0	6	0	0	0	0	0	0	0	0	0	88
13:00	1	51	7	0	1	0	0	0	0	0	0	0	0	0	60
14:00	2	62	6	0	1	0	0	0	0	0	0	0	0	0	71
15:00	0	60	8	0	1	0	0	0	0	0	0	0	0	0	69
16:00	1	69	5	0	0	0	0	0	0	0	0	0	0	0	75
17:00	0	58	7	0	1	0	0	0	0	0	0	0	0	0	66
18:00	0	51	11	0	1	0	0	0	0	0	0	0	0	0	63
19:00	2	47	6	0	2	0	0	0	0	0	0	0	0	0	57
20:00	0	33	2	0	1	0	0	0	0	0	0	0	0	0	36
21:00	0	30	2	0	0	0	0	0	0	0	0	0	0	0	32
22:00	0	15	2	0	1	0	0	0	0	0	0	0	0	0	18
23:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
Total	8	729	98	0	26	0	0	0	0	0	0	0	0	0	861
Percent	0.9%	84.7%	11.4%	0.0%	3.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	10:00		09:00										
Vol.	1	58	10		3										
PM Peak	14:00	12:00	12:00		12:00										
Vol.	2	69	12		6										

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/05/21	0	5	2	0	0	0	0	0	0	0	0	0	0	0	7
01:00	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	6	2	0	0	0	0	0	0	0	0	0	0	0	8
06:00	0	10	6	0	1	0	0	0	0	0	0	0	0	0	17
07:00	0	33	16	0	5	0	0	0	0	0	0	0	0	0	54
08:00	0	48	9	0	1	0	0	0	0	0	0	0	0	0	58
09:00	0	58	13	1	3	1	0	0	0	0	0	0	0	0	76
10:00	1	61	12	0	7	0	0	0	0	0	0	0	0	0	81
11:00	1	55	7	0	3	0	0	0	0	0	0	0	0	0	66
12 PM	2	78	10	0	3	0	0	0	0	0	0	0	0	0	93
13:00	0	69	10	1	2	0	0	0	0	0	0	0	0	0	82
14:00	0	88	13	0	4	0	0	0	0	0	0	0	0	0	105
15:00	1	77	13	0	7	0	0	0	0	0	0	0	0	0	98
16:00	2	85	15	0	4	0	0	0	0	0	0	0	0	0	106
17:00	0	89	14	0	1	0	0	0	0	0	0	0	0	0	104
18:00	2	64	3	0	1	0	0	0	0	0	0	0	0	0	70
19:00	0	33	7	0	2	0	0	0	0	0	0	0	0	0	42
20:00	0	36	3	0	1	0	0	0	0	0	0	0	0	0	40
21:00	0	20	3	0	0	0	0	0	0	0	0	0	0	0	23
22:00	0	11	2	0	1	0	0	0	0	0	0	0	0	0	14
23:00	0	5	3	0	1	0	0	0	0	0	0	0	0	0	9
Total	9	936	165	2	48	1	0	0	0	0	0	0	0	0	1161
Percent	0.8%	80.6%	14.2%	0.2%	4.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	10:00	07:00	09:00	10:00	09:00									
Vol.	1	61	16	1	7	1									
PM Peak	12:00	17:00	16:00	13:00	15:00										
Vol.	2	89	15	1	7										

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/06/21	0	8	1	0	0	0	0	0	0	0	0	0	0	0	9
01:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	7	2	0	0	0	0	0	0	0	0	0	0	0	9
06:00	0	12	6	0	0	0	0	0	0	0	0	0	0	0	18
07:00	0	31	13	1	5	0	0	0	0	0	0	0	0	0	50
08:00	0	55	18	0	2	0	0	1	0	0	0	0	0	0	76
09:00	0	61	16	0	4	0	0	0	0	0	0	0	0	0	81
10:00	0	53	6	0	2	0	0	0	0	0	0	0	0	0	61
11:00	1	62	11	0	2	0	0	0	0	0	0	0	0	0	76
12 PM	1	57	15	0	2	0	0	0	0	0	0	0	0	0	75
13:00	1	88	12	0	5	1	0	1	0	0	0	0	0	0	108
14:00	0	69	9	0	5	0	0	0	0	0	0	0	0	0	83
15:00	1	96	19	0	3	0	0	0	0	0	0	0	0	0	119
16:00	2	75	13	0	4	0	0	1	0	0	0	0	0	0	95
17:00	1	77	11	0	5	0	0	1	0	0	0	0	0	0	95
18:00	2	85	13	0	0	0	0	0	0	0	0	0	0	0	100
19:00	2	55	10	0	2	0	0	0	0	0	0	0	0	0	69
20:00	0	23	5	0	1	0	0	0	0	0	0	0	0	0	29
21:00	0	17	3	0	0	0	0	0	0	0	0	0	0	0	20
22:00	0	15	2	0	0	0	0	0	0	0	0	0	0	0	17
23:00	1	8	1	0	0	0	0	0	0	0	0	0	0	0	10
Total	12	961	187	1	42	1	0	4	0	0	0	0	0	0	1208
Percent	1.0%	79.6%	15.5%	0.1%	3.5%	0.1%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	08:00	07:00	07:00			08:00							
Vol.	1	62	18	1	5			1							
PM Peak	16:00	15:00	15:00		13:00	13:00		13:00							
Vol.	2	96	19		5	1		1							

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/07/21	0	4	1	0	0	0	0	0	0	0	0	0	0	0	5
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	4	0	0	0	0	0	0	0	0	0	0	0	0	4
04:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
05:00	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
06:00	1	7	8	0	0	0	0	0	0	0	0	0	0	0	16
07:00	0	29	11	0	5	1	0	0	1	0	0	0	0	0	47
08:00	0	60	17	0	2	0	0	0	0	0	0	0	0	0	79
09:00	1	73	16	1	6	0	0	0	0	0	0	0	0	0	97
10:00	0	93	8	1	4	0	0	0	0	0	0	0	0	0	106
11:00	0	60	8	0	4	1	0	1	0	0	0	0	0	0	74
12 PM	0	95	8	0	1	0	0	0	0	0	0	0	0	0	104
13:00	3	97	12	1	4	0	0	0	0	0	0	0	0	0	117
14:00	1	106	20	1	4	0	0	0	0	0	0	0	0	0	132
15:00	2	123	18	0	1	0	0	0	0	0	0	0	0	0	144
16:00	2	106	17	0	5	0	0	0	0	0	0	0	0	0	130
17:00	0	96	14	0	3	0	0	0	0	0	0	0	0	0	113
18:00	1	67	12	0	1	0	0	0	0	0	0	0	0	0	81
19:00	2	43	9	0	1	0	0	0	0	0	0	0	0	0	55
20:00	0	38	6	0	1	0	0	0	0	0	0	0	0	0	45
21:00	0	11	3	0	0	0	0	0	0	0	0	0	0	0	14
22:00	0	13	0	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	11	1	0	0	0	0	0	0	0	0	0	0	0	12
Total	13	1150	191	4	42	2	0	1	1	0	0	0	0	0	1404
Percent	0.9%	81.9%	13.6%	0.3%	3.0%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	10:00	08:00	09:00	09:00	07:00		11:00	07:00						
Vol.	1	93	17	1	6	1		1	1						
PM Peak	13:00	15:00	14:00	13:00	16:00										
Vol.	3	123	20	1	5										

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/08/21	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	5	1	0	2	0	0	0	0	0	0	0	0	0	8
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	8	2	0	0	0	0	0	0	0	0	0	0	0	10
06:00	0	12	6	0	2	0	0	0	0	0	0	0	0	0	20
07:00	0	42	14	0	6	0	0	0	0	0	0	0	0	0	62
08:00	0	60	7	0	5	0	0	0	0	0	0	0	0	0	72
09:00	0	62	11	0	6	0	0	0	0	0	0	0	0	0	79
10:00	1	69	9	1	2	0	0	0	0	0	0	0	0	0	82
11:00	0	75	9	0	7	0	0	0	0	0	0	0	0	0	91
12 PM	1	80	12	0	5	0	1	0	0	0	0	0	0	0	99
13:00	2	81	17	1	5	0	0	0	0	0	0	0	0	0	106
14:00	1	79	8	0	7	0	0	0	0	0	0	0	0	0	95
15:00	1	100	19	1	3	0	0	0	0	0	0	0	0	0	124
16:00	2	99	14	0	3	0	0	0	0	0	0	0	0	0	118
17:00	2	77	10	0	4	0	0	0	0	0	0	0	0	0	93
18:00	1	74	6	0	1	0	0	0	0	0	0	0	0	0	82
19:00	0	50	7	0	3	0	0	0	0	0	0	0	0	0	60
20:00	0	36	2	0	0	0	0	0	0	0	0	0	0	0	38
21:00	0	13	4	0	0	0	0	0	0	0	0	0	0	0	17
22:00	0	12	1	0	0	0	0	0	0	0	0	0	0	0	13
23:00	0	11	3	0	0	0	0	0	0	0	0	0	0	0	14
Total	11	1050	162	3	61	0	1	0	0	0	0	0	0	0	1288
Percent	0.9%	81.5%	12.6%	0.2%	4.7%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	10:00	11:00	07:00	10:00	11:00										
Vol.	1	75	14	1	7										
PM Peak	13:00	15:00	15:00	13:00	14:00		12:00								
Vol.	2	100	19	1	7		1								

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/09/21	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	5	1	0	0	0	0	0	0	0	0	0	0	0	6
06:00	0	10	8	0	0	0	0	0	0	0	0	0	0	0	18
07:00	0	26	13	0	5	0	1	0	0	0	0	0	0	0	45
08:00	1	57	13	1	2	0	0	0	0	0	0	0	0	0	74
09:00	0	59	12	0	4	0	0	0	0	0	0	0	0	0	75
10:00	1	61	13	2	8	0	0	1	0	0	0	0	0	0	86
11:00	2	72	12	0	2	0	0	0	0	0	0	0	0	0	88
12 PM	1	80	11	0	7	0	1	0	0	0	0	0	0	0	100
13:00	0	97	9	0	4	0	1	0	0	0	0	0	0	0	111
14:00	0	85	8	0	3	0	0	0	0	0	0	0	0	0	96
15:00	2	81	23	0	7	0	0	0	0	0	0	0	0	0	113
16:00	0	76	18	0	4	0	0	0	0	0	0	0	0	0	98
17:00	2	92	9	0	1	0	0	0	0	0	0	0	0	0	104
18:00	2	67	10	0	1	0	0	0	0	0	0	0	0	0	80
19:00	0	47	6	0	1	0	0	0	0	0	0	0	0	0	54
20:00	0	35	5	0	0	0	0	0	0	0	0	0	0	0	40
21:00	0	21	4	0	1	0	0	0	0	0	0	0	0	0	26
22:00	0	20	4	0	0	0	0	0	0	0	0	0	0	0	24
23:00	0	11	4	0	0	0	0	0	0	0	0	0	0	0	15
Total	11	1010	183	3	50	0	3	1	0	0	0	0	0	0	1261
Percent	0.9%	80.1%	14.5%	0.2%	4.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	07:00	10:00	10:00		07:00	10:00							
Vol.	2	72	13	2	8		1	1							
PM Peak	15:00	13:00	15:00		12:00		12:00								
Vol.	2	97	23		7		1								

Mt Carmel Avenue East of Outer Ridge Rd
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Not Classed	Total
04/10/21	0	13	2	0	0	0	0	0	0	0	0	0	0	0	15
01:00	0	2	2	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
04:00	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
05:00	0	2	1	0	0	0	0	0	0	0	0	0	0	0	3
06:00	0	8	4	0	0	0	0	0	0	0	0	0	0	0	12
07:00	0	36	8	0	3	0	0	0	0	0	0	0	0	0	47
08:00	0	38	14	0	4	0	0	0	0	0	0	0	0	0	56
09:00	0	57	10	0	2	0	0	0	0	0	0	0	0	0	69
10:00	0	70	12	0	8	0	0	0	0	0	0	0	0	0	90
11:00	2	87	21	0	7	1	0	0	0	0	0	0	0	0	118
12 PM	2	95	9	0	9	0	0	0	0	0	0	0	0	0	115
13:00	1	100	12	0	6	0	0	1	0	0	0	0	0	0	120
14:00	3	86	16	0	1	0	0	1	0	0	0	0	0	0	107
15:00	3	88	8	0	3	0	0	1	0	0	0	0	0	0	103
16:00	2	72	9	0	3	0	0	0	0	0	0	0	0	0	86
17:00	4	67	11	0	2	0	0	0	0	0	0	0	0	0	84
18:00	0	69	13	0	0	0	0	0	0	0	0	0	0	0	82
19:00	1	52	4	0	3	0	0	0	0	0	0	0	0	0	60
20:00	0	31	6	0	1	0	0	0	0	0	0	0	0	0	38
21:00	0	27	2	0	2	0	0	0	0	0	0	0	0	0	31
22:00	0	20	3	0	0	0	0	0	0	0	0	0	0	0	23
23:00	0	16	3	0	1	0	0	0	0	0	0	0	0	0	20
Total	18	1039	172	0	55	1	0	3	0	0	0	0	0	0	1288
Percent	1.4%	80.7%	13.4%	0.0%	4.3%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	11:00	11:00	11:00		10:00	11:00									
Vol.	2	87	21		8	1									
PM Peak	17:00	13:00	14:00		12:00			13:00							
Vol.	4	100	16		9			1							
Grand Total	98	10053	1729	19	505	15	5	13	2	0	0	0	0	0	12439
Percent	0.8%	80.8%	13.9%	0.2%	4.1%	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
03/31/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	**1**	**8**	**50**	30	2	0	0	0	0	0	0	0	0	0	91	21-30	80
11:00	0	8	50	**42**	**4**	0	0	0	0	0	0	0	0	0	**104**	21-30	92
12 PM	0	**12**	65	28	0	0	0	0	0	0	0	0	0	0	105	21-30	93
13:00	1	4	61	**40**	2	0	0	0	0	0	0	0	0	0	108	21-30	101
14:00	0	11	**78**	39	2	0	0	0	0	0	0	0	0	0	**130**	21-30	117
15:00	**2**	10	66	26	2	0	0	0	0	0	0	0	0	0	106	21-30	92
16:00	0	7	64	24	**4**	0	0	0	0	0	0	0	0	0	99	21-30	88
17:00	0	9	54	19	0	0	0	0	0	0	0	0	0	0	82	21-30	73
18:00	0	5	34	19	1	0	0	0	0	0	0	0	0	0	59	21-30	53
19:00	0	1	20	5	0	0	0	0	0	0	0	0	0	0	26	21-30	25
20:00	0	7	24	8	1	0	0	0	0	0	0	0	0	0	40	21-30	32
21:00	1	1	18	5	1	0	0	0	0	0	0	0	0	0	26	21-30	23
22:00	0	1	7	4	1	0	0	0	0	0	0	0	0	0	13	21-30	11
23:00	0	2	3	1	0	0	0	0	0	0	0	0	0	0	6	16-25	5
Total	5	86	594	290	20	0	0	0	0	0	0	0	0	0	995		
Percent	0.5%	8.6%	59.7%	29.1%	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	11:00										11:00		
Vol.	1	8	50	42	4										104		
PM Peak	15:00	12:00	14:00	13:00	16:00										14:00		
Vol.	2	12	78	40	4										130		

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/01/21	0	0	5	0	0	0	0	0	0	0	0	0	0	0	5	16-25	5
01:00	0	1	2	1	0	0	0	0	0	0	0	0	0	0	4	15-24	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
05:00	0	1	1	1	0	0	0	0	0	0	0	0	0	0	3	14-23	2
06:00	0	0	15	11	1	0	0	0	0	0	0	0	0	0	27	21-30	26
07:00	0	1	29	8	**2**	0	0	0	0	0	0	0	0	0	40	21-30	37
08:00	0	4	27	16	0	0	0	0	0	0	0	0	0	0	47	21-30	43
09:00	0	3	**32**	16	0	0	0	0	0	0	0	0	0	0	51	21-30	48
10:00	**1**	5	26	12	0	0	0	0	0	0	0	0	0	0	44	21-30	38
11:00	0	**6**	31	**24**	1	0	0	0	0	0	0	0	0	0	**62**	21-30	55
12 PM	0	6	42	22	**4**	0	0	0	0	0	0	0	0	0	74	21-30	64
13:00	0	5	50	30	1	0	0	0	0	0	0	0	0	0	86	21-30	80
14:00	0	**8**	47	30	0	0	0	0	0	0	0	0	0	0	85	21-30	77
15:00	0	5	53	33	0	0	0	0	0	0	0	0	0	0	91	21-30	86
16:00	0	6	**55**	**34**	2	0	0	0	0	0	0	0	0	0	**97**	21-30	89
17:00	0	4	50	26	1	0	0	0	0	0	0	0	0	0	81	21-30	76
18:00	**1**	2	44	29	1	0	0	0	0	0	0	0	0	0	77	21-30	73
19:00	0	2	19	17	0	0	0	0	0	0	0	0	0	0	38	21-30	36
20:00	0	5	21	8	1	0	0	0	0	0	0	0	0	0	35	21-30	29
21:00	0	5	18	10	0	0	0	0	0	0	0	0	0	0	33	21-30	28
22:00	0	3	6	5	0	0	0	0	0	0	0	0	0	0	14	21-30	11
23:00	0	1	7	0	0	0	0	0	0	0	0	0	0	0	8	16-25	8
Total	2	73	583	333	14	0	0	0	0	0	0	0	0	0	1005		
Percent	0.2%	7.3%	58.0%	33.1%	1.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	09:00	11:00	07:00										11:00		
Vol.	1	6	32	24	2										62		
PM Peak	18:00	14:00	16:00	16:00	12:00										16:00		
Vol.	1	8	55	34	4										97		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/02/21	0	1	6	4	0	0	0	0	0	0	0	0	0	0	11	21-30	10
01:00	0	0	2	0	1	0	0	0	0	0	0	0	0	0	3	15-24	2
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	24-33	1
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	19-28	3
05:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3	15-24	3
06:00	0	0	5	4	1	0	0	0	0	0	0	0	0	0	10	21-30	9
07:00	0	2	24	11	2	0	0	0	0	0	0	0	0	0	39	21-30	35
08:00	0	4	31	13	2	0	0	0	0	0	0	0	0	0	50	21-30	44
09:00	0	7	23	**23**	2	0	0	0	0	0	0	0	0	0	55	21-30	46
10:00	**1**	8	**41**	18	**4**	0	0	0	0	0	0	0	0	0	72	21-30	59
11:00	0	**10**	41	23	3	0	0	0	0	0	0	0	0	0	**77**	21-30	64
12 PM	1	6	52	21	**3**	0	0	0	0	0	0	0	0	0	83	21-30	73
13:00	0	6	42	25	2	**1**	0	0	0	0	0	0	0	0	76	21-30	67
14:00	0	**8**	**65**	21	0	0	0	0	0	0	0	0	0	0	**94**	21-30	86
15:00	1	6	47	21	1	0	0	0	0	0	0	0	0	0	76	21-30	68
16:00	0	7	45	24	2	0	0	0	0	0	0	0	0	0	78	21-30	69
17:00	1	1	46	**28**	0	0	0	0	0	0	0	0	0	0	76	21-30	74
18:00	**2**	3	22	16	1	0	0	0	0	0	0	0	0	0	44	21-30	38
19:00	0	6	22	9	0	0	0	0	0	0	0	0	0	0	37	21-30	31
20:00	0	3	10	3	1	0	0	0	0	0	0	0	0	0	17	16-25	13
21:00	0	1	10	11	0	0	0	0	0	0	0	0	0	0	22	21-30	21
22:00	1	1	7	4	3	0	0	0	0	0	0	0	0	0	16	21-30	11
23:00	0	0	7	3	0	0	0	0	0	0	0	0	0	0	10	21-30	10
Total	7	81	553	283	29	1	0	0	0	0	0	0	0	0	954		
Percent	0.7%	8.5%	58.0%	29.7%	3.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	11:00	10:00	09:00	10:00										11:00		
Vol.	1	10	41	23	4										77		
PM Peak	18:00	14:00	14:00	17:00	12:00	13:00									14:00		
Vol.	2	8	65	28	3	1									94		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/03/21	0	0	1	5	0	0	0	0	0	0	0	0	0	0	6	21-30	6
01:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	19-28	3
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
04:00	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	19-28	3
05:00	1	1	2	1	0	0	0	0	0	0	0	0	0	0	5	21-30	3
06:00	0	0	2	5	0	0	0	0	0	0	0	0	0	0	7	21-30	7
07:00	0	0	12	6	**2**	0	0	0	0	0	0	0	0	0	20	21-30	18
08:00	0	2	18	9	2	0	0	0	0	0	0	0	0	0	31	21-30	27
09:00	**3**	4	34	15	1	0	0	0	0	0	0	0	0	0	57	21-30	49
10:00	0	3	39	**20**	0	0	0	0	0	0	0	0	0	0	62	21-30	59
11:00	0	**10**	**41**	13	2	0	0	0	0	0	0	0	0	0	**66**	21-30	54
12 PM	2	9	54	14	**3**	0	0	0	0	0	0	0	0	0	82	21-30	68
13:00	1	**14**	51	27	2	0	0	0	0	0	0	0	0	0	95	21-30	78
14:00	**4**	6	53	20	0	0	0	0	0	0	0	0	0	0	83	21-30	73
15:00	2	7	**66**	**28**	2	**1**	0	0	0	0	0	0	0	0	**106**	21-30	94
16:00	1	7	50	18	3	1	0	0	0	0	0	0	0	0	80	21-30	68
17:00	0	12	44	15	0	1	0	0	0	0	0	0	0	0	72	21-30	59
18:00	0	7	31	5	0	0	0	0	0	0	0	0	0	0	43	16-25	38
19:00	0	3	28	15	0	0	0	0	0	0	0	0	0	0	46	21-30	43
20:00	0	3	17	7	1	0	0	0	0	0	0	0	0	0	28	21-30	24
21:00	0	5	11	13	0	0	0	0	0	0	0	0	0	0	29	21-30	24
22:00	0	6	14	4	1	0	0	0	0	0	0	0	0	0	25	16-25	20
23:00	0	0	4	4	0	1	0	0	0	0	0	0	0	0	9	21-30	8
Total	14	99	578	246	19	4	0	0	0	0	0	0	0	0	960		
Percent	1.5%	10.3%	60.2%	25.6%	2.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	11:00	11:00	10:00	07:00										11:00		
Vol.	3	10	41	20	2										66		
PM Peak	14:00	13:00	15:00	15:00	12:00	15:00									15:00		
Vol.	4	14	66	28	3	1									106		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/04/21	0	0	7	3	0	0	0	0	0	0	0	0	0	0	10	21-30	10
01:00	0	0	3	1	0	0	0	0	0	0	0	0	0	0	4	19-28	4
02:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
05:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	9-18	1
06:00	0	0	3	1	0	0	0	0	0	0	0	0	0	0	4	19-28	4
07:00	0	2	8	2	0	0	0	0	0	0	0	0	0	0	12	18-27	10
08:00	0	1	7	7	2	0	0	0	0	0	0	0	0	0	17	21-30	14
09:00	0	1	16	8	0	0	0	0	0	0	0	0	0	0	25	21-30	24
10:00	0	3	27	8	**3**	0	0	0	0	0	0	0	0	0	41	21-30	35
11:00	0	**7**	**30**	**16**	1	0	0	0	0	0	0	0	0	0	**54**	21-30	46
12 PM	1	6	**51**	15	1	0	0	0	0	0	0	0	0	0	**74**	21-30	66
13:00	**2**	**11**	40	14	0	0	0	0	0	0	0	0	0	0	67	21-30	54
14:00	1	3	32	**24**	1	0	0	0	0	0	0	0	0	0	61	21-30	56
15:00	0	7	32	16	1	**1**	0	0	0	0	0	0	0	0	57	21-30	48
16:00	0	5	42	15	0	0	0	0	0	0	0	0	0	0	62	21-30	57
17:00	2	4	31	8	1	0	0	0	0	0	0	0	0	0	46	21-30	39
18:00	0	4	45	21	**2**	0	0	0	0	0	0	0	0	0	72	21-30	66
19:00	0	3	37	14	1	1	0	0	0	0	0	0	0	0	56	21-30	51
20:00	0	4	17	6	2	0	0	0	0	0	0	0	0	0	29	21-30	23
21:00	0	0	13	3	1	0	0	0	0	0	0	0	0	0	17	21-30	16
22:00	0	2	4	5	0	0	0	0	0	0	0	0	0	0	11	21-30	9
23:00	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	9-18	1
Total	6	65	447	188	16	2	0	0	0	0	0	0	0	0	724		
Percent	0.8%	9.0%	61.7%	26.0%	2.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	11:00	10:00										11:00		
Vol.		7	30	16	3										54		
PM Peak	13:00	13:00	12:00	14:00	18:00	15:00									12:00		
Vol.	2	11	51	24	2	1									74		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/05/21	0	2	1	1	0	0	0	0	0	0	0	0	0	0	4	14-23	3
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	1	0	0	**1**	0	0	0	0	0	0	0	0	2	14-23	1
05:00	0	0	3	0	**1**	0	0	0	0	0	0	0	0	0	4	16-25	3
06:00	0	1	8	18	1	0	0	0	0	0	0	0	0	0	28	21-30	26
07:00	0	3	21	20	1	0	0	0	0	0	0	0	0	0	45	21-30	41
08:00	**1**	1	29	10	1	0	0	0	0	0	0	0	0	0	42	21-30	39
09:00	0	4	28	13	0	0	0	0	0	0	0	0	0	0	45	21-30	41
10:00	0	4	**41**	23	1	0	0	0	0	0	0	0	0	0	69	21-30	64
11:00	0	**5**	37	**28**	0	0	0	0	0	0	0	0	0	0	**70**	21-30	65
12 PM	0	3	46	21	3	0	0	0	0	0	0	0	0	0	73	21-30	67
13:00	0	**10**	40	24	1	0	0	0	0	0	0	0	0	0	75	21-30	64
14:00	0	6	59	22	1	0	0	0	0	0	0	0	0	0	88	21-30	81
15:00	0	6	47	27	0	0	0	0	0	0	0	0	0	0	80	21-30	74
16:00	0	5	63	**47**	0	0	0	0	0	0	0	0	0	0	**115**	21-30	110
17:00	0	6	**64**	29	**4**	0	0	0	0	0	0	0	0	0	103	21-30	93
18:00	0	6	41	18	4	0	0	0	0	0	0	0	0	0	69	21-30	59
19:00	0	2	33	7	0	0	0	0	0	0	0	0	0	0	42	21-30	40
20:00	0	3	19	9	1	0	0	0	0	0	0	0	0	0	32	21-30	28
21:00	**1**	6	13	9	2	0	0	0	0	0	0	0	0	0	31	21-30	22
22:00	0	2	5	4	1	0	0	0	0	0	0	0	0	0	12	21-30	9
23:00	0	0	2	3	0	0	0	0	0	0	0	0	0	0	5	21-30	5
Total	2	75	602	333	22	1	0	0	0	0	0	0	0	0	1035		
Percent	0.2%	7.2%	58.2%	32.2%	2.1%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	11:00	10:00	11:00	05:00	04:00									11:00		
Vol.	1	5	41	28	1	1									70		
PM Peak	21:00	13:00	17:00	16:00	17:00										16:00		
Vol.	1	10	64	47	4										115		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/06/21	0	0	3	3	0	0	0	0	0	0	0	0	0	0	6	21-30	6
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
05:00	0	1	3	2	0	0	0	0	0	0	0	0	0	0	6	19-28	5
06:00	0	2	10	8	1	0	0	0	0	0	0	0	0	0	21	21-30	18
07:00	0	**7**	34	25	1	0	0	0	0	0	0	0	0	0	**67**	21-30	59
08:00	0	4	13	**27**	**4**	0	0	0	0	0	0	0	0	0	48	21-30	40
09:00	0	2	23	23	0	0	0	0	0	0	0	0	0	0	48	21-30	46
10:00	0	0	**39**	19	1	0	0	0	0	0	0	0	0	0	59	21-30	58
11:00	0	4	35	23	1	0	0	0	0	0	0	0	0	0	63	21-30	58
12 PM	**1**	4	41	26	1	0	0	0	0	0	0	0	0	0	73	21-30	67
13:00	0	3	45	28	0	0	0	0	0	0	0	0	0	0	76	21-30	73
14:00	0	4	41	21	0	**1**	0	0	0	0	0	0	0	0	67	21-30	62
15:00	0	7	48	26	**2**	0	0	0	0	0	0	0	0	0	83	21-30	74
16:00	1	6	**68**	28	1	0	0	0	0	0	0	0	0	0	**104**	21-30	96
17:00	1	**12**	58	26	2	0	0	0	0	0	0	0	0	0	99	21-30	84
18:00	0	5	57	**29**	2	0	0	0	0	0	0	0	0	0	93	21-30	86
19:00	0	5	30	13	0	0	0	0	0	0	0	0	0	0	48	21-30	43
20:00	0	1	24	6	1	0	0	0	0	0	0	0	0	0	32	21-30	30
21:00	0	2	4	6	1	0	0	0	0	0	0	0	0	0	13	21-30	10
22:00	0	1	8	5	1	0	0	0	0	0	0	0	0	0	15	21-30	13
23:00	0	1	3	1	0	0	0	0	0	0	0	0	0	0	5	21-30	4
Total	3	71	590	345	19	1	0	0	0	0	0	0	0	0	1029		
Percent	0.3%	6.9%	57.3%	33.5%	1.8%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		07:00	10:00	08:00	08:00										07:00		
Vol.		7	39	27	4										67		
PM Peak	12:00	17:00	16:00	18:00	15:00	14:00									16:00		
Vol.	1	12	68	29	2	1									104		

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/07/21	0	1	3	0	0	0	0	0	0	0	0	0	0	0	4	16-25	4
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
05:00	0	2	2	3	0	0	0	0	0	0	0	0	0	0	7	19-28	5
06:00	0	1	14	13	**2**	0	0	0	0	0	0	0	0	0	30	21-30	27
07:00	0	0	25	17	0	0	0	0	0	0	0	0	0	0	42	21-30	42
08:00	0	4	21	20	1	0	0	0	0	0	0	0	0	0	46	21-30	41
09:00	0	3	39	19	1	0	0	0	0	0	0	0	0	0	62	21-30	58
10:00	**1**	**5**	**58**	21	2	0	0	0	0	0	0	0	0	0	87	21-30	79
11:00	0	3	57	**40**	2	0	0	0	0	0	0	0	0	0	**102**	21-30	97
12 PM	0	9	51	34	1	0	0	0	0	0	0	0	0	0	95	21-30	85
13:00	0	**15**	46	29	0	0	0	0	0	0	0	0	0	0	90	21-30	75
14:00	0	8	68	**47**	**5**	0	0	0	0	0	0	0	0	0	**128**	21-30	115
15:00	0	12	68	33	1	0	0	0	0	0	0	0	0	0	114	21-30	101
16:00	**2**	8	59	35	4	0	0	0	0	0	0	0	0	0	108	21-30	94
17:00	2	6	**82**	25	4	0	0	0	0	0	0	0	0	0	119	21-30	107
18:00	1	6	53	27	1	0	0	0	0	0	0	0	0	0	88	21-30	80
19:00	0	6	31	23	0	0	0	0	0	0	0	0	0	0	60	21-30	54
20:00	0	1	20	20	1	0	0	0	0	0	0	0	0	0	42	21-30	40
21:00	0	3	8	7	0	0	0	0	0	0	0	0	0	0	18	21-30	15
22:00	0	0	8	12	2	0	0	0	0	0	0	0	0	0	22	21-30	20
23:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
Total	6	93	717	426	27	0	0	0	0	0	0	0	0	0	1269		
Percent	0.5%	7.3%	56.5%	33.6%	2.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	06:00										11:00		
Vol.	1	5	58	40	2										102		
PM Peak	16:00	13:00	17:00	14:00	14:00										14:00		
Vol.	2	15	82	47	5										128		

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/08/21	0	1	0	1	0	**1**	0	0	0	0	0	0	0	0	3	9-18	1
01:00	0	0	1	3	**1**	0	0	0	0	0	0	0	0	0	5	26-35	4
02:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
05:00	0	1	1	5	0	0	0	0	0	0	0	0	0	0	7	21-30	6
06:00	0	1	9	9	1	0	0	0	0	0	0	0	0	0	20	21-30	18
07:00	0	4	25	15	0	0	0	0	0	0	0	0	0	0	44	21-30	40
08:00	0	4	27	**24**	1	0	0	0	0	0	0	0	0	0	56	21-30	51
09:00	0	2	22	18	0	0	0	0	0	0	0	0	0	0	42	21-30	40
10:00	0	2	28	16	1	0	0	0	0	0	0	0	0	0	47	21-30	44
11:00	0	**5**	**55**	23	0	0	0	0	0	0	0	0	0	0	**83**	21-30	78
12 PM	0	13	50	31	2	0	0	0	0	0	0	0	0	0	96	21-30	81
13:00	0	10	67	21	1	0	0	0	0	0	0	0	0	0	99	21-30	88
14:00	**1**	7	66	27	3	0	0	0	0	0	0	0	0	0	104	21-30	93
15:00	1	8	65	34	1	0	0	0	0	0	0	0	0	0	109	21-30	99
16:00	0	5	**82**	**36**	**5**	0	0	0	0	0	0	0	0	0	**128**	21-30	118
17:00	1	**18**	71	35	2	0	0	0	0	0	0	0	0	0	127	21-30	106
18:00	0	6	62	26	1	**2**	0	0	0	0	0	0	0	0	97	21-30	88
19:00	0	2	38	18	1	0	0	0	0	0	0	0	0	0	59	21-30	56
20:00	0	2	22	12	1	0	0	0	0	0	0	0	0	0	37	21-30	34
21:00	0	4	11	4	1	0	0	0	0	0	0	0	0	0	20	21-30	15
22:00	0	2	4	8	1	0	0	0	0	0	0	0	0	0	15	21-30	12
23:00	0	1	5	3	0	0	0	0	0	0	0	0	0	0	9	20-29	8
Total	3	98	712	371	23	3	0	0	0	0	0	0	0	0	1210		
Percent	0.2%	8.1%	58.8%	30.7%	1.9%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		11:00	11:00	08:00	01:00	00:00									11:00		
Vol.		5	55	24	1	1									83		
PM Peak	14:00	17:00	16:00	16:00	16:00	18:00									16:00		
Vol.	1	18	82	36	5	2									128		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/09/21	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3	19-28	3
01:00	0	1	2	0	0	0	0	0	0	0	0	0	0	0	3	15-24	3
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
03:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	14-23	2
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
05:00	0	1	3	2	0	0	0	0	0	0	0	0	0	0	6	19-28	5
06:00	0	0	17	14	1	0	0	0	0	0	0	0	0	0	32	21-30	31
07:00	0	4	42	14	0	0	0	0	0	0	0	0	0	0	60	21-30	56
08:00	0	**6**	22	28	2	0	0	0	0	0	0	0	0	0	58	21-30	50
09:00	0	4	24	19	**3**	0	0	0	0	0	0	0	0	0	50	21-30	43
10:00	0	2	22	17	0	0	0	0	0	0	0	0	0	0	41	21-30	39
11:00	0	2	**44**	**34**	2	0	0	0	0	0	0	0	0	0	**82**	21-30	78
12 PM	1	8	54	25	0	0	0	0	0	0	0	0	0	0	88	21-30	79
13:00	0	4	38	25	0	0	0	0	0	0	0	0	0	0	67	21-30	63
14:00	2	**11**	63	18	0	0	0	0	0	0	0	0	0	0	94	21-30	81
15:00	0	4	65	**36**	1	0	0	0	0	0	0	0	0	0	106	21-30	101
16:00	**3**	8	**66**	32	2	**1**	0	0	0	0	0	0	0	0	**112**	21-30	98
17:00	2	5	57	29	**4**	0	0	0	0	0	0	0	0	0	97	21-30	86
18:00	0	11	48	26	3	0	0	0	0	0	0	0	0	0	88	21-30	74
19:00	0	3	22	8	1	0	0	0	0	0	0	0	0	0	34	21-30	30
20:00	0	2	14	10	1	0	0	0	0	0	0	0	0	0	27	21-30	24
21:00	0	1	15	13	2	0	0	0	0	0	0	0	0	0	31	21-30	28
22:00	0	3	10	14	3	0	0	0	0	0	0	0	0	0	30	21-30	24
23:00	0	0	5	5	3	0	0	0	0	0	0	0	0	0	13	21-30	10
Total	8	81	637	371	28	1	0	0	0	0	0	0	0	0	1126		
Percent	0.7%	7.2%	56.6%	32.9%	2.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		08:00	11:00	11:00	09:00										11:00		
Vol.		6	44	34	3										82		
PM Peak	16:00	14:00	16:00	15:00	17:00	16:00									16:00		
Vol.	3	11	66	36	4	1									112		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Eastbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/10/21	0	2	6	1	0	0	0	0	0	0	0	0	0	0	9	16-25	8
01:00	0	0	1	0	**1**	0	0	0	0	0	0	0	0	0	2	14-23	1
02:00	0	1	1	1	0	0	0	0	0	0	0	0	0	0	3	14-23	2
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
05:00	0	2	1	4	0	0	0	0	0	0	0	0	0	0	7	20-29	5
06:00	0	0	5	2	1	0	0	0	0	0	0	0	0	0	8	21-30	7
07:00	0	6	14	8	1	0	0	0	0	0	0	0	0	0	29	20-29	22
08:00	0	4	21	10	0	0	0	0	0	0	0	0	0	0	35	21-30	31
09:00	**1**	7	30	16	1	0	0	0	0	0	0	0	0	0	55	21-30	46
10:00	0	**14**	**52**	15	0	0	0	0	0	0	0	0	0	0	81	19-28	67
11:00	0	4	51	**32**	1	0	0	0	0	0	0	0	0	0	**88**	21-30	83
12 PM	2	5	65	14	0	**1**	0	0	0	0	0	0	0	0	87	21-30	79
13:00	3	7	63	**27**	0	0	0	0	0	0	0	0	0	0	100	21-30	90
14:00	0	**14**	**82**	26	**2**	0	0	0	0	0	0	0	0	0	**124**	21-30	108
15:00	**5**	5	60	19	2	0	0	0	0	0	0	0	0	0	91	21-30	79
16:00	1	13	54	26	1	0	0	0	0	0	0	0	0	0	95	21-30	80
17:00	1	7	55	20	0	0	0	0	0	0	0	0	0	0	83	21-30	75
18:00	0	9	37	26	2	0	0	0	0	0	0	0	0	0	74	21-30	63
19:00	1	7	26	17	2	0	0	0	0	0	0	0	0	0	53	21-30	43
20:00	0	5	19	15	1	1	0	0	0	0	0	0	0	0	41	21-30	34
21:00	0	2	16	10	0	0	0	0	0	0	0	0	0	0	28	21-30	26
22:00	0	3	13	3	0	0	0	0	0	0	0	0	0	0	19	16-25	16
23:00	0	5	9	4	0	0	0	0	0	0	0	0	0	0	18	16-25	14
Total	14	122	681	297	15	2	0	0	0	0	0	0	0	0	1131		
Percent	1.2%	10.8%	60.2%	26.3%	1.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	10:00	10:00	11:00	01:00										11:00		
Vol.	1	14	52	32	1										88		
PM Peak	15:00	14:00	14:00	13:00	14:00	12:00									14:00		
Vol.	5	14	82	27	2	1									124		
Total	70	944	6694	3483	232	15	0	0	0	0	0	0	0	0	11438		
Percent	0.6%	8.3%	58.5%	30.5%	2.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile : 20 MPH
50th Percentile : 23 MPH
85th Percentile : 27 MPH
95th Percentile : 29 MPH

Stats
10 MPH Pace Speed : 21-30 MPH
Number in Pace : 10177
Percent in Pace : 89.0%
Number of Vehicles > 25 MPH : 3730
Percent of Vehicles > 25 MPH : 32.6%
Mean Speed(Average) : 24 MPH

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
03/31/21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
01:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
02:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
03:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
04:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
05:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
06:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
07:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
08:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
09:00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10:00	0	**9**	**43**	28	**7**	1	0	0	0	0	0	0	0	0	88	21-30	71
11:00	0	9	36	**44**	2	**2**	0	0	0	0	0	0	0	0	**93**	21-30	80
12 PM	0	**7**	43	40	7	0	0	0	0	0	0	0	0	0	97	21-30	83
13:00	0	5	55	39	4	0	0	0	0	0	0	0	0	0	103	21-30	94
14:00	0	3	50	**51**	**11**	0	0	0	0	0	0	0	0	0	**115**	21-30	101
15:00	1	6	39	47	4	0	0	0	0	0	0	0	0	0	97	21-30	86
16:00	0	4	**56**	46	4	0	0	0	0	0	0	0	0	0	110	21-30	102
17:00	0	4	53	29	5	0	0	0	0	0	0	0	0	0	91	21-30	82
18:00	**2**	3	31	14	3	0	0	0	0	0	0	0	0	0	53	21-30	45
19:00	0	2	19	10	1	0	0	0	0	0	0	0	0	0	32	21-30	29
20:00	1	0	12	9	0	0	0	0	0	0	0	0	0	0	22	21-30	21
21:00	0	2	16	8	1	0	0	0	0	0	0	0	0	0	27	21-30	24
22:00	0	4	6	3	2	0	0	0	0	0	0	0	0	0	15	16-25	10
23:00	0	1	7	3	0	**1**	0	0	0	0	0	0	0	0	12	20-29	10
Total	4	59	466	371	51	4	0	0	0	0	0	0	0	0	955		
Percent	0.4%	6.2%	48.8%	38.8%	5.3%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		10:00	10:00	11:00	10:00	11:00									11:00		
Vol.		9	43	44	7	2									93		
PM Peak	18:00	12:00	16:00	14:00	14:00	23:00									14:00		
Vol.	2	7	56	51	11	1									115		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/01/21	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
01:00	0	1	1	1	1	0	0	0	0	0	0	0	0	0	4	14-23	2
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	9-18	1
05:00	0	1	5	0	0	0	0	0	0	0	0	0	0	0	6	16-25	6
06:00	0	2	10	9	1	0	0	0	0	0	0	0	0	0	22	21-30	19
07:00	**2**	**7**	**29**	20	2	0	0	0	0	0	0	0	0	0	60	21-30	49
08:00	0	2	28	18	2	0	0	0	0	0	0	0	0	0	50	21-30	46
09:00	0	2	29	34	3	0	0	0	0	0	0	0	0	0	**68**	21-30	63
10:00	0	4	25	24	1	**1**	0	0	0	0	0	0	0	0	55	21-30	49
11:00	1	1	14	**35**	**5**	0	0	0	0	0	0	0	0	0	56	21-30	49
12 PM	0	5	32	32	3	**2**	0	0	0	0	0	0	0	0	74	21-30	64
13:00	**1**	4	29	31	7	1	0	0	0	0	0	0	0	0	73	21-30	60
14:00	0	3	41	30	7	0	0	0	0	0	0	0	0	0	81	21-30	71
15:00	0	1	35	39	6	0	0	0	0	0	0	0	0	0	81	21-30	74
16:00	1	5	**50**	**48**	4	0	0	0	0	0	0	0	0	0	**108**	21-30	98
17:00	0	**7**	42	37	5	1	0	0	0	0	0	0	0	0	92	21-30	79
18:00	0	4	31	30	**8**	0	0	0	0	0	0	0	0	0	73	21-30	61
19:00	0	4	18	16	2	0	0	0	0	0	0	0	0	0	40	21-30	34
20:00	0	1	17	13	1	0	0	0	0	0	0	0	0	0	32	21-30	30
21:00	0	0	13	9	3	0	0	0	0	0	0	0	0	0	25	21-30	22
22:00	0	1	8	5	0	0	**1**	0	0	0	0	0	0	0	15	21-30	13
23:00	1	1	5	9	0	0	0	0	0	0	0	0	0	0	16	21-30	14
Total	6	57	464	441	61	5	1	0	0	0	0	0	0	0	1035		
Percent	0.6%	5.5%	44.8%	42.6%	5.9%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	07:00	07:00	11:00	11:00	10:00									09:00		
Vol.	2	7	29	35	5	1									68		
PM Peak	13:00	17:00	16:00	16:00	18:00	12:00	22:00								16:00		
Vol.	1	7	50	48	8	2	1								108		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/02/21	0	0	4	1	0	0	0	0	0	0	0	0	0	0	5	19-28	5
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
02:00	0	1	0	3	0	0	0	0	0	0	0	0	0	0	4	20-29	3
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	14-23	2
05:00	0	2	2	0	1	0	0	0	0	0	0	0	0	0	5	16-25	4
06:00	0	0	5	3	1	0	0	0	0	0	0	0	0	0	9	21-30	8
07:00	0	1	24	10	2	0	0	0	0	0	0	0	0	0	37	21-30	34
08:00	**1**	**4**	28	25	3	0	0	0	0	0	0	0	0	0	61	21-30	53
09:00	1	4	18	33	5	0	0	0	0	0	0	0	0	0	61	21-30	51
10:00	1	4	29	**41**	5	0	0	0	0	0	0	0	0	0	80	21-30	70
11:00	0	3	**36**	38	**12**	0	0	0	0	0	0	0	0	0	**89**	21-30	74
12 PM	**1**	4	35	**40**	10	**2**	0	0	0	0	0	0	0	0	**92**	21-30	75
13:00	1	5	24	36	**13**	0	0	0	0	0	0	0	0	0	79	21-30	60
14:00	0	**10**	**43**	36	3	0	0	0	0	0	0	0	0	0	92	21-30	79
15:00	0	6	39	32	6	0	0	0	0	0	0	0	0	0	83	21-30	71
16:00	0	2	25	33	5	1	0	0	0	0	0	0	0	0	66	21-30	58
17:00	0	4	40	21	3	0	0	0	0	0	0	0	0	0	68	21-30	61
18:00	0	3	22	20	1	0	0	0	0	0	0	0	0	0	46	21-30	42
19:00	0	2	20	17	3	0	0	0	0	0	0	0	0	0	42	21-30	37
20:00	0	3	4	11	2	0	0	0	0	0	0	0	0	0	20	21-30	15
21:00	0	2	13	3	1	0	0	0	0	0	0	0	0	0	19	19-28	16
22:00	0	1	6	8	4	0	0	0	0	0	0	0	0	0	19	21-30	14
23:00	0	1	6	4	1	0	0	0	0	0	0	0	0	0	12	21-30	10
Total	5	63	425	415	81	3	0	0	0	0	0	0	0	0	992		
Percent	0.5%	6.4%	42.8%	41.8%	8.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	11:00	10:00	11:00										11:00		
Vol.	1	4	36	41	12										89		
PM Peak	12:00	14:00	14:00	12:00	13:00	12:00									12:00		
Vol.	1	10	43	40	13	2									92		

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/03/21	0	1	4	2	1	0	0	0	0	0	0	0	0	0	8	21-30	6
01:00	0	0	2	0	1	0	0	0	0	0	0	0	0	0	3	15-24	2
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
03:00	0	0	0	2	1	0	0	0	0	0	0	0	0	0	3	24-33	3
04:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
05:00	0	1	0	2	0	0	0	0	0	0	0	0	0	0	3	19-28	2
06:00	0	0	5	1	0	0	0	0	0	0	0	0	0	0	6	19-28	6
07:00	0	1	12	20	0	0	0	0	0	0	0	0	0	0	33	21-30	32
08:00	0	1	12	17	2	1	0	0	0	0	0	0	0	0	33	21-30	29
09:00	0	0	25	25	2	**2**	0	0	0	0	0	0	0	0	54	21-30	50
10:00	**1**	**4**	**36**	37	3	0	0	0	0	0	0	0	0	0	81	21-30	73
11:00	0	2	36	**47**	**4**	0	0	0	0	0	0	0	0	0	**89**	21-30	83
12 PM	0	5	**52**	**40**	4	0	0	0	0	0	0	0	0	0	**101**	21-30	92
13:00	0	3	39	33	4	0	0	0	0	0	0	0	0	0	79	21-30	72
14:00	1	5	48	38	6	0	0	0	0	0	0	0	0	0	98	21-30	86
15:00	0	3	39	36	4	0	0	0	0	0	0	0	0	0	82	21-30	75
16:00	1	5	29	27	1	**1**	0	0	0	0	0	0	0	0	64	21-30	56
17:00	**2**	7	23	18	**8**	0	0	0	0	0	0	0	0	0	58	21-30	41
18:00	1	6	28	21	4	0	0	0	0	0	0	0	0	0	60	21-30	49
19:00	0	**9**	25	13	3	0	0	0	0	0	0	0	0	0	50	21-30	38
20:00	0	1	9	13	2	0	0	0	0	0	0	0	0	0	25	21-30	22
21:00	0	2	7	6	1	0	0	0	0	0	0	0	0	0	16	21-30	13
22:00	0	2	9	9	1	0	0	0	0	0	0	0	0	0	21	21-30	18
23:00	1	0	8	5	2	0	0	0	0	0	0	0	0	0	16	21-30	13
Total	7	58	449	414	54	4	0	0	0	0	0	0	0	0	986		
Percent	0.7%	5.9%	45.5%	42.0%	5.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	10:00	10:00	10:00	11:00	11:00	09:00									11:00		
Vol.	1	4	36	47	4	2									89		
PM Peak	17:00	19:00	12:00	12:00	17:00	16:00									12:00		
Vol.	2	9	52	40	8	1									101		

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/04/21	0	0	3	1	0	**1**	0	0	0	0	0	0	0	0	5	21-30	4
01:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
04:00	0	1	0	1	0	0	0	0	0	0	0	0	0	0	2	9-18	1
05:00	0	1	1	0	0	0	0	0	0	0	0	0	0	0	2	14-23	2
06:00	0	0	3	0	3	0	0	0	0	0	0	0	0	0	6	31-40	3
07:00	0	3	8	5	2	0	0	0	0	0	0	0	0	0	18	21-30	13
08:00	0	0	11	14	5	0	0	0	0	0	0	0	0	0	30	21-30	25
09:00	0	3	10	15	1	0	0	0	0	0	0	0	0	0	29	21-30	25
10:00	0	**4**	26	23	**7**	0	0	0	0	0	0	0	0	0	60	21-30	49
11:00	**2**	3	**27**	**29**	5	0	0	0	0	0	0	0	0	0	**66**	21-30	56
12 PM	1	3	35	**40**	**9**	0	0	0	0	0	0	0	0	0	**88**	21-30	75
13:00	0	1	27	28	4	0	0	0	0	0	0	0	0	0	60	21-30	55
14:00	1	2	**40**	23	5	0	0	0	0	0	0	0	0	0	71	21-30	63
15:00	0	5	26	29	9	0	0	0	0	0	0	0	0	0	69	21-30	55
16:00	0	8	33	30	4	0	0	0	0	0	0	0	0	0	75	21-30	63
17:00	0	8	20	32	5	**1**	0	0	0	0	0	0	0	0	66	21-30	52
18:00	**2**	3	32	23	3	0	0	0	0	0	0	0	0	0	63	21-30	55
19:00	0	**10**	27	15	5	0	0	0	0	0	0	0	0	0	57	21-30	42
20:00	0	1	21	12	2	0	0	0	0	0	0	0	0	0	36	21-30	33
21:00	0	3	15	10	4	0	0	0	0	0	0	0	0	0	32	21-30	25
22:00	0	0	9	7	1	1	0	0	0	0	0	0	0	0	18	21-30	16
23:00	0	0	1	4	1	0	0	0	0	0	0	0	0	0	6	23-32	5
Total	6	59	375	343	75	3	0	0	0	0	0	0	0	0	861		
Percent	0.7%	6.9%	43.6%	39.8%	8.7%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	11:00	10:00	11:00	11:00	10:00	00:00									11:00		
Vol.	2	4	27	29	7	1									66		
PM Peak	18:00	19:00	14:00	12:00	12:00	17:00									12:00		
Vol.	2	10	40	40	9	1									88		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/05/21	0	1	4	1	1	0	0	0	0	0	0	0	0	0	7	19-28	5
01:00	0	0	3	1	1	0	0	0	0	0	0	0	0	0	5	21-30	4
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	0	1	0	**1**	0	0	0	0	0	0	0	0	2	19-28	1
05:00	0	**4**	2	1	0	1	0	0	0	0	0	0	0	0	8	16-25	6
06:00	0	1	9	6	1	0	0	0	0	0	0	0	0	0	17	21-30	15
07:00	0	4	17	29	3	1	0	0	0	0	0	0	0	0	54	21-30	46
08:00	0	3	29	25	1	0	0	0	0	0	0	0	0	0	58	21-30	54
09:00	**1**	1	**35**	33	6	0	0	0	0	0	0	0	0	0	76	21-30	68
10:00	0	1	33	**42**	5	0	0	0	0	0	0	0	0	0	**81**	21-30	75
11:00	0	1	28	30	**7**	0	0	0	0	0	0	0	0	0	66	21-30	58
12 PM	1	2	34	44	**12**	0	0	0	0	0	0	0	0	0	93	21-30	78
13:00	**3**	**8**	30	35	6	0	0	0	0	0	0	0	0	0	82	21-30	65
14:00	1	4	54	38	8	0	0	0	0	0	0	0	0	0	105	21-30	92
15:00	0	6	45	38	9	0	0	0	0	0	0	0	0	0	98	21-30	83
16:00	0	4	**58**	36	8	0	0	0	0	0	0	0	0	0	**106**	21-30	94
17:00	0	2	45	**49**	7	**1**	0	0	0	0	0	0	0	0	104	21-30	94
18:00	0	5	39	21	5	0	0	0	0	0	0	0	0	0	70	21-30	60
19:00	0	4	24	14	0	0	0	0	0	0	0	0	0	0	42	21-30	38
20:00	1	2	26	8	3	0	0	0	0	0	0	0	0	0	40	21-30	34
21:00	0	0	10	10	2	1	0	0	0	0	0	0	0	0	23	21-30	20
22:00	0	0	4	8	2	0	0	0	0	0	0	0	0	0	14	21-30	12
23:00	0	2	4	3	0	0	0	0	0	0	0	0	0	0	9	19-28	7
Total	7	55	534	473	87	5	0	0	0	0	0	0	0	0	1161		
Percent	0.6%	4.7%	46.0%	40.7%	7.5%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	09:00	05:00	09:00	10:00	11:00	04:00									10:00		
Vol.	1	4	35	42	7	1									81		
PM Peak	13:00	13:00	16:00	17:00	12:00	17:00									16:00		
Vol.	3	8	58	49	12	1									106		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/06/21	0	1	4	4	0	0	0	0	0	0	0	0	0	0	9	21-30	8
01:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	19-28	2
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	1	1	0	0	0	0	0	0	0	0	0	0	2	19-28	2
05:00	0	**4**	3	2	0	0	0	0	0	0	0	0	0	0	9	16-25	7
06:00	0	1	6	11	0	0	0	0	0	0	0	0	0	0	18	21-30	17
07:00	0	4	22	21	3	0	0	0	0	0	0	0	0	0	50	21-30	43
08:00	0	2	36	34	4	0	0	0	0	0	0	0	0	0	76	21-30	70
09:00	0	1	**37**	41	2	0	0	0	0	0	0	0	0	0	**81**	21-30	78
10:00	0	4	22	28	**7**	0	0	0	0	0	0	0	0	0	61	21-30	50
11:00	0	3	27	**43**	3	0	0	0	0	0	0	0	0	0	76	21-30	70
12 PM	0	1	37	32	5	0	0	0	0	0	0	0	0	0	75	21-30	69
13:00	1	6	43	43	**14**	**1**	0	0	0	0	0	0	0	0	108	21-30	86
14:00	1	3	33	40	6	0	0	0	0	0	0	0	0	0	83	21-30	73
15:00	2	11	55	**44**	6	1	0	0	0	0	0	0	0	0	**119**	21-30	99
16:00	0	7	**57**	30	1	0	0	0	0	0	0	0	0	0	95	21-30	87
17:00	**3**	7	53	26	5	1	0	0	0	0	0	0	0	0	95	21-30	79
18:00	3	**12**	57	25	3	0	0	0	0	0	0	0	0	0	100	21-30	82
19:00	3	7	39	19	0	1	0	0	0	0	0	0	0	0	69	21-30	58
20:00	0	0	11	14	4	0	0	0	0	0	0	0	0	0	29	21-30	25
21:00	0	0	9	7	4	0	0	0	0	0	0	0	0	0	20	21-30	16
22:00	0	0	8	7	2	0	0	0	0	0	0	0	0	0	17	21-30	15
23:00	1	1	4	2	2	0	0	0	0	0	0	0	0	0	10	21-30	6
Total	14	75	566	477	72	4	0	0	0	0	0	0	0	0	1208		
Percent	1.2%	6.2%	46.9%	39.5%	6.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak		05:00	09:00	11:00	10:00										09:00		
Vol.		4	37	43	7										81		
PM Peak	17:00	18:00	16:00	15:00	13:00	13:00									15:00		
Vol.	3	12	57	44	14	1									119		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/07/21	0	0	4	1	0	0	0	0	0	0	0	0	0	0	5	19-28	5
01:00	0	0	2	2	0	0	0	0	0	0	0	0	0	0	4	20-29	4
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
03:00	0	0	2	1	1	0	0	0	0	0	0	0	0	0	4	19-28	3
04:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
05:00	**1**	2	3	3	1	0	0	0	0	0	0	0	0	0	10	21-30	6
06:00	0	0	5	10	1	0	0	0	0	0	0	0	0	0	16	21-30	15
07:00	0	**7**	19	17	4	0	0	0	0	0	0	0	0	0	47	21-30	36
08:00	0	2	28	47	2	0	0	0	0	0	0	0	0	0	79	21-30	75
09:00	0	6	**40**	44	6	**1**	0	0	0	0	0	0	0	0	97	21-30	84
10:00	0	3	35	**61**	**7**	0	0	0	0	0	0	0	0	0	**106**	21-30	96
11:00	0	1	39	30	4	0	0	0	0	0	0	0	0	0	74	21-30	69
12 PM	0	4	45	49	5	0	**1**	0	0	0	0	0	0	0	104	21-30	94
13:00	**2**	4	62	45	3	**1**	0	0	0	0	0	0	0	0	117	21-30	107
14:00	1	**15**	**69**	42	5	0	0	0	0	0	0	0	0	0	132	21-30	111
15:00	0	10	66	56	**12**	0	0	0	0	0	0	0	0	0	**144**	21-30	122
16:00	0	8	57	**60**	5	0	0	0	0	0	0	0	0	0	130	21-30	117
17:00	0	9	66	32	5	1	0	0	0	0	0	0	0	0	113	21-30	98
18:00	0	9	41	28	3	0	0	0	0	0	0	0	0	0	81	21-30	69
19:00	0	8	26	21	0	0	0	0	0	0	0	0	0	0	55	21-30	47
20:00	0	0	22	21	1	1	0	0	0	0	0	0	0	0	45	21-30	43
21:00	0	0	3	8	3	0	0	0	0	0	0	0	0	0	14	26-35	11
22:00	0	0	2	7	4	0	0	0	0	0	0	0	0	0	13	25-34	11
23:00	0	0	2	6	4	0	0	0	0	0	0	0	0	0	12	25-34	10
Total	4	88	638	593	76	4	1	0	0	0	0	0	0	0	1404		
Percent	0.3%	6.3%	45.4%	42.2%	5.4%	0.3%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	05:00	07:00	09:00	10:00	10:00	09:00									10:00		
Vol.	1	7	40	61	7	1									106		
PM Peak	13:00	14:00	14:00	16:00	15:00	13:00	12:00								15:00		
Vol.	2	15	69	60	12	1	1								144		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/08/21	0	0	1	1	0	**1**	0	0	0	0	0	0	0	0	3	19-28	2
01:00	**1**	0	5	2	0	0	0	0	0	0	0	0	0	0	8	21-30	7
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
05:00	0	2	5	3	0	0	0	0	0	0	0	0	0	0	10	19-28	8
06:00	0	1	8	9	2	0	0	0	0	0	0	0	0	0	20	21-30	17
07:00	0	2	23	33	4	0	0	0	0	0	0	0	0	0	62	21-30	56
08:00	0	2	24	43	3	0	0	0	0	0	0	0	0	0	72	21-30	67
09:00	0	1	34	41	3	0	0	0	0	0	0	0	0	0	79	21-30	75
10:00	0	**4**	22	**47**	**8**	1	0	0	0	0	0	0	0	0	82	21-30	69
11:00	0	1	**40**	42	8	0	0	0	0	0	0	0	0	0	**91**	21-30	82
12 PM	0	4	42	44	9	0	0	0	0	0	0	0	0	0	99	21-30	86
13:00	0	**11**	55	33	7	0	0	0	0	0	0	0	0	0	106	21-30	88
14:00	**3**	4	38	41	9	0	0	0	0	0	0	0	0	0	95	21-30	79
15:00	0	7	56	**56**	5	0	0	0	0	0	0	0	0	0	**124**	21-30	112
16:00	1	9	**58**	40	**10**	0	0	0	0	0	0	0	0	0	118	21-30	98
17:00	0	5	40	45	3	0	0	0	0	0	0	0	0	0	93	21-30	85
18:00	0	11	37	28	6	0	0	0	0	0	0	0	0	0	82	21-30	65
19:00	0	5	26	24	5	0	0	0	0	0	0	0	0	0	60	21-30	50
20:00	1	4	14	12	6	**1**	0	0	0	0	0	0	0	0	38	21-30	26
21:00	0	0	9	6	2	0	0	0	0	0	0	0	0	0	17	21-30	15
22:00	0	0	4	5	4	0	0	0	0	0	0	0	0	0	13	21-30	9
23:00	0	1	6	7	0	0	0	0	0	0	0	0	0	0	14	21-30	13
Total	6	74	549	562	94	3	0	0	0	0	0	0	0	0	1288		
Percent	0.5%	5.7%	42.6%	43.6%	7.3%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	01:00	10:00	11:00	10:00	10:00	00:00									11:00		
Vol.	1	4	40	47	8	1									91		
PM Peak	14:00	13:00	16:00	15:00	16:00	20:00									15:00		
Vol.	3	11	58	56	10	1									124		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/09/21	0	1	1	1	0	0	0	0	0	0	0	0	0	0	3	14-23	2
01:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
02:00	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	19-28	1
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	15-24	2
05:00	0	3	2	1	0	0	0	0	0	0	0	0	0	0	6	16-25	5
06:00	0	2	6	8	2	0	0	0	0	0	0	0	0	0	18	21-30	14
07:00	0	3	19	20	3	0	0	0	0	0	0	0	0	0	45	21-30	39
08:00	**1**	4	31	36	1	**1**	0	0	0	0	0	0	0	0	74	21-30	67
09:00	0	**6**	30	34	5	0	0	0	0	0	0	0	0	0	75	21-30	64
10:00	0	5	34	**39**	7	1	0	0	0	0	0	0	0	0	86	21-30	73
11:00	0	1	**40**	37	**10**	0	0	0	0	0	0	0	0	0	**88**	21-30	77
12 PM	0	3	37	47	**13**	0	0	0	0	0	0	0	0	0	100	21-30	84
13:00	0	4	54	47	6	0	0	0	0	0	0	0	0	0	111	21-30	101
14:00	**2**	6	47	37	4	0	0	0	0	0	0	0	0	0	96	21-30	84
15:00	1	10	41	**55**	6	0	0	0	0	0	0	0	0	0	**113**	21-30	96
16:00	1	**12**	48	36	1	0	0	0	0	0	0	0	0	0	98	21-30	84
17:00	0	9	**56**	31	8	0	0	0	0	0	0	0	0	0	104	21-30	87
18:00	1	7	40	25	5	**2**	0	0	0	0	0	0	0	0	80	21-30	65
19:00	0	4	18	25	5	2	0	0	0	0	0	0	0	0	54	21-30	43
20:00	0	4	17	11	8	0	0	0	0	0	0	0	0	0	40	21-30	28
21:00	0	0	4	20	2	0	0	0	0	0	0	0	0	0	26	21-30	24
22:00	0	2	8	10	3	1	0	0	0	0	0	0	0	0	24	21-30	18
23:00	0	1	5	7	2	0	0	0	0	0	0	0	0	0	15	21-30	12
Total	6	87	542	528	91	7	0	0	0	0	0	0	0	0	1261		
Percent	0.5%	6.9%	43.0%	41.9%	7.2%	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	09:00	11:00	10:00	11:00	08:00									11:00		
Vol.	1	6	40	39	10	1									88		
PM Peak	14:00	16:00	17:00	15:00	12:00	18:00									15:00		
Vol.	2	12	56	55	13	2									113		

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Westbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
04/10/21	0	1	4	8	1	**1**	0	0	0	0	0	0	0	0	15	21-30	12
01:00	0	0	4	0	0	0	0	0	0	0	0	0	0	0	4	16-25	4
02:00	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	20-29	2
03:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	14-23	1
04:00	0	0	1	0	0	1	0	0	0	0	0	0	0	0	2	14-23	1
05:00	0	0	1	1	1	0	0	0	0	0	0	0	0	0	3	19-28	2
06:00	0	1	4	5	2	0	0	0	0	0	0	0	0	0	12	21-30	9
07:00	**1**	0	24	22	0	0	0	0	0	0	0	0	0	0	47	21-30	46
08:00	0	4	25	24	3	0	0	0	0	0	0	0	0	0	56	21-30	49
09:00	0	3	28	32	**6**	0	0	0	0	0	0	0	0	0	69	21-30	60
10:00	1	**11**	41	35	2	0	0	0	0	0	0	0	0	0	90	21-30	76
11:00	0	2	**44**	**66**	6	0	0	0	0	0	0	0	0	0	**118**	21-30	110
12 PM	2	4	**64**	41	4	0	0	0	0	0	0	0	0	0	115	21-30	105
13:00	0	6	61	**49**	4	0	0	0	0	0	0	0	0	0	**120**	21-30	110
14:00	**4**	**16**	43	38	5	**1**	0	0	0	0	0	0	0	0	107	21-30	81
15:00	2	8	45	37	**10**	1	0	0	0	0	0	0	0	0	103	21-30	82
16:00	0	6	44	31	4	1	0	0	0	0	0	0	0	0	86	21-30	75
17:00	1	8	46	22	7	0	0	0	0	0	0	0	0	0	84	21-30	68
18:00	1	10	36	30	5	0	0	0	0	0	0	0	0	0	82	21-30	66
19:00	0	7	28	21	4	0	0	0	0	0	0	0	0	0	60	21-30	49
20:00	0	1	17	15	5	0	0	0	0	0	0	0	0	0	38	21-30	32
21:00	0	0	14	13	3	1	0	0	0	0	0	0	0	0	31	21-30	27
22:00	0	1	6	13	2	1	0	0	0	0	0	0	0	0	23	21-30	19
23:00	0	1	9	9	1	0	0	0	0	0	0	0	0	0	20	21-30	18
Total	12	90	590	514	75	7	0	0	0	0	0	0	0	0	1288		
Percent	0.9%	7.0%	45.8%	39.9%	5.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			
AM Peak	07:00	10:00	11:00	11:00	09:00	00:00									11:00		
Vol.	1	11	44	66	6	1									118		
PM Peak	14:00	14:00	12:00	13:00	15:00	14:00									13:00		
Vol.	4	16	64	49	10	1									120		
Total	77	765	5598	5131	817	49	2	0	0	0	0	0	0	0	12439		
Percent	0.6%	6.2%	45.0%	41.2%	6.6%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%			

15th Percentile :	20 MPH
50th Percentile :	24 MPH
85th Percentile :	29 MPH
95th Percentile :	31 MPH

Stats

10 MPH Pace Speed :	21-30 MPH
Number in Pace :	10729
Percent in Pace :	86.3%
Number of Vehicles > 25 MPH :	5999
Percent of Vehicles > 25 MPH :	48.2%
Mean Speed(Average) :	25 MPH

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Start	29-Mar-21		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	Eastbound	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou
12:00 AM	*	*	*	*	*	*	5	2	11	5	6	8	10	5	8	5
01:00	*	*	*	*	*	*	4	4	3	1	3	3	4	1	4	2
02:00	*	*	*	*	*	*	0	0	1	4	0	2	2	0	1	2
03:00	*	*	*	*	*	*	1	0	1	0	2	3	1	1	1	1
04:00	*	*	*	*	*	*	2	2	3	2	3	1	0	2	2	2
05:00	*	*	*	*	*	*	3	6	3	5	5	3	1	2	3	4
06:00	*	*	*	*	*	*	27	22	10	9	7	6	4	6	12	11
07:00	*	*	*	*	*	*	40	60	39	37	20	33	12	18	28	37
08:00	*	*	*	*	*	*	47	50	50	61	31	33	17	30	36	44
09:00	*	*	*	*	*	*	51	**68**	55	61	57	54	25	29	47	53
10:00	*	*	*	*	91	88	44	55	72	80	62	81	41	60	62	73
11:00	*	*	*	*	**104**	**93**	**62**	56	**77**	**89**	**66**	**89**	**54**	**66**	**73**	**79**
12:00 PM	*	*	*	*	105	97	74	74	83	**92**	82	**101**	**74**	**88**	84	90
01:00	*	*	*	*	108	103	86	73	76	79	95	79	67	60	86	79
02:00	*	*	*	*	**130**	**115**	85	81	**94**	92	83	98	61	71	**91**	**91**
03:00	*	*	*	*	106	97	91	81	76	83	**106**	82	57	69	87	82
04:00	*	*	*	*	99	110	**97**	**108**	78	66	80	64	62	75	83	85
05:00	*	*	*	*	82	91	81	92	76	68	72	58	46	66	71	75
06:00	*	*	*	*	59	53	77	73	44	46	43	60	72	63	59	59
07:00	*	*	*	*	26	32	38	40	37	42	46	50	56	57	41	44
08:00	*	*	*	*	40	22	35	32	17	20	28	25	29	36	30	27
09:00	*	*	*	*	26	27	33	25	22	19	29	16	17	32	25	24
10:00	*	*	*	*	13	15	14	15	16	19	25	21	11	18	16	18
11:00	*	*	*	*	6	12	8	16	10	12	9	16	1	6	7	12
Lane	0	0	0	0	995	955	1005	1035	954	992	960	986	724	861	957	999
Day	0		0		1950		2040		1946		1946		1585		1956	
AM Peak	-	-	-	-	11:00	11:00	11:00	09:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Vol.	-	-	-	-	104	93	62	68	77	89	66	89	54	66	73	79
PM Peak	-	-	-	-	14:00	14:00	16:00	16:00	14:00	12:00	15:00	12:00	12:00	12:00	14:00	14:00
Vol.	-	-	-	-	130	115	97	108	94	92	106	101	74	88	91	91

Connecticut Counts LLC
Kensington, Connecticut 06037
(860) 828-1693

Mt Carmel Avenue East of Outer Ridge Road
North Haven, Connecticut

Site Code:
Station ID: 5393

Latitude: 0' 0.0000 Undefined

Start	05-Apr-21		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
Time	Eastbound	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou	Eastboun	Westbou
12:00 AM	4	7	6	9	4	5	3	3	3	3	9	15	*	*	5	7
01:00	1	5	1	3	1	4	5	8	3	1	2	4	*	*	2	4
02:00	0	0	0	2	0	1	2	0	1	1	3	2	*	*	1	1
03:00	0	1	0	1	0	4	0	0	2	1	0	1	*	*	0	1
04:00	2	2	2	2	2	1	1	2	1	2	1	2	*	*	2	2
05:00	4	8	6	9	7	10	7	10	6	6	7	3	*	*	6	8
06:00	28	17	21	18	30	16	20	20	32	18	8	12	*	*	23	17
07:00	45	54	**67**	50	42	47	44	62	60	45	29	47	*	*	48	51
08:00	42	58	48	76	46	79	56	72	58	74	35	56	*	*	48	69
09:00	45	76	48	**81**	62	97	42	79	50	75	55	69	*	*	50	80
10:00	69	**81**	59	61	87	**106**	47	82	41	86	81	90	*	*	64	84
11:00	**70**	66	63	76	**102**	74	**83**	**91**	**82**	**88**	**88**	**118**	*	*	**81**	**86**
12:00 PM	73	93	73	75	95	104	96	99	88	100	87	115	*	*	85	98
01:00	75	82	76	108	90	117	99	106	67	111	100	**120**	*	*	84	107
02:00	88	105	67	83	**128**	132	104	95	94	96	**124**	107	*	*	101	103
03:00	80	98	83	**119**	114	**144**	109	**124**	106	**113**	91	103	*	*	97	**117**
04:00	**115**	**106**	**104**	95	108	130	**128**	118	**112**	98	95	86	*	*	**110**	106
05:00	103	104	99	95	119	113	127	93	97	104	83	84	*	*	105	99
06:00	69	70	93	100	88	81	97	82	88	80	74	82	*	*	85	82
07:00	42	42	48	69	60	55	59	60	34	54	53	60	*	*	49	57
08:00	32	40	32	29	42	45	37	38	27	40	41	38	*	*	35	38
09:00	31	23	13	20	18	14	20	17	31	26	28	31	*	*	24	22
10:00	12	14	15	17	22	13	15	13	30	24	19	23	*	*	19	17
11:00	5	9	5	10	2	12	9	14	13	15	18	20	*	*	9	13
Lane	1035	1161	1029	1208	1269	1404	1210	1288	1126	1261	1131	1288	0	0	1133	1269
Day	2196		2237		2673		2498		2387		2419		0		2402	
AM Peak	11:00	10:00	07:00	09:00	11:00	10:00	11:00	11:00	11:00	11:00	11:00	11:00	-	-	11:00	11:00
Vol.	70	81	67	81	102	106	83	91	82	88	88	118	-	-	81	86
PM Peak	16:00	16:00	16:00	15:00	14:00	15:00	16:00	15:00	16:00	15:00	14:00	13:00	-	-	16:00	15:00
Vol.	115	106	104	119	128	144	128	124	112	113	124	120	-	-	110	117

Comb. Total	2196	2237	4623	4538	4333	4365	1585	4358
ADT	ADT 2,282	AADT 2,282						

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School
John Lo Monte Appraisal Report

Rev 1.0

Slate Upper School Opposition
Comparison of Slate School Applications

COMPARISION OF DESIGN ASPECTS OF MANSFIELD AND RIDGE ROAD SCHOOLS PER APPLICANT DATA

Feature	**124 Mansfield**	**5100 Ridge**
Visibility from road	Screened from sight	Directly visible
	825’ from road	50’ from road
	One-story high (13’)	Two-stories high (27’)
Proximity to Nearby Homes	Minimum of 384’	~160’ S & ~173’ N
	Screened from view	Visible & Intrusive
Size of Site, acres	24.16	2.97
Building Footprint, sq. ft.	5,800	~10,000
Number of Students, max.	70	100
Density, Students/Acre	2.9	33.7
Total Disturbed Area, acres	0.1/24.16 (=0.41%)	2.6/2.97 (=87.5%)
Traffic volume before	38-58/day	35-50/day
Traffic volume after	140/day	137-192/day
Traffic speed, mph	40 mph	32 mph
Traffic sightlines, ft	435’	<200’ currently
Drop-off Queue Length, ft	200’, 10-12 cars	~125’ (~7 cars)
Parking Spaces	30	36
Light Intrusion	“None”	~100’ from Light Pole
Impact on Market Values	None claimed	-17.6% to -26.7% reduction
Conservation easement	207,000sf/1,052,390sf	None
Compliance with Zone Regs	“100%”	See separate table
Compliance with POCD	Not provided	See separate table

Rev 1.0

Slate Upper School Opposition

John Lo Monte Appraisal Summary & Conclusions

- Upper scale residential neighborhood
- Excellent curb appeal
- All of above average size, layout, etc
- All in good to very good condition
- Very tranquil, well established, rural area
- Excellent privacy
- Easy access to transportation, shopping, employment
- Market values of homes near established schools already reflect the price devaluation caused by being near the school; this is not the case when a new school intrudes into an established neighborhood
- Appraised Values Will Decline 17.6%-26.7% due to intrusion of this school (average -22.4%)


5200 Ridge Road North
5100 Ridge Road North
5060 Ridge Road North

COPIES

OF FULL APPRAISALS

FOUND IN

SECOND BINDER

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School
Environmental Issues

Loureiro

Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

April 14, 2021

Town of North Haven
Planning and Zoning Commission
Memorial Town Hall
18 Church St.
North Haven, Conn. 06473

RE: Application # P20-38S
The Slate School-5100 Ridge Road

Dear Commission Members;

On behalf of the residential property owners that adjoin this site, Loureiro Engineering Associates Inc. (LEA) has been requested to review this application as it relates to the requirements of the Zoning Regulations and related considerations. We have reviewed the original application, the Revised Drainage Report (12/10/20) and the revised set of Plans (3/25/21). On the basis of that review, we want to call the following matters to your attention in your consideration of this application.

1. Earthwork Quantities-To put this project in proper perspective, we have estimated the amount of earthwork required to accommodate the building, site improvements and infrastructure. Based on the grading plans, approximately 6,629 cubic yards of cut and 8,162 cubic yards of fill activity will be required. This will require the import of 1,533 cubic yards of material to establish grades and additional material of unknown quantity will have to be imported for structural fill for building foundation, subgrade fill under parking and other hardscape areas and special material for the sewage disposal and stormwater systems. This will create a significant site soil management/storage problem as well as parking and traffic issues as a number of large trucks will be using Ridge Road which has serious limitations as identified in the various traffic studies.

2. Topography and Grading-According to the submitted topographic survey plan the topography of the site varies 28 feet along the site frontage and 48 feet along the rear. In order to accommodate building, site development and infrastructure, extensive site clearing and grading is proposed over approximately 80 % of the site. The average cut is 4+ ft. and the average fill is 4+ feet with some cuts and fills in the 12-13 foot range. This extent of earthwork will create a landform that is not consistent with the character and rural residential setting of the site and surrounding neighborhood.

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

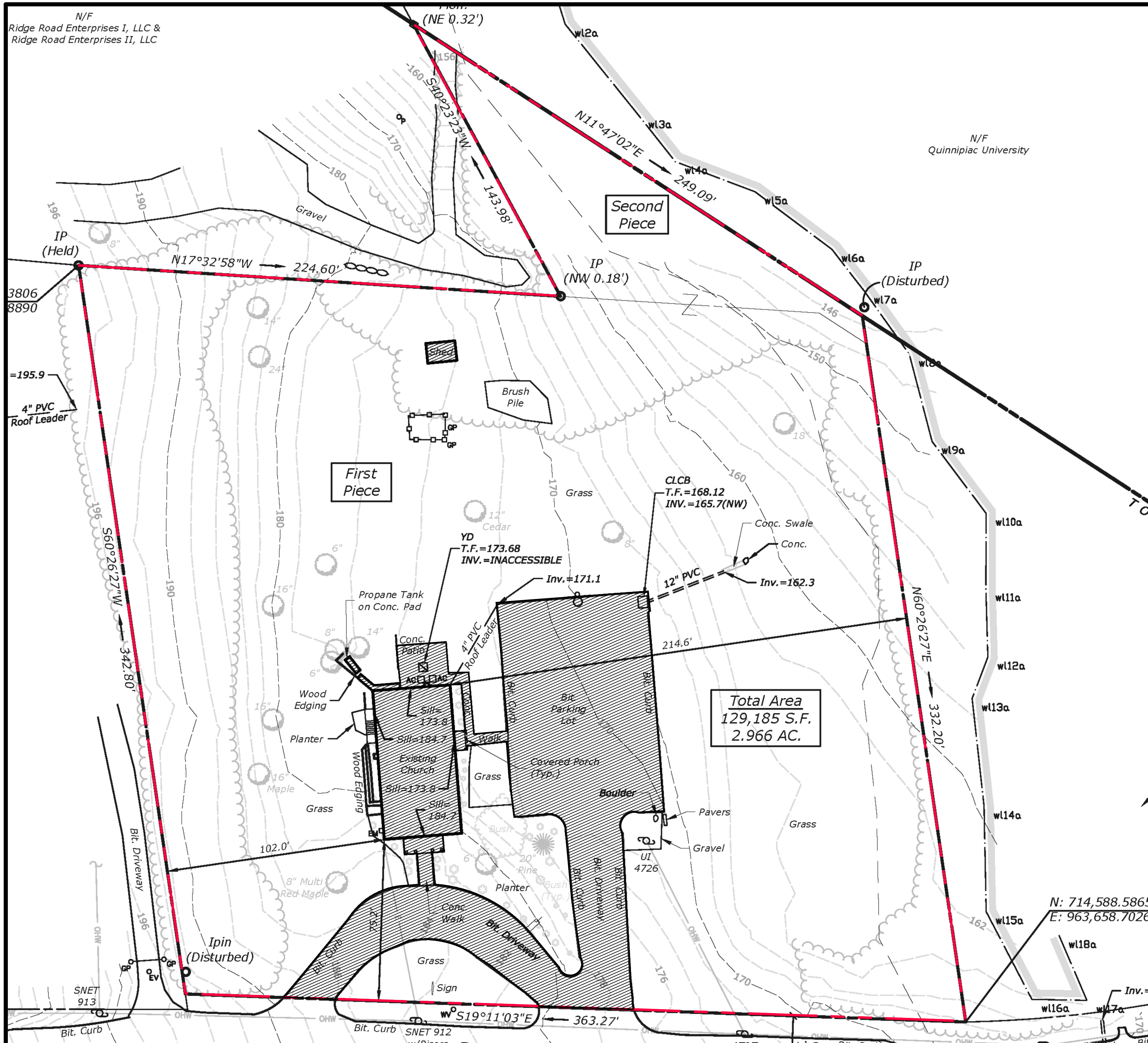
3. Soils Erosion-The project requires that 80% of the site will be disturbed to accommodate the buildings, site improvements and infrastructure. The impervious surfaces will be nearly tripled and over 40 mature trees and shrubs will be removed. The site soils are mapped and listed as having high erodibility potential and existing site slopes are nearly 15 % in some locations. Given the substantial area and volume of earthwork required there is concern for impact from erosion and sedimentation both during construction and operation to properties immediately downgradient of the site. In spite of the erosion control measures proposed, there is considerable potential to impact these properties; the project scope should be scaled down considerably to reduce the extent of site disturbance and earthwork so that erosion can be properly managed and impact to neighboring properties minimized.

We appreciate the opportunity to present the neighbors' concerns to you and trust that you will give them the consideration that they deserve.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

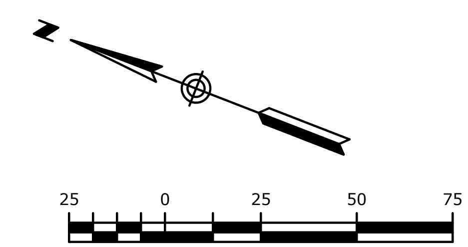
Clinton S. Brown II PE AICP
Director



EXISTING TOTAL AREA
129,585± SF PER SURVEY

EXISTING IMPERVIOUS AREA
BUILDING= 2,493± SF
SHED = 132± SF
AC PAD = 22± SF
OTHER =13,860± SF
TOTAL = **16,507± SF**

EXISTING PERVIOUS AREA
129,585± SF
-16,507± SF
113,078± SF



APPROIMATE SCALE IN FEET

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory
Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
Phone: 860-747-6181 • Fax: 860-747-8822
An Employee Owned Company • www.Loureiro.com

SCALE 1" = 50'±

COMM. NO. 00005.00

DATE 12/15/2020

EXISTING CONDITONS PERVIOUS VS IMPERVIOUS

PROPOSED SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CONNECTICUT
PREPARED FOR:
ACAMPORA - NORTH HAVEN CSB

1

P:\CT\NORTH HAVEN\RIDGE RD-5100\ACAMPORA\PROPOSED SCHOOL\DWG\VOLUME-AREA CALCS.DWG Tab: EXISTING Saved: 12/15/2020 2:57 PM Plotted: 12/15/2020 2:58 PM

EXISTING TOTAL AREA
129,585± SF PER SURVEY

PROPOSED IMPERVIOUS AREA

BUILDING=	2,493± SF
NEW BUILDING =	7,791± SF
OTHER	=35,056± SF
TOTAL	= **45,340 ± SF**

PROPOSED PERVIOUS AREA
129,585± SF
-45.340± SF
84,245± SF

N

25 0 25 50 75
APPROIMATE SCALE IN FEET

Loureiro
Engineering • Construction • EHS • Energy
Waste • Facility Services • Laboratory

Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
Phone: 860-747-6181 • Fax: 860-747-8822
An Employee Owned Company • www.Loureiro.com

SCALE 1" = 50'±
COMM. NO. 00005.00
DATE 12/15/2020

PROPOSED CONDITONS PERVIOUS VS IMPERVIOUS

PROPOSED SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CONNECTICUT
PREPARED FOR:
ACAMPORA - NORTH HAVEN CSB

Volumes by Triangulation (Prisms) Tue Dec 15 14:16:34 2020
Existing Surface: P:\CT\North Haven\Ridge RD-5100\Acampora\Proposed School\dwg\EXISTING-REV0.tin
Final Surface: P:\CT\North Haven\Ridge RD-5100\Acampora\Proposed School\dwg\PROPOSED REV0.tin

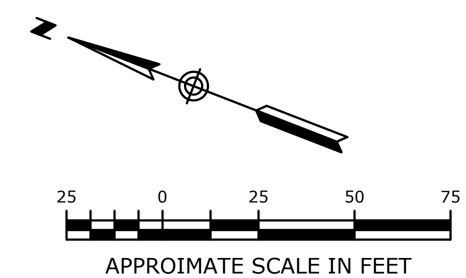
Cut volume: 178,980.9 C.F., 6,628.92 C.Y.
Fill volume: 220,369.3 C.F., 8,161.83 C.Y.

Area in Cut : 42,212.9 S.F., 0.97 Acres
Area in Fill: 54,282.8 S.F., 1.25 Acres
Total inclusion area: 96,495.8 S.F., 2.22 Acres
Total exclusion area: 2,493.0 S.F., 0.06 Acres

Average Cut Depth: 4.24 feet
Average Fill Depth: 4.06 feet
Cut to Fill ratio: 0.81
Import Volume: 1,532.9 C.Y.
Elevation Change To Reach Balance: -0.429
Volume Change Per .1 ft: 357.4 C.Y.

Cut (C.Y.) / Area (acres): 2992.42
Fill (C.Y.) / Area (acres): 3684.40

Max Cut: 13.146 at 963647.882,714414.271
Max Fill: 12.414 at 963455.646,714342.727



REFERENCE:

VOLUME CALCULATION DERIVED FROM A DIGITIZED ELECTRONIC FILE FROM PLANS ENTITLED "SLATE UPPER SCHOOL", 5100 RIDGE ROAD, NORTH HAVEN, CONNECTICUT, PLANNING AND ZONING SUBMISSION, DATED NOVEMBER 6, 2020, SCALES 1"= 40' & 1" = 20', PREPARED BY MILONE & MACBROOM.

LEGEND

DIGITIZED EXISTING CONTOUR 1 FOOT INTERVAL
DIGITIZED PROPOSED CONTOUR 1 FOOT INTERVAL

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory
Loureiro Engineering Associates, Inc.
100 Northwest Drive • Plainville, Connecticut 06062
Phone: 860-747-6181 • Fax: 860-747-8822
An Employee Owned Company • www.Loureiro.com

SCALE 1" = 50'±

COMM. NO. 00005.00

DATE 12/15/2020

VOLUME CALCULATIONS EXISITNG VS PROPOSED

PROPOSED SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CONNECTICUT

PREPARED FOR:
ACAMPORA - NORTH HAVEN CSB

P:\CT\NORTH HAVEN\RIDGE RD-5100\ACAMPORA\PROPOSED SCHOOL\DWG\VOLUME-AREA CALCS.DWG Tab: VOLUMES Saved: 12/15/2020 2:57 PM Plotted: 12/15/2020 2:58 PM

January 25, 2021

Town of North Haven
Inland Wetlands Commission
Memorial Town Hall
18 Church St.
North Haven, Conn.06473

RE: Inland Wetlands Application # 120-06
The Slate School-5100 Ridge Road

Dear Commission Members;

On behalf of the residential property owners that adjoin this site, Loureiro Engineering Associates Inc. (LEA) has been requested to review this application as it relates to the requirements of the Wetlands Regulations and related considerations. We have reviewed the original application, the Wetland Scientist Report, the Revised Drainage Report (12/10/20) and the revised set of Plans (12/10/20). On the basis of that review, we want to call the following matters to your attention in your consideration of this application.

1. Wetlands Application-the wetland application form, under the item entitled "ANSWER ALL QUESTIONS APPLICABLE TO THE PROPERTY OR WRITE N/A", second item, requires applicant to indicate if the site lies within the Aquifer protection zone (must be shown on certified plan); there is no response provided but other documents submitted in support of the application allude to it being in the Zone. Review of aquifer protection mapping indicates that the site is in the Aquifer Protection Zone and therefore subject to the applicable provisions of the Aquifer Protection Regulations. Further, the Aquifer zone limits as they relate to this property are not shown as required. The application is incomplete in this regard.

Secondly, review of the plans indicates that while the location and amount of upland review activity have been shown, the creation of a new discharge to the wetlands for the new stormwater discharge has neither been identified or depicted on the plans as a regulated activity. The discharge of stormwater to a wetland or upland review area is a regulated activity above and beyond the disturbance and construction activity that must be disclosed, reviewed and permitted. So the application is incomplete in this regard.

Thirdly, as expressed by the town staff in their review comments, an alternative analysis needs be prepared that provides a basis for proposing the regulated activities. In particular, it should address why this location, why not other locations(such as the other Slate School Campus in town,

Loureiro

Engineering • Construction • EHS • Energy
Waste • Facility Services • Laboratory

other locations in town, locations in other towns), possible modifications to the scope of the project to eliminate regulated activities associated with critical infrastructure, particularly stormwater and sewage, from being located in the upland review area and impacting nearby wetlands and use of other means to manage stormwater and sewage that do not require activities in the upland review area that could impact wetlands. Such an analysis is fundamental to the decision making process on this application.

2. Soils Erosion-The project requires that almost 83% of the site will be disturbed to accommodate the buildings, site improvements and infrastructure. The impervious surfaces will be nearly tripled and over 40 mature trees and shrubs will be removed. The site soils are mapped and listed as having high readability potential and existing site slopes are nearly 15 %. Given the substantial area and volume of earthwork required there is concern for potential wetland impact from erosion and sedimentation both during construction and operation as the wetlands are immediately downgradient of the site. There needs to be a far more proactive erosion and sediment control plan for this site that recognizes this condition and minimizes disturbance at all times and also provides several layers of management within and adjacent to all disturbed areas, including redundant erosion controls.

3.Sewage Disposal System-QVHD has indicated that to be compliant with the health code, two separate systems are required for the two buildings, if the applicant is going to comply with this requirement, the plans would have to be revised significantly; if they are going to pursue some alternative, they need to be transparent about it. In either event, QVHD needs to review and permit the systems(s). Until the applicant states their intentions, it is impossible to review or comment further.

The relationship between the sewage disposal system and the level spreader are also a matter of concern as to impact to the wetlands. The sewage system is located approximately 40' distant and up gradient of the level spreader and the level spreader is located approximately 30' from the wetland. As the bottom of the spreader basin is at the existing ground surface, and as there's 36" of silt loam beneath it, stormwater will likely infiltrate into this soils and the level spreader will act as a defacto infiltration measure. The health code SSDS technical standards require 75' separation from the SSDS to an infiltration system at a commercial site.

There is also the potential for unrenovated sewage effluent to migrate to the level spreader , mix with either ground or surface water and be discharged to the nearby wetlands with unknown impacts. Nitrogen, phosphorous and pathogens are of particular concern. The potential for this to occur should be evaluated using the modelling techniques in the 2006 DEEP guidance document for large scale sewage systems. In case there is any question about the applicability of the techniques, the publication (Sect 1-p.2 of 12) reads as follows: "While this document is directed toward design, construction, operation and maintenance of large scale OWRS having design flows of greater than 5,000 gpd, including associated wastewater collection systems, the underlying principles involved apply to all on-site system, regardless of size."

4. Stormwater Management-As indicated on the revised plans and drainage report, the project includes two drainage systems, both of which discharge to a level spread at the west property line

(and town line), just up-gradient of wetlands. One system uses Stormtech chambers for detention storage and presumably for infiltration. The other uses an open detention/retention basin. There are several concerns with system design that could impact wetlands.

•As applicable to the chambers and basin, test pit data indicates approx. 30" of silt loam underlain by hardpan (noted as a restrictive layer) throughout the site. Depth to mottling, groundwater and ledge are indicated as N/A for all test pits (not sure what this means) and perc tests of silt loam is 10-20 MPI. No perc test appears to have been performed within the footprints of the infiltration chambers or basin and the report is silent on undisturbed soil samples and permeability testing which is the protocol recommended in the Conn. Stormwater Design Manual.

•The drainage report indicates that the Water Quality Volume (WQV) for each system is treated prior to discharge but is silent on infiltration of the Groundwater Recharge Volume (GRV). requirements.

•The report indicates that the WQV treatment is achieved at the Stormtech chambers with an isolator row and an up-gradient in-line CDS (HydraFlow Model Node DET- 120). Treatment of WQV appears okay but the report is silent on infiltration.

•The report indicates that the WQV treatment at the basin (HydraFlow Model Node DET- 110) is achieved via retention of the WQV which enables vegetation filtering of the first flush and bio-uptake. The stormwater manual requires that a permanent pool be maintained to treat the WQV; however, this basin has a 6" underdrain that discharges though the outlet control structure to the outlet pipe, indicating that the basin will drain completely. This configuration is similar to a dry detention basin, which, per the stormwater manual, is not suitable for water quality treatment.

We appreciate the opportunity to present the neighbors' concerns to you and trust that you will give them the consideration that they deserve.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Clinton S. Brown II PE AICP
Director

Clinton S. Brown, P.E., AICP
Director

Education

Bachelor of Science, Civil Engineering
Northeastern University

Professional Licenses/Registrations

Professional Engineer (Civil), Connecticut

American Institute Certified Planners (AICP)

Professional Affiliations

American Institute of Certified Planners

American Planning Association

American Society of Civil Engineers

Key Practice Areas

Planning, design and construction of subdivisions, shopping centers, office complexes, research and development complexes, municipal facilities and education institutions.

Summary Biography

Mr. Brown has over thirty years' experience in the planning, design and construction of subdivisions, shopping centers, office complexes, research and development complexes, municipal facilities and education institutions. On these projects Mr. Brown has served as Design Engineer, Project Manager and Principal-in-Charge where his responsibilities included concept planning and feasibility studies, preliminary and final design for roads, utilities, Stormwater management, site layout and grading, drainage, permitting activities and construction document preparation and administration.

Mr. Brown's professional experience includes eight years in community planning where he was responsible for developing community master plans, special area plans, capital improvement programs and preparation of zoning regulations and regulation amendments. Mr. Brown has also prepared grant applications and performed third party reviews of site designs for institutional complexes. He has an intimate working knowledge of local municipal government, planning regulations, and data requirements.

His professional experience also includes expert witness services where he has provided expert testimony regarding sound engineering principles and professional standard of care.

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

Highlights of Accomplishments and Experience

Municipal Planning

- Prepared grant applications for state funded municipal development projects and administered two state funded municipal development project plans for 200 acres each(Groton and Waterford), including consultant selection/ management, coordination with state DED (predecessor to DECD), elected /appointed officials, municipal administration/ departments, utility providers and property owners, including business and resident relocation.
- Prepared grant application for state funded open space acquisition. Administered open space grant for acquisition of 94 acre historic farm property (Stenger Farm) including relocation of handicapped resident.
- Prepared functional element plans and special land use/zoning/development program studies in support of Plan of Conservation and Development (POCD) recommendations and initiatives for consideration and adoption by local land use agencies.

Site Development

- Odd Fellows/Fairview/Thames Edge at Fairview-Prepared master plan for multi-phase development program for independent living/congregate/active adult project on 70 acre site in Groton. Scope of work included land use/zoning, access and parking and water, sewer and Stormwater management facilities. Also, solicited, procured and managed environmental, geotechnical, traffic and landscape architecture services on behalf of owner.
- Lawrence & Memorial Hospital – West Campus- As part of an interdisciplinary design team, prepared a master plan for land use and infrastructure for this 100 acre Waterford site to identify building sites, access and utility requirements. On the basis of the plan, the owner completed the overall utility infrastructure (water and sewer) and the first building.
- Perkins Farm Complex- This multi-phase, mixed use development on 71 acres in Stonington includes office, education and residential land use components and an extensive system of wetlands. A master plan/zone amendment was prepared by the interdisciplinary design team to accomplish the first phase of permitting. Our role was to determine adequacy of utility systems and to provide a plan for water supply, sanitary sewage and Stormwater facilities to support the various phases of the plan implementation.
- Site Assessments- Various Locations-We have completed numerous site assessments covering land use (zoning, wetlands, and special district requirements), access/parking, flood zone, utilities and Stormwater management, earth- work/grading/ retaining walls and other owner considerations. Types of projects include mixed use, healthcare, schools, municipal facilities (such as firehouses), hospitality, industrial /office buildings and all types of residential uses. The purpose of these assessments was to determine feasibility, identify unique site characteristics or facility requirements, review alternative sites or designs, and to establish preliminary basis for cost estimates.

Loureiro

Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

February 23, 2021

Town of North Haven
Inland Wetlands Commission
Memorial Town Hall
18 Church St.
North Haven, Conn.06473

RE: Inland Wetlands Application # I20-06
The Slate School-5100 Ridge Road-Revised Plan and Drainage Report

Dear Commission Members:

Loureiro has conducted a review of following documents as they pertain to Inland Wetlands application #I20-06:

1. Drainage report entitled, "Drainage Report, Slate Upper School, 5100 Ridge Road, North Haven, Connecticut," last revised February 17, 2021, prepared by Milone & MacBroom, Inc.
2. Plan set entitled, "Slate Upper School, 5100 Ridge Road, North Haven, Connecticut, Regulatory Submission," last revised February 17, 2021, prepared by Milone & MacBroom, Inc.

Based on this review, we understand that proposed stormwater management Best Management Practices (BMPs) include maintaining drainage patterns, catch basins with 2' sumps, a hydrodynamic separator, an isolator row integrated within an underground stormwater management system, a green roof for a portion of the new building and a surface detention basin with a sediment forebay. The proposed development will have two drainage systems that collect runoff from the site and discharge to a level spreader located approximately 30-40 feet east of the wetland limit.

With respect to the overall impact the stormwater management improvements may have on the wetlands, we offer the following comments and observations:

1. The Town Engineer should conduct a full review of the substantially revised stormwater management improvements and drainage report for consistency between the two documents and compliance with applicable requirements.
2. There are no details or call-outs for the proposed green roof stormwater system referenced in the drainage report.
3. A discrepancy exists in the Milone & MacBroom, Inc. (MMI) report with regard to impervious coverage. Page 75 of the drainage report indicates an existing impervious area

of 0.401 acres and a proposed impervious area of 0.993 acres. Pages 64 of 91 through 67 of 91 of the report indicate a total existing impervious surface area of 0.62 acres for the existing watershed (EW WS10) and a total proposed impervious surface area of 1.21 ac for proposed watersheds (PR WS10, PR WS11, PR WS12). Also, the Water Quality Volume calculations on sheets 49 of 91 and 51 of 91 indicate a proposed impervious surface area of 1.01 acres for PR WS11 and PR WS12.

4. Inconsistencies appear to exist in the design and modeling of the surface basin. Per the plans, the bottom of the basin elevation should be elevation 153.0 with a low flow orifice invert elevation of 156.2. This would be consistent with the Water Quality Volume calculation on sheet 50 of 91 of the drainage report which indicates a storage capacity of 0.097 ac-ft between the bottom of the basin (elevation 153.0) and the low flow orifice invert elevation of 156.2. However, page 86 of 91 of the drainage report indicates a bottom basin elevation of 156.2 which is supported by page 76 of 91 of the report which indicates the water surface elevation (WSE) of the surface basin at the 1-year storm event is at elevation 157.0. If the intention is to have storage volume below the low-flow orifice for detention of the Water Quality Volume, it should indicate how the water will discharge from the basin and at what rate as it currently does not have any provisions to drain the basin.

Given the proper design and functioning of the stormwater management system is a key pillar in the applicant's representation of no wetland impact, these matters should be fully addressed. We appreciate the opportunity to present the neighbors' concerns to you and trust that you will give them the consideration that they deserve.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Clinton S. Brown II PE AICP
Director

Pc.Att'y John Acampora w/att.
Att'y John Parise w/att.
George Logan, REMA

February 23, 2021

Town of North Haven
Inland Wetlands Commission
Memorial Town Hall
18 Church St.
North Haven, Conn.06473

RE: Inland Wetlands Application # 120-06
The Slate School-5100 Ridge Road-Nitrogen Dilution Analysis

Dear Commission Members:

This letter and attached information will serve to follow-up to and expand upon concerns raised in our January 25, 2021 letter to you on this matter. In particular, these concerns relate to the unrenovated sewage plume reaching the nearby wetland and introducing nitrogen and other pollutants to the wetlands. We suggested that there was a way to model these conditions using an established, well accepted technique that is contained in the referenced 2006 DEEP guidance document. Excerpts from pertinent sections of the document are attached and we have highlighted particular provisions that are on point. As we did in our prior letter, we call your attention to the applicability of the principles contained in the document which are clearly expressed in Section 1- p. 2 of 12 as follows "…**the underlying principles involved apply to all on-site systems, regardless of size."** (**Bold added**)

We understand that the applicant has submitted revised documents and a response to our comments that attempt to sidestep this matter by suggesting that the principles do not apply because of the size of the sewage disposal system which is clearly contrary to the statement contained in the document as quoted above. In light of this, the neighbors have requested that this office prepare a nitrogen dilution analysis and we have done so. The analysis follows the methodology recommended by DEEP and relies on the maps and other documents provided by the applicant. It is interesting to note that the example provided in the DEEP document uses a school as the land use further supporting the appropriateness of this method of analysis to this matter. Copies of the applicable sections of the DEEP methodology are attached along with our calculations.

Our calculations indicate that the concentration of nitrate at the wetland is 32.4 mg/L which exceeds the DEEP target of 10 mg/L and, as in the DEEP example, indicates that there is insufficient dilution from infiltrated precipitation. Equally important in this instance is the concentration of the ammonium byproduct which can be toxic to aquatic life at concentrations as low as 1 mg/L.

Loureiro Engineering Associates, Inc.
100 Fort Hill Road • Groton, CT 06340 • 860-448-0400 • Fax 860-448-0899 • www.Loureiro.com
AN EMPLOYEE-OWNED COMPANY

We have shared this information with the Environmental Scientist, George Logan, who will provide an opinion of the significance of these concentrations relative to wetland impact.

We appreciate the opportunity to present the neighbors' concerns to you and trust that you will give them the consideration that they deserve.

Sincerely,

LOUREIRO ENGINEERING ASSOCIATES, INC.

Clinton S. Brown II PE AICP
Director

Attachments

Pc.Att'y. John Acampora w/att.
Att'y. John Parise w/att.
George Logan REMA w/att.

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory

Nitrogen Dilution Analysis

Source:
Connecticut Department of Environmental Protection
Bureau of Materials Management and Compliance Assurance
Guidance for Design of Large-Scale On-Site Wastewater Renovation Systems
February 2006

Nitrogen Dilution Model

$$N_{gw} = [(Q_{ww} \times N_{ww}) / (Q_{ww} + Q_{ip})]$$

where:

N_{gw} = nitrogen concentration in ground water at the point of concern, [M/V]
Q_{ww} = daily design volume of wastewater, [L^3]
N_{ww} = nitrogen concentration in the wastewater reaching the ground water = 60% of the raw wastewater total nitrogen concentration, [M/V]
Q_{ip} = daily volume of infiltrated precipitation, [L^3]

Also,
Q_{ip} = %I x A_e /100
where:
%I = percent infiltration, from Figure N-1
A_e = effective infiltration area, = $(X_d + X_u + X_{SWAS})(2y)$, [$L^2$]

As shown on Figure N-2,
X_d = longitudinal horizontal distance from the downgradient side of the SWAS to the down gradient point of concern, measured parallel to the local direction of ground water flow [L]
X_u = longitudinal horizontal distance from the up-gradient side of the SWAS to the up gradient property line, measured parallel to the local direction of ground water flow [L]
X_{SWAS} = horizontal width of SWAS, measured parallel to the local direction of ground water flow [L]
y = horizontal transverse distance from the point of concern on the longitudinal centerline of nitrogen plume to the plume concentration contour = 10 mg/l nitrogen, measured perpendicular to direction of local ground water flow, obtained from Tables No. N-1A or Table N- 1B (by interpolation if necessary) [L]
Y = horizontal transverse width of SWAS, measured perpendicular to direction of local ground water flow [L]

Assumptions:

a. Raw Wastewater has a total nitrogen concentration of 80mg/L
b. Annual precipitation = 48 inches (equivalent to 0.13 inches/day)

Calculations:

a. From Fig N-1 (attached):
CN = 70 (per MMI report and TR-55 manual for woods (good) with a hydrologic soil group C)
Therefore, %I = 44%, or 0.44
b. N_{ww} = 0.60 x 80mg/L = 48 mg/L
c. From Table No. N-1A (attached): y = 70'

$A_e = (X_d + X_u + X_{SWAS})(2y)$
X_d = 69' (closest downgradient point of concern – wetland)
X_u = 32' (average distance to nearest upgradient edge of contributing drainage area)
X_{SWAS} = 4' (system width)
y = 70'

A_e = (69' + 32' + 4')(2 x 70') = 14,700 ft^2 = 1,366 m^2

d. Q_{ip} = %I x A_e / 100
= (0.44)(0.13 in/day)(2.54 cm/in)(1m/100cm)(1,366 m^2)
= (0.44)(0.003 m/day)(1,366 m^2) = 1.803 m^3/day
= (1.803 m^3/day) (1000 L/m^3) = 1,803 L/day
e. Q_{ww} = 990 GPD x 3.785 L/gal. = 3,747 L/day
f. Q_{ww} x N_{ww} = (3,747 L/day)(48 mg/L) = 179,856 mg/day
g. $Q_{ww} + Q_{ip}$ = (3,747 L/day) + (1,803 L/day) = 5,550 L/day
h. $N_{gw} = [(Q_{ww} \times N_{ww}) / (Q_{ww} + Q_{ip})$
= (179,856 mg/day) / (5,550 L/day) **= 32.4 mg/L**

Percent Infiltration vs. CN Number

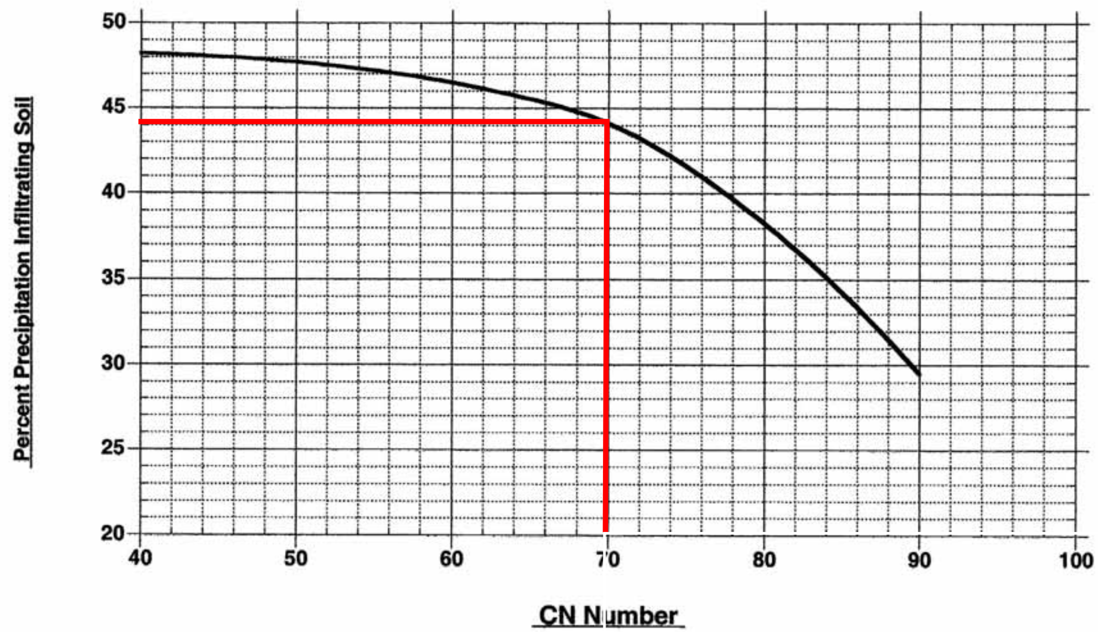


Figure N-1

TABLE N-1A

Lateral Extent of 10 mg/L Nitrogen Plume in Glacial Till

y=Distance perpendicular to direction of ground water flow, from centerline of plume to plume C = 10 mg/L												
Co, mg/L	Y=100 Ft.						Y=200 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	50	54	58	58	58	58	100	104	108	113	116	117
30	50	59	67	73	73	73	100	109	117	126	134	141
36	50	62	74	83	87	87	100	112	124	135	147	158
42	50	64	78	91	99	102	100	114	129	143	159	170
48	50	66	82	97	109	115	100	116	133	149	165	180
54	50	68	86	103	118	126	100	118	136	154	172	189
60	50	69	89	107	123	134	100	119	139	158	177	196
66	50	71	91	111	128	142	100	121	141	162	182	203
72	50	72	93	114	133	148	100	122	143	165	187	208

Co, mg/L	Y=300 Ft.						Y=400 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	150	154	158	163	167	171	200	204	208	213	217	221
30	150	159	167	176	185	193	200	209	217	226	236	243
36	150	162	174	185	197	209	200	212	224	236	247	259
42	150	164	179	193	207	221	200	214	229	243	257	271
48	150	166	183	199	215	231	200	216	233	249	265	281
54	150	168	186	204	222	240	200	218	236	254	272	290
60	150	169	189	208	227	247	200	219	23	258	277	297
66	150	171	191	212	232	253	200	221	241	262	282	303
72	150	172	193	215	237	259	200	222	243	265	287	309

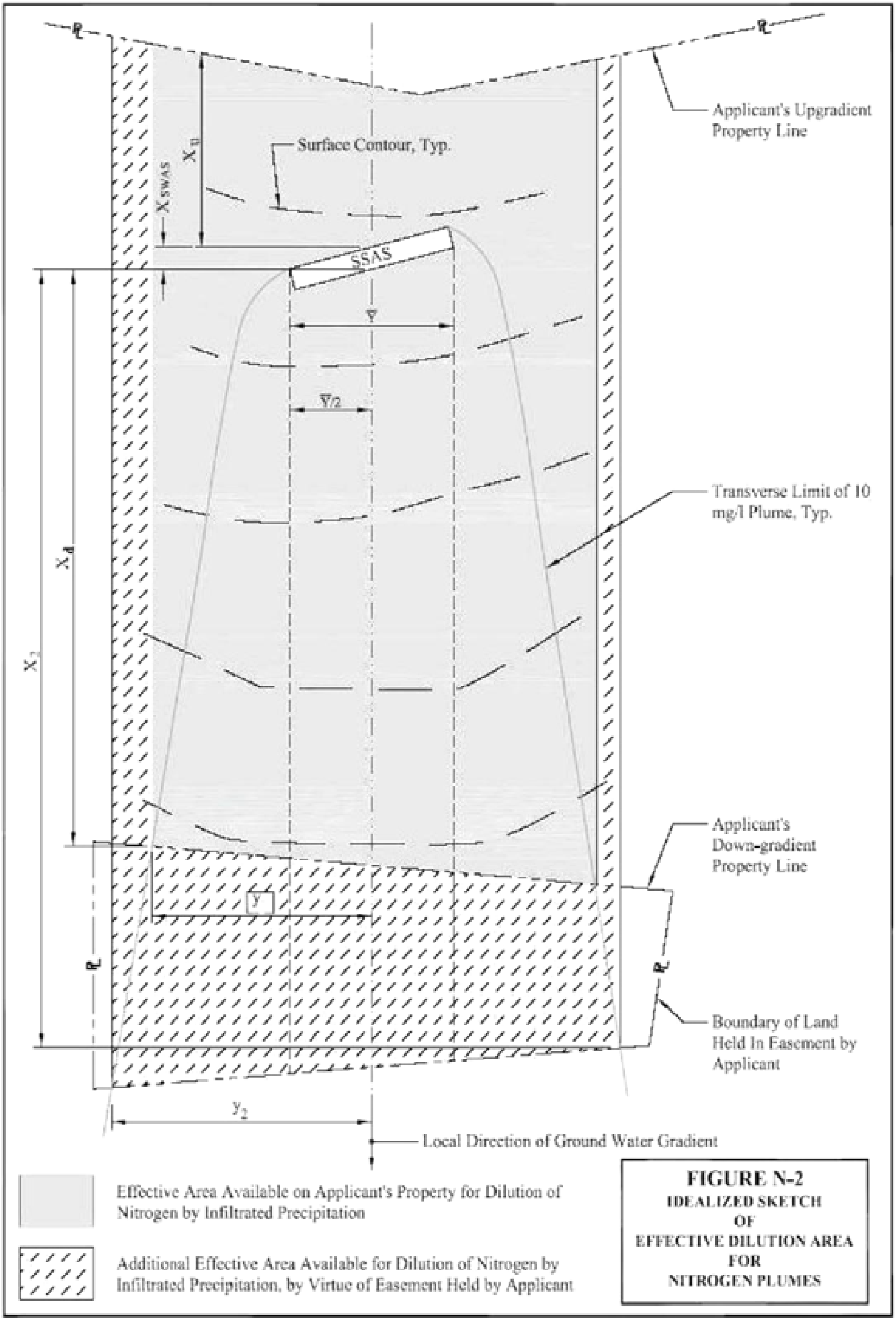
Input values:
Co = 48 mg/L
Y = 118' (length of system spread)
x = 69' (closest downgradient point of concern)

Co, mg/L	Y=500 Ft.						Y=600 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	250	254	258	262	267	271	300	304	308	313	317	321
30	250	258	267	276	285	293	300	308	317	326	335	343
36	250	262	274	285	297	309	300	312	324	335	347	359
42	250	264	279	293	307	321	300	315	329	343	357	371
48	250	267	283	299	315	331	300	317	333	349	365	381
54	250	268	286	308	322	340	300	318	336	354	372	390
60	250	269	289	308	327	347	300	319	339	358	377	397
66	250	270	291	312	332	353	300	320	341	362	382	403
72	250	271	293	315	337	359	300	321	343	365	387	409

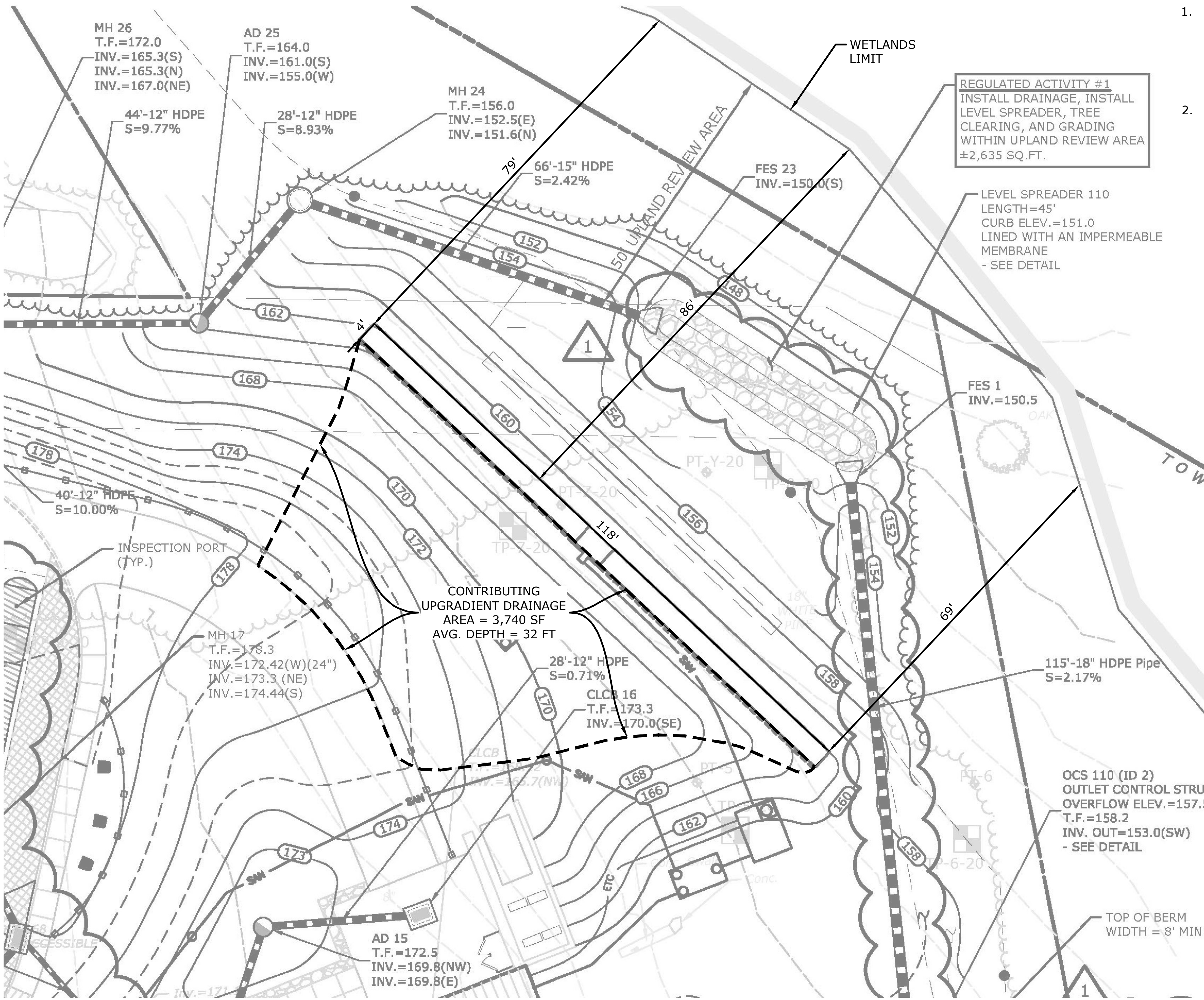
Averages:
when Y = 100', x = 0' to 100':
y = 50' + ((66'-50') x 0.69) = 50 '+ 11' = 61'
when Y = 200', x = 0' to 100':
y = 100' + ((116' - 100') x 0.69) = 100 + 11 = 111'
when Y = 118', y = 61' and y = 111'
y = 61' + ((111' - 61') x 0.18) = 61' + 9' = 70'

Notes:

1. C_o = Nitrogen concentration in discharge from SWAS.
2. x = longitudinal horizontal distance from SWAS to point of concern, measured parallel to the local direction of ground water flow.
3. Y = horizontal dimension of SWAS measured perpendicular to the local direction of ground water flow.
4. For intermediate values of C_o, Y and y, interpolate from tables.
5. Refer to Figure N-2 for depiction of x, Y, and y.



Applicant's Upgradient Property Line
Surface Contour, Typ.
X_u
X_{SWAS}
SSAS
$\overline{Y}$
$\overline{Y}/2$
Transverse Limit of 10 mg/l Plume, Typ.
X_d
X_2
Applicant's Down-gradient Property Line
y
Boundary of Land Held In Easement by Applicant
y_2
Local Direction of Ground Water Gradient
Effective Area Available on Applicant's Property for Dilution of Nitrogen by Infiltrated Precipitation
Additional Effective Area Available for Dilution of Nitrogen by Infiltrated Precipitation, by Virtue of Easement Held by Applicant
FIGURE N-2
IDEALIZED SKETCH
OF
EFFECTIVE DILUTION AREA
FOR
NITROGEN PLUMES



NOTES:

1. BASE MAPPING IS PROVIDED PER THE SITE PLAN SET ENTITLED, "SLATE UPPER SCHOOL, 5100 RIDGE ROAD, NORTH HAVEN, CONNECTICUT, PLANNING AND ZONING SUBMISSIONS", DATED NOVEMBER 6, 2020, LAST REVISED FEBRUARY 17, 2021, PREPARED BY MILONE & MACBROOM.
2. PLAN HAS BEEN PREPARED TO SUPPORT NITROGEN DILUTION ANALYSIS ONLY.

Loureiro
Engineering • Construction • EH&S • Energy
Waste • Facility Services • Laboratory
Loureiro Engineering Associates, Inc.
100 Fort Hill Road • Groton, Connecticut 06340
Phone: 860-448-0400 • Fax: 860-448-0899
An Employee Owned Company • www.Loureiro.com

SCALE 1" = 20'

COMM. NO.

DATE 2020-02-22

NITROGEN DILUTION ANALYSIS

THE SLATE SCHOOL
5100 RIDGE ROAD
NORTH HAVEN, CONNECTICUT

1

P:\CT\NORTH HAVEN\RIDGE RD-5100\ACAMPORA\PROPOSED SCHOOL\DWG\NITROGEN DILUTION ANALYSIS.DWG Tab: 11X17 Saved: 2/22/2021 2:30 PM Plotted: 2/22/2021 2:32 PM

CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF MATERIALS MANAGEMENT AND COMPLIANCE ASSURANCE

GUIDANCE FOR DESIGN OF LARGE-SCALE ON-SITE WASTEWATER RENOVATION SYSTEMS

February 2006

Funded in part by the CT DEP through a US EPA Nonpoint Source Grant under § 319 Clean Water Act

Jacobson

Nathan L. Jacobson & Associates, Inc.
Consulting Civil and Environmental Engineers
86 Main Street, P.O. Box 337
Chester, Connecticut 06412-0337

When the pretreated wastewater is discharged to the subsurface via a properly designed SWAS it is further renovated as it travels through the subsurface soils and eventually reaches and commingles with the ground water. The ground water in turn is eventually extracted via wells for various water supply purposes, including drinking water, or discharges to surface waters that are used for many purposes.

Therefore, the chief objective for design, construction, operation and maintenance of a SWAS and the associated pretreatment facilities must be to renovate the wastewater so as to protect the public health and the environment. Most soils have substantial but finite capacities to accomplish the renovation of pretreated domestic wastewater by providing an environment that causes the death or inactivation of pathogens and removal or attenuation of chemical pollutants. It is axiomatic that the pretreated wastewater must remain in the soil for a suitable time to permit such renovation to take place. A corollary objective is to ensure that the wastewater makes intimate contact with the soil particles under suitable environmental conditions so as to effect such renovation. This requires that the soils in which a SWAS are installed have ample hydraulic and renovative capacities and that there are adequate vertical and horizontal separating distances between the SWAS and any point of concern to provide the necessary time and adequate soil contact for the renovation to take place.

While this document is directed toward design, construction, operation and maintenance of large-scale OWRS having design flows greater than 5,000 gpd, including associated wastewater collection systems, the underlying principles involved apply to all on-site systems, regardless of size. The size of a system is a function of the daily rate of wastewater discharge and its bio-chemical characteristics, and the physical characteristics of the site, including: area, shape, topography, depth to the controlling ground water table and soil characteristics. The two basic criteria for judging the adequacy of an OWRS are: "Will the discharge cause pollution?" and "Will the system work?"

The basic concerns that must be addressed to judge the adequacy of an OWRS are:

- Does the proposed site of a subsurface wastewater absorption system (SWAS) have sufficient land area to accept the size of the system necessary to meet the requirements of the Department?
- Does the soil-ground water regime in which the SWAS is proposed to be located have sufficient renovative capacity to bring the pretreated wastewater into compliance with the required ground water quality standards of the Department before it reaches a point of concern, such as: a potable water supply well, wetland, surface water body or the applicant's property boundary?
- Does the soil-ground water regime in which the SWAS is proposed to be located have sufficient hydraulic capacity to accept and transport the pretreated wastewater for an adequate distance without surfacing or breakout?
- Is or will there be a responsible entity, with adequate and continual authority and assured financial means, to properly construct, operate and maintain the OWRS to the satisfaction of the Department?

To address these concerns, many factors must be thoroughly and methodically evaluated, using the best engineering practice in applying fundamental scientific and engineering principles, and the best information currently available or reasonably obtainable.

The basic purpose of this document is to present information and methodologies that can be used in evaluating these factors and addressing these concerns.

B. Units Of Measure

The U.S. ("English") system of measurement units is utilized in this document, with few exceptions (e.g. mg/L, meters). For those persons who need, or prefer, to work in metric units, a table of U.S. to Metric conversion factors is provided in Appendix D.

C. Terminology

As previously stated, this document stresses the renovation of domestic wastewater. However, at the time this document was written, the governing State Statutes and the Department's Water Quality Standards, Water Discharge Regulations, Rules of Practice and Environmental Permit Application Package all refer to "Sewage", "Domestic Sewage", "Sewage Disposal", "Subsurface Sewage Disposal System", "Leaching System" and like terms. In this document, the following words and terms are equivalent:

This Document	Existing Terminology
Wastewater	Sewage
Domestic Wastewater	Domestic Sewage
Wastewater Renovation	Sewage Disposal
Subsurface Wastewater Absorption System (SWAS)	Subsurface Sewage Disposal System, or Leaching System
On-site Wastewater Renovation System (OWRS)	Land Treatment System, Subsurface Sewage Disposal System

D. Disclaimer

Throughout this document, proprietary commercial products and processes have been mentioned by trade name in order to illustrate a point or to provide a general indication as to what products or processes may be available for use in on-site wastewater renovation facilities. Mention of trade names, proprietary commercial products and processes does not constitute endorsement or recommendation for use by the Department.

E. Departments' Jurisdiction over OWRS

The Department has jurisdiction over the design, construction and operation of: OWRS facilities having a design capacity in excess of 5,000 gallons per day that discharge to any one property, regardless of the number of systems; systems including advanced pretreatment regardless of capacity; and Community Sewerage Systems (those serving more than one residential structure). Under t 22a-430 of the Connecticut General Statutes (CGS), the Department is responsible for issuing State Discharge Permits for operation and monitoring of such systems.

Nitrogen is essential to the growth and reproduction of phytoplankton. In saline bays and estuaries, nitrogen is the limiting nutrient. In the presence of an over abundance of nitrogen, organisms such as algae (phytoplankton) and floating, submerged or emergent aquatic vegetation (macrophytes) can proliferate in these water bodies. This can accelerate the natural processes of eutrophication.

The death and decay of excessive algae results in oxygen depletion, a condition that is inimical to fish and other aquatic life that require oxygen to survive. The decay of organic sediment under anoxic conditions can also result in the release of ammonia, which can have a toxic effect on aquatic life, as discussed elsewhere herein. The adverse ecological effects of high nitrogen loads to The Long Island Sound, which stimulate phytoplankton blooms, leading to hypoxia (dissolved oxygen (DO) concentration of 3 mg/l or less), have been well documented (LISS–1990, CT DEP–1998).

Health problems can occur when water that contains nitrates in excess of 10 mg/l, (expressed as nitrate-nitrogen, or NO_3-N), is consumed by infants, either by direct ingestion, as a result of its use in preparing baby formulas, or to a fetus in a pregnant woman. Nitrate is reduced in the baby's body to nitrite. Nitrite is able to oxidize ferrous iron in hemoglobin to ferric iron and convert hemoglobin (the blood pigment that carries oxygen from the lungs to tissue) to methemoglobin that is incapable of carrying molecular oxygen to tissue. This condition, known as methemoglobinemia (infant cyanosis, or "blue baby disease"), can result in suffocation and is particularly toxic to infants less than three months old.

Methemoglobinemia can also occur in older children and adults if sufficient nitrate is ingested (Bitton and Gerba, 1994; Ammann-1995). Nitrite is also reputed to induce human gastric cancer (Lee, et al.- 1995). The U.S. EPA has established a maximum pollutant level (MCL) of 10 mg/l of nitrate, expressed as NO_3 –N, for drinking water supplies.

2. Nitrogen

Nitrogen is one of two most prominent nutrients in pretreated wastewater discharged to the ground water (the other being phosphorus), and its fate and transport in the soil/ground water regime is of considerable concern when designing OWRS. Concentrations of total nitrogen (TN) in septic tank effluent (STE) typically range from 40-80 mg/l or more, depending upon the source of the wastewater. Sources of wastewater containing higher percentages of toilet/urinal wastes (blackwater) than typical residential septic tank effluent can have much higher TN concentrations.

Most of the nitrogen in wastewater receiving pretreatment in a septic tank is in the form of the ammonium ion (NH_4), with some organic nitrogen, and sometimes trace-to-small amounts of nitrite (NO_2) and nitrate (NO_3) also present. In a conventional OWRS that has an aerobic soil zone beneath the SWAS, ammonium and organic nitrogen are rapidly converted to nitrate. Organic nitrogen must first be mineralized (converted to the inorganic form) by microbial action to ammonium, which takes place in the septic tank and in the biomat, before it is oxidized to nitrate by autotrophic bacteria in the aerobic unsaturated zone.

Where conditions are favorable, various processes remove some of the nitrate. The most significant of these processes is biological denitrification, the reduction of nitrates to nitrogen gas by the metabolic processes of facultative microbes under anoxic conditions. The gaseous nitrogen is then released into the atmosphere via the unsaturated soil pores in the unsaturated zone. However, where conditions are not favorable for the denitrification process (the usual case), nitrate, being very soluble and chemically inactive, may easily percolate down to, mingle, and move with the ground water to points of concern such as drinking water wells and surface waters. The presence of nitrates in both ground water and surface water in concentrations significantly greater than natural background levels can lead to environmental problems.

Up to 20 percent or more of the total nitrogen in raw domestic wastewater can be removed in the septic tank by sedimentation and microbial assimilation (Hardesty, 1974; Laak-1986; Pell and Nyberg-1989, Long-1995). However, where most of the nitrogen enters the septic tank in dissolved forms, as may be the case for wastewaters from schools and domestic wastewater from commercial establishments and industrial facilities (where urine may be the main contribution), the amount removed will be much lower, as sedimentation will not be a significant factor. The remaining nitrogen is discharged with the septic tank effluent to the SWAS.

The fate of the remaining nitrogen depends upon a number of mechanisms and processes, including mineralization, adsorption, plant uptake, volatilization, fixation, immobilization, nitrification and denitrification. These processes in turn depend upon such factors as; soil pH, temperature, moisture, oxidation-reduction (redox) potential, oxygen present in the soil gases, presence and type of organic matter in the soil, soil cation exchange capacity, and microbial populations. In a properly functioning SWAS, 15 to 25 percent of the nitrogen remaining in the septic tank effluent may be removed (Laak – 1986; Long, 1995; Wilhelm et al. – 1996; Crites & Tchobanoglous - 1998).

Mineralization of nitrogen, the conversion of organic nitrogen to inorganic nitrogen (predominantly ammonium) by biological action occurs both in the septic tank and at the biomat in the SWAS, and very little organic nitrogen is found in the wastewater after it flows through the biomat.

Adsorption of ammonium via soil cation exchange may play a role in nitrogen removal, but nitrogen so adsorbed is subject to subsequent desorption and leaching. In addition, eventually a state of equilibrium may become established as all of the cation exchange sites are occupied. When this occurs, desorbed ammonium is replaced with new ammonium cations, and no net removal of ammonium occurs (Magdoff et. al.-1974; Sikora and Corey-1976; Brown, et al.-1978; Brown et al.-1984). Thus, ammonia-nitrogen may remain in ground water that discharges to surface water bodies.

Ammonia is reported to be toxic to aquatic life at very low concentrations of less than 1 mg/L (Laak-1986; U.S.EPA-1993). The EPA criteria for ambient water quality, as well as modified-state criteria, give both maximum total and unionized (free) ammonia levels as a function of pH and temperature. The maximum one-hour average in-stream concentrations of un-ionized ammonia-nitrogen (NH_3) permissible in a three-year period are all under 1 mg/L. The maximum four-day average concentrations for the same are all under 0.1 mg/L (USEPA-1985; USEPA-1993).

The acute toxicity of NH_3 has been shown to increase as pH and temperature decrease. Thus, if nitrification does not occur due to the existence of anaerobic conditions beneath the SWAS, and small amounts of free ammonia persist in the ground water, an adverse effect on aquatic life could result where the ground water discharges to nearby surface waters.

Plant uptake of some of the nitrogen may occur, provided the [SWAS] is within the root zone of the plants, but the amount of nitrogen discharged to a [SWAS] greatly exceeds that which can normally be utilized by nearby plants (Sikora-1976). Plant uptake is usually visually evident from the distinctively greener grass that grows above a SWAS where the effluent can rise into the root zone. This situation may occur when a SWAS malfunctions and floods the surface or near surface, or when a normally operating SWAS has been constructed at a shallow depth below ground surface. However, most of the pretreated wastewater is discharged below the root zone of local vegetation; also, such uptake essentially ceases during the dormant season. Further, unless the vegetation is harvested, it is likely that N will be recycled to the soil as the vegetation decays during the dormant season.

Volatilization of ammonium is only significant at high pH values (≥ 9.5), which seldom exist in and beneath a SWAS. Fixation occurs when ammonium ions become trapped between intercellular layers of clay. Volatilization and fixation are not thought to be significant nitrogen removal processes (Lance-1972).

Immobilization occurs as the microorganisms engaged in removing organic matter incorporate nitrogen in their cells during synthesis reactions. This may account for five to ten percent, or less, of nitrogen removal (Lance –1972). Research has shown that nitrogen incorporated into microbes is held in a rather stable form (Laak–1986).

In a properly functioning SWAS, underlain by an ample depth of unsaturated aerobic soil, almost complete oxidation of ammonium to nitrate usually occurs within 30 - 60 cm (1-2 ft.) of unsaturated soil below the bottom of the leaching system due to the metabolic action of nitrifying bacteria. This usually occurs within a few hours of the exposure of ammonium to an aerobic soil environment (Anderson, et al.–1994; Duncan, et al.-1994; Long -1995). Ammonium is first oxidized to nitrites and the nitrites are subsequently oxidized rapidly to nitrates. If dissolved oxygen is present in the effluent when it reaches the water table, or if the background ground water contains appreciable dissolved oxygen, aerobic oxidation of ammonium may continue in the saturated zone (Wilhelm, et al.-1994).

It should be noted that the necessity for aerobic, unsaturated soil conditions requires that the SWAS not be installed too deeply into the soil, since the oxygen present in the unsaturated soil voids decreases rapidly with depth below ground surface. Below about 40 cm (16 in.) from the surface, the rate of oxygen diffusion decreases exponentially (Otis-1997). Likewise, the placement of a dense layer of soil or pavement above the [SSAS] will severely restrict the transfer of oxygen into the soil (Long-1995).

If conditions are favorable for denitrification (presence of a suitable carbon source, facultative heterotrophic bacteria, and anoxic or anaerobic conditions), some of the nitrate may be denitrified. Very little denitrification will take place in clean sands because of the lack of organic carbon. Some small amount of denitrification may take place in saturated micro-sites between the soil grains (Sextone et al. 1985; Long-1995) where the traces of dissolved organic carbon in the ground water may be sufficient to support the denitrification process. Crites and Tchobanoglous (1998) indicated that about 15% of the nitrate is denitrified in sandy, well-drained soils and 25% in heavier soils.

Nitrate removal from wastewater by denitrification is considered to be rare in aquifers below SWAS (Wilhelm et al.–1994) and most investigators have presumed that dilution by ground water is the predominant mechanism that significantly lowers the nitrate-nitrogen concentration in the ground water. Recent studies have indicated that, in some cases, dilution of nitrates (and other constituents of wastewater) below a SWAS may be much less than posited in previous decades (ibid.) Most investigators have indicated that, generally, any remaining nitrate in the percolate from a SWAS that has not been denitrified before it reaches the ground water will remain unaltered in chemical composition or concentration other than by dilution. In general, nitrate is found to be more mobile in soils with greater moisture content, greater hydraulic conductivity, coarser texture and greater structure.

On the other hand, there is evidence that substantial denitrification may take place where nitrate laden ground water flows through saturated soils with significant readily assimilable (labile) organic carbon content, such as those that exist in wetlands and beneath some water bodies (Robertson, et al. 1991; Korom-1992; Long-1995). Denitrification can also be caused by the action of certain autotrophic bacteria using reduced iron and sulfide as electron donors in the absence of organic carbon (Korom, ibid). However, current capabilities to predict an aquifer's denitrification characteristics are site specific at best (Korom-ibid.).

Nitrogen also reaches the ground water from other sources such as decomposing plants and animals, animal wastes, application of fertilizers for lawn care and agricultural purposes, bacterial action in soil, and direct deposition from the atmosphere.

3. Phosphorus

Phosphorus (P) is the other prominent nutrient in wastewater discharged to the ground water. Phosphorus occurs in natural waters and in wastewaters almost solely as phosphates (PO_4-P) (Standard Methods-1995). The principal sources of PO_4-P in domestic wastewater are human waste, food wastes, toothpaste, pharmaceuticals, detergents (particularly dishwashing detergents), and food-treating compounds. Phosphates in wastewater may include orthophosphates, condensed phosphates (polyphosphates) and organically bound phosphates.

Since in most cases ground water will eventually reach a surface water body, it is important that the phosphorus concentration in the percolate from a SWAS be reduced to background levels in the ground water prior to the ground water reaching a point of concern. Laak (1986) reported that natural ground waters contain 0.01-0.06 mg/l of PO_4-P, while Reneau, et al (1989) reported that PO_4-P concentrations in shallow groundwater are

2. Exact specified materials are difficult to acquire and may be drastically altered by placement methods.

3. The cost of such an installation, particularly engineering inspection and testing, is very high. If an error is made, the cost of correction may become prohibitive.

G. Nutrient Reduction (Nitrogen and Phosphorus)

1. General

A discussion on the importance of reduction of the amount nitrogen and phosphorus discharged to the environment via an OWRS is given in Section II. In the following, where computations of nitrogen dilution or phosphorus immobilization in the soil are made, the wastewater flow used in such computations should be the design average daily flow, rather than the design maximum day flow.

2. Nitrogen Dilution by Infiltrated Precipitation

The model used by the Department for nitrogen dilution by infiltrated precipitation, as presented in Healy and May (1982, rev. 1997) is retained in this document. However the methodologies for determining the amount of rainfall that infiltrates to the ground water, and the effective infiltration area, have been revised.

A study of available publications on water resources in Connecticut and rainfall-runoff relationships lead to adoption of a method for defining the percent of precipitation that infiltrates to the ground water under various soil conditions (Jacobson-2001). The results, given in graphical form in Figure No. N-1, permits determination of the percentage of infiltration based on the Runoff Curve Number (CN) method developed by the US S.C.S.(U.S.D.A.-1986).

The curve shown in Figure No. N-1 is intended to be used with a composite CN value computed for that portion of a project site that can logically be assumed to contribute infiltration for dilution of nitrogen discharged from a SWAS. The soil types and Hydrologic Soil Group classifications for soils at a project site can be obtained from maps and tables contained in the S.C.S. Soil Surveys for the various counties in Connecticut. The corresponding CN values can be obtained from Tables 2a-2c in the S.C.S./N.R.C.S. publication TR-55 (U.S.D.A.-1986). The procedures for computing a composite CN value for a project site are explained in TR-55, are familiar to most consulting engineers, and need not be given here.

Using the total lot area as the effective infiltration area, where the SWAS occupies only a small portion of the lot width, results in overestimating the affect of nitrogen dilution by infiltrated precipitation. After wastewater percolates downward from a SWAS to the ground water table, it generally flows as a plume in the local direction of ground water flow and gradually spreads transverse to the direction of the local ground water flow. The spreading of the nitrogen plume depends on the characteristics of the aquifer. When the lot width is substantially greater than the width of the SWAS, the spread may not be such that the plume covers the entire lot area, and therefore the total lot area should not be used as the effective infiltration area.

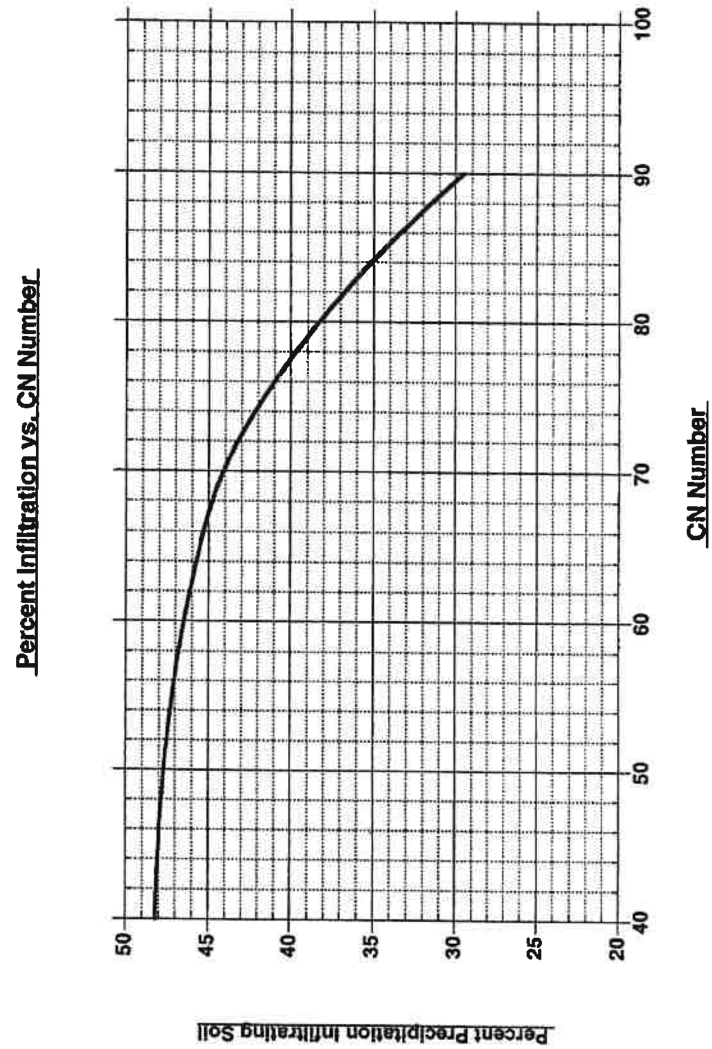

Percent Infiltration vs. CN Number
Percent Precipitation Infiltrating Soil
50
45
40
35
30
25
20
40
50
60
70
80
90
100
CN Number

Figure N-1

Mass transport processes determine the extent of plume spread and the geometric character of the contaminant concentration distribution (Domenico and Schwartz-1990). The principal processes responsible for the mass transport of chemicals dissolved in the ground water include advection, dispersion, and retardation. For non-reactive (conservative) chemicals, only the advection and dispersion processes are of concern. Based on the information previously discussed concerning the fate and transport of nitrogen (specifically, nitrates) in ground water, it can be considered as a non-reactive contaminant.

An elementary approach for modeling the effective dilution area was developed based on the concepts of hydrodynamic dispersion discussed in Freeze and Cherry (1979) and of contaminant transport in Domenico and Schwartz (1990). Domenico and Schwartz (1990) provide an analytical equation developed by Domenico and Robbins (1985) for advective and dispersive mass transport of a contaminant from a continuous finite planar source. A two-dimensional solution (vertical dispersion assumed negligible) was deemed reasonable for delineating the horizontal extent(boundary) of a nitrogen plume.

Therefore, the Domenico and Robbins equation was adjusted for a two-dimensional plume analysis (horizontal x and y directions) by eliminating the term for dispersion in the vertical direction as suggested in Domenico and Schwartz (1990). The analytical equation was solved for values of the horizontal perpendicular offset (y) from the plume centerline to the point on the plume boundary where the N concentration in the ground water is reduced from the initial concentration (C_o) in the percolating wastewater to a concentration (C)=10 mg/l (Jacobson-2001). Thus, within the plume boundary, the N concentrations vary from the initial concentration C_0 to a concentration of 10 mg/L, while outside of the plume boundary the concentration of N is less than 10 mg/L.

Tables were prepared to provide values of y, at various distances (designated as x) down-gradient from the SWAS, for various values of the initial concentration (C_o) of N in the wastewater percolating downward from a SWAS and for various lateral dimensions of the SWAS. Separate tables are provided for glacial till (Table No. N-1A) and stratified drift aquifers (Table No. N-1B). These tables can be used to determine the lateral extent of the effective infiltration area.

Figure No. N-2 presents an idealized view of the lateral extent of the plume concentration contour of 10 mg/l at a distance of x meters down-gradient of a SWAS, and indicates how the information obtained from Tables N-1A and N-1B can be used to determine the effective infiltration area.

It should be noted that, when the horizontal perpendicular offset (y) from the plume centerline to the point on the plume boundary where the N concentration is 10 mg/l, (for a given value of x from the SWAS to the Applicant's downgradient property line), indicates the plume boundary extends beyond a side boundary of the Applicant's property, it will be necessary to enter either Table N-1A or Table N-1B with the value of the shortest horizontal perpendicular offset (y) from the plume centerline to the nearest side boundary and solve for a revised distance x. It is this revised distance that should be used, together with the values for X_{swas} and X_u to determine the length of the effective infiltration area (See Figure N-2 for depiction of (y), (x), X_{swas} and X_u).

TABLE N-1A

Lateral Extent of 10 mg/L Nitrogen Plume in Glacial Till

y=Distance perpendicular to direction of ground water flow, from centerline of plume to plume C = 10 mg/L												
Co, mg/L	Y=100 Ft.						Y=200 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	50	54	58	58	58	58	100	104	108	113	116	117
30	50	59	67	73	73	73	100	109	117	126	134	141
36	50	62	74	83	87	87	100	112	124	135	147	158
42	50	64	78	91	99	102	100	114	129	143	159	170
48	50	66	82	97	109	115	100	116	133	149	165	180
54	50	68	86	103	118	126	100	118	136	154	172	189
60	50	69	89	107	123	134	100	119	139	158	177	196
66	50	71	91	111	128	142	100	121	141	162	182	203
72	50	72	93	114	133	148	100	122	143	165	187	208

Co, mg/L	Y=300 Ft.						Y=400 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	150	154	158	163	167	171	200	204	208	213	217	221
30	150	159	167	176	185	193	200	209	217	226	236	243
36	150	162	174	185	197	209	200	212	224	236	247	259
42	150	164	179	193	207	227	200	214	229	243	257	271
48	150	166	183	199	215	231	200	216	233	249	265	281
54	150	168	186	204	222	240	200	218	236	254	272	290
60	150	169	189	208	227	247	200	219	23	258	277	297
66	150	171	191	212	232	253	200	221	241	262	282	303
72	150	172	193	215	237	259	200	222	243	265	287	309

Co, mg/L	Y=500 Ft.						Y=600 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	250	254	258	262	267	271	300	304	308	313	317	321
30	250	258	267	276	285	293	300	308	317	326	335	343
36	250	262	274	285	297	309	300	312	324	335	347	359
42	250	264	279	293	307	321	300	315	329	343	357	371
48	250	267	283	299	315	331	300	317	333	349	365	381
54	250	268	286	308	322	340	300	318	336	354	372	390
60	250	269	289	308	327	347	300	319	339	358	377	397
66	250	270	291	312	332	353	300	320	341	362	382	403
72	250	271	293	315	337	359	300	321	343	365	387	409

Notes:

1. C_o = Nitrogen concentration in discharge from SWAS.
2. x = longitudinal horizontal distance from SWAS to point of concern, measured parallel to the local direction of ground water flow.
3. Y = horizontal dimension of SWAS measured perpendicular to the local direction of ground water flow.
4. For intermediate values of C_o, Y and y, interpolate from tables.
5. Refer to Figure N-2 for depiction of x, Y, and y.

TABLE N -1B

Lateral Extent of 10 mg/L Nitrogen Plume in Stratified Drift

y=Distance perpendicular to direction of ground water flow, from centerline of plume to plume C = 10 mg/L												
Co, mg/L	Y=100 Ft.						Y=200 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	50	52	54	56	58	59	100	102	104	106	108	111
30	50	54	59	63	67	70	100	104	109	113	117	122
36	50	56	62	68	74	79	100	106	112	118	124	130
42	50	57	64	71	78	85	100	107	114	121	129	136
48	50	58	66	74	82	90	100	108	116	124	133	141
54	50	59	68	77	86	94	100	109	118	127	136	145
60	50	60	69	79	89	98	100	110	119	129	139	148
66	50	60	71	81	91	101	100	110	121	131	141	152
72	50	61	72	83	93	104	100	111	122	133	143	154

Co, mg/L	Y=300 Ft.						Y=400 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	150	152	154	156	158	161	200	202	204	206	208	211
30	150	154	159	163	167	172	200	204	209	213	217	222
36	150	156	162	168	174	180	200	206	212	218	224	230
42	150	157	164	171	179	186	200	207	214	221	229	236
48	150	158	166	174	183	191	200	208	216	224	233	241
54	150	159	168	177	186	195	200	209	218	227	236	245
60	150	160	169	179	189	198	200	210	219	229	239	248
66	150	160	171	181	191	202	200	210	221	231	241	252
72	150	161	172	183	193	204	200	211	222	233	243	254

Co, mg/L	Y=500 Ft.						Y=600 Ft.					
	x=0	x=100	x=200	x=300	x=400	x=500	x=0	x=100	x=200	x=300	x=400	x=500
	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=	y=
24	250	252	254	256	258	261	300	302	304	306	308	311
30	250	254	259	263	267	272	300	304	309	313	317	322
36	250	256	262	268	274	280	300	306	312	318	324	330
42	250	257	264	271	279	286	300	307	314	321	329	336
48	250	258	266	274	283	291	300	308	316	324	333	341
54	250	259	268	277	286	295	300	309	318	327	336	345
60	250	260	269	279	289	298	300	310	319	329	339	348
66	250	260	271	281	291	302	300	311	321	331	341	351
72	250	261	272	283	293	304	300	311	322	333	343	354

Notes:

1. C_o = Nitrogen Concentration in discharge from SWAS.
2. x = longitudinal horizontal distance from SWAS to point of concern, measured parallel to local direction of ground water flow.
3. Y = horizontal dimension of SWAS measured perpendicular to the local direction of ground water flow.
4. For intermediate values of Co, Y and y, interpolate from tables.
5. Refer to Figure N-2 for depiction of x, Y, and y.

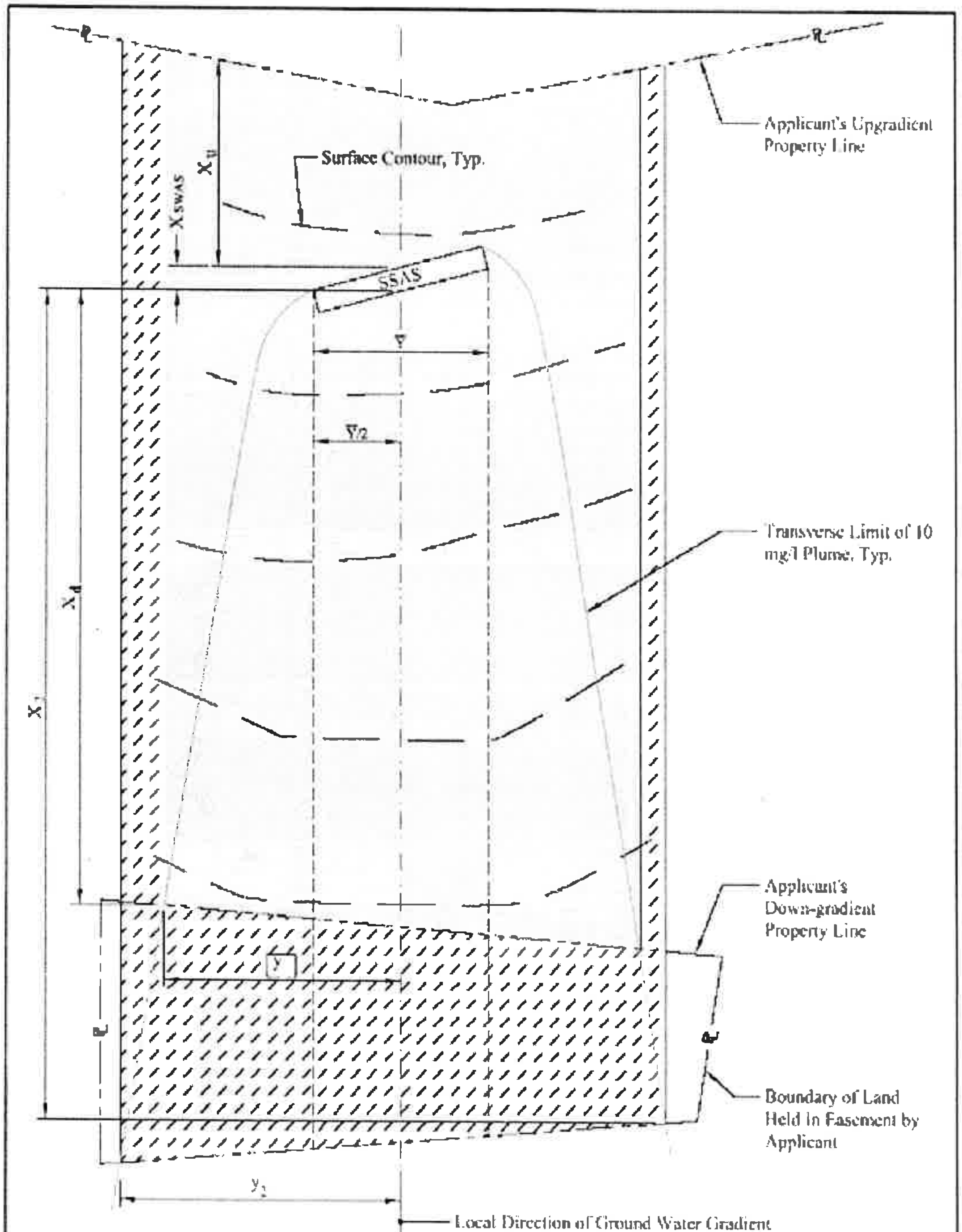


FIGURE N-2
IDEALIZED SKETCH OF EFFECTIVE DILUTION AREA FOR NITROGEN PLUMES

Nitrogen Dilution Model

The mathematical expression of the nitrogen dilution model used by the Department is as follows:

$$N_{gw} = [(Q_{ww} \times N_{ww}) / (Q_{ww} + Q_{ip})],$$

where:

N_{gw} = nitrogen concentration in ground water at the point of concern, [M/V]
Q_{ww} = daily design volume of wastewater, [L^3]
N_{ww} = nitrogen concentration in the wastewater reaching the ground water, = 60% of the raw wastewater total nitrogen concentration, [M/V]
Q_{ip} = daily volume of infiltrated precipitation, [L^3]

Also, Qip = %I x A_e /100 where %I = percent infiltration, from Figure N-1, and A_e= effective infiltration area, = $(X_d + X_u + X_{SWAS})(2y)$, [$L^2$]

As shown on Figure N-2,

X_d = longitudinal horizontal distance from the downgradient side of the SWAS to the down gradient point of concern, measured parallel to the local direction of ground water flow [L]

X_u = longitudinal horizontal distance from the up-gradient side of the SWAS to the up gradient property line, measured parallel to the local direction of ground water flow [L]

X_{SWAS} = horizontal width of SWAS, measured parallel to the local direction of ground water flow [L]

y = horizontal transverse distance from the point of concern on the longitudinal centerline of nitrogen plume to the plume concentration contour = 10 mg/l nitrogen, measured perpendicular to direction of local ground water flow, obtained from Tables No. N-1A or Table N-1B (by interpolation if necessary) [L]

Y = horizontal transverse width of SWAS, measured perpendicular to direction of local ground water flow [L]

An example of the use of the model equation follows.

A design average daily flow of 5,000 gallons of wastewater discharged from a school is to be discharged from a SWAS to a glacial till aquifer. The raw wastewater has a total nitrogen concentration of 80 mg/l. There is sufficient depth of unsaturated soil to permit installation of the SWAS in the existing soil while still maintaining the required separating distance between the bottom of the SWAS and the mounded ground water.

The width of the SWAS measured perpendicular to the direction of the local ground water gradient = 256 ft and the SWAS is located 164 ft from the applicant's up-gradient property line. The dimension of the SWAS parallel to the direction of the local ground water gradient = 46 ft The distance from the SWAS to the closest down gradient point of concern, measured parallel to the direction of the local ground water gradient, = 400 ft The composite SCS Curve Number (CN) for the soil in the area of the proposed SWAS = 72. Annual average precipitation = 48 inches (equivalent to 0.13 inches/day).

a. From Figure No. N-1, for a CN value of 72, the percent of precipitation infiltrating to the ground water = 43%. (Stated another way, the decimal fraction of total precipitation infiltrating to the ground water = 0.43)

b. The total nitrogen concentration in the wastewater discharged from the SWAS (Co), Nww, = 0.6 x 80 mg/l = 48 mg/L.

c. From Table No. N-1A (for glacial till aquifers), for Co = 48 mg/l, Y = 256 ft. and x = 400 ft, y = 193 ft (by interpolation between Y= 200 ft. and 300 ft. Therefore, Ae, the effective infiltration area, = (2 x 193) x (164+ 46 + 400) ft = 235,400 sq. ft, or 21,870 sq. meters.

d. Q_{ip}, the annual daily volume of infiltrated precipitation, = 0.43 x 0.13 in/day x 2.54 cm/inch x (1 m/100 cm) x 21,870 sq. meters = 0.43 x 0.003 meters/d x 21,870 sq. meters =31.1 cu. meters x 1000 liters/cu. meter = 31,100 liters/d.

e. Q_{ww} = 5,000 gal/d x 3.785 liters/gal = 18,925 liters/d.

f. Q_{ww} x N_{ww} = [18,925 liters/d x 48 mg/l] = 908,400 mg/d

g. $Q_{ww} + Q_{ip}$ = [18,925 liters/d +31,100 liters]/d = 50,025 liters/d.

$N_{gw} = [(Q_{ww} \times N_{ww}) / (Q_{ww} + Q_{ip})]$ = 908,400 mg/d/50,025 l/d = 18.2 mg/l. Since this concentration > 10 mg/l, additional pretreatment will be necessary as the nitrate nitrogen will not be sufficiently diluted by infiltrated precipitation. As alternatives, the width of the SWAS could be increased to increase the nitrogen dilution area; or, if that was not possible, additional land that would contribute to nitrogen dilution could be acquired by purchase or easement.

The nitrogen dilution model equation can also be re-arranged to solve for the reduction in N_{ww} required to be obtained by additional pretreatment in order to meet the requirement that $N_{gw} \leq 10$ mg/l. In this case, the equation takes the following form:

$$\text{Maximum allowable } N_{ww} = 10[(Q_{ww}+Q_{ip})/Q_{ww}].$$

In the example just given, the maximum allowable N_{ww}=10 x [(18,925 liters/d + 31,100 liters/d) /18,925 liters/d] = 26.4 mg/l. Thus, additional pretreatment would be required to reduce the total nitrogen in the wastewater discharged to the SSDS from 48 mg/l to 26.4 mg/l.

3. Additional Pretreatment for Nitrogen Removal

Physical/chemical processes and biological processes can be used for nitrogen removal. However, physical/chemical processes are not considered to be suitable for on-site wastewater renovation systems because of the cost of such processes, the operational problems inherent in such processes, and the need for highly skilled operation. In fact, while physical/chemical processes were once considered to be attractive for nitrogen removal at municipal wastewater treatment facilities, they have largely been abandoned in favor of biological processes.

Biological nitrogen removal is a two-step process involving nitrification and de-nitrification. As previously discussed in Section II of this document, nitrification is the biological oxidation of ammonium (NH4+) to nitrate (NO3-), and de-nitrification is the biological reduction of NO3- to nitrogen gas.

There are two basic types of wastewater treatment systems used in the biological nitrogen removal process. One type consists of the suspended growth system, in which the microorganisms that remove the impurities from the wastewater are maintained in suspension in intimate contact with the wastewater to be treated. The other consists of the fixed film system, in which the microorganisms are attached to some type of media, with the wastewater either passing through the media or the media passing through the wastewater. There are also hybrid systems that combine both suspended growth and fixed film processes.

The Department has approved several types of facilities that employ either suspended growth or fixed film processes, or hybrid processes, for pretreatment. Further discussion on enhanced pretreatment for nitrogen removal, including requirements for design, construction, operation, and maintenance, is given in Enhanced Pretreatment, Section XI of this document.

4. Phosphorus Removal

The model used by the Department for removal of phosphorus (P) in the percolate from a SWAS assumes that 30% of the P is removed in the septic tank and in the biomat that forms at the SWAS-soil interface. The remainder must be removed in the soil beneath the SWAS.

Studies have indicated that very limited P transport to ground water occurs in aerobic, water-unsaturated soils of suitable texture and chemical characteristics. In most soils in which Fe, Al and Ca are present in reactive form, aerobic conditions exist, and flow rates are minimal, P movement is minimal and pollution of ground and surface waters from P applied in a SWAS is considered unlikely. In recent extensive field studies, the evidence suggested that P removal in the subsurface is influenced by mineral precipitation reactions in the unsaturated zone which tend to be irreversible

On the other hand, while some P may be removed in the saturated (ground water) zone beneath and down-gradient of the SWAS there is potential for the migration of P in the saturated zone under certain conditions. P removal in the ground water zone appears to be dominated by sorption reactions that are readily reversible (Robertson and Harman-1999). P has been detected above background levels in ground water adjacent to and down-gradient of subsurface wastewater absorption systems under conditions of saturated flow, high water tables, or high hydraulic loading rates (Reneau-1979).

Therefore, absent any enhanced pretreatment for P removal, it should be demonstrated that the P in the percolate from a SWAS will be removed in the unsaturated soil zone beneath the SWAS.

The Department model assumes that P removed in the unsaturated zone is initially sorbed onto active soil particles, but that over a 6 month period, the sorbed P will combine with Fe, Al or Ca in the soil to form less soluble precipitates. As the precipitates form, the original sorption sites are regenerated. It should be demonstrated that the unsaturated soil beneath a SWAS has the capacity to sorb at least 6 months of the P in the percolate from the SWAS. Therefore, it is necessary to determine the P sorption capacity of the unsaturated soils below the SWAS area and the total mass of soil that the percolate from a SWAS will contact as it moves downward through the unsaturated zone.

January 25, 2021

VIA E-MAIL

Town of North Haven
Inland Wetlands Commission
Memorial Town Hall, 18 Church Street
North Haven, CT 06473

RE: **PRELIMINARY APPLICATION REVIEW**
The Slate Upper School, 5100 Ridge Road
IWC Application No.: 120-06

REMA Job #: 20-2352-NHA12

Dear Chairman Bumsted and Commissioners:

At the request of adjacent property owners, REMA ECOLOGICAL SERVICES ("REMA") has been asked to review the application for the above-referenced development proposal, for completeness and consistency with the Town's Inland Wetlands and Watercourses Regulations, based on Sections 22a-36 to 45 of the Connecticut General Statutes.

The original application materials were reviewed, including the *Wetland and Watercourse Delineation Report* by Milone & MacBroom, Inc. (MMI), dated October 26th, 2020, as well as the more recently revised plans by MMI (15 sheets), and the MMI *Drainage Report*, both revised through December 10th, 2020. REMA also reviewed secondary-source information, mostly available on-line, such as from Town of North Haven GIS, and the Connecticut Environmental Conditions Online (CTECO), and both archival and recent aerial photographs (e.g., UConn MAGIC, CT State Library, Google Earth, etc.).

A REMA soil and wetland scientist conducted a site visit on January 10th, 2021, documenting conditions at the off-site wetland and watercourse corridor, and viewing the subject property from its perimeter. Several illustrative figures (i.e., Figures A to D) and a few annotated photographs taken during the field visit are attached to this report (i.e., Photos 1 to 7).

It should be noted that this application review is preliminary in nature, since in our professional opinion the application is deficient in many respects. Should the applicant attempt correct such deficiencies and revise the submitted plans, REMA will provide its final review.

Following are comments and concerns regarding the application as currently presented in the record:

1. Wetland Delineations: A MMI wetland/soil scientist delineated wetlands off-site and to the north, on a neighboring property. Setting aside at this juncture the fact that permission had not been granted for wetland delineations or for survey by the property owner, REMA reviewed the wetland boundary and found it wanting is several areas.

   Each of the wetland boundary flags were evaluated in the field. To those flags that were found to be substantially correct a green survey ribbon was added (see attached photo). Additional pink and/or pink & blue survey flags were added upgradient at those locations where the wetland delineation was incorrect.

   With one notable exception only a handful of flags were found to be incorrect and additional wetland boundary markers were added, typically 6-8 feet or more above the existing wetland boundary markers. However, in the segment bracketed by wetland boundary markers “wl13a” to “wl16a,” the actual wetland boundary is up to 24 feet further upgradient, and may even extend onto the property that is the subject of the application (see Figure A, attached). This would substantially change the activities within the 50-foot wide upland review area (URA).

   We recommend that MMI’s soil scientist(s) should inspect the wetland boundary with REMA’s soil scientist(s) and jointly perform the wetland delineations at the off-site property, and within the subject property if the wetland boundary extends further upslope. Moreover, we would suggest that any new wetland boundary markers, be surveyed using conventional survey methods.

2. Wetland Characterizations/Inventory: While a *Wetland and Watercourse Delineation Report* was produced by MMI, a report that would characterize the wetlands and

watercourses or provide an inventory of at least flora if not also fauna is missing from the record. Also, a wetland functions & values analysis is absent as well as an analysis of potential short-term and long-term impacts to the regulated resources. Such data and analysis is of paramount importance in analyzing the potential for adverse and or significant impacts to these resources.

At first glance the wetland corridor and its intermittent watercourse immediately adjacent to the site may not seem highly functioning or comprised by diverse wetland communities. However, just the fact that these resources are situated in an area dominated and influenced by the underlying bedrock geology (i.e., New Haven arkose) changes this initial assumption. It is widely understood that wetlands and uplands influenced by red Triassic age materials are more likely to harbor rare and uncommon flora and fauna, leading high functionality.

Moreover, the forested wetland complex immediately downgradient of the subject property is relatively large, diverse, and is headwaters to a perennial stream, tributary to the Mill River.

3. <u>Aquifer Protection Zone</u>: The subject property, as well as its associated wetlands and watercourse are found within a Class AA watershed, and with a Class GAA groundwater classification (see Figures B and C, attached). In fact, the property is within a Level A, Aquifer Protection Area (APA). The State has an "antidegradation policy" (see CGS Section 22a426-8) that gives the highest priority to protecting Class AA and GAA, surface and groundwaters, respectively. While the location of the subject site within an APA is mentioned in the *Wetland and Watercourse Delineation Report* and in the *Drainage Report*, discussion of how the water quality of the receiving waters will be maintained and not degraded in view of that fact, is not put forth with any clarity. As will be explained below, degradation of surface and groundwaters *will* take place, given the current design of the proposed school.

4. <u>Soil Erodibility</u>: The soils associated with the site are classified as being highly erodible (see Figure D, attached). The primary upland soil mapping unit, as seen on the State of Connecticut Soil Survey, is the Yalesville (69) fine sandy loam, on 8 to 15 percent slopes. Many of the soil test pits documented on the site appear to verify the Yalesville soils series, with even finer substrata (i.e., fine silty loam), as well as a "hardpan" which

refers to the typical massive to firm restrictive layer associated with these soils. It should be noted that Yalesville soils, within 30 inches of the surface have a typical silt content of 36% and a clay content of 9.7%. The size range of silt particles is 2 to 50 microns, while for clay particles it is less than 2 microns. The majority of these particles will pass through a standard silt fence and haybale combination.

The combination of slope (8 to 15 percent), the magnitude of proposed earthwork, and the high erodibility of the soils, lead us to conclude that the probability of erosion and sedimentation of the receiving waters is *high*, even if additional measures were included on the plans.

5. <u>Water Quality</u>: The revised plans show two interconnected stormwater management systems. One system conveys and treats stormwater runoff from the parking field to a below-ground detention system, which includes an isolator row for water quality purposes. A second system treats the balance of the site's impervious surfaces by conveying runoff to an above-ground basin, with a dewatering underdrain. The discharges from both these systems are combined to final discharge point, a a rip-rap level-spreader at the far western section of the site, immediately above the off-site wetlands, that is, within 30 feet.

   First, given the overall sensitivity of the receiving surface waters (i.e., Class AA), the below-ground detention system with an isolator row is not efficient enough to protect water quality. While these systems purportedly achieve over 80% TSS (total suspended particles) removal, they are not efficient in attenuating other runoff constituents, especially the soluble forms of nitrogen, phosphorus, and heavy metals. This is the primary reason why CT DEEP's 2004 Stormwater Quality Manual ("the Manual"), does not consider underground systems as "primary treatment systems," as would be, for example, a properly designed and sized above-ground extended detention basin or stormwater wetland. They are considered "secondary systems" since they cannot achieve superior stormwater renovation.

   In addition to the less than stelar runoff renovation efficiency of the below ground detention system, which will release the majority of dissolved constituents such as nitrogen, the final discharge is taking place at the level-spreader, which is situated just downgradient of the proposed septic system.

It is widely understood, that while septic systems are designed to attenuated nitrate-nitrogen to below 10 mg/L, per the CT Health Code, most natural streams and watercourses have nitrate-nitrogen concentrations of less than 0.5 mg/L. In addition to this, above-ground detention basins, if they are property sized and designed, which the one proposed is not as will be explained below, only take out 50 to 60 percent of nitrogen. In the case of the proposed stormwater system discharge, nitrate-nitrogen from the septic system will combine with soluble nitrogen from the below ground detention system, and with nitrogen from the detention basin discharge, and flow either as surface flow, or as shallow groundwater flow downgradient to the wetlands and watercourse. The intervening uplands soils below the discharge do not have enough denitrification capacity or uptake capacity to reduce nitrogen concentrations to background levels, resulting in pollution of the wetland, and more importantly the watercourse, *a significant and adverse impact*.

Because of the proposed underdrain in the detention basin, this basin also does not qualify as a "primary treatment system" per the CT DEEP Manual. The residence time of stormwater in this basin is not sufficient for water renovation mechanisms to work, and because of the inherent permeability of the underdrain system, stormwater will exit relatively quickly. While this design may be sufficient in reducing peak flow rates, it is not sufficient for water quality purposes.

6. <u>Hydrologic Sizing Criteria</u>: In Chapter 7 of the CT DEEP Manual, hydrologic criteria for stormwater practices are presented and discussed. Over the years, most practitioners have focused on the Water Quality Volume (WQV), but often do not pay much attention to other important criteria. The MMI Drainage Report presents WQV calculations but does not discuss other pertinent criteria, such as the Groundwater Recharge Volume (GRV), and the Stream Channel Protection. The GRV is described as:

> "The groundwater recharge criterion is intended to maintain pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff. The objective of the groundwater recharge criterion is to maintain water table levels, stream baseflow, and wetland moisture levels."

The wetland and watercourse downgradient of the proposed development is fed both by surface flows, within its drainage area, and shallow groundwater flows. The latter is rainwater that infiltrates into the ground and reaches the less permeable “hardpan” described in the soil test pit data, which is a massive and firm layer. In areas such as this one where slopes are at least moderate, the infiltrated rainwater runs along the restrictive layer and discharges to the wetlands and watercourse below. That is why the GRV should have been calculated for this site. Furthermore, as discussed below, the proposed stormwater management system will starve the wetland and watercourse from the water that currently receives.

The Stream Channel Protection criterion is described as follows in the Manual:

> “The stream channel protection criterion is intended to protect stream channels from erosion and associated sedimentation in downstream receiving waters and wetlands as a result of urbanization within a watershed. By restricting peak flows from storm events that result in bankfull flow conditions (typically the 2-year storm, which controls the form of the stream channel), damaging effects to the channel from increased runoff due to urbanization can be reduced.”

As can be seen in the attached photos of the wetland immediately downgradient of the discharge, the channel is quite narrow and diffuse, as water from the stream channel in the higher gradient segment to Ridge Road spreads out over the wide and nearly flat wetland. This narrow and shallow channel within the wetland is very susceptible to the increased volumes of water that it will receive from the proposed stormwater management system. One of the two methods prescribed in Manual for protecting against bank erosion and sedimentation states: *“control the 2-year, 24-hour, post-development peak flow rate to 50 percent of the 2 year, 24-hour pre-development level.”*

Based on the MMI *Drainage Report*, the 2-year, post-development peak flow rate is 4.5 cfs (cubic feet per second), while the 2-year, pre-development peak flow rate is 4.7 cfs. Therefore, in order to meet this criterion, the peak flow rate during a 2-year, post-development peak flow must not be higher than 2.35 cfs. If this is not achieved, then there will be *a significant and adverse impact* upon the downgradient regulated resources.

7. Impacts to Wetland Hydrology: Under existing conditions the hydrology of the off-site wetland and watercourse are supported in part by both surface flows and shallow groundwater flows associated with the subject site. This especially true of the wetland fringe along the watercourse, but the ecology of the watercourse itself is supported by discharge from the wetland, during the early portion of the growing season and also during low flow conditions. Under the proposed conditions the portion of the wetland associated with the watercourse upstream of the proposed level spreader, a distance of approximately 220 feet, is in the "shadow" or influence of the proposed detention basin.

   It is estimated that the watershed (and ground-shed) to the wetland under proposed conditions and "upstream" of the level-spreader is at least 2.85 acres, but the great majority of this will be intercepted by the detention basin and its underdrain, and shunted to the level-spreader, thus by-passing the wetland. Even rainwater that would infiltrate into the ground above and to the east of the detention basin, will be intercepted by the underdrain which is well into the ground. The underdrain is at elevation of 153.0 feet, while the existing surface elevation is between roughly 161.0 and 164.0 feet. This will result in dewatering of the wetland fringe, *a significant adverse impact*.

To summarize, based on the review of the submitted revised plans and supporting documentation, and also supported by our inf-field view of the wetlands and watercourses, it is our professional opinion that the proposed development will result in significant adverse impacts to these regulated watercourses.

The primary categories of the significant, adverse, "physical" impacts to wetlands and watercourses are as follows:

A. ***Impacts to the water quality of wetlands and watercourses***, through the design of an ineffective stormwater management system, which does comply with CT DEEP's guidelines found in the Connecticut Stormwater Quality Manual (2004). Impacts are exacerbated by the "stacking" of the septic system above the stormwater management system's discharge.

B. ***Impacts from erosion and sedimentation***, through the discharge of additional volumes of water, generated on impervious surfaces, which will result in the erosion of the downgradient stream through bankfull events, and subsequent sedimentation of wetlands and downgradient aquatic habitats (i.e., stream habitat).

C. ***Impacts to wetland hydrology***, through the diversion of both surface and shallow groundwater flows that feed wetlands to off-site wetlands.

Finally, we should note that the above described adverse impacts to regulated wetlands and watercourses, will occur both in the Town of North Haven (hydrology impacts) and in the Town of Hamden (water quality and erosion/sedimentation impacts). The Town of Hamden Inland Wetlands Commission (IWC), in a letter to the North Haven Inland Wetlands Commission, dated December 11th, 2020, has asked the North Haven IWC to consider a non-disturbance buffer zone to wetlands of 100-feet. The letter cites The Town of Hamden Inland Wetlands & Watercourses Regulations (i.e., 10.2.k), in which factors to be considered in the determination of a sufficient buffer include, but are not limited to, "intensity of adjacent land use" and "soil erodibility." We concur with Hamden IWC's request and would recommend a *minimum* non-disturbance buffer of eighty (80) feet.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

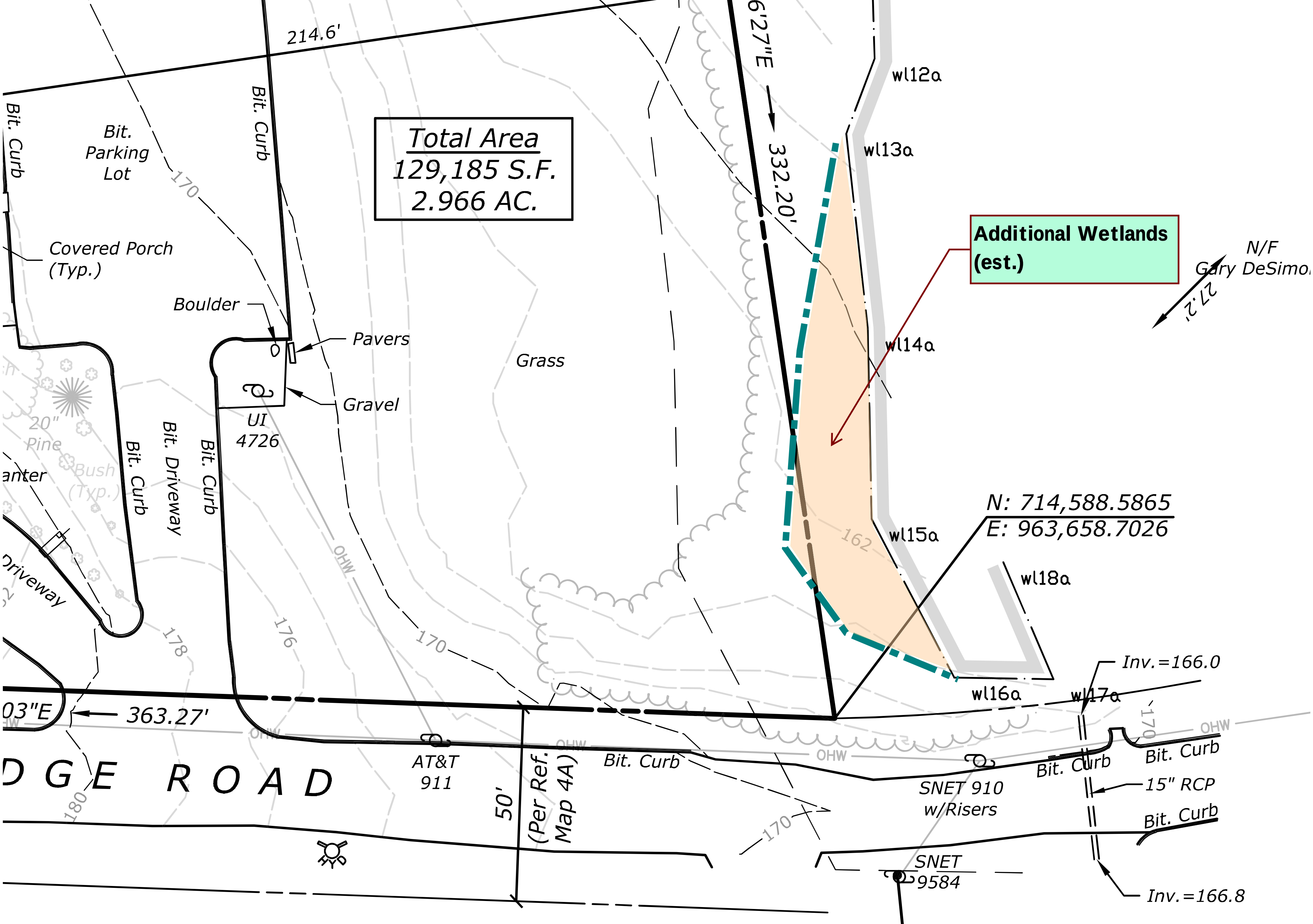
George T. Logan

George T. Logan, MS, PWS, CSE
Professional Wetland Scientist, Registered Soil Scientist
Certified Senior Ecologist (ESA)

Attachments: Figures A through D; Photos 1 to 7

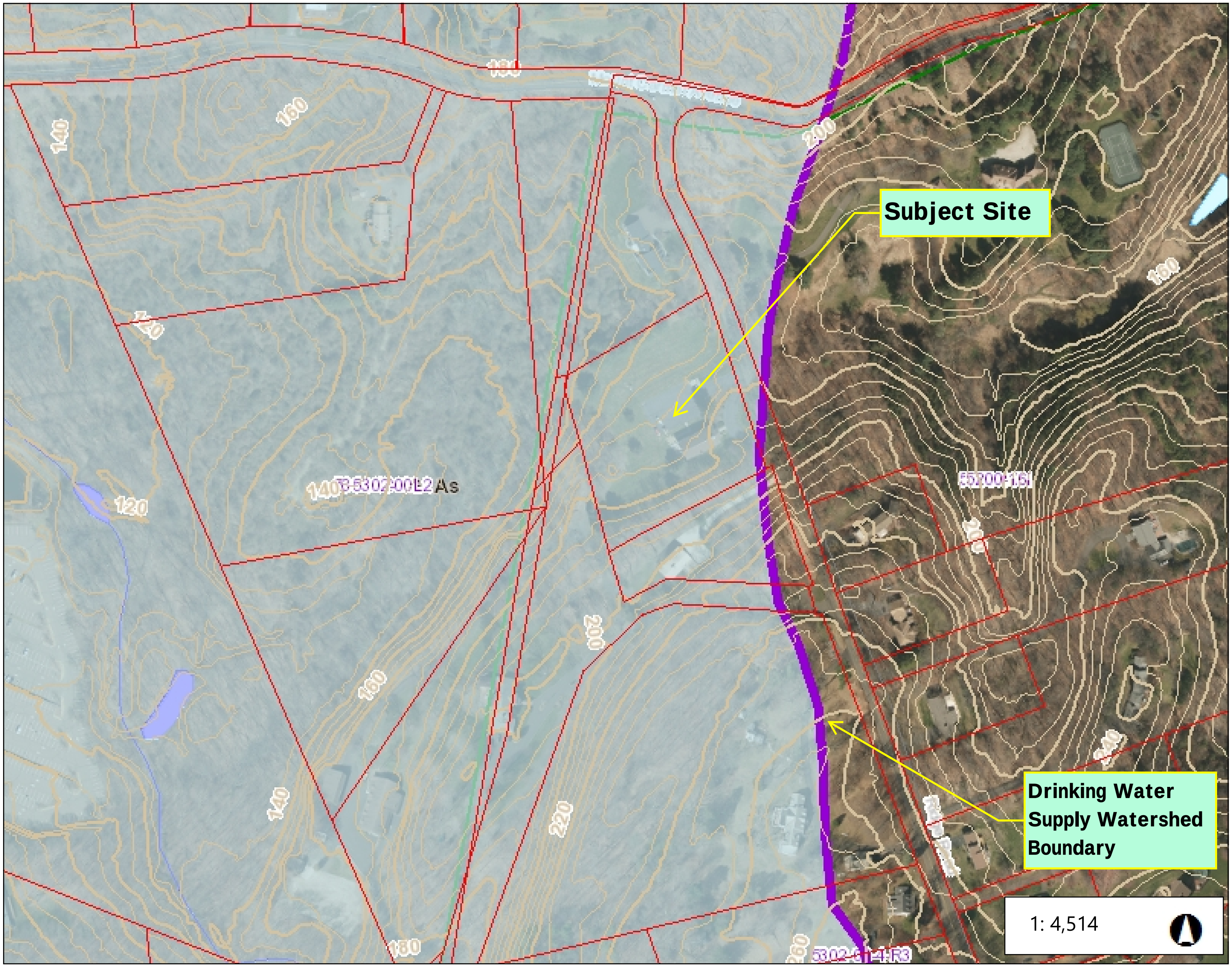
cc: Joan F. Lakin, Chair, Hamden Inland Wetlands Commission (via email to Tom Vocelli)

FIGURE A: Proposed Slate Upper School
5100 Ridge Road, North Haven, CT
(showing probable wetland boundary correction)



CT ECO CT Environmental Conditions Online

FIGURE B: Proposed Slate Upper School, 5100 Ridge Road, N. Haven, CT showing site within Class AA and Class GAA watershed



Legend

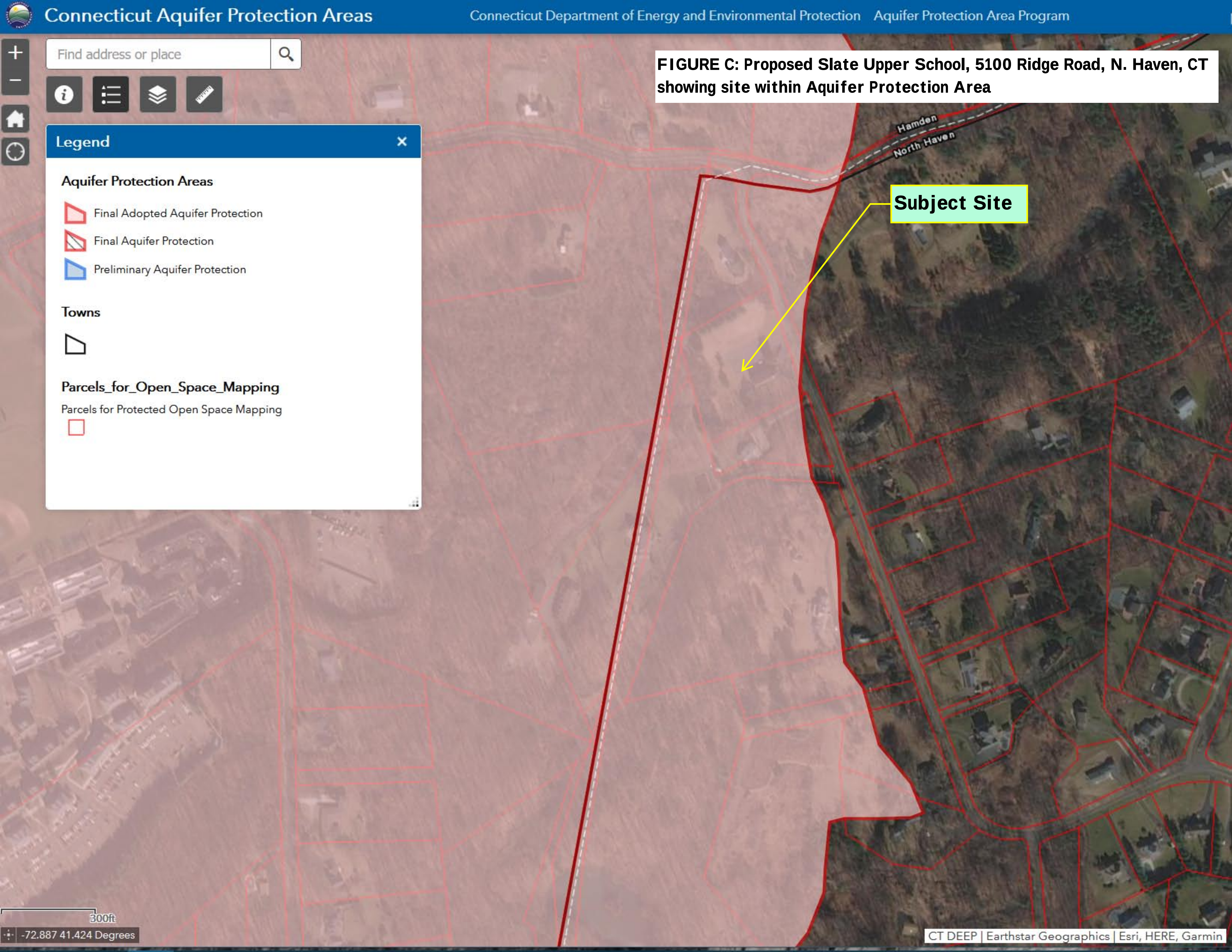
- Parcels for Protected Open Sp
- Local Basin Boundary
  - Major Basin
  - Regional Basin
  - Subregional Basin
  - Local Basin
- Local Drainage Basin Directior
  - Outlet Direction
  - Main Stem Direction
  - Coastal Direction
- Basin Line
  - Major Basin
  - Regional Basin
  - Subregional Basin
  - Local Basin
  - Basin Reach
- Local Drainage Basin Directior
  - Outlet Direction
  - Main Stem Direction
  - Coastal Direction
- Surface Water Quality Line
  - A
  - AA
  - B, B*
  - SA
  - SB

Notes

0.1 0 0.07 0.1 Miles

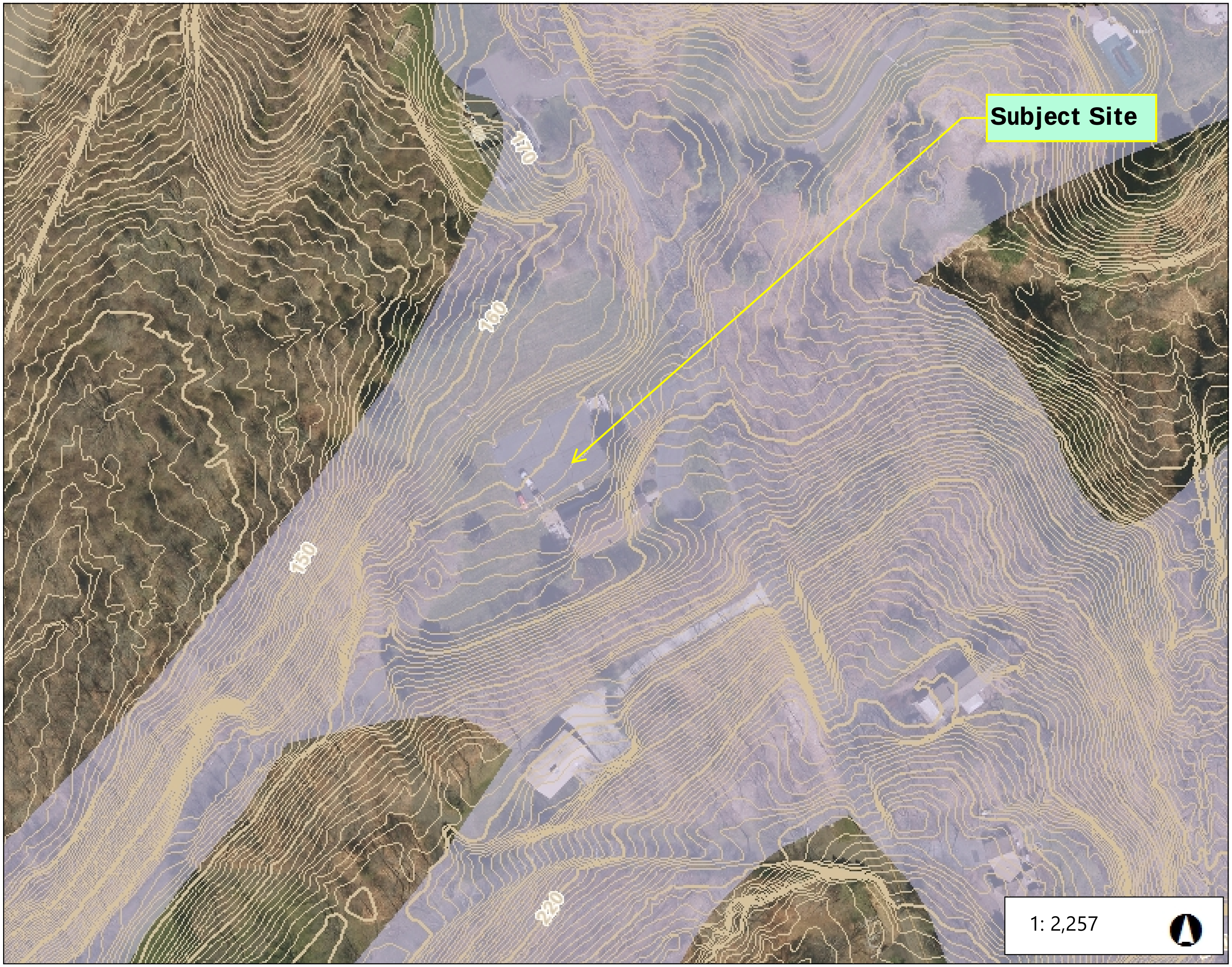
This map is intended for general planning, management, education, and research purposes only. Data shown on this map may not be complete or current. The data shown may have been compiled at different times and at different map scales, which may not match the scale at which the data is shown on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION


Connecticut Aquifer Protection Areas
Connecticut Department of Energy and Environmental Protection
Aquifer Protection Area Program
Find address or place
FIGURE C: Proposed Slate Upper School, 5100 Ridge Road, N. Haven, CT showing site within Aquifer Protection Area
Legend
Aquifer Protection Areas
Final Adopted Aquifer Protection
Final Aquifer Protection
Preliminary Aquifer Protection
Towns
Parcels_for_Open_Space_Mapping
Parcels for Protected Open Space Mapping
Hamden
North Haven
Subject Site
300ft
-72.887 41.424 Degrees
CT DEEP | Earthstar Geographics | Esri, HERE, Garmin

CT ECO CT Environmental Conditions Online

FIGURE D: Proposed Slate Upper School, 5100 Ridge Road, N. Haven, CT
showing site with soils susceptible to erosion



Legend

Erosion Susceptibility Sites
- Minor
- Moderate
- Severe

Erosion Susceptibility
- Most Susceptable to Erosion
- Highly Susceptable to Erosion
- Surficial Materials Susceptable to E
- Soils Susceptable to Erosion

Light Gray Canvas Base

Notes

0.1 0 0.04 0.1 Miles

This map is intended for general planning, management, education, and research purposes only. Data shown on this map may not be complete or current. The data shown may have been compiled at different times and at different map scales, which may not match the scale at which the data is shown on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Slate Upper School, 5100 Ridge Road, North Haven, CT
Photos taken on 1/10/2021, by REMA Ecological Services, LLC

Photo 1: Large discrepancy in wetland delineation; blue flag (existing), pink/blue flag (correction); facing southeasterly.

Photo 2: Small correction in wetland delineation (pink vs. blue flags); along intermittent watercourse; facing northwesterly.

Slate Upper School, 5100 Ridge Road, North Haven, CT
Photos taken on 1/10/2021, by REMA Ecological Services, LLC

Photo 3: Small discrepancy in wetland delineations; facing southeasterly.

Photo 4: Example of alternate wetland delineation flag.

Photo 5: Green flag indicating agreement of wetland delineation flag; facing southerly.

Photo 6: Immediately downgradient broad wetland corridor showing diffuse watercourse channel; facing westerly.

Photo 7: Immediately downgradient forested wetland; facing northerly.

• Soil & Wetland Studies
• Ecology • Application Reviews
• Listed Species Surveys • GPS
• Environmental Planning & Management
• Ecological Restoration & Habitat Mitigation
• Expert Testimony • Permitting

February 23, 2021

VIA E-MAIL

Town of North Haven
Inland Wetlands Commission
Memorial Town Hall, 18 Church Street
North Haven, CT 06473

RE: APPLICATION REVIEW - SUPPLEMENTAL
The Slate Upper School, 5100 Ridge Road
IWC Application No.: 120-06
REMA Job #: 20-2352-NHA12

Dear Chairman Bumsted and Commissioners:

At the request of adjacent property owners, REMA ECOLOGICAL SERVICES ("REMA") has been asked to review the applicant's February 19th, 2021 submission for the above-referenced development proposal, which included revised plans and drainage report (i.e., revision dates: 2/17/22), as well as documents responding to comments made by REMA (1/25/21) and by Loureiro Engineering Associates, Inc. (LEA) (1/25/21).

1.0 Pollutant Loading

Loading of pollutants in stormwater runoff discharged from the above ground basin (Basin 110), and of airborne particulate pollutants will reflect the much higher frequency of trips (135/day)[1] for a school with 125 students plus staff, than would have been generated by the alternative of a small church, or by an alternative of several single family homes. Pollutants will include the entire suite of roadway pollutants, including toxic heavy metals, hydrocarbons

[1] Trip generation rates are from the 8th Edition of the ITE Trip Generation Guide, a standard reference for traffic studies.

including PAHs, phosphorus, and salt. If designed and built per customary engineering practices, pollutant removal efficiency will be that expected for these BMPs, in the range 30-80%, but no more than 30% – 40% for total nitrogen, as seen in the Table below.

Recommended pollutant removal efficiencies, in percent, for constructed ponds. Sources.
TSS=total suspended solids; TP=total phosphorus; PP=particulate phosphorus; DP=dissolved phosphorus; TN=total nitrogen

TSS	TP	PP	DP	TN	Metals	Bacteria	Hydrocarbons
85	50	91	0	30	70	60	80

Note: see "sources" in attached references[2]

The sensitivity of the receiving resource determines whether treatment by the stormwater basin will be sufficient to prevent significant adverse impacts, or whether additional polishing by passage through a wide vegetated buffer is warranted. The applicant failed to inventory, characterize, and assess the sensitivity of the receiving wetland and watercourse. Although constrained by the season, REMA has done so to the extent possible.

In fact, with the recent revision of the stormwater basin outlet and removal of the previous underdrain, this basin is still deficient in its design, and does not fully comply with the guidelines found in CT DEEP's 2004 Stormwater Quality Manual ("the Manual"). Therefore, its efficiency in treating stormwater runoff is diminished. We have attached Chapter 11 of the Manual, in its entirety. This chapter deals with "Stormwater Ponds" which is the closest fit based on the development plans. For instance, according to the "Design Criteria for Stormwater Ponds" (Table 1-P1-1) stormwater ponds should have a vegetated aquatic bench. Vegetation is necessary for the uptake and immobilization of pollutants, including nutrients from stormwater. Unfortunately, not only do the current plans not include an aquatic bench, the proposed seed mixture is incompatible with the expected hydrology of this basin.

Based on nearby soil test pits (i.e., TP-2-20 and TP-3-20) the basin will be excavated down into a "red sandy hardpan" by roughly 5 to 7 feet. With minimal infiltration being possible, a fact attest to by the applicant in his submitted narrative, this will be a wet bottom pond, with a fluctuating water level, depending on the season. Since the pond will not tap into a stable

---

[2] This table is from the State of Minnesota Stormwater Manual:
https://stormwater.pca.state.mn.us/index.php/Information_on_pollutant_removal_by_BMPs#References

water table, growth of vegetation will be quite challenging. Nevertheless, the applicant should have proposed an aquatic bench and emergent plants of wet meadows and shallow marshes.

We note that based on the poor design of the detention basin, which is the primary water quality renovation BMP (best management practice) for the site, it will discharge partially treated runoff to the level spreader which is just a few feet upgradient of the wetland boundary. With respect to nitrogen, for instance, this discharged runoff will combine with nitrogen that will reach the wetland from a poorly designed and inefficient septic system.

Based on computations by LEA, submitted separately, the concentration of nitrogen reaching the wetland boundary will be 33.3 mg/L, which is more than three times what is allowable by the CT Health Code, of 10 mg/L. As will be explained in the following section, this high concentration, augmented by the partially treated discharge from the detention basin, will have result in significant adverse physical impacts to the regulated resources, that is, the downgradient wetlands and watercourses.

2.0 Nitrogen Loading

Roughly 50-60% of nitrogen is not treated by a correctly designed and maintained septic system and exits the system as septic effluent. Given an adequate distance to the receiving wetland or watercourses, and an adequate upgradient watershed, the concentration of nitrogen from a septic system in groundwater, most of which is nitrate-nitrogen, can be brought down to a safe level both from the standpoint of a human health and wetland and watercourse health. This happens (1) by means of dilution, (2) by means of uptake by plants (conversion to foliage and biomass), and (3) by means of conversion to atmospheric nitrogen by denitrifying bacteria. Note that dilution alone is the mechanism required for septic system design. This is because mechanisms 2 and 3 are site specific, depending on local characteristics such as tree cover, and available organic matter as a microbial substrate.

However, multiple carefully designed studies have measured nitrogen uptake in vegetated buffers between septic systems or crop fields, and receiving wetlands or streams. A vegetated, preferably forested, buffer of 80 to 100 feet, has repeatedly been found to remove over 90% of the untreated nitrate in septic effluent, and also excess nitrate from lawns or farm operation. But this is only for septic systems that are property designed in the first place (Sabater et al. 2003, Mayer et al. 2005, Hill et al. 1996).

With larger inputs into a septic system, use of the more fine-tuned and accurate CT DEEP methodology for calculating dilution, used by LEA, is able to predict the concentration of nitrogen reaching the edge of the receiving wetland. This methodology takes into account factors such as soil properties and slopes. Although developed for use in large community septic systems, it can be used with any septic system, even an individual home; REMA confirmed this though discussions with CTDEEP personnel, over a decade ago.

The results of using this methodology for the septic system proposed for the Slate Middle School are of grave concern, both for the wetland resource and human health: a concentration of 33.3 mg/L of nitrogen is predicted at the wetland edge. The human health standard is 10 mg/L; infants suffer "blue baby syndrome" if the water in their formula has a nitrate-nitrogen concentration exceeding 10 mg/L.

The draft USEPA criterion for nitrate + nitrite nitrogen issued in 2000 is 0.31 mg/L; it is based on extensive data sets on streams in our ecoregion.[3] States were given the option of developing their own standards based on local in-state data, but Connecticut is still in the process. An USEPA workshop, with conference proceedings, addressed this issue in April 2013.[4] This USEPA criterion is consistent with more than 30 years of experience by REMA, with stream assessment, accompanied by water testing[5]. The assessed streams with nitrate-N levels less than 1 mg/L, and most often with less than 0.5 mg/L, were the ones without excessive periphyton, and a normal quota of stream macroinvertebrates including pollution sensitive taxa like mayflies (<u>E</u>phemoptera), stoneflies (<u>P</u>lecoptera), and caddisflies (<u>T</u>richoptera), termed EPT taxa. Stream bio-assessments of benthic macroinvertebrates, often conducted by volunteer stream monitors[6] are used as a snapshot of stream health; given diverse and plentiful benthic macroinvertebrates, it can be assumed that nitrate-N levels are low, in the neighborhood of the USEPA criterion of 0.31 mg/l. The calculated 33.3 mg/L by LEA, is a far higher level.

Over the past fifteen years, we (REMA) and many other volunteer stream monitors have been alarmed by the increasing scarcity of lower order streams (i.e., headwater) with diverse benthic

---

[3] USEPA Nutrient Criteria (draft) for EcoRegion 1V, Level 11 Ecoregion 59 (coastal New England)
[4] USEPA Expert Workshop: Nutrient Enrichment Indicators in Stream. September 2014. Office of Water EPA-822-R-14-004 www.epa.gov
[5] Much of this testing has been combined with testing by other wetland and environmental scientists and is accessible at the website of the Connecticut Association of Wetland Scientists (CAWS).
[6] Such a program is adiminstered by the CT DEEP: Riffle Bioassessment by Volunteers (RBV)

macroinvertebrates. Excessive nitrogen loading both from septic systems and from over fertilized lawns is a large part of the problem, though sedimentation and other toxins such as polycyclic hydrocarbons (PAHs) in road runoff also impair streams.

Carpenter et al. (1998) reviewed the effects on surface waters of non-point pollution with phosphorus and nitrogen. Eutrophication, including toxic algal blooms, oxygen stress, proliferation of aquatic invasives, may occur in downgradient ponds, lakes, and reservoirs. Excess nutrients in lakes, estuaries, or slow-moving streams and rivers can lead to an increase in primary productivity that degrades water quality.

An algal bloom, reduces dissolved oxygen (DO) in the water when the algae die and decompose and can cause fish and invertebrates to die. If this cycle happens repeatedly, species may be lost from the lake or waterway. Loss of habitat and eutrophication of the water can kill off plants and macrobenthos (i.e., aquatic organisms) that fish depend on for their habitat and alter the streambed habitat for invertebrate species. Increased turbidity and decreased water clarity, visibility, reduces recreational suitability and also reduces the ability of some fish to see prey or predators.

Elevated nitrate-N levels also impair in-stream watercourse habitats through the following processes. The surfaces of stones and woody debris and crevices between them are an important macroinvertebrate habitat, and multiple taxa graze on the thin coating of diatoms on these rocks. Elevated nitrate-N levels trigger heavy growth of other algae which smothers this habitat, and then depletes oxygen in the water as it decomposes. The rotting algae blacken the rocks. Note that phosphorus is also needed for algal growth, but is usually available in a shallow stream from the sediment on the stream bottom.

Excessive nitrogen also stimulates tall growth of cattails and *Phragmites*, often converting open water habitat into a marsh. Likewise, wetland plant diversity suffers as species that grow well in low-nutrient environments are outcompeted and overshaded by taller, denser reeds and other rank vegetation.

3.0 Water Quality and Macrobenthos Sampling

On February 20th, 2021, REMA investigated the off-site downgradient wetlands and watercourses, located within the Town of Hamden, that would be receiving the excessive nitrogen and other pollutants from the stormwater discharge and from the proposed septic system. We sampled surface water at the downgradient stream (main stem), and conducted a qualitative macroinvertebrate biosurvey. Figure E, attached, shows the approximate stream sampling location (i.e., SS-1), as well as other important features of the downgradient resources.

Stream biosurveys are methods of assessing the quality and sensitivity of a stream, that have used for many decades. Macroinvertebrate biosurveys are conducted by CT DEEP on annual basis any many stream throughout Connecticut, and as mentioned above, CT DEEP also administers a volunteer program (RBV) that collects valuable data on stream health. REMA has been conducting biosurveys, including per CT DEEP requirements and protocols for several decades, and REMA staff have also been specifically trained in benthic biosurveys per USEPA standard methodologies. Attached is a simple, informative, fact sheet that REMA put together many years ago, to introduce stream biosurveys.

Since the surface water sampling at the stream station was conducted on a Saturday, the first opportunity following the submittal by the applicant, the analytical lab (Phoenix Environmental Laboratories) received the sample on Monday morning (2/22/21). Even with an "expedite" the results will not be available until after this review letter is submitted. We will supply the results as soon as they are made available, and further analyze them as deemed necessary.

We should note, however, that REMA observed an active seep within the downgradient wetland, which is likely to receive all or some of the discharge from the proposed stormwater management system (see Photos 3, 4 and 5, attached). This seep appears to be active for a prolonged period of time during a normal precipitation year, because a small stream channel has formed which feeds the main stream (see Figure E, attached; Photo 5). It is well understood that headwater seeps and streams are considerably more sensitive to water quality degradation, since, among many factors, they do not have a high dilution capacity as would a stream with a larger watershed.

A qualitative biosurvey at the main stem of the stream (see Figure E, attached), revealed an abundance of macroinvertebrates that are considered pollution sensitive and are typically only found in abundance in clean, unimpaired headwater streams, such as the one associated with the site. Two taxa, caddisflies and stoneflies were in abundance, represented by two families: Perlodidae (stoneflies) and Glossosomtidae (caddisflies) (see attached photos). Both of these taxa were found utilizing the hard substrate (i.e., rocks, cobbles) within the stream. These two families have very low pollution tolerance values.

Tolerance is a listing of tolerance values for each taxon used in the calculation of numerous well tested indices foremost among which are the Hilsenhoff species-level Biotic Index (HBI) and the Family Biotic Index. Tolerance values range from 0 for organisms very intolerant of organic wastes, including nutrients, to 10 for organisms very tolerant of organic wastes. Most of these values were taken from Hilsenhoff (1987) but were modified using latter data from Bode *et al* (1996 and 2002). For species not inluded in Hilsenhoff's listing, such as oligochaeta, values were assigned based on water quality data from the Stream Biomonitoring Unit surveys of New York and from other literature references. Values taken from survey data were assigned by taking the mean of the tolerance values of other species in the sample. According published values the tolerance values for both of the taxa that were abundant at the stream section that was sampled were: **1**. This indicates very good water quality an unimpaired stream.

In conclusion, it is our professional opinion that the excessive nitrogen released by an inadequately designed septic system, in combination with the release of excessive nitrogen and other pollutants from an ineffective stormwater management system, will result in pollution and impairment of the receiving wetlands and watercourses, through destruction of the stream habitat upon which aquatic biota rely, algal blooms, and the growth of rank vegetation in wetlands that will reduce the diversity of plants and the fauna that rely upon them.

4.0 Hydrologic Sizing Criteria

In their February 17th, 2021 response to our original review letter (1/25/21), MMI stated that since they were able to reduce the effective impervious surfaces to less than 1 acre, the Stream Channel Protection criterion was no longer applicable. We note the following: (1) there is no call outs for the "green roofs" that were included in the design, no details, and no discussion on how they work, (2) with the discovery of a wetland seep and a headwater feeder stream (see above section and annotated photographs), even less than an acre of impervious surfaces must comply with the channel protection criterion, and (3) while less than one acre is claimed, the impervious surfaces that are conveyed to the level spreader total 1.21 acres, based on the applicant's most recently revised drainage report. Therefore, without compliance with the Stream Channel Protection criterion as seen in the CT DEEP Manual, and as presented in our previous review report, there will be a significant and adverse impact upon the downgradient regulated resources, specifically through the erosion of stream banks, and sedimentation of aquatic habitat within the streams.

5.0 Conclusion

We stand by our previous stated primary categories of *significant, adverse, physical impacts to wetland and watercourses*, as stated in our previous review letter (1/25/2021). While the applicant, with the recent revisions, attempted to rectify some of the issues, it was not done successfully. With the recent baseline data collected by REMA, something that the applicant failed to do, and the calculations by LEA regarding the ineffectiveness of the septic system to treat nitrogen, we can even more confidently say that the impairment of the water quality of the downgradient regulated wetlands and watercourses is fully expected, and should be avoided by proposing alternatives that would generate much less pollution, and provide a generous permanent buffer to the regulated resources. As we have stated before this buffer should be a minimum 80-foot wide non-disturbance buffer.

We thank you for the opportunity to comment on the application before the Commission.

Respectfully submitted,

REMA ECOLOGICAL SERVICES, LLC

George T. Logan

George T. Logan, MS, PWS, CSE
Professional Wetland Scientist, Registered Soil Scientist
Certified Senior Ecologist (ESA)

Attachments: Figure E, Photos 1 to 6, Stream Biosurveys, Chapter 11 (2004 Stormwater Quality Manual

cc: Joan F. Lakin, Chair, Hamden Inland Wetlands Commission (via email to Tom Vocelli)

REFERENCES:

Bode, R.W., Novak, M.A., and Abele, L.E. 1996. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYS Department of Environmental Conservation, Albany, NY. 89p.

Bode, R.W., Novak, M.A., Abele, L.E., Heitzman, D.L., and Smith, A.J. 2002. Quality Assurance Work Plan for Biological Stream Monitoring in New York State. NYS Department of Environmental Conservation, Albany, NY. 115p.

Carpenter, S. R., Caraco, N. F., Correll, D. L., Howarth, R. W., Sharpley, A. N., & Smith, V. H. (1998). Nonpoint pollution of surface waters with phosphorus and nitrogen. *Ecological Applications, 8*(3), 559-568. doi:10.2307/2641247

Hanson, G. C., Groffman, P. M., & Gold, A. J. (1994). Symptoms of nitrogen saturation in a riparian wetland. *Ecological Applications, 45*(4), 750-756.

Hilsenhoff, W.L. 1987. An improved biotic index of organic stream pollution. Great Lakes Entomol. 20:31-39.

Hilsenhoff, W. L. 1988. Rapid field assessment of organic pollution with a family-level biotic index. J. N. Am. Benthol. Soc. 7(1):65-68.

Hill, A. R. (1996). Nitrate removal in stream riparian zones. *Journal of Environmental Quality, 25*, 743-755.

Lowrance, R., Altier, L. S., Newbold, J. D., Schnabel, R. R., Groffman, P., M., Denver, J. M.,…Todd, A. H. (1997). *Environmental Management, 21*(5), 687-712.

Mayer, P. M., Reynolds, S. K., Canfield, T. J., & McCutchen, M. D. (2005). *Riparian buffer width, vegetative cover, and nitrogen removal effectiveness: A review of current science and regulations*. Washington, D. C.: U. S. Environmental Protection Agency. EPA/600/R-05/118

Mayer, P. M., Reynolds, S. K., McCutchen, M. D., & Canfield, T. J. (2007). Meta-analysis of nitrogen removal in riparian buffers. *Journal of Environmental Quality, 36*, 1172-1180. doi: 10.2134/jeq2006.0462

Plafkin, J.L., Barbour, M.T., Porter, K.D., Gross, S.K., and Hughes, R.M.. 1989. Rapid Bioassessment Protocols for use in Streams and Rivers: Benthic Macroinvertebrates and Fish. U.S. Environmental Protection Agency. EPA 440/4-89/001. 8 chapters, Appendices A-D.

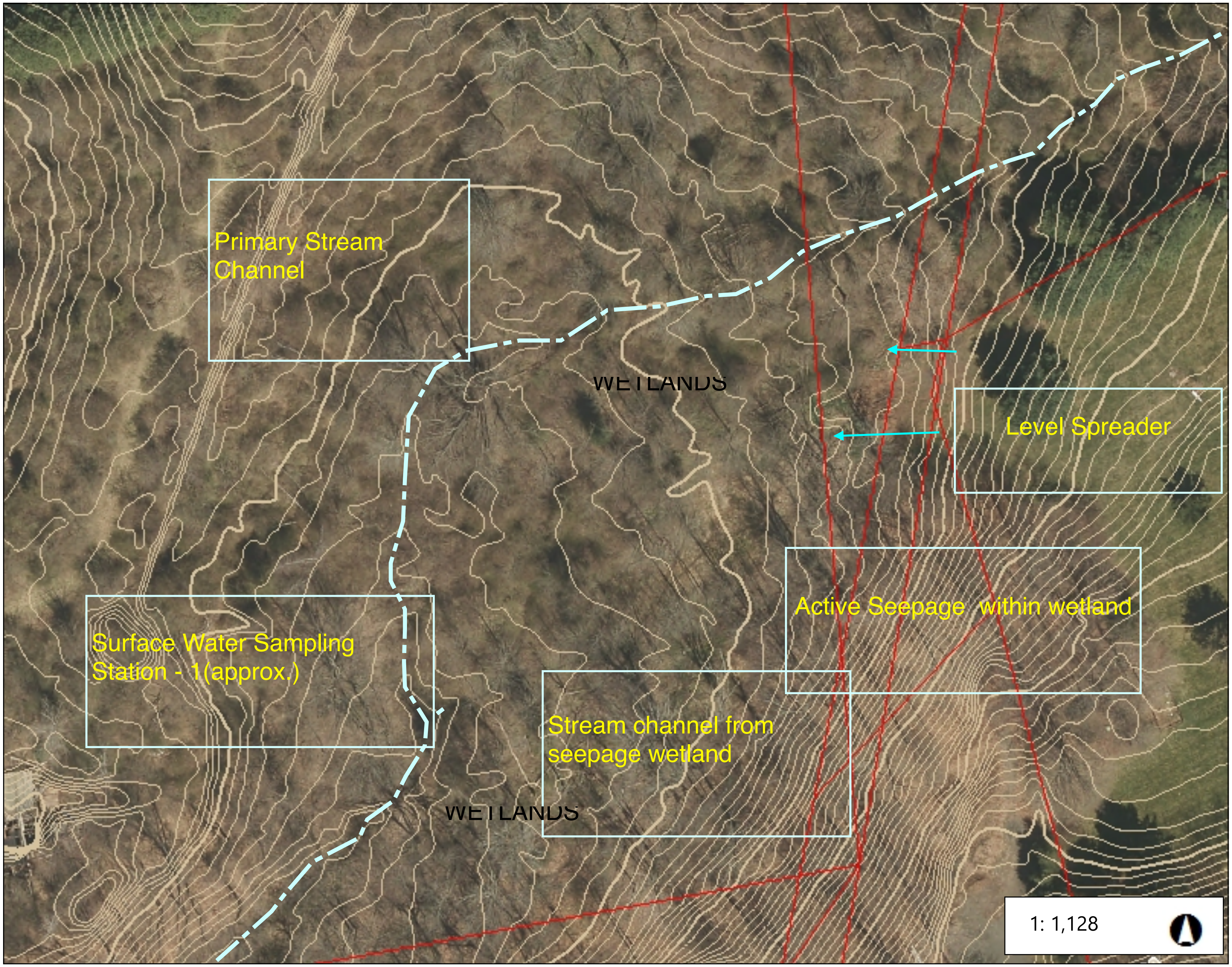
Sabater, S., Butturini, A., Clement, J., Burt, T, Dowrick, D, Hefting, M, Maître, V., Pinay, G.,…Sabater, F. (2003). Nitrogen removal by riparian buffers along a European climatic gradient: patterns and factors of variation. *Ecosystems, 6*, 20-30. doi: 10.1007/s10021-002-0183-8

"Sources" for pollutant removal efficiencies of stormwater management practices discussed in this report:

- ASCE/EPA Database. International Stormwater Best Management Practices (BMP) Database.
- ASCE/EPA 2000. Determining Urban Stormwater Best Management Practice Removal Efficiencies. EPA Assistance Agreement Number CX 824555-01-Task 3.4.
- Geosyntec Consultants and Wright Water Engineers. 2012. Urban Stormwater BMP Performance Monitoring. Prepared under Support from U.S. Environmental Protection Agency, Water Environment Research Foundation, Federal Highway Administration, Environmental and Water Resource Institute of the American Society of Civil Engineers.
- Langer, R. 1997. *1997 Twin Cities Water Quality Initiative Grant Report*. Ramsey-Washington Metro Watershed District.
- Schueler, T. 1996. Irreducible Pollutant Concentrations Discharged from Stormwater Practices. Article 65: Technical Note #75 from Watershed Protection Techniques 2(2):369-372. Center for Watershed Protection.
- Strecker, E, and M. Quigley. 1999. Development of Performance Measures, Task 3.a – Technical Memorandum: Determining Urban Stormwater Best Management Practice (BMP) Removal Efficiencies. Prepared by URS Greiner Woodward Clyde, Urban Drainage and Flood Control District, Urban Water Resources Research Council (UWRRC) of ASCE, and Office of Water, US Environmental Protection Agency.
- SWAMP (Stormwater Assessment Monitoring and Performance Program) 2005. Synthesis of Monitoring Studies Conducted Under the Stormwater Assessment Monitoring and Performance Program. Prepared for Great Lakes Sustainability Fund of the Government of Canada, Toronto and Region Conservation Authority, Municipal Engineers Association of Ontario, and Ontario Ministry of the Environment.
- Tornes, L. 2005. Effects of Rain Gardens on the Quality of Water in the Minneapolis-St. Paul Metropolitan Area of Minnesota, 2002-04. U.S. Geological Survey Scientific Investigations Report 2005-5189.
- Yetka, L. and K. Leuthold. 2005. *Burnsville Rainwater Garden Retrofit Project*. Presentation at 2005 Annual Minnesota Erosion Control Association Conference.
- Weiss, P.T., J.S. Gulliver, and A.J. Erickson. 2005. The Cost and Effectiveness of Stormwater Management Practices. Minnesota Department of Transportation, St. Paul, MN.
- Winer, R. 2000. National Pollutant Removal Performance Database for Stormwater Treatment Practices, 2nd Edition. Center for Watershed Protection, for EPA Office of Science and Technology

CT Environmental Conditions Online

showing prop. stormwater discharge, streams, seepage wetland, and surface water sampling station



Legend

Parcels for Protected Open Sp

Light Gray Canvas Base

Notes

0.0 0 0.02 0.0 Miles

THIS MAP IS NOT TO BE USED FOR NAVIGATION

This map is intended for general planning, management, education, and research purposes only. Data shown on this map may not be complete or current. The data shown may have been compiled at different times and at different map scales, which may not match the scale at which the data is shown on this map.

Chapter 7
Hydrologic Sizing Criteria for Stormwater Treatment Practices

Volume II: Design

Chapter 7 Hydrologic Sizing Criteria for Stormwater Treatment Practices

7.1 Introduction 7-2

7.2 Criteria Applicability 7-2

7.3 Criteria Summary 7-4

7.4 Pollutant Reduction 7-4

- 7.4.1 Water Quality Volume (WQV) 7-4
- 7.4.2 Water Quality Flow (WQF) 7-5

7.5 Groundwater Recharge and Runoff Volume Reduction 7-5

- 7.5.1 Groundwater Recharge Volume (GRV) 7-6
- 7.5.2 Runoff Capture Volume (RCV) 7-7

7.6 Peak Flow Control 7-8

- 7.6.1 Stream Channel Protection 7-8
- 7.6.2 Conveyance Protection 7-9
- 7.6.3 Peak Runoff Attenuation 7-9
- 7.6.4 Emergency Outlet Sizing 7-10
- 7.6.5 Downstream Analysis 7-10

7.7 Sizing Example 7-10

7.1 Introduction

This chapter presents a recommended approach for sizing stormwater treatment practices in the State of Connecticut. Although the primary focus of this Manual is on stormwater quality, the management of stormwater quantity is an important related concern. Therefore, the sizing criteria in this chapter are designed to achieve both water quality and quantity control objectives. The recommended sizing criteria have been adapted from the Center for Watershed Protection's Unified Sizing Criteria, which is one of the more comprehensive approaches for sizing stormwater treatment practices developed to date. This approach has been implemented in several other states including Maryland, New York, Vermont, and Georgia.

The sizing approach described in this chapter is intended to manage the full spectrum of storm flows and their associated water quality and quantity impacts. These range from small, frequent storms that are responsible for a majority of the annual runoff volume and pollutant loads to large, infrequent events which are responsible for nuisance and catastrophic flooding. Stormwater treatment practices should be designed to accomplish the following primary objectives:

- *Pollutant reduction*
- *Runoff volume reduction and groundwater recharge*
- *Stream channel protection and peak flow control*

The following sections of this chapter describe criteria and methods for sizing stormwater treatment practices to meet these objectives. These criteria are intended to be consistent with local subdivision and planning/zoning ordinances of most municipalities throughout the state, particularly regarding peak flow control requirements. Some differences may exist between the criteria presented in this chapter and local requirements. Local requirements should be consulted in addition to these criteria. However, the criteria presented in this chapter are recommended where local regulations are less stringent.

7.2 Criteria Applicability

The design criteria presented in this chapter are generally applicable to the following types of new development and redevelopment projects, including phased developments:

- *Any development resulting in the disturbance of greater than or equal to one acre of land*
- *Residential development consisting of 5 or more dwelling units*
- *Residential development consisting of fewer than 5 dwelling units involving construction of a new road or reconstruction of an existing road*
- *Residential development consisting of fewer than 5 dwelling units where imperviousness of the site after construction exceeds 30 percent*
- *Stormwater discharge to wetlands/watercourses*
- *New stormwater discharges located less than 500 feet from tidal wetlands*
- *Land uses or activities with potential for higher pollutant loadings (see **Table 7-5**), excluding the groundwater recharge criterion*
- *Industrial and commercial development projects which result in 10,000 sq. ft. or greater of impervious surface*
- *New highway, road, and street construction*
- *Modifications to existing storm drainage systems*

These and other types of projects not listed above, such as single family residential development, are encouraged to incorporate alternative site design, low impact development practices, and source controls to reduce imperviousness, runoff volumes, and stormwater pollutant sources.

Table 7-1 Summary of Stormwater Treatment Practice Sizing Criteria

Sizing Criteria	Description	Post-Development Storm Magnitude
Pollutant Reduction	***Water Quality Volume (WQV)*** Volume of runoff generated by one inch of rainfall on the site WQV = (1")(R)(A)/12 WQV = water quality volume (ac-ft) R = volumetric runoff coefficient = 0.05+0.009(I) I = percent impervious cover A = site area in acres ***Water Quality Flow (WQF)*** Peak flow associated with the water quality volume calculated using the NRCS Graphical Peak Discharge Method	First one inch of rainfall
Groundwater Recharge and Runoff Volume Reduction	***Groundwater Recharge Volume (GRV)*** Maintain pre-development annual groundwater recharge volume to the maximum extent practicable through the use of infiltration measures	Not applicable
	Runoff Capture Volume (RCV) Retain on-site the volume of runoff generated by one inch of rainfall for new stormwater discharges located within 500 feet of tidal wetlands RCV = (1")(R)(A)/12 RCV = runoff capture volume (ac-ft) R = volumetric runoff coefficient = 0.05+0.009(I) A = site area in acres	First one inch of rainfall
Peak Flow Control	***Stream Channel Protection*** Control the 2-yr, 24-hour post-development peak flow rate to 50 percent of the 2-yr, 24-hr pre-development level or to the 1-yr, 24-hr pre-development level ("Two-Year Over-Control").	2-year, 24-hour rainfall
	Conveyance Protection Design the conveyance system leading to, from, and through stormwater management facilities based on the 10-year, 24-hour storm.	10-year, 24-hour rainfall
	Peak Runoff Attenuation Control the post-development peak discharge rates from the 10-, 25-, and 100-year storms to the corresponding pre-development peak discharge rates, as required by the local review authority.	10-, 25-, and 100-year 24-hour rainfall
	Emergency Outlet Sizing Size the emergency outlet to safely pass the post-development peak runoff from, at a minimum, the 100-year storm in a controlled manner without eroding the outlet works and downstream drainages.	100-year, 24-hour rainfall

Consult local regulations for additional criteria. The above criteria are recommended where local regulations are less stringent.

Some of the sizing criteria presented in this chapter may not be practical to meet due to space limitations, soil conditions, and other site constraints which are common in redevelopment or retrofit applications. Treatment practices sized for smaller treatment volumes/flows or exemptions from certain criteria may be appropriate in these situations, at the discretion of the review authority. Conditions where the recommended sizing criteria may not be applicable are identified in the following sections.

7.3 Criteria Summary

Table 7-1 summarizes the hydrologic sizing criteria for stormwater treatment practices in Connecticut. As indicated in **Table 7-1**, the sizing criteria are based on stormwater runoff generated by 24-hour duration storms of various return frequencies (i.e., design storms). **Table 7-2** lists 24-hour design rainfall depths for each county in Connecticut. The rationale for and application of these criteria are described in the following sections.

Table 7-2
Design Rainfall Amounts By County

	24-Hour Rainfall Amount (inches)				
County	**1-yr**	**2-yr**	**10-yr**	**25-yr**	**100-yr**
Fairfield	2.7	3.3	5.0	5.7	7.2
Hartford	2.6	3.2	4.7	5.5	6.9
Litchfield	2.6	3.2	4.7	5.5	7.0
Middlesex	2.7	3.3	5.0	5.6	7.1
New Haven	2.7	3.3	5.0	5.6	7.1
New London	2.7	3.4	5.0	5.7	7.1
Tolland	2.6	3.2	4.8	5.5	6.9
Windham	2.6	3.2	4.8	5.5	6.9

Source: TP-40, Department of Commerce, Weather Bureau, May 1961; NWS Hydro-35, Department of Commerce, National Weather Service, June 1977.

7.4 Pollutant Reduction

The pollutant reduction criterion is designed to improve the water quality of stormwater discharges by treating a prescribed water quality volume or associated peak flow, referred to as the water quality flow. Most treatment practices described in this Manual use a volume-based sizing criterion. The exceptions are grass drainage channels, proprietary stormwater treatment devices, and flow diversion structures, where a peak flow rate is utilized.

7.4.1 Water Quality Volume (WQV)

Description

The water quality volume (WQV) is the amount of stormwater runoff from any given storm that should be captured and treated in order to remove a majority of stormwater pollutants on an average annual basis. The recommended WQV, which results in the capture and treatment of the entire runoff volume for 90 percent of the average annual storm events, is equivalent to the runoff associated with the first one-inch of rainfall. The WQV is calculated using the following equation:

$$WQV = \frac{(1")(R)(A)}{12}$$

where:
WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

- *The volumetric runoff coefficient R can also be determined from commonly available tabulated values for various land use, vegetative cover, soil, and ground slope conditions. However, the use of the above equation is recommended since it is directly related to the amount of impervious cover at a site, thereby providing incentive to reduce site imperviousness and the required runoff treatment volume. Reducing impervious cover using the site planning and design techniques described in Chapter Four can significantly reduce the WQV.*
- *Impervious cover should be measured from the site plan and includes all impermeable surfaces that are directly connected to the stormwater treatment practice such as paved and gravel roads, rooftops, driveways, parking lots, sidewalks, pools, patios and decks. In the absence of site-specific information or for large residential developments, impervious cover may be estimated based on average impervious coverage values for various parcel sizes listed in **Table 7-3**. The values shown in **Table 7-3** were derived from research by the University of Connecticut, Cooperative Extension System NEMO Project (Prisloe et al.,).*
- *The WQV should be treated by an acceptable stormwater treatment practice or group of practices described in this Manual. The WQV should be used for the design of the stormwater treatment practices described in this Manual, except grass drainage channels and proprietary stormwater treatment devices (e.g., hydrodynamic separators, catch basin inserts, and media filters), which should be designed based on the water quality flow (WQF).*

Table 7-3 Residential Land Use Impervious Cover	
Parcel Size (acres)	**Average Percent Impervious Cover**
<1/8	39
1/8 to 1/4	28
1/4 to 1/2	21
1/2 to 3/4	16
3/4 to 1	14
1 to 1 1/2	10
1 1/2 to 2	9
>2	8

Rationale

The above approach is similar to water quality sizing criteria that have been adopted elsewhere in the United States for the design of stormwater treatment practices. These criteria are intended to remove the majority of pollutants in stormwater runoff at a reasonable cost by capturing and treating runoff from small, frequent storm events that account for a majority of the annual pollutant load, while bypassing larger, infrequent storm events that account for a small percentage of the annual pollutant load. This approach is based on the "first flush" concept, which assumes that the majority of pollutants in urban stormwater runoff are contained in the first half-inch to one-inch of runoff primarily due to pollutant wash-off during the first portion of a storm event. Early studies in Florida determined that the first flush generally carries 90 percent of the pollution from a storm (Novotny, 1995). As a result, treatment of the first half-inch of runoff was adopted as a water quality volume sizing criterion requirement throughout much of the United States. More recent research has shown that pollutant removal achieved using the half-inch rule drops off considerably as site imperviousness increases.

A number of alternative water quality sizing methods were developed to achieve higher pollutant removals for a wider range of site imperviousness. One of the more common methods is known as the "90 Percent Rule", in which the water quality volume is equal to the storage required to capture and treat 90 percent of the annual runoff events (approximately 90 percent of the annual runoff pollutant load) based on analysis of historical precipitation records. The specific rainfall event captured is the storm event that is less than or equal to 90 percent of all 24-hour storms on an average annual basis. In the northeastern U.S., the 90 percent rainfall event is equal to approximately one inch, which is consistent with the recommended WQV sizing criteria for Connecticut.

7.4.2 Water Quality Flow (WQF)

Description

The water quality flow (WQF) is the peak flow rate associated with the water quality design storm or WQV. Although most of the stormwater treatment practices in this Manual should be sized based on WQV, some treatment practices such as grass drainage channels and proprietary treatment devices (designed to treat higher flow rates, thereby requiring less water quality storage volume) are more appropriately designed based on peak flow rate. In this approach, a stormwater treatment facility must have a flow rate capacity equal to or greater than the WQF in order to treat the entire water quality volume (Adams, 1998). In addition, flow diversion structures for off-line stormwater treatment practices can also be designed to bypass flows greater than the WQF.

The WQF should be calculated using the WQV described above and the NRCS, TR-55 Graphical Peak Discharge Method. The procedure is based on the approach described in Claytor and Schueler, 1996 and is summarized in **Appendix B**. Design guidance for flow diversion structures is also found in **Appendix B**.

Rationale

The use of the NRCS, TR-55 Graphical Peak Discharge Method in conjunction with the water quality volume for computing the peak flow associated with the water quality design storm is preferable to both traditional SCS Methods and the Rational Equation, both of which have been widely used for peak runoff calculations and drainage design. The traditional SCS TR-55 methods are valuable for estimating peak discharge rates for large storms (i.e., greater than 2 inches), but can significantly underestimate runoff from small storm events (Claytor and Schueler, 1996). Similarly, the Rational Equation may be appropriate for estimating peak flows for small urbanized drainage areas with short times of concentration, but does not estimate runoff volume and is based on many restrictive assumptions regarding the intensity, duration, and aerial coverage of precipitation. The Rational Equation is highly sensitive to the time of concentration and rainfall intensity, and therefore should only be used with reliable intensity, duration, frequency (IDF) tables or curves for the storm and region of interest (Claytor and Schueler, 1996).

7.5 Groundwater Recharge and Runoff Volume Reduction

This criterion is designed to reduce stormwater runoff volumes and maintain groundwater recharge rates to pre-development levels. The criterion includes two components: groundwater recharge and runoff capture, which are described below.

7.5.1 Groundwater Recharge Volume (GRV)

Description

The groundwater recharge criterion is intended to maintain pre-development annual groundwater recharge volumes by capturing and infiltrating stormwater runoff. The objective of the groundwater recharge criterion is to maintain water table levels, stream baseflow, and wetland moisture levels. Maintaining pre-development groundwater recharge conditions can also reduce the volume requirements dictated by the other sizing criteria (i.e., water quality, channel protection, and peak flow control) and the overall size and cost of stormwater treatment practices.

The groundwater recharge volume (GRV) is the post-development design recharge volume (i.e., on a storm event basis) required to minimize the loss of annual pre-development groundwater recharge. The GRV is determined as a function of annual pre-development recharge for site-specific soils or surficial materials, average annual rainfall volume, and amount of impervious cover on a site. Several approaches can be used to calculate the GRV:

- ***Hydrologic Soil Group Approach:*** *This method was first developed and adopted by the state of Massachusetts, and has since been implemented in several other states including Maryland and Vermont. This approach involves determining the average annual pre-development recharge volume at a site based on the existing site hydrologic soil groups (HSG) as defined by the United States Natural Resources Conservation Service (NRCS) County Soil Surveys (MADEP, 1997). Based on this approach, the GRV can be calculated as the depth of runoff to be recharged, multiplied by the area of impervious cover, as shown below:*

$$GRV = \frac{(D)(A)(I)}{12}$$

where: GRV = groundwater recharge volume (ac-ft)
D = depth of runoff to be recharged (inches), see **Table 7-4**
A = site area (acres)
I = post-development site imperviousness (decimal, not percent) for new development projects or the net increase in site imperviousness for re-development projects

Table 7-4
Groundwater Recharge Depth

NRCS Hydrologic Soil Group	Average Annual Recharge	Groundwater Recharge Depth (D)
A	18 inches/year	0.4 inches
B	12 inches/year	0.25 inches
C	6 inches/year	0.10 inches
D	3 inches/year	0 inches (waived)

Source: MADEP, 1997.
NRCS – Natural Resources Conservation Service

Where more than one hydrologic soil group is present on a site, a composite or weighted recharge value should be calculated based upon the relative area of each soil group. The GRV should be infiltrated in the most permeable soil group available on the site.

- ***USGS Surficial Materials Approach:*** *This approach is similar to the above hydrologic soil group method, except the pre-development average annual recharge quantities and recharge depths are based on the predominant surficial materials classifications on the site (coarse-grained stratified drift versus glacial till and bedrock) as determined from U.S. Geological Survey (USGS) mapping. In areas underlain by coarse-grained stratified drift, average annual recharge is approximately three times greater than from till and bedrock areas. Areas of coarse-grained stratified drift and till/bedrock can be obtained from USGS 7.5-minute topographic maps of 1:24,000 scale, available from the USGS and DEP. Estimates of average annual recharge values for these materials are available from the Connecticut Water Resources Inventory Bulletins prepared jointly by the USGS and DEP for the major drainage basins throughout the state.*

- ***Other Methods:*** *Pre-development recharge values and the required GRV can also be determined using the results of on-site soil evaluations or other geologic information provided that information sources and methods are clearly documented.*

Meeting the recharge requirement can be accomplished through the use of primary treatment practices (infiltration, bioretention, filtration, and swales), secondary treatment practices (drywells, permeable pavement, level spreaders), and non-structural site design techniques such as disconnection of rooftop runoff and grading. Stormwater ponds, wetlands, and sediment forebays generally are not suitable for groundwater recharge since they are either designed with impermeable bottoms or have significantly reduced permeability due to accumulation of fine sediment. When designing infiltration practices, a factor of safety should be used to account for potential compaction of soils by construction equipment, which can significantly reduce soil infiltration capacity and groundwater recharge. See the design sections of this Manual for guidance on the design and construction of infiltration practices to reduce this potential.

The GRV is considered as part of the total water quality volume (WQV) and therefore can be subtracted from the WQV, provided that the proposed infiltration measures are capable of infiltrating the required recharge volume. Reducing the WQV (and consequently the size and cost of stormwater treatment) is an additional incentive for meeting the groundwater recharge criterion. Additionally, both WQV and GRV are a function of site imperviousness, providing further incentive to minimize site impervious cover.

There are several instances where the groundwater recharge criterion should be waived to protect against contamination of drinking water supplies and mobilization of existing subsurface contamination. Infiltration of stormwater is not recommended under the following site conditions:

- ***Land Uses or Activities with Potential for Higher Pollutant Loads:*** *Infiltration of stormwater from these land uses or activities (**Table 7-5**), also referred to as stormwater "hotspots," can contaminate public and private groundwater supplies. Infiltration of stormwater from these land uses or activities may be allowed by the review authority with appropriate pretreatment. Pretreatment could consist of one or a combination of the primary or secondary treatment practices described in this Manual provided that the treatment practice is designed to remove the stormwater contaminants of concern.*

- ***Subsurface Contamination:*** *Infiltration of stormwater in areas with soil or groundwater contamination such as brownfield sites and urban redevelopment areas can mobilize contaminants.*

- ***Groundwater Supply Areas:*** *Infiltration of stormwater can potentially contaminate groundwater drinking water supplies in public drinking water aquifer recharge areas and wellhead protection areas.*

Rationale

The objective of the groundwater recharge criterion is to mimic the average annual recharge rate for pre-development site conditions. The recommended approach for calculating the GRV (i.e., the required stormwater infiltration volume) is a function of post-development site imperviousness and the prevailing surface permeability and infiltration capacity. The hydrologic soil group approach uses the widely available NRCS Soil Survey maps and estimates of average annual infiltration rates for each hydrologic soil group. This method has been adopted in Massachusetts and other northeastern states, which have humid climates and receive approximately 44 inches of average annual rainfall. The recharge factors developed for this approach are also valid for Connecticut, which has similar rainfall, soils, and climate.

The alternative surficial materials approach may be less accurate than other soil-specific methods for estimating site-specific infiltration rates. The annual recharge values for surficial material categories are based on basin-wide analyses of stratified drift and till, which may not be applicable to specific sites. However, the approach is believed to be suitable for estimating the required recharge volume and utilizes readily available, published information from the USGS and DEP.

7.5.2 Runoff Capture Volume (RCV)

Description

The objective of the runoff capture criterion is to capture stormwater runoff to prevent the discharge of pollutants, including "unpolluted" fresh water, to sensitive coastal receiving waters and wetlands. The runoff capture criterion applies to new stormwater discharges located less than 500 feet from tidal wetlands, which are not fresh-tidal wetlands. The stormwater runoff volume generated by the first inch of rainfall must be retained on-site for such discharges. The runoff capture volume is equivalent to the WQV and can be calculated using the following equation:

Table 7-5 Land Uses or Activities with Potential for Higher Pollutant Loads

Land Use/Activities	
○ Industrial facilities subject to the DEP Industrial Stormwater General Permit or the U.S. EPA National Pollution Discharge Elimination System (NPDES) Stormwater Permit Program[1]	○ Road salt storage facilities (if exposed to rainfall)
○ Vehicle salvage yards and recycling facilities	○ Commercial nurseries
○ Vehicle fueling facilities (gas stations and other facilities with on-site vehicle fueling)	○ Flat metal rooftops of industrial facilities
○ Vehicle service, maintenance, and equipment cleaning facilities	○ Facilities with outdoor storage and loading/unloading of hazardous substances or materials, regardless of the primary land use of the facility or development
○ Fleet storage areas (cars, buses, trucks, public works)	○ Facilities subject to chemical inventory reporting under Section 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA), if materials or containers are exposed to rainfall
○ Commercial parking lots with high intensity use (shopping malls, fast food restaurants, convenience stores, supermarkets, etc.)	○ Marinas (service and maintenance)
○ Public works storage areas	○ Other land uses and activities as designated by the review authority

[1]Stormwater pollution prevention plans are required for these facilities. Pollution prevention and source controls are recommended for the other land uses and activities listed above.

$$RCV = \frac{(1'')(R)(A)}{(12)}$$

where: RCV = runoff capture volume (acre-feet)
R = volumetric runoff coefficient
I = percent impervious cover
A = site area in acres

Wet ponds designed with adequate storage volume to capture and retain the RCV or infiltration practices described in this Manual can be used to satisfy the runoff capture volume criterion.

Rationale

The runoff capture volume criterion is consistent with DEP coastal management policy and stormwater general permit requirements. Discharge of the "first-flush" of stormwater runoff into brackish and tidal wetlands is prohibited due to the resultant dilution of the high marsh salinity and encouragement of the invasion of brackish or upland wetland species such as Phragmites.

7.6 Peak Flow Control

Peak flow control criteria are intended to address increases in the frequency and magnitude of a range of potential flood conditions resulting from development. These include relatively frequent events that cause channel erosion, larger events that result in bankfull and overbank flooding, and extreme floods. The following sections describe sizing criteria for controlling peak flows, as well as for designing stormwater conveyance and emergency outlet structures. Natural Resource Conservation Service (NRCS) peak flow calculation methods such as TR-55 or TR-20 should be used to compute the required peak flow rates for each of the criteria described below.

7.6.1 Stream Channel Protection

Description

The stream channel protection criterion is intended to protect stream channels from erosion and associated sedimentation in downstream receiving waters and wetlands as a result of urbanization within a watershed. By restricting peak flows from storm events that result in bankfull flow conditions (typically the 2-year storm, which controls the form of the stream channel), damaging effects to the channel from increased runoff due to urbanization can be reduced.

Either of the following two methods can be used to satisfy the stream channel protection criterion. Both rely on "over-control" of the two-year frequency design storm:

- *Control the 2-year, 24-hour post-development peak flow rate to 50 percent of the 2-year, 24-hour pre-development level or*
- *Control the 2-year, 24-hour post-development peak flow rate to the 1-year, 24-hour pre-development level*

There are several practical limitations on the application of the stream channel protection criterion. For sites having less than one acre of impervious cover, the size of the orifice or weir required for extended detention becomes too small (approximately 1 inch in diameter) to effectively operate without clogging. In addition, channel protection is generally not required where sites discharge to a large receiving water body (Brown and Caraco, 2001). Therefore, the channel protection criterion does not apply under the following conditions:

- *The entire channel protection volume is recharged to groundwater*
- *Sites less than or equal to one acre of impervious cover*
- *The site discharges to a large river (fourth order or greater), lake, estuary, or tidal water where the development area is less than 5 percent of the watershed area upstream of the development site unless known water quality problems exist in the receiving waters. Stream order indicates the relative size of a stream based on Strahler's (1957) method. Streams with no tributaries are first order streams, represented as the start of a solid line on a 1:24,000 USGS Quadrangle Sheet. A second order stream is formed at the confluence of two first order streams, and so on.*

Rationale

A number of design criteria have been developed for the purpose of stream channel protection. The earliest and most common method relied on control of post-development peak flows associated with the 2-year, 24-hour storm event to pre-development levels based on the assumption that bankfull discharge for most streams has a recurrence interval of between 1 and 2 years (Leopold, et al., 1964 and Leopold, 1994). More recent research indicates that this method does not adequately protect stream channels from downstream erosion and may actually contribute to erosion since banks are exposed to a longer duration of erosive bankfull and sub-bankfull events (MacRae, 1993 and 1996, McCuen and Moglen, 1988).

The two-year "over-control" methods recommended above were developed as a modification of the original two-year control approach to provide additional protection. These methods require larger detention volumes than the traditional two-year approach, but reduce the duration of bankfull flows. More recent research has shown that extended detention of the 1-year, 24-hour storm event and a method referred to as Distributed Runoff Control (DRC) potentially provide the highest level of stream channel protection. In the extended detention method, the runoff volume generated by the 1-year, 24-hour rainfall (2.6 to 2.7 inches in Connecticut) is captured and gradually released over a 24-hour period to control erosive velocities in downstream channels. However, this method results in extremely large detention storage requirements (comparable to the storage volume required for 10-year peak discharge control), and the incremental benefits of this approach over the two-year over-control approach are undocumented. The DRC method involves detailed field assessments and hydraulic/hydrologic modeling to determine hydraulic stress and erosion potential of stream banks. This level of detailed, site-specific analysis is not warranted for use as a general stream channel protection criterion.

7.6.2 Conveyance Protection

Description

The conveyance systems to, from, and through stormwater management facilities should be designed based on the peak discharge rate for the 10-year, 24-hour storm. This criterion is designed to prevent erosive flows within internal and external conveyance systems associated with stormwater treatment practices such as channels, ditches, berms, overflow channels, and outfalls. The local review authority may require the use of larger magnitude design storms for conveyance systems associated with stormwater treatment practices.

Rationale

This criterion is generally consistent with storm drainage system design in Connecticut, including design requirements of most municipalities and the Connecticut Department of Transportation.

7.6.3 Peak Runoff Attenuation

Description

The peak runoff attenuation criterion is designed to address increases in the frequency and magnitude of flooding caused by development. This criterion is intended to control a range of flood conditions, from events that just exceed the bankfull capacity of the stream channel to catastrophic flooding associated with extremely large events. Other objectives include maintaining the boundaries of the pre-development 100-year floodplain and protecting the physical integrity of stormwater management facilities.

The recommended peak runoff attenuation criterion in Connecticut includes control of post-development peak discharge rates from the 10-year, 25-year, and 100-year storms to the corresponding pre-development peak discharge rates, as required by the local review authority. Attention must be given to timing of peak flows. The local review authority may require peak runoff attenuation for additional design storms such as the 1-year, 2-year, 5-year and 50-year, 24-hour events. The local review authority may waive the peak runoff attenuation criterion for sites that discharge to a large river (fourth order or greater), lake, estuary, or tidal waters where the development area is less than 5 percent of the watershed area upstream of the development site.

Rationale

This criterion is generally consistent with storm drainage system design in Connecticut, including design requirements of most municipalities and the Connecticut Department of Transportation.

7.6.4 Emergency Outlet Sizing

Description

The emergency outlets of stormwater management facilities should be designed to safely pass the peak discharge rate associated with the 100-year storm or larger. The emergency outlet should be able to pass the 100-year peak runoff rate, at a minimum, in a controlled manner, without eroding outfalls or downstream conveyances. Emergency outlets constructed in natural ground are generally preferable to constructed embankments. This criterion is applicable to all stormwater management facilities that employ an emergency outlet.

Rationale

This criterion is generally consistent with storm drainage system design in Connecticut, including design requirements of most municipalities and the Connecticut Department of Transportation.

7.6.5 Downstream Analysis

Peak runoff control criteria are typically applied at the immediate downstream boundary of a project area. However, since stormwater management facilities may change the timing of the post-development hydrograph, multiple stormwater treatment practices or detention facilities in a watershed may result in unexpected increases in peak flows at critical downstream locations such as road culverts and areas prone to flooding. This effect is most pronounced for detention structures in the middle to lower third of a watershed. The local review authority may require a downstream analysis to identify potential detrimental effects of proposed stormwater treatment practices and detention facilities on downstream areas.

The downstream analysis should include the following elements:

- *Routing calculations should proceed downstream to a confluence point where the site drainage area represents 10 percent of the total drainage area (i.e., the "10 percent rule")*
- *Calculation of peak flows, velocities, and hydraulic effects at critical downstream locations (stream confluences, culverts, other channel constrictions, and flood-prone areas) to the confluence point where the 10 percent rule applies*
- *The analysis should use an appropriate hydrograph routing method, such as TR-20, to route the pre- and post-development runoff hydrographs from the project site to the downstream critical locations*

The ultimate objective of this analysis is to ensure that proposed projects do not increase post-development peak flows and velocities at critical downstream locations in the watershed. Increases in flow rates and velocities at these locations should be limited to less than 5 percent of the pre-developed condition (NYDEC, 2001) and should not exceed freeboard clearances or allowable velocities.

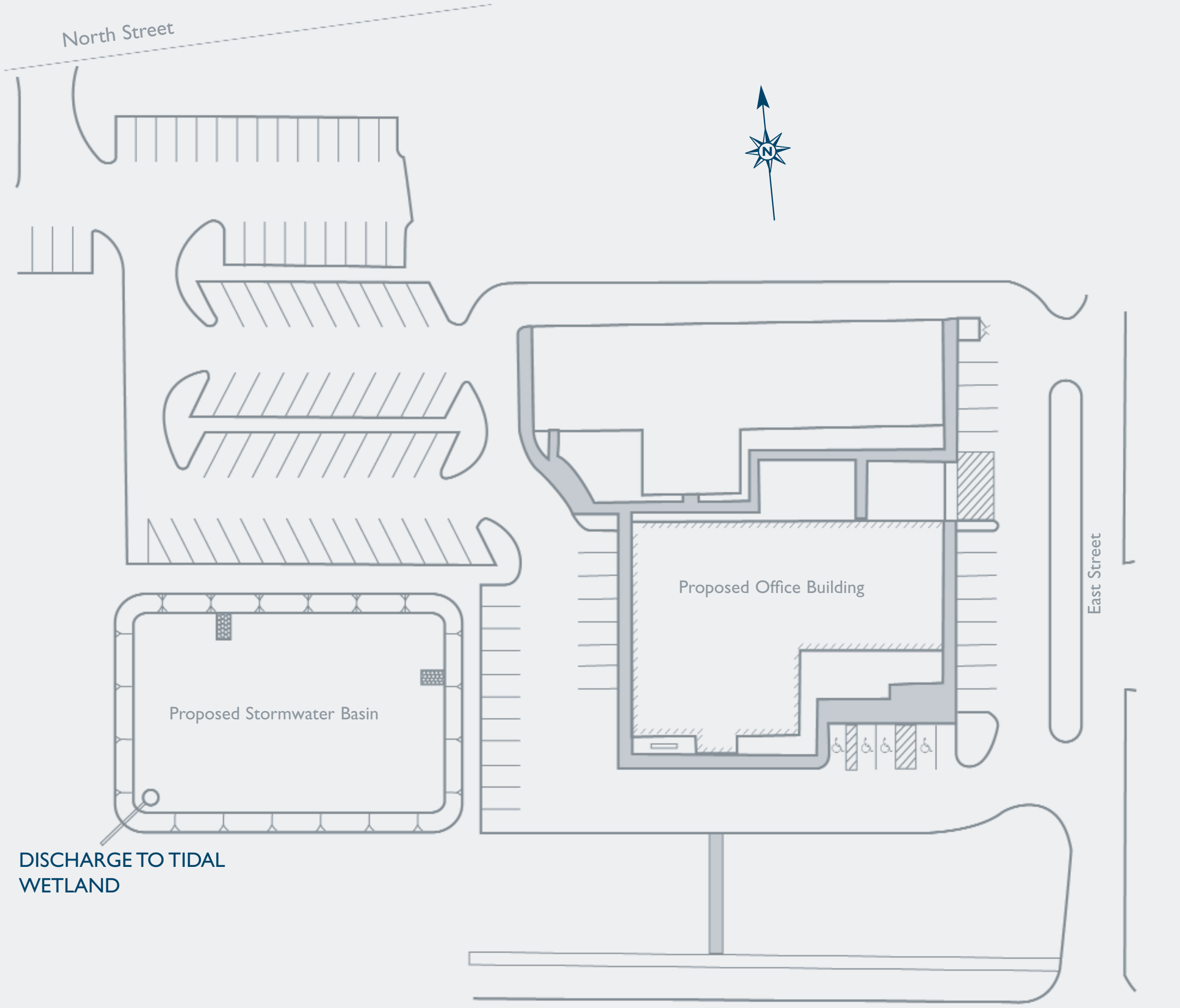
7.7 Sizing Example

The following example illustrates how the various sizing criteria described in this chapter are applied to determine stormwater treatment requirements (required storage volume and hydraulic capacity) for a hypothetical development project.

Old Town Office Building, New London, Connecticut

An office building is proposed on a commercial property in New London, Connecticut. The approximately 2-acre site is characterized by Type B soils. The proposed development consists of approximately 80 percent impervious area (parking lots and buildings), with approximately 20 percent as lawn or undisturbed area. Runoff from the impervious areas is collected and conveyed to a hypothetical stormwater treatment basin located on the southwest portion of the site. Stormwater is discharged from the basin to an adjacent tidal wetland. **Figure 7-1** shows a schematic layout of the proposed development.

Figure 7-1 Sizing Example – Proposed Old Town Office Building



Project Data

Location: New London, CT
Total Drainage Area (A)
Existing = 1.98 Ac; Proposed = 2.40
Impervious Area = 1.92 Ac; or I = 1.92/2.40= 80.0 %
Site Soil Type: "B"
Zoning: Business
Discharge to tidal wetlands

Hydrologic Data

	Pre-Development	Post-Development
CN	82	92
Tc (hr)	0.25	0.17

Source: Fuss & O'Neill, Inc.

1. Water Quality Volume

a. Compute volumetric runoff coefficient, R

$$R = 0.05+0.009(I)$$
$$= 0.05+0.009(80)$$
$$= \underline{0.77}$$

b. Compute water quality volume, WQV

$$WQV = (1")(R)(A)/12$$
$$= (1")(0.77)(2.40)/12$$
$$= \underline{0.15 \text{ ac-ft}}$$

2. Water Quality Flow

Compute the water quality flow (WQF) for off-line stormwater treatment.

a. Compute the runoff depth, Q

$$Q = \frac{[WQV(acre-feet)] \text{ x } [12(inches/foot)]}{Drainage\ Area\ (acres)}$$

$$= \frac{(0.15)\text{x}[12(inches/foot)]}{2.40}$$

$$= \underline{0.77 \text{ in}}$$

b. Compute the NRCS Runoff Curve Number (CN)

$$CN = \frac{1000}{\left[10 + 5P + 10Q - 10(Q^2 + 1.25QP)^{1/2}\right]}$$

$$= \frac{1000}{\left[10 + 5(1) + 10(0.77) - 10\left((0.77)^2 + 1.25\ (0.77)(1)\right)^{1/2}\right]}$$

$$= \underline{98}$$

c. Read initial abstraction, I_a (Table 4-1 in Chapter 4, TR-55)

$I_a = 0.041$

d. Compute I_a/P

$= 0.041/1$

$= \underline{0.041}$

e. Read initial abstraction, q_u (Exhibit 4-11 in Chapter 4, TR-55)

q_u = 580 csm/in (Type III storm)

f. Compute water quality flow (WQF)

$$WQF = (q_u)(A)(Q)$$
$$= (580)(0.004)(0.77)$$
$$= \underline{1.8 \text{ cfs}}$$

3. *Groundwater Recharge Volume*

Compute the groundwater recharge volume (*GRV*) using the hydrologic soil group approach.

a. Read runoff depth to be recharged, D (Table 7-4)

D = <u>0.25 in</u>

b. Compute net increase in site imperviousness, I (proposed) – I (existing)

$I = 0.80\text{-}0.44$

$= \underline{0.36}$

c. Compute groundwater recharge volume, *GRV*

$$GRV = \frac{(D)(A)(I)}{12}$$

$$= \frac{(0.25)(2.40)(0.36)}{12}$$

$$= \underline{0.018 \text{ ac-ft}}$$

4. *Runoff Capture Volume*

Compute the runoff capture volume (*RCV*) since the site discharges stormwater within 500 feet of tidal wetlands.

$$RCV = \frac{(1")(R)(A)}{(12)}$$

$$= \frac{(1")(0.77)(2.40)}{(12)}$$

$$= \underline{0.15 \text{ ac-ft}}$$

5. *Stream Channel Protection*

Compute the required stream channel protection discharge using both "Two-Year Over-Control" methods recommended in Section 7.6.1.

a. Method-1, control the 2-year, 24-hour post-development flow to 50% of the 2-year, 24-hour pre-development flow

$$Q_{2(control)} = (0.5)\ Q_{2(exist)}$$
$$= (0.5)(2.2)$$
$$= 1.1 \text{ cfs}$$
$$Q_{2(proposed)} = \underline{0.9 \text{ cfs}}$$
$Q_{2(proposed)} < Q_{2(control)}$, meets method-1 criteria

b. Method-2, control the 2-year, 24-hour post-development flow to the 1-year, 24-hour pre-development flow

$$Q_{1(exist)} = 1.8 \text{ cfs}$$
$Q_{1(exist)} > Q_{2(proposed)}$, meets method-2 criteria

6. *Conveyance Protection*

Site storm drainage conveyance system designed for a 10-yr, 24-hour post-development peak flow, Q10.

$$Q_{10} = \underline{4.3 \text{ cfs}}$$

7. *Peak Runoff Attenuation*

From TR-55 peak discharge summary worksheets:

Storm Event	Pre-Development (cfs)	Post Development (cfs)
10-year	4.3	4.0
25-year	5.3	5.2
100-year	6.8	9.8

8. *Emergency Outlet Sizing*

Safe passage of the 100-year storm event under proposed conditions requires passing Q_{100} of 9.8 cfs through the proposed stormwater basin emergency spillway. The spillway is designed to safely convey 9.8 cfs without causing a breach of the stormwater basin that would otherwise damage downstream areas or present a safety risk.

Summary of Sizing Requirements

Criterion	Requirement
Water Quality Volume	0.15 ac-ft
Water Quality Flow	1.8 cfs
Groundwater Recharge Volume	0.018 ac-ft
Runoff Capture Volume	0.15 ac-ft
Stream Channel Protection	0.9 cfs (2-year “over-control”)
Conveyance Protection	4.3 cfs (10-year)
Peak Runoff Attenuation	5.3 cfs (25-year)
Emergency Outlet Sizing	9.8 cfs (100-year)

References

Adams, T. 1998. Stormwater Facility Design: Calculating the First Flush. *Pollution Engineering.*

Brown, T. and D. Caraco. 2001. “Channel Protection” *Water Resources IMPACT.*

Chang, G., Parish, J., and C. Sober. 1990. *The First Flush of Runoff and Its Effect on Control Structure Design.* Environmental Resource Management Division. City of Austin, Texas.

Claytor, R.A. and T. R. Schueler. 1996. *Design of Stormwater Filtering Systems.* Center for Watershed Protection. Silver Spring, Maryland.

Department of Commerce. 1961.Weather Bureau, *TP-40.*

Leopold, L.B. 1994. *A View of A River.* Harvard University Press. Cambridge, MA.

Leopold, L.B., Wolman, M.G., and J.P. Miller. 1964. *Fluvial Processes in Geomorphology.* W.H. Freeman and Company. San Francisco, CA.

MacRae, C. 1993. “An Alternative Design Approach for the Control of Instream Erosion Potential in Urbanizing Watersheds.” In Proceedings of *Sixth International Conference on Urban Storm Drainage.* Niagara Falls, Ontario.

MacRae, C. 1996. “Experience from Morphological Research on Canadian Streams: Is Control of the Two-Year Frequency Runoff Event the Best Basis for Stream Channel Protection?” In Effects of Watershed Development and Management on Aquatic Systems. L. Roesner editor. Proceedings of *Engineering Foundation Conference.* Snowbird, UT, August 4-9, 1996.

McCuen, R. and G. Moglen. 1988. “Multicriterion Stormwater Management Methods.” *Journal of Water Resources Planning and Management*. Vol. 114, No. 4.

New York State Department of Environmental Conservation (NYDEC). 2001. *New York State Stormwater Management Design Manual.* Prepared by Center for Watershed Protection. Albany, New York.

Novotny, V. 1995. *Nonpoint Pollution and Urban Stormwater Management.* Technomic Publishing Company, Inc. Lancaster, Pennsylvania.

Prisloe, M., Giannotti, L., and W. Sleavin, No date. “Determining Impervious Surfaces for Watershed Modeling Applications.” University of Connecticut, Cooperative Extension System. Nonpoint Education for Municipal Officials (NEMO) Project. Haddam, CT.

STREAM BIOSURVEYS

Introduction

Organic pollution in streams can result in the loss of many desirable aquatic species including fish and mussels

As human populations have grown, more and more pollution of our waters has occurred, both from point source discharges and as nonpoint or "diffuse" pollution. There are several categories of pollution associated with the aquatic environment (e.g. toxic pollution), but one of the most common categories is *organic pollution*. This is caused by oxygen-demanding wastes such as domestic sewage, leachate from landfills, and agricultural and urban runoff.

The natural processes of chemical oxidation and biological decomposition that occur within water-courses, consume dissolved oxygen. Decomposition of materials is a normal process in all aquatic ecosystems and is a function of decomposers such as bacteria and fungi. These organisms play an important role by metabolizing organic matter as an energy and nutrient source and use dissolved oxygen in the process.

However, serious consequences to aquatic organisms can result if the natural mechanisms that clean the water are overloaded by large influxes of organic pollution. Severe oxygen depletion can result in the loss of many desirable aquatic species including fish (e.g. trout) and mussels, and aquatic organisms such as stoneflies and mayflies.

Water Quality Testing

Traditional Methods

The long-term effects of nonpoint source pollution, such as from urban runoff, have often been determined through chemical monitoring. In recent years, however, a growing body of literature has emerged that points to the importance of biological monitoring. Many states are now selecting biological and physical monitoring over traditional chemical monitoring in their efforts to determine the health of aquatic ecosystems and of general watershed quality.

A single sampling of stream chemical constituents only provides a "snapshot" of water quality

Traditional water quality sampling methods have emphasized analyses of physical and chemical parameters such as dissolved oxygen, pH, temperature, nitrates, phosphates, and others. Although useful, this approach has several limitations. There are many chemical constituents that could theoretically result in water quality degradation. Not only are some of these very expensive to analyze, but their sheer number increases the likelihood that a pollutant will not be identified. A single sample can only provide a "snapshot" of water quality on the day of sampling, and may provide no information on recent degraded conditions which have since cleared up, but whose effect upon aquatic biota may be more lasting.

Benthic Organism Sampling

Biosurvey Methods

The technique of stream benthic organism or macroinvertebrate sampling was developed more than 50 years ago to complement traditional chemical water quality approaches, as well as to provide new information not available through other methodologies. This includes information about effects from multiple stressors (e.g. chemicals, sedimentation, exotic species, etc.) arising from point sources, nonpoint sources, habitat alteration, and hydrological modification. For example, ecological responses to such disturbances can be observed at the community level of organization of benthic macroinvertebrates, offering dependable and readily observable indicators that integrate the impacts of multiple, and often subtle, stressors.

What Are Benthic Macroinvertebrates?

Benthic organisms can serve as biological indictors of water pollution

The term "benthic" means bottom-dwelling. Benthic macroinvertebrates are organisms without backbones that live in, crawl upon, or attach themselves to bottom substrates (e.g. sediments, debris, logs, plants, filamentous algae, etc.). The term "macroinvertebrate" refers to those organisms that are large enough to be viewed without the aid of a microscope and that are retained by a sieve with mesh sizes greater or equal to 200 to 500 micrometers. Benthic macroinvertebrates include immature insects (larvae and nymphs), worms, crustaceans, mollusks, (clams and mussels), leeches, mites and snails. Insect larvae tend to be the most abundant macroinvertebrates in freshwater aquatic systems.

The majority of benthic macroinvertebrates are found in the riffles (i.e. erosional areas) of streams. Riffles range from uneven bedrock to cobbles to boulders. The optimum riffle area contains gravel-sized (1-inch diameter) to cobble-sized (10-inch diameter) substrate. The flow of water over these areas provides plentiful oxygen and food particles. Riffle-dwelling communities are made up of macroinvertebrates that generally require high dissolved oxygen levels and clean water. Most of these organisms are intolerant to pollution. In slow flow areas such as runs and pools (depositional areas), decomposer communities, which tolerate lower dissolved oxygen levels and higher organic matter and sedimentation, are typically more abundant. Riffle-dwelling communities are more sensitive to increasing pollution than communities in the pools or slow flowing areas of the same stream.

There are four primary feeding groups of benthic macroinvertebrates: shredders, filter collectors, grazers, and predators. Shredders such as stoneflies (*Plecoptera*) feed on plant material and some animal material, which is generally dead, and break it down into smaller particles through their feeding and digestive process. Collectors, such as caddisflies (*Trichoptera*) and blackflies (*Diptera*), feed on fine particulate matter that they filter from the water. Grazers, such as snails and beetles (*Coleoptera*), feed on algae and other plant material living on rocks and on plant surfaces. Predators such as dobsonflies (*Megaloptera*) or dragonflies (*Odonata*) feed on other macroinvertebrates. Individual species may be generalists, and fit into more than one of these groups (as opposed to specialists).

Benthic macroinvertebrates, as a group, exhibit a relatively wide range of response to chemical and physical water quality stressors (pH, temperature, dissolved oxygen, organic pollutants, heavy metals, sedimentation, etc.) and thus can serve as ***biological indicators*** of water pollution. Some organisms are tolerant of degraded water quality conditions, while others are pollution-sensitive. Many snails, worms and midge larvae belong to the former group, while the most widely recognized members of the latter group are the *Plecoptera* (Stoneflies), *Ephemenoptera* (Mayflies) and *Trichoptera* (Caddisflies).

In most cases, unpolluted streams will support a diverse population of macroinvertebrates

Some pristine streams have a low diversity of macroinvertebrate fauna because of the cold temperature and/or relatively low nutrient levels. Headwater streams may have only two or three dominant species. In most cases, however, an unpolluted stream will support a diverse population of macroinvertebrates, with pollution-sensitive species well represented. However, species diversity declines as water quality deteriorates and pollution-tolerant organisms become increasingly dominant.

Advantages of Macroinverterbrate Sampling

Plafkin et al. (1989) list several advantages of sampling stream macroinvertebrates in order to make inferences about water quality:

1. Since most stream macroinvertebrates have limited migration patterns or are sessile and spend much time clinging to rocks or the stream substrate, and do not move long distances, they are good indicators of localized water conditions.

2. Aquatic organisms integrate the effects of chemical, physical and biological parameters. Conducting an aquatic biosurvey will thus increase the likelihood that a degraded condition will be detected, if present.

3. Since most of these species have a relatively short life cycle (approximately one year), they will respond to stressors more rapidly than other longer-lived components of the community (e.g. fish).

4. Sampling techniques are rapid and inexpensive. An experienced biologist can detect degraded water conditions with only a cursory, or qualitative, examination of the macroinvertebrate community.

5. Benthic macroinvertebrates are a primary food source for fish, and as such can provide valuable information on the relative health of the fish community.

6. Benthic macroinvertebrates are common to abundant in most streams.

Sampling Methods

The simplest method of collecting stream macroinvertebrates is to inspect in-stream rocks for attached organisms, or disturb the stream substrate while placing a net downstream to gather dislodged biota. Depending upon the nature of the study, the organisms are identified to either the family, genus or species level. Family-level identification is most expeditious, and is the technique most commonly used. However, it is less precise since members of some stream macroinvertebrate families show a range of pollution tolerances, and the sensitivity of these families can only be expressed as an average (Hilsenhoff 1988).

Measuring Biological Health

The Biotic Index

A variety of useful indices or measurements (metrics) have been developed for assessing the health of streams through benthic macroinvertebrate sampling. These include: taxa richness, EPT Index or richness, percent abundance of EPT, percent dominance, percent dominance of scrapers, Hilsenhoff's Biotic Index (HBI), EPT:chironomid ratio, Pinkham and Pearson community similarity index, and many others.

Of these, and there are many, Hilsenhoff's (1988) "biotic index" (HBI) is one of most commonly used. Hilsenhoff developed a rapid stream biosurvey methodology that requires identification of macroinvertebrates to family-level. This method assigns a numerical score (biotic index) ranging from 0 to 10 to the most common stream macroinvertebrate taxa. The biotic index is directly related to the degree of pollution-tolerance and is based on field and laboratory responses of organisms toward organic pollution.

Approximately 100 organisms are collected and randomly sampled from a variety of habitats within the stream, including erosional and depositional areas (e.g. riffles and runs). The organisms are identified to family-level and the total number (**n**i) of each is recorded. The following formula is then used for the estimation of the Family-level Biotic Index (FBI):

$$FBI = \frac{\Sigma \, \mathbf{n}i \, \mathbf{a}i}{N}$$

where:

ni = the number of specimens in each taxonomic group
ai = the pollution tolerance score for the taxonomic group (see Table 1)
N = the total number of organisms in the sample (usually 100).

Ideally, the Family-level Biotic Index should be calculated during several different times of a year (e.g spring, summer and fall) and compared with reference sites within the particular watershed or in the region for more accurate conclusions to be drawn.

Who Can Take This Pollution?

Introduction

It is well documented that pollution of streams reduces the number of species of the aquatic ecosystem, (i.e. species diversity), while frequently creating an environment that is favorable to only a few species (i.e. pollution-tolerant forms). Thus, in a polluted stream, there are usually large numbers of a few species, while in a clean stream there are moderate numbers of many species.

For instance, turbidity reduces light penetration and submerged aquatic plant productivity. Thus turbidity will affect those macroinvertebrates depending on plant matter for food and those that rely heavily on visual location of prey (predators). Filter feeders' filtering mechanisms may also be blocked by sediment particles associated with turbid waters. Turbidity also tends to increase temperature in waters and is often associated with higher organic decomposition. These are conditions that reduce oxygen levels and may result in impacts to many gill-breathing mayfly, stonefly, and caddisfly larvae that thrive only where there is abundant oxygen in the water. As turbidity increases - and turbidity is often associated with other pollutants such as nutrients and heavy metals - rock dwelling or attaching macroinvertebrates such as mayflies, stoneflies, and caddisflies, will be replaced by silt-tolerant and pollution tolerant macroinvertebrates that can tolerate low oxygen levels in the water or that can breath atmospheric oxygen. For example, rat-tailed maggots have snorkel-like breathing tubes, some snails have lungs (e.g. *Physa* spp.), and midges (chironomids) and worms (oligochaetes) have respiratory pigments which enable them to more efficiently obtain oxygen that is in low concentrations.

Pollution *Intolerant* Macroinvertebrates

The following are some typical macroinvertebrate groups (taxa) commonly encountered in streams and that usually indicate ***good water quality***.

Mayflies

Mayfly nymphs are often the most numerous organisms found in clean streams. They are sensitive to most types of pollution, including low dissolved oxygen (less than 5 ppm), chlorine, ammonia, metals, pesticides and acidity. Most mayflies are found clinging to the undersides of rocks.

Stoneflies

Stonefly nymphs are most limited to cool, well-oxygenated streams. They are sensitive to most of the same pollutants as mayflies except acidity. They are usually much less numerous than mayflies. The presence of even a few stoneflies in a steam usually suggests that good water quality has been maintained for several months prior.

Caddisflies

Caddisfly larvae often build a portable case of sand, stones, sticks, or other debris. Many caddisfly larvae are sensitive to pollution, although a few are moderately tolerant. One family spins nets to catch drifting plankton, and is often numerous in recovery zones below sewage discharges.

Beetles

The most common beetles in streams are riffle beetles and water pennies. Most of these require swift current and an adequate supply of oxygen, and are generally considered to be clean water indicators.

Pollution *Tolerant* Macroinvertebrates

The following are some typical macroinvertebrate groups that are commonly encountered in streams and which usually indicate ***poor water quality***.

Midges

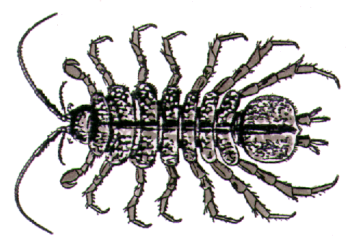
Midges are the most common aquatic flies. The larvae occur in almost any aquatic situation. Many species are very tolerant to pollution; most of these are red and are called “bloodworms”. Other species filter suspended food particles, and are numerous in
sewage outfall recovery zones.

Worms

The segmented worms include the leeches and the small aquatic earthworms. The latter are more common, though usually unnoticed. They burrow in the substrate and feed on bacteria in the sediment. They can thrive under conditions of severe pollution and very low oxygen levels.

Sowbugs

Aquatic sowbugs are crustaceans that are often numerous in situations of high organic content and low oxygen levels. When abundant they can indicate a stream segment in the recovery stage of organic pollution.



Black Flies

Black fly larvae have specialized antennae for filtering plankton and bacteria from the water, and require a strong current. Most species are numerous in the decomposition and recovery zones of sewage outfalls and are generally indicative of at least moderate levels of organic pollution.

What Can We Do for You?

Benthic Macroinvertebrate Studies

Rema Ecological Services, LLC (RES) performs instream macroinvertebrate studies to assess existing water quality conditions. Instream biomonitoring can be used to assess baseline water quality conditions prior to development or alteration within the contributing watershed. These studies can also be used as part of a National Pollution Discharge System (NPDES) permit modification.

Our basic services include:

- Benthic faunal sampling and analysis
- Water quality assessments of streams and rivers
- Macroinvertebrate identification to genus or species
- Historical data comparisons

- Quantitative studies using multi-plate samplers

Depending on the level of analysis required, any combination of the following analyses can be incorporated to provide comprehensive assessments:

- Rapid Bioassessment (US EPA Rapid Bioassessment Protocol III)
- EPA Pollution Tolerance Index
- Invertebrate Community Index (ICI)
- Functional Feeding Group Analysis
- Diversity Analysis
- Modified Hilsenhoff Biotic Index

Fisheries Studies

In addition, RES can perform a variety of fisheries studies to determine the effects of point and nonpoint pollution on aquatic communities. Quantitative studies of fish communities can be used to assess general water quality and stream health. Because fish are large, highly visible organisms, they are useful when relating water quality issues to the general public and to the regulated community.

References:

Hilsenhoff, W. L. 1988. Rapid field assessment of organic pollution with a family-level biotic index. J. N. Am. Benthol. Soc. 7(1):65-68.

Plafkin, J. L, M. Barbour, K. D. Porter, S. K. Gross, and R. M. Hughes. 1989. Rapid Bioassessment Protocols for use in streams and rivers. US EPA. EPA/440/4-89/001

Slate Upper School, 5100 Ridge Road, North Haven, CT
Photos taken on 2/20/2021, by REMA Ecological Services, LLC

Photo 1: Primary stream channel below subject site, and water quality sampling station; note eroded bank; facing southerly.

Photo 2: Stream roughly 50 feet downgradient of water quality sampling station; facing southwesterly.

Photo 3: Active seepage within wetland; in the path of proposed stormwater discharge from subject site; facing easterly.

Photo 4: Wetland below proposed discharge, including area of active seepage (groundwater); facing westerly.

Slate Upper School, 5100 Ridge Road, North Haven, CT
Photos taken on 2/20/2021, by REMA Ecological Services, LLC

Photo 5: Secondary stream channel from active wetland seepage; subject site in background; facing easterly.

Photo 6: Example of caddisfly larva (Glossosomatidae) on hard substrate from stream at water quality sampling station

Slate Upper School, 5100 Ridge Road, North Haven, CT
Photos taken on 2/20/2021, by REMA Ecological Services, LLC

Photo 7: Examples of Glossosomatidae (family) caddisflies from subject stream

Photo 8: Examples of stonefly larva (Perlodidae) from stream at water quality sampling station

Tuesday, February 23, 2021

Attn: George Logan
Rema Ecological Services
164 East Center Street
Suite 8
Manchester CT 06040

Project ID: RIDGE RD N HAVEN/HAMDEN
SDG ID: GCH66054
Sample ID#s: CH66054

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
UT Lab Registration #CT00007
VT Lab Registration #VT11301

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

SDG Comments

February 23, 2021

SDG I.D.: GCH66054

Sample CH66054 was analyzed past hold time for Nitrite-N (E353.2).
Sample CH66054 was analyzed past hold time for Nitrate-N (E353.2).
Sample CH66054 was analyzed past hold time for Ortho-Phosphate-P (SM4500PF).

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Sample Id Cross Reference

February 23, 2021

SDG I.D.: GCH66054

Project ID: RIDGE RD N HAVEN/HAMDEN

Client Id	Lab Id	Matrix
SS-1	CH66054	SURFACE WATER

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

February 23, 2021

FOR: Attn: George Logan
Rema Ecological Services
164 East Center Street
Suite 8
Manchester CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	SURFACE WATER	Collected by:		02/20/21	14:10
Location Code:	REMA	Received by:	SW	02/22/21	9:50
Rush Request:	24 Hour	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GCH66054
Phoenix ID: CH66054

Project ID: RIDGE RD N HAVEN/HAMDEN
Client ID: SS-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Silver	0.001	0.001	mg/L	1	02/23/21	EK	SW6010D
Arsenic	< 0.004	0.004	mg/L	1	02/23/21	EK	SW6010D
Barium	0.078	0.002	mg/L	1	02/23/21	EK	SW6010D
Cadmium	< 0.001	0.001	mg/L	1	02/23/21	EK	SW6010D
Chromium	< 0.001	0.001	mg/L	1	02/23/21	EK	SW6010D
Mercury	< 0.0002	0.0002	mg/L	1	02/23/21	RS	SW7470A
Lead	< 0.002	0.002	mg/L	1	02/23/21	EK	SW6010D
Selenium	< 0.010	0.010	mg/L	1	02/23/21	EK	SW6010D
Conductivity	311	5.00	umhos/cm	1	02/22/21	AP/EG	SM2510B-11
Nitrite-N	< 0.010	0.010	mg/L	1	02/22/21 19:14	TB	E353.2
Nitrate-N	1.10	0.02	mg/L	1	02/22/21 19:14	TB	E353.2
Ortho-Phosphate-P	0.015	0.010	mg/L	1	02/22/21 20:57	TB	SM4500PF-11
Nitrogen Tot Kjeldahl	0.22	0.10	mg/L	1	02/23/21	KDB	E351.1
Total Nitrogen	1.32	0.10	mg/L	1	02/23/21	KDB	SM4500NH3/E300.0-11
Phosphorus, as P	0.017	0.010	mg/L	1	02/22/21	MI	SM4500PE-11
Total Suspended Solids	15	3.3	mg/L	0.7	02/22/21	LS	SM 2540D-11
Mercury Digestion	Completed				02/23/21	ARW	SW7470A
Total Metals Digestion	Completed				02/22/21	AG	

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

Ortho-Phosphate was not field filtered within 15 minutes of collection.

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller

Phyllis Shiller, Laboratory Director
February 23, 2021
Reviewed and Released by: Helen Geoghegan, Project Manager

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

February 23, 2021

QA/QC Data

SDG I.D.: GCH66054

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 564269 (mg/L), QC Sample No: CH66222 (CH66054)													
Mercury - Water	BRL	0.0002	<0.0002	<0.0002	NC	118			111			80 - 120	20

Comment:

Additional Mercury criteria: LCS acceptance range for waters is 80-120% and for soils is 70-130%. MS acceptance range is 75-125%.

QA/QC Batch 564204 (mg/L), QC Sample No: CH64973 (CH66054)

ICP Metals - Aqueous

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
Arsenic	BRL	0.004	<0.004	<0.004	NC	98.5	101	2.5	106			80 - 120	20
Barium	BRL	0.002	0.022	0.022	0	99.5	103	3.5	103			80 - 120	20
Cadmium	BRL	0.001	<0.001	<0.001	NC	98.5	102	3.5	101			80 - 120	20
Chromium	BRL	0.001	0.005	0.005	0	102	105	2.9	105			80 - 120	20
Lead	BRL	0.002	0.002	<0.002	NC	98.9	102	3.1	104			80 - 120	20
Selenium	BRL	0.010	<0.010	<0.010	NC	96.3	98.8	2.6	99.6			80 - 120	20
Silver	BRL	0.001	<0.001	<0.001	NC	98.5	101	2.5	104			80 - 120	20

Comment:

Additional Criteria: LCS acceptance range is 80-120% MS acceptance range 75-125%.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

February 23, 2021

QA/QC Data

SDG I.D.: GCH66054

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 564116 (mg/L), QC Sample No: CH64326 (CH66054)													
Total Suspended Solids	BRL	2.5	56	58	3.50	104						85 - 115	20
QA/QC Batch 564187 (mg/L), QC Sample No: CH64634 (CH66054)													
Phosphorus, as P	BRL	0.01	<0.010	<0.010	NC	100			102			85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 564280 (umhos/cm), QC Sample No: CH66211 (CH66054)													
Conductivity	BRL	5.00	294	292	0.70	98.3						85 - 115	20
Comment:													
Additional criteria matrix spike acceptance range is 75-125%.													
QA/QC Batch 564243 (mg/L), QC Sample No: CH65955 (CH66054)													
Nitrate-N	BRL	0.02	0.54	0.54	0	93.9			102			90 - 110	20
Nitrite-N	BRL	0.01	<0.010	<0.01	NC	108			105			90 - 110	20
QA/QC Batch 564254 (mg/L), QC Sample No: CH66072 (CH66054)													
Ortho-Phosphate-P	BRL	0.01	<0.01	<0.01	NC	102			103			85 - 115	20
QA/QC Batch 564212 (mg/L), QC Sample No: CH64326 (CH66054)													
Nitrogen Tot Kjeldahl	BRL	0.10	18.7	18.91	1.10	99.1			106			85 - 115	20
Comment:													
TKN is reported as Organic Nitrogen in the Blank, LCS, DUP and MS.													
Additional criteria: LCS acceptance range for waters is 85-115% and for soils is 75-125%. MS acceptance range is 75-125%.													

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller

Phyllis Shiller, Laboratory Director
February 23, 2021

Sample Criteria Exceedances Report

GCH66054 - REMA

Criteria: None

State: CT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this exceedance report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

Analysis Comments

February 23, 2021 SDG I.D.: GCH66054

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

Cooler: Yes [x] No [ ]
Coolant: IPK [ ] ICE [x] No [ ]

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 2.3 °C Pg of

Data Delivery/Contact Options:
- [ ] Fax:
- [ ] Phone:
- [x] Email: rema8@aol.com

Customer: REMA ECOLOGICAL SERVICES, LLC
Address: 164 E. CENTER ST
MANCHESTER, CT 06040

Project: RIDGE RD. N. HAVEN / HAMDEN
Report to: GEORGE T. LOGAN
Invoice to: REMA
QUOTE #
Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification
Sampler's Signature [signature] Date: 2/22/21

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe **OIL**=Oil
B=Bulk **L**=Liquid **X** = ____________(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	NO2+NO3	CONDUCTIVITY	TSS	OP	TN	OP	TP	RCRA 8 METALS	MS/MSD*	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( )oz	GL Soil container ( )oz	40 ml VOA Vial [ ] As is [ ] HCL	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [x] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [x] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
66054	SS-1	SW	2/20/21	2:10pm	X	X	X	X	X	X	X	X								✓	✓	✓			

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	2/22/21	0980

Comments, Special Requirements or Regulations:
We would appreciate a call & email when results are ready @860-883-8690 & email above

*MS/MSD are considered site samples and will be billed as such in accordance with the prices quoted.

Turnaround Time:
- [x] 1 Day*
- [ ] 2 Days*
- [ ] 3 Days*
- [ ] Standard
- [ ] Other

* SURCHARGE APPLIES

RI
- [ ] (Residential) Direct Exposure
- [ ] (Comm/Industrial) Direct Exposure
- [ ] GA Leachability
- [ ] GB Leachability
- [ ] GA-GW Objectives
- [ ] GB-GW Objectives

CT
- [ ] RCP Cert
- [ ] GW Protection
- [ ] SW Protection
- [ ] GA Mobility
- [ ] GB Mobility
- [ ] Residential DEC
- [ ] I/C DEC
- [ ] Other

MA
- [ ] MCP Certification
- [ ] GW-1
- [ ] GW-2
- [ ] GW-3
- [ ] MWRA eSMART
- [ ] S-1 10% CALC
- [ ] S-1 GW-1 [ ] S-1 GW-2 [ ] S-1 GW-3
- [ ] S-2 GW-1 [ ] S-2 GW-2 [ ] S-2 GW-3
- [ ] S-3 GW-1 [ ] S-3 GW-2 [ ] S-3 GW-3
- [ ] SW Protection

State where samples were collected: ________

Data Format
- [ ] Excel
- [x] PDF
- [ ] GIS/Key
- [ ] EQuIS
- [ ] Other

Data Package
- [ ] Tier II Checklist
- [ ] Full Data Package*
- [ ] Phoenix Std Report
- [ ] Other

* SURCHARGE APPLIES

PEL-126 REV. 06/20

Makrina Nolan

Subject: GCH66054

From: Makrina Nolan
Sent: Tuesday, February 23, 2021 1:47 PM
To: 'George Logan'
Subject: RE: Sample received yesterday

Okay, we will report these results to you past hold with a comment to reflect this.

Thank you!

From: George Logan [mailto:rema8@aol.com]
Sent: Tuesday, February 23, 2021 1:45 PM
To: Makrina Nolan
Subject: Re: Sample received yesterday

Yes, please.... It is barely past hold...

George

-----Original Message-----
From: Makrina Nolan <Makrina@phoenixlabs.com>
To: rema8@aol.com <rema8@aol.com>
Sent: Tue, Feb 23, 2021 1:26 pm
Subject: Sample received yesterday

Good Afternoon,

We received your sample yesterday, with regards to the attached chain. Unfortunately, this sample was received too close to hold for Nitrate, Nitrite, and Orthophosphate and were analyzed past hold for these compounds.

Please let me know if you would like the NO2, NO3, and OP results reported to you past hold.

Thank you,

Makrina Nolan
Client Services –Project Manager
Drinking Water Specialist
Phoenix Environmental Labs
587 Middle Turnpike East
Manchester, CT
Direct Line: 860-645-3219
Website: www.phoenixlabs.com

Ridge-top above a Headwater Stream: Unsuitable Site for Slate Upper School

Say that you are applying for a wetlands permit, for a small facility. Can you rest easy, knowing that the septic system has been designed according to the Connecticut public health code, and that stormwater basin design follows the 2004 CT stormwater manual?

Not if the downgradient "receptor" is a small, headwater stream, with nearly pristine water, documented sensitive stream organisms, and little capacity to dilute stormwater and septic leachate. Correctly following the usual practices will not be enough to prevent a sharp increase in nutrient levels, that will degrade an ecologically sensitive wetland.

Not if the septic system is near the crest of the ridge. Nitrates in septic leachate are diluted by rainwater that has soaked into the ground, uphill from the system; however, on a ridgetop the watershed above the site may be too small for adequate dilution.

Not if the volume of soil available for filtering pollutants is limited by shallow ledge and/or impermeable hardpan soils, reducing the treatment efficiency.

Not if the streambed soil is a soft, fine-textured, saturated loam in a headwaters seep; if so, standard velocity controls, e.g. a level spreader, will not prevent severe erosion from a modest increase in runoff volume.

The proposed repurposing of Mt. Carmel Christian Church on Ridge Road in North Haven into the Slate Upper School is facing just such a permitting situation. Each of the four constraints listed above is a stumbling block, and warrants additional analysis. Engineer, Clint Brown, PE was hired to use the "cadillac method" (February 2006, developed by Nathan Jacobsen, Inc for CTDEEP) to calculate nitrogen dilution, taking all those factors into account. The proposed septic system would serve 90 students and about 30 adults, five days a week (substantially more than a church). The result of the analysis: 32.4 mg/l at the wetland boundary is triple the 10 mg/l limit set by the CT health code, and about 30 times the current nitrate level of 1.1 mg/l, which is typical for a clean headwater stream!

This headwater stream flows westerly down a gentle hillside towards the Quinnipiac College Campus, where it joins a larger tributary of the Mill River. Only a few inches deep and 2-3 feet wide, with clear water and scattered, clean cobbles, it has a silty substrate that is susceptible to erosion. Low, mostly grassy banks have occasional raw eroded sections. Pick up a cobble, and you'll see caddisfly cases and skittering stoneflies, and the distinctive distended shapes of black flies. The stream flows through wet meadow habitat with sensitive fern, skunk cabbage, sedge tussocks chewed by deer, and foraging white-throated sparrows. It also traverses thickets of silky dogwood, multiflora rose, and spicebush. It passes through forest with red maple, American elm, ironwood, dead ash, as well as crisscrossed, blown-over fallen trees. Wind-throw is extensive in some areas, due to the high-water table.

Increases in runoff volumes will worsen the windthrow problem on this hillside and cause the stream banks to erode even further. Elevated nitrate levels and silt deposits from erosion, will cause a scum of algae to form in the streambed leading to the growth of rank vegetation in the wetlands, allowing invasive species to flourish, reducing the diversity of plants and the fauna that rely on them for food, and leading to degradation of this stream habitat.

A river can only be as healthy as the sum of its headwater streams, which are more vulnerable than larger wetland systems, and need especially sensitive permitting. I urge the North Haven Inland Wetlands Commission to deny this application.

3-12-21

Sigrun N. Gadwa

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Petitions and Letters in Opposition

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS

List of Names of Slate Upper School Opposition Petition Signers

Last Name	First Name	Address	Street	Town
Acampora	Denise	5036	Ridge Road	North Haven
Acampora	John	5036	Ridge Road	North Haven
Acampora	Maria	5060	Ridge Road	North Haven
Annatone	Michael	1330	Mt. Carmel Avenue	Hamden
Arcecerda	Bruno	330	Six Rod Highway	Hamden
Becker	Hal	4051	Whitney Avenue	Hamden
Becker	Kris	4051	Whitney Avenue	Hamden
Bombara	Michael	330	Six Rod Highway	Hamden
Bourque	Anita	5051	Ridge Road	North Haven
Branneis	Michael	123	Manomet Avenue	North Haven
Browning	Robert	39	Lancelot Drive	North Haven
Byers	Allison	300	Hogan Road	Hamden
Byers	Bonnie	300	Hogan Road	Hamden
Cameron	Gail	117	Squire Lane	Hamden
Chaney	Donna	42	Homewood Avenue	North Haven
Civitello	Cynthia	61	Berkley Court	Hamden
Colonna	Robert	40	Lucien Drive	Hamden
Coppola	Gil	3013	Ridge Road	North Haven
Coppola	Nick	3013	Ridge Road	North Haven
Culliney	Constance	19	Lancelot Drive	North Haven
Cuomo	Richard	1149	Ridge Road	North Haven
Dannenhoffer	Alex	1277	Mt. Carmel Avenue	Hamden
Dannenhoffer	Susan	1277	Mt. Carmel Avenue	Hamden
De Marsilis	Calvin	311	Hogan Road	Hamden
De Rosa	Tom	43	Lancelot Drive	North Haven
de Simone	Gary	5200	Ridge Road	North Haven
Earley	Robert	29	Riverside Drive	Hamden
Elmer	Portia	20	Lancelot Drive	North Haven
Esposito	Jay	20	Lincoln Street	Hamden
Esposito	Michelle	123	Pool Road	North Haven
Fasano	Anthony	155	Mill Road	North Haven
Ferrucci	Joe	315	Chestnut Lane	Hamden
Flynn	William	11	Regency Drive	North Haven
Gee	Kathleen	26	Laydon Avenue	North Haven
Gee	Laurence	26	Laydon Avenue	North Haven
Gould	Katie	114	Walter Lane	Hamden
Gray	Scott	14	Oxford Trail	Wallingford
Gregg	Glen	210	Hogan Road	Hamden

Gregg	Ramona	210	Hogan Road	Hamden
Gumkowski	John	4401	Ridge Road	North Haven
Harlow	Kristen	1535	Hartford Turnpike	North Haven
Henrici	Kenneth	27	Regency Drive	North Haven
Henrici	Lauren	45	Ives Street	Hamden
Hulten	Julie	42	Homewood Avenue	North Haven
Kaplan	Barbara	5005	Ridge Road	North Haven
Kaplan	Harold	5005	Ridge Road	North Haven
Kissner	Michelle	20	Goodsell Road	North Haven
Klaus	Fred	75	Blue Hills Road	North Haven
Klaus	Katherine	75	Blue Hills Road	North Haven
Knope	Elizabeth	5200	Ridge Road	North Haven
Knudsen	Florence	465	Hogan Road	Hamden
Knudsen	Tom	465	Hogan Road	Hamden
Krombel	Mary	720	Mt. Carmel Avenue	Hamden
Lane	Robin	39	Lancelot Drive	North Haven
Lanier	Paul	35	Mountain Brook Rd	North Haven
Lanius	Mary	4200	Ridge Road	North Haven
Lanius	Ross	4200	Ridge Road	North Haven
Lindenfelser	Peter	260	Hogan Road	Hamden
Mangi	Johanne	5061	Ridge Road	North Haven
Mangi	Richard	5061	Ridge Road	North Haven
Martinelli	Matthew	303	Upper State Street	North Haven
Martuccci	Mick	720	Mt. Carmel Avenue	Hamden
Martuccci	Patricia	720	Mt. Carmel Avenue	Hamden
Mastrigno	Paul	29	North Avenue	North Haven
Matthew	Colette	2	Tokeneke Drive	North Haven
Matthew	William	2	Tokeneke Drive	North Haven
McCarthy	Laura	33	Mansfield Road	North Haven
McGrath	Elizabeth	980	Mt. Carmel Avenue	Hamden
McGrath	Raymond	980	Mt. Carmel Avenue	Hamden
Meinsen	Bruce	15	Highland Park Rd	North Haven
Meinsen	Janice	15	Highland Park Rd	North Haven
Melillo	Mary	57	Ralston Avenue	Hamden
Minichiello	Frank	23	Regency Drive	North Haven
Mongillo	John	123	Pool Road	North Haven
Moore	Dorothy	23	Mountain Brook Rd	North Haven
Moore	Jeffrey	23	Mountain Brook Rd	North Haven
Moorer	Bettye	35	Mountain Brook Rd	North Haven
Moroz	Scott	4061	Whitney Avenue	Hamden
Navaretta	Nancy	311	Hogan Road	Hamden
Nutcher	Gina	325	Chestnut Lane	Hamden

Nutcher	Greg	325	Chestnut Lane	Hamden
Nutcher	Greg	325	Chestnut Lane	Hamden
Nutcher	John	4045	Whitney Avenue	Hamden
Nutcher	Kaitlyn	325	Chestnut Lane	Hamden
Nutcher	Kathy	4045	Whitney Avenue	Hamden
O'Connor	Stephen	112	Summer Lane	North Haven
O'Donnell	Lynda	11	Canterbury Way	North Haven
O'Donnell	Rick	11	Canterbury Way	North Haven
Oliver	Garth	40	Mountain Brook Rd	North Haven
Oliver	Octavia	40	Mountain Brook Rd	North Haven
Palmieri	Ann	1090	Mt. Carmel Avenue	Hamden
Palmieri	Marco	1090	Mt. Carmel Avenue	Hamden
Parese	John	25	Tokeneke Drive	North Haven
Perrino	Albert	5051	Ridge Road	North Haven
Purcell	Brian	3757	Whitney Avenue	Hamden
Purcell	Rebecca	3757	Whitney Avenue	Hamden
Reilly	Jim	4500	Ridge Road	North Haven
Restivo	Nancy	315	Chestnut Lane	Hamden
Roussel	Andy	590	Mt. Carmel Avenue	Hamden
Roussel	Carla	590	Mt. Carmel Avenue	Hamden
Roy	Dhillon	1	Leona Avenue	North Haven
Roy	Jennifer	1	Leona Avenue	North Haven
Roy	Mitchell	1	Leona Avenue	North Haven
Roy	Robin	1	Leona Avenue	North Haven
Russell	Anne	4401	Ridge Road	North Haven
Russell	Katherine	4401	Ridge Road	North Haven
Salvo	Catherine	65	Blue Hills Road	North Haven
Savinelli	Michael	32	Home Place	Hamden
Schatzlein	Scott	19	Lancelot Drive	North Haven
Sinard	John	4421	Ridge Road	North Haven
Sullivan	Colby	91	Robertson Drive	Hamden
Sweeney	George	1330	Mt. Carmel Avenue	Hamden
Sweeney	Sandra	1330	Mt. Carmel Avenue	Hamden
Tardy	Michael	200	Hogan Road	Hamden
Toce	Michael	65	Blue Hills Road	North Haven
Valente	Edward	63	Mountain Brook Rd	North Haven
Valente	Kristen	63	Mountain Brook Rd	North Haven
Vigorito	Tom	19	Highland Park Rd	North Haven
Wade	Donna	301	Hogan Road	Hamden
Wade	Richard	301	Hogan Road	Hamden
Zampano	Suzanne	123	Pool Road	North Haven
Zingarella	Cynthia	39	Mountain Brook Rd	North Haven

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Gary de Simone NAME GARY de SIMONE	5200 RIDGE RD, NORTH HAVEN ADDRESS
Elizabeth A Knope NAME ELIZABETH A KNOPE	5200 RIDGE RD, NORTH HAVEN ADDRESS
[signature] NAME F MICHAEL MARTUCCI	720 MT CARMEL AVE, HAMDEN ADDRESS
Mary Krombel NAME Mary Krombel	720 Mt Carmel Ave ADDRESS
Patricia Martucci NAME Patricia Martucci	720 Mt. Carmel Ave, Hamden ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Anita L. Bourque NAME Anita L. Bourque	5051 Ridge Rd, North Haven ADDRESS
[signature] NAME Albert Perrino	5051 Ridge Rd, North Haven ADDRESS
Julie Hulten [signature] NAME	42 Homewood Ave North Haven ADDRESS
DONNA Chaney [signature] NAME	42 Homewood Ave, North HAVEN 06473 ADDRESS
[signature] NAME RAYMOND McGRATH	980 Mt Carmel Ave, Hamden Ct 06518 ADDRESS
Elizabeth P. [signature] NAME Elizabeth McGrath	980 Mount Carmel Ave Hamden 06518 ADDRESS
Susan Dannenhoffer NAME Susan Dannenhoffer	1277 Mount Carmel Avenue ADDRESS North Haven, CT 06473
[signature] NAME Alex Dannenhoffer	1277 Mount Carmel Ave ADDRESS North Haven CT 06473

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

A. Roussel NAME ANDY ROUSSEL	590 Mt. Carmel Ave ADDRESS Hamden CT 06518
Carla M. Roussel NAME CARLA ROUSSEL	590 Mt. Carmel Ave ADDRESS Hamden, CT 06518
James C Reilly NAME JIM REILLY	4500 RIDGE RD ADDRESS NORTH HAVEN, CT 06473
Richard Mangi NAME RICHARD MANGI	5061 Ridge Rd North Haven ADDRESS 06473
Johanne Mangi NAME Johanne Mangi	5061 Ridge Rd North Haven ADDRESS 06473
T. D. Rutton NAME Tom DeNova	43 Lancelot D. North Hav ADDRESS 06473
Harold P. Kaplan NAME HAROLD P. KAPLAN	5005 RIDGE ROAD, North Haven ADDRESS
Barbara S. Kaplan NAME BARBARA S. KAPLAN	5005 RIDGE ROAD, NORTH HAVEN ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Mary L Lanius	4200 Ridge Rd No H
NAME Mary Lanius	ADDRESS
Ross M Lanius Jr	4200 Ridge Rd No Haven
NAME Ross M Lanius JR	ADDRESS
Cynthia D Civitello	61 Berkeley Ct Hamden CT
NAME Cynthia D Civitello	ADDRESS
John Sinard	4421 Ridge Rd
NAME JOHN SINARD	ADDRESS
Katherine Russell	4401 Ridge Rd.
NAME Katherine Russell	ADDRESS
Anne Russell	4401 Ridge Rd
NAME ANNE RUSSELL	ADDRESS North Haven CT
[illegible]	4401 Ridge Rd
NAME JOHN GUMKOWSKI	ADDRESS
NAME	ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

[signature] NAME LAURENCE E. GEE	26 LAYDON AVE NO. HAVEN ADDRESS
[signature] NAME KATHLEEN F. GEE	26 Laydon Ave. No. Haven ADDRESS
Gail Cameron NAME gail Cameron	117 Squire La Hamden ADDRESS
[signature] NAME Marco PAlmieri	1090 MT. CARMEL Ave Hamden. ADDRESS
Ann P. Palmieri NAME Ann Palmieri	1090 Mt. Carmel Ave Hamden ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Maria Acampora NAME MARIA ACAMPORA	5060 RIDGE Rd., NORTH HAVEN, CT ADDRESS
John Parese NAME John A. Parese	25 Tokeneke Drive, North Haven ADDRESS
[illegible] NAME John Acampora	5036 Ridge Rd North Haven Ct. ADDRESS
Denise Acampora NAME Denise Acampora	5036 Ridge Rd. North Haven Ct. ADDRESS
NAME	ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME	ADDRESS
Calvin W DeMarsilis CALVIN W DeMARSILIS	311 Hogan Rd Hamden CT.
Bonnie Byers Bonnie Byers	300 Hogan Rd, Hamden, Ct.
ALLison Byers Allison Byers	300 Hogan Rd, Hamden, Ct
Glen H Gregg GLEN H GREGG	210 Hogan Rd. Hamden, CT
Ramona Gregg Ramona Gregg	210 Hogan Rd. Hamden, CT

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

P. Lindenfelsa P. Lindenfelser NAME	260 Hogan Rd. ADDRESS
George Sweeney NAME	1330 Mt. Carmel Ave ADDRESS
Zandra Sweeney NAME	1330 Mt. Carmel Ave ADDRESS
Michael E Amatone Michael E. Amatone NAME	3 Edith Way ADDRESS
MICHAEL TARDY NAME	200 HOGAN Rd. ADDRESS
Tom Knudsen NAME TOM Knudsen	465 Hogan Rd ADDRESS
Florence Knudsen NAME Florence Knudsen	465 Hogan Rd. ADDRESS
Kristin Harlow NAME	1535 Hartford Tpke ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME	ADDRESS
Suzanne Zampano Suzanne Zampano	123 Pool Rd. No. Haven
Michelle Esposito Michelle Esposito	123 Pool Rd. No. Haven
John Mongillo John Mongillo	123 Pool Rd No Haven
Michael H. Brennas Michael H. Brennas	12 Menomet Ave No. Haven
[illegible]	20 Lincoln St Hamden
[illegible]	301 Hogan Rd. Hamden CT.
[illegible]	301 Hogan Rd, Hamden CT
Nancy Navarretta [signature]	311 Hogan Rd Hamden CT

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME Anthony Fasano	ADDRESS 155 Mill Rd. North haven
NAME Mike Savinelli	ADDRESS 32 Home place Hamden
NAME Greg Nutcher	ADDRESS 325 Chestnut Ln Hamden
NAME Katie Gould	ADDRESS 114 walter lane - Hamden
NAME Colby Sullivan	ADDRESS 91 Robertson Drive Hamden
NAME Gina Nutcher	ADDRESS 325 Chestnut Lane Hamden
NAME Greg Nutcher	ADDRESS 325 Chestnut lane - Hamden
NAME	ADDRESS 3757 Whitney Ave - Hamden
Brian Purcell	3757 Whitney AV Hamden

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME	ADDRESS
John Nutcher	4045 Whitney Ave Hamden
Kathy Nutcher	4045 Whitney Ave
Kaitlyn Nutcher	325 Chestnut Lane
Scott Moroz	4061 Whitney Ave
Hal Becker	4051 Whitney Ave Hamden
Kris Becker	4051 Whitney Ave Hamden
Stephen O'Connor	112 Summer LN North Haven
Matthew Martinelli	303 Upper State St No. Haven

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Paul Mastriano
NAME

29 North Avenue No. Haven CT
ADDRESS

Lauren Henrici
Lauren Henrici
NAME

45 Ives St. Hamden CT 06[illegible]
ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Mary Melillo
MARY MELILLO — 57 RALSTON Ave Hamden 0651?
NAME — ADDRESS

Robert A Colonna
[signature] — 40 Lucien dr Hamden, CT 06518
NAME — ADDRESS

Robert Earley
[signature] — 29 Riverside Dr Hamden CT 06518
NAME — ADDRESS

NAME — ADDRESS

NAME — ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

BETTYE MOORER NAME	35 MOUNTAIN BROOK Rd. ADDRESS
PAUL LANIER NAME	35 MOUNTAIN BROOK Rd. ADDRESS
Octavia Oliver NAME	40 Mountain Brook Rd ADDRESS
[illegible] NAME	40 Mt Brook Rd. ADDRESS
Dorothy Moore NAME	23 Mtn brook rd ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Jeffrey Moore
JEFFREY MOORE
NAME

23 MountainBrook Rd
ADDRESS

Ralph Zingarella
NAME RALPH ZINGARELLA

39 MOUNTAINBROOK RD
ADDRESS

Cynthia Zingarella
NAME Cynthia Zingarella

39 Mountainbrook Rd
ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

NAME

ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Nancy Restivo NAME NANCY RESTIVO	315 Chestnut Ln Hamden ADDRESS
Joe Ferrucci NAME JOE FERRUCCI	315 Chestnut Ln, Hamden ADDRESS
NAME MICHAEL BOMBARA	330 Six Rod Hwy, Hamden ADDRESS
NAME BRUNO ARCE CERDA	330 SIX ROD HWY, HAMDEN ADDRESS
NAME	ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

SCOTT GRAY NAME	14 OXFORD TRAIL WALLINGFORD, CT ADDRESS
NAME RICHARD CUOMO	1149 Ridge Rd North Haven Ct. ADDRESS
NAME Dhillon Roy	1 Leona ave North Haven ct ADDRESS
NAME MITCHELL ROY	1 Leona ave North Haven Ct ADDRESS
NAME Jennifer Roy	1 Leona Ave North Haven, CT ADDRESS
NAME Robbie Roy	1 Leona Ave North Haven CT ADDRESS
NAME William D. Matthew	2 Tokeneke Dr. North Haven CT ADDRESS
NAME Colette Matthew	2 Tokeneke Dr North Haven CT ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Richard K. O'Donnell NAME	11 CANTERBURY WAY ADDRESS NORTH HAVEN
Lynda O O'Donnell NAME	11 Canterbury Way, North Haven CT ADDRESS
[signature] NAME	65 Blue Hills Road, North Haven, CT ADDRESS
[signature] NAME	65 Blue Hills Road, North Haven, CT ADDRESS
Kenneth V. Henrici NAME Kenneth V. Henrici	27 Regency Drive North Haven, CT ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

[signature]	11 Regency Drive
NAME William Flynn	ADDRESS
[signature]	23 REGENCY DRIVE
NAME Frank Minichiello	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL 5100 RIDGE ROAD, NORTH HAVEN, CT 06473

We, the undersigned, being property owners in the towns of Hamden and or North Haven, and being fully informed of the application, strongly oppose the proposed development of the Slate school at 5100 Ridge Road, North Haven, Connecticut. This development abuts a wetland, is entirely within a protected aquifer zone and is in direct contravention to The Plan of Conservation and Development (POCD) for the Town of North Haven. The proposal for the Slate School will irrevocably destroy the rural character and tranquility of the neighborhood. The site and the adjacent wetlands presently support a variety of wildlife. In addition, property values will be substantially reduced due to the noise, lighting, traffic and other detrimental impacts caused by the intense commercial development of the site. (The proposal anticipates approximately 120 students and personnel will occupy the site on a daily basis in addition to sponsoring additional events.) We believe that this project SHOULD NOT be approved under any circumstances. We urge you, the commission, as the gatekeepers of orderly development in our town (In accordance with POCD) to deny this proposal for all the above reasons and for the good of North Haven and Hamden.

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Janice Meinsen NAME JANICE MEINSEN	15 HIGHLAND PK RD ADDRESS
Bruce Meinsen NAME BRUCE MEINSEN	15 Highland Park Rd. ADDRESS
Tom Vigorito NAME	19 Highland Park Rd. ADDRESS
Laura McCarthy NAME LAURA MCCARTHY	33 Mansfield Rd. ADDRESS
Edward Valente NAME Edward Valente	63 mountain Brook rd ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

NAME Kristen Valente	63 Mt. Brook Rd - ADDRESS
NAME Katherine A. Klaus	75 Blue Hills Rd No. Haven ADDRESS
NAME Frederick L. Klaus	75 Blue Hills Rd ADDRESS
NAME ROBIN LANE	39 Lancelot Dr ADDRESS
NAME Robert Browning	39 Lancelot Dr. ADDRESS
NAME Githia Coppola	3013 Ridge Rd ADDRESS
NAME Nicholas J. Coppola	3013 Ridge Rd ADDRESS
NAME PORTIA ELMER	20 LANCELOT DR. ADDRESS

PETITION OPPOSING THE PROPOSED DEVELOPMENT OF SLATE SCHOOL
5100 RIDGE ROAD, NORTH HAVEN, CT 06473

Please sign your name on the line, print it clearly below your signature, and clearly print your address on the line provided. Thank you.

Constance M. Culliney NAME Constance M. Culliney	19 Lancelot Drive No. Haven ADDRESS
NAME Scott Schatzlein	19 Lancelot Dr. No. Haven ADDRESS
Michelle Kissm Michelle Kissm NAME	20 Goodsell RD ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS
NAME	ADDRESS

change.org/northhavenct as of 3/19/21, 6PM

Name		Location	Email	Signed On
1.	Evelyn Springston	Bedford, US		Mar 19, 2021
2.	Emily Perkins	Tallahassee, US		Mar 19, 2021
3.	Rebekah Goodyear	Louisville, US		Mar 19, 2021
4.	Jose Villegas	Santa Maria, US		Mar 19, 2021
5.	Michelle Shiro	APO, US		Mar 19, 2021
6.	Neel Mirpuri	Pompano Beach, US		Mar 19, 2021
7.	Sophie Kennedy	Somerville, US		Mar 19, 2021
8.	Richard McConnell	Crown Point, US		Mar 19, 2021
9.	**Louis Angelucci**	North Haven, CT	louangelucci@gmail.com	Mar 19, 2021
10.	**Kayla Magliula**	Naugatuck, CT	kayla.magliula@gmail.com	Mar 19, 2021
11.	**Diane Lippincott**	North Haven, CT	dlippincott2@comcast.net	Mar 18, 2021
12.	**James DiCarlo**	North Haven, CT	jxdix@aol.com	Mar 18, 2021
13.	R Collins	North Haven, CT		Mar 18, 2021
14.	**Lynn Fredricksen**	North Haven, CT	lynnfredricksen@outlook.com	Mar 18, 2021
15.	Robin Masheb	North Haven, CT		Mar 18, 2021
16.	**Joe Antonino**	North Haven, CT	joeantonino80@gmail.com	Mar 18, 2021
17.	**Jennifer Kirchoff**	Hamden, CT	ackbar@ackbar.net	Mar 18, 2021
18.	**David Hazall-Farrell**	North Haven,CT	drff@hotmail.com	Mar 18, 2021
19.	**Theresa Woyciesjes**	North Haven		Mar 18, 2021
20.	**Michele O'Connell**	North Haven, CT	michelecoconnell@gmail.com	Mar 18, 2021
21.	Nic M	Hamden, CT		Mar 17, 2021
22.	**Boettger, Heidi**	North Haven, CT	haboettget@snet.net	Mar 17, 2021
23.	**Beale, Roger**	North Haven, CT	rcbeale1950@gmail.com	Mar 17, 2021
24.	**Minichiello, Frank**	North Haven, CT	frank.minichiello@gmail.com	Mar 17, 2021
25.	**Riccio, Carol**	North Haven, CT	ricciocarol@comcast.net	Mar 17, 2021
26.	Cifaldi, Donna	Hamden		Mar 17, 2021
27.	Whittaker, Raymond	Hamden		Mar 17, 2021
28.	Beckett, Leah	Asheville, NC		Mar 17, 2021
29.	**Doyle, Katie**	North Haven		Mar 17, 2021
30.	**Whittaker, Sarah**	Colchester, Vermont		Mar 17, 2021
31.	Mahmood, Carol M	North Haven, CT	cmmahmood@aol.com	Mar 17, 2021
32.	**Wilkosz, Meghan**	Hamden, CT	meghan.wilkosz@gmail.com	Mar 16, 2021
33.	**Coutermash, Brad**	Hamden, CT	btcoutermash@gmail.com	Mar 16, 2021
34.	**Avery, Stephanie**	Hamden, CT	stephanieavery7@gmail.com	Mar 16, 2021
35.	**McCarthy-Krombel, Pamela**	Wallingford, CT	krombel5@snet.net	Mar 16, 2021
36.	Martucci (Andrich), Anna	Wallingford, CT		
37.	Persaud, Emily	Trumbull		
38.	Clayton, Molly	Hamden		
39.	**Schneider, George**	Hamden, CT	george.schneider1957@gmail.com	Mar 15, 2021

____

____

January _____, 2021

Mr. Vern Carlson
Chairman, P&Z Commission
Town of North Haven
Town Hall Annex
5 Linsley Street
North Haven, CT 06473

RE: Application I20-06, Application to conduct regulated activity by the Slate School, Inc. at 5100 Ridge Road, North Haven, CT

Dear Chairman Carlson:

I (we) live in the northwest part of North Haven, and enjoy our tranquil, verdant, neighborhood, which is contiguous with the beautiful Sleeping Giant State Park, is home to abundant and diverse wildlife, and is so much a part of the Town's character and appeal. An application is now before our Wetlands Commission, which, if approved, will irreparably damage the character of our neighborhood, diminish the value of our homes, and adversely impact North Haven's allure to new residents.

The Slate School, Inc. has applied to conduct regulated activity as part of its proposal to build a so-called "upper" school (grades 7-12) for 90-100 students, at 5100 Ridge Road, on a site that is less than three acres. The plans call for a new parking lot, an outdoor amphitheater, a large storm water retention pond, an expanded septic system, the installation of 82 lights, and the widening of portions of Outer Ridge Road. The site abuts extensive wetlands in North Haven and in Hamden, and the entire region is an aquifer zone.

This proposal is in direct contravention to North Haven's Plan of Conservation and Development (POCD) which recommends limiting development in this area in order to preserve its rural and pastoral nature, reducing traffic on Mt. Carmel Avenue and Outer Ridge Road, and adopting a Scenic Road Ordinance to protect views along roads such as Outer Ridge Road that contribute to the Town's character.

If approved, there will be a large increase in impervious area, increased discharge of the septic system into the wetlands, and a huge increase in daily activity at the site. As a result, there will be negative impacts on the wildlife and neighbors residing in the area, along with increased traffic, noise, and light pollution. This proposal is an inappropriate use of this site, and the scale of the project is much too large for its size.

I [we] implore North Haven's Wetlands and Zoning Commissions to adhere to the recommendations in the town's POCD, defer to Hamden's request to adhere to their wetlands regulations which stipulate a 100' non-disturbance zone and a 200' Upland Review Area, and deny this application. We ask you to support our efforts to preserve the sensitive ecosystem of this area of our town and the Town of Hamden and preserve its pastoral character. Thank you for your consideration.

Sincerely,

____________________________________ ____________________________________

Signature Printed Name

cc: Andy Bevilacqua, Sally Buemi, Frank Bumstead, Paul Cicarella, James DiCarlo, Michael Freda, Alan Fredricksen, Martin Looney, William Pieper, Brian Thompson, Dave Yaccarino

North Haven, CT 06473
March 18, 2021

The Honorable Michael J. Freda
First Selectman, Town of North Haven
Memorial Town Hall
18 Church Street
North Haven, CT 06473

RE: Application I20-06, Application to conduct regulated activity by the Slate School, Inc. at 5100 Ridge Road, North Haven, CT

Dear First Selectman Freda:

Since our previous correspondence, there have been numerous substantive developments concerning this proposed project that have heightened our opposition (the number of people who have signed our petition in opposition has grown to over 130), and which we want to make sure you are aware of, given their detrimental impacts on our community.

To begin with, we reiterate that we are not opposed to the concept of a Slate Upper School; we are strongly opposed to locating it at 5100 Ridge Road for many reasons. Among them: During the recent Inland Wetlands Commission hearings, experts that we engaged testified that the adjacent wetlands and watercourses in Hamden contain diverse flora that sustain thriving wildlife populations, and this project causes several significant adverse impacts. Very high nitrogen levels in septic system discharges from the property will entirely change the wetlands vegetation, allowing invasive plant species to dominate and drive out the wildlife inhabitants. The proposed plan nearly doubles the recommended 24-hour, post-development, peak storm water runoff, further eroding watercourse stream banks that erode now because they cannot accommodate the existing, pre-development runoff.

Our experts also testified that the proposed plan violates the goals in the Town's Plan of Conservation and Development (POCD) by increasing impervious surface area, increasing storm water runoff, destroying wetland habitats, destroying the rural character of the Outer Ridge Road area, and introducing more unnecessary sewage into a sewer avoidance area. There are also serious concerns regarding public safety, as traffic is projected to increase significantly – particularly during peak periods – which is both hazardous and in contravention of North Haven's POCD.

We have created a website that shines a spotlight on significant deficiencies in the proposed plan and also debunks several key myths propagated by the applicants. We invite you to examine the material included on this website and see for yourself why this proposal is too much development for too small a space – a project that is incompatible with the neighborhood, and would do more harm than good for North Haven and Hamden.

The website address is www.SleepingGiantNeighbors.net. We urge you to visit the website, review the facts, share them with other town leaders, and join us in opposition to allowing this school to be built on this site. Your time and attention are greatly appreciated.

Sincerely,

Harold P. Kaplan, M.D., F.A.C.P.
5005 Ridge Road
North Haven, Connecticut 06473

27 March 2021

The honorable Michael J. Freda
First Selectman, Town of North Haven
Memorial Town Hall
18 Church Street
North Haven, CT 06473

RE: Application 120-6, Application to conduct regulated activity by the Slate School, Inc. at 5100 Ridge Road, North Haven, CT

Dear Selectman Freda:

My wife, Barbara, and I have been residents of North Haven, originally living on Drazen Drive, since the summer of 1967. In 1978, we purchased property on what was then called Outer Ridge Road and built our "dream house" on an approximately 3.3-acre lot, now known as 5005 Ridge Road. That is across the street and a short way down the road from the proposed Slate Middle and High Schools.

Having grown up in the Bronx, NYC, just a few blocks from Yankee Stadium, I really appreciated the bucolic environment of Outer Ridge Road, the privacy and the quiet. During the following 40-plus years, the area has further developed, substantially, with many new residents (as we had anticipated), but the character of my home environment and of the neighborhood, remains unchanged.

When we were younger, and our children were still children, I served, for several years, as President of The Alliance for Education of North Haven, which at that time included, as members, several hundred North Haven families. The Alliance was instrumental in the support of public education in North Haven, through the Town Meeting and the then seldom used referendum process. My wife and I also served as Presidents of the

Clintonville School PTA, and then the central town PTA Board. I also served on several Board of Education Committees. Barbara served, for several years, as a member of the Board of the Hopkins School, in Hamden. The Alliance was instrumental in supporting Selectman Walter Gawrych in gaining approval for sale of the Orchard Hill Junior High School property and subsequent construction of the town indoor swimming pool, now named in his honor. I tell you all this to support our claim that we have experience with, and extensive understanding of both public and private schools and systems.

It is my understanding that zoning regulations have provided for the development of schools and places of worship in residential areas because as they developed, there could be a parallel need for simultaneous development of those facilities to serve the needs of those residents. The above cited proposal does not do that. It is a private venture, designed to satisfy the desires and goals of private individuals, and does nothing to meet any North Haven public need. It is a solution in search of a problem.

North Haven is already well served by available public schools, and there are, for those who wish to go that way, excellent available private schools in nearby Wallingford, Cheshire, Hamden and New Haven. Approval of this proposed School, at this location, is a perversion of the intent of Zoning Regulation, and defeats the purpose of having such regulation.

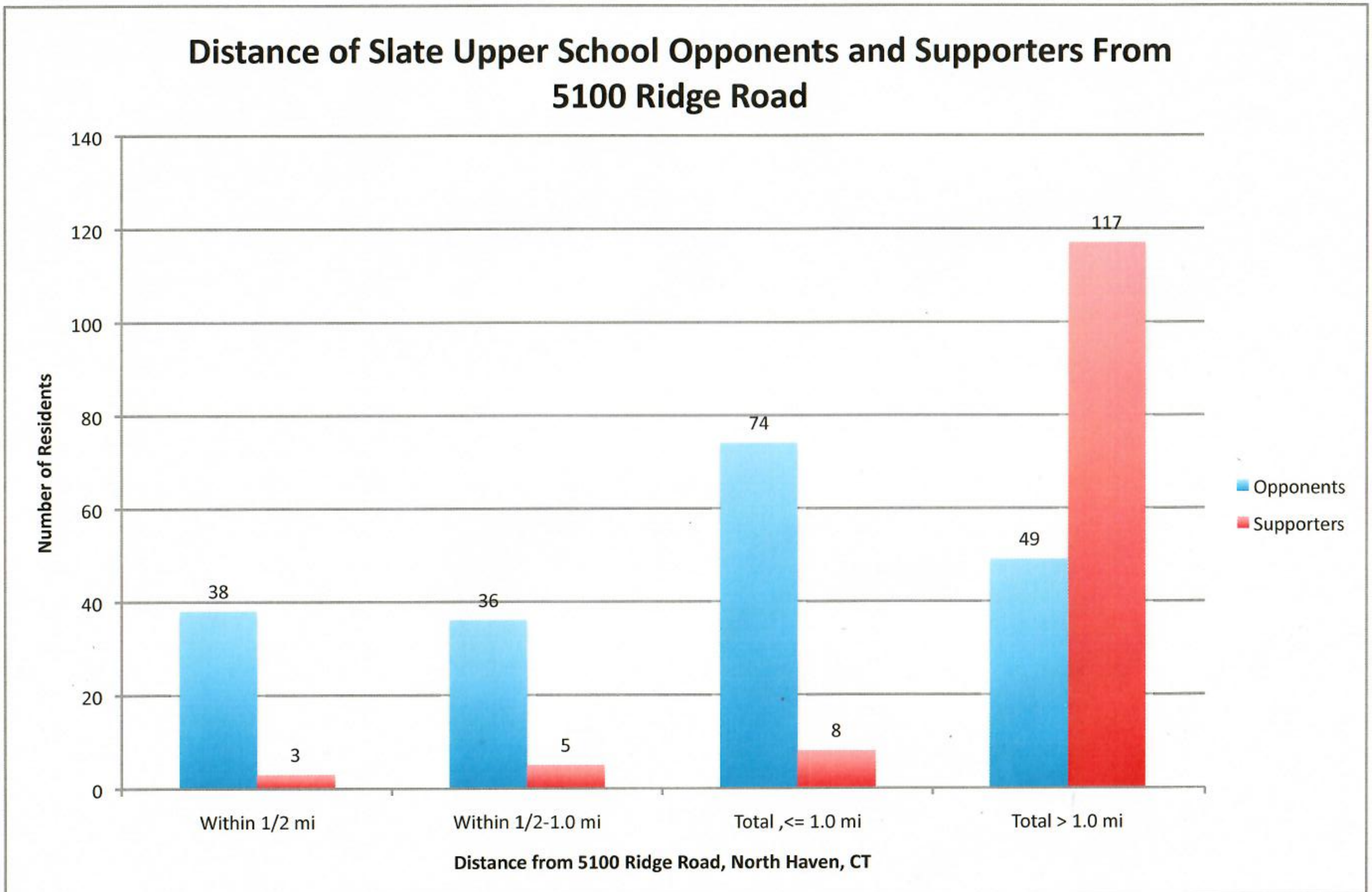
The is not a "NIMBY" protest. That acronym refers to proposed institutions and facilities that are clearly necessary and needed, resisted by a desire to put them elsewhere. The proposed Slate Upper Schools are neither necessary nor needed. Even worse, the proposed school will likely gradually expand, taking over adjacent properties as they become undesirable and unsuitable as residences. Quinnipiac University has provided the model.

Thank you for your indulgence. Please give this matter serious consideration.

Sincerely,

Harold P. Kaplan

Harold P. Kaplan



Distance of Slate Upper School Opponents and Supporters From 5100 Ridge Road
Number of Residents
140
120
100
80
60
40
20
0
38
3
36
5
74
8
49
117
Within 1/2 mi
Within 1/2-1.0 mi
Total ,<= 1.0 mi
Total > 1.0 mi
Distance from 5100 Ridge Road, North Haven, CT
Opponents
Supporters

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School
Analysis of Support Letters

Slate Upper School Opposition

Analyzing Slate Upper School Support

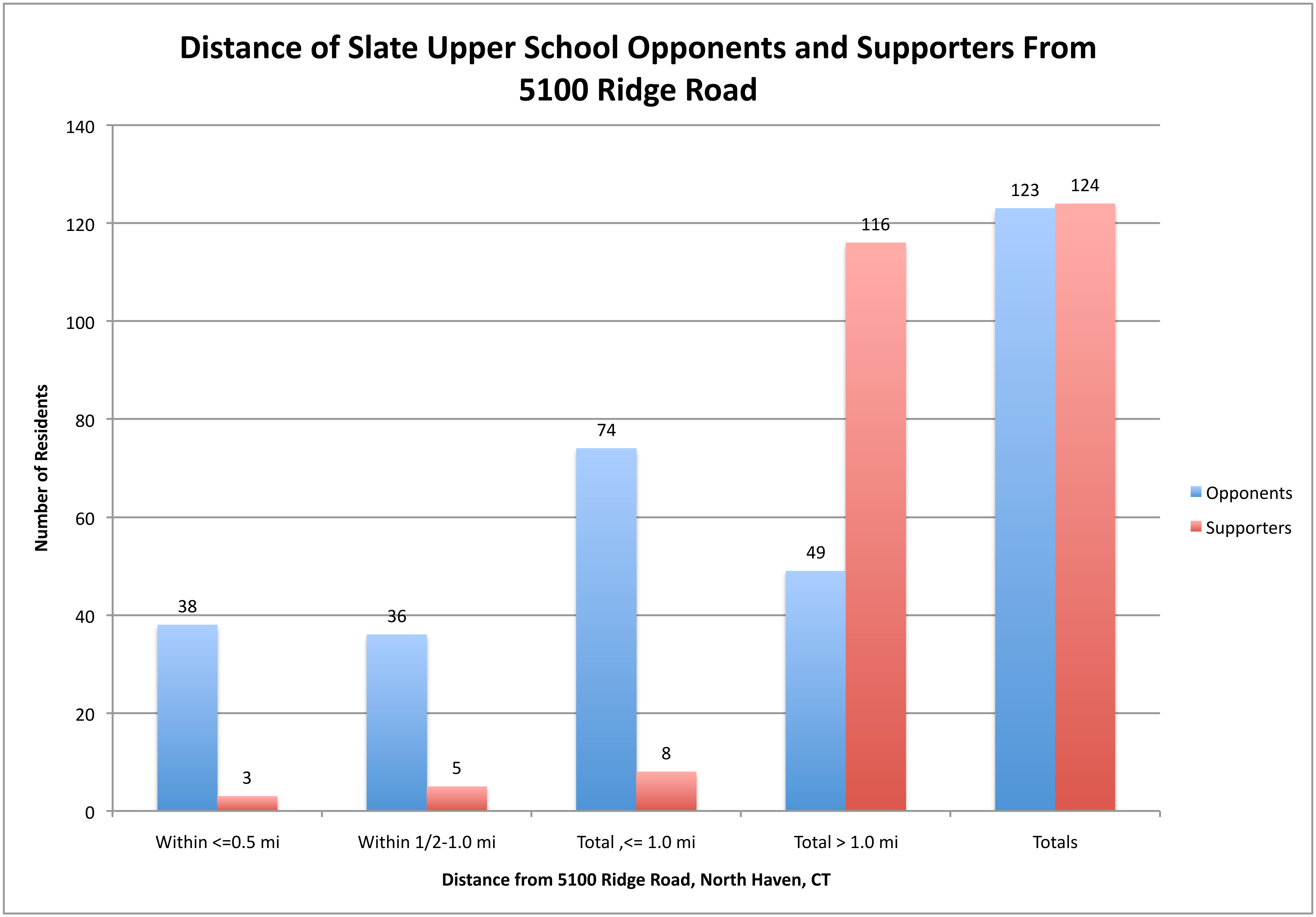
- The applicants claim they have 200 support emails
- They have provided copies from 140 purported supporters. These include 6 duplicates, 1 opponent, and 9 young, non-tax-paying students of the Lower School
- *Please refer to the large, rolled, spreadsheet for the data discussed below*
- Of the remaining 124 emails, 3 are from people who live within ½ mile of the proposed site; another 5 live within ½-1-mile of the site
- 29 supporters live in Hamden
- 13 supporters live in towns other than North Haven or Hamden
- 19 supporters did not identify a town or street where they live
- Almost every supporter states they support this school because the Lower School is a great school, paying no regard to the very real issues with this proposal
- 66 supporters identified a relationship to the proposed project:
  - 32 are relatives of Lower School students
  - 10 are friends of parents of Lower School students, 2 are friends of Lower School teachers
  - 8 work at the Lower School
  - 7 are neighbors
  - 4 are parents of prospective students

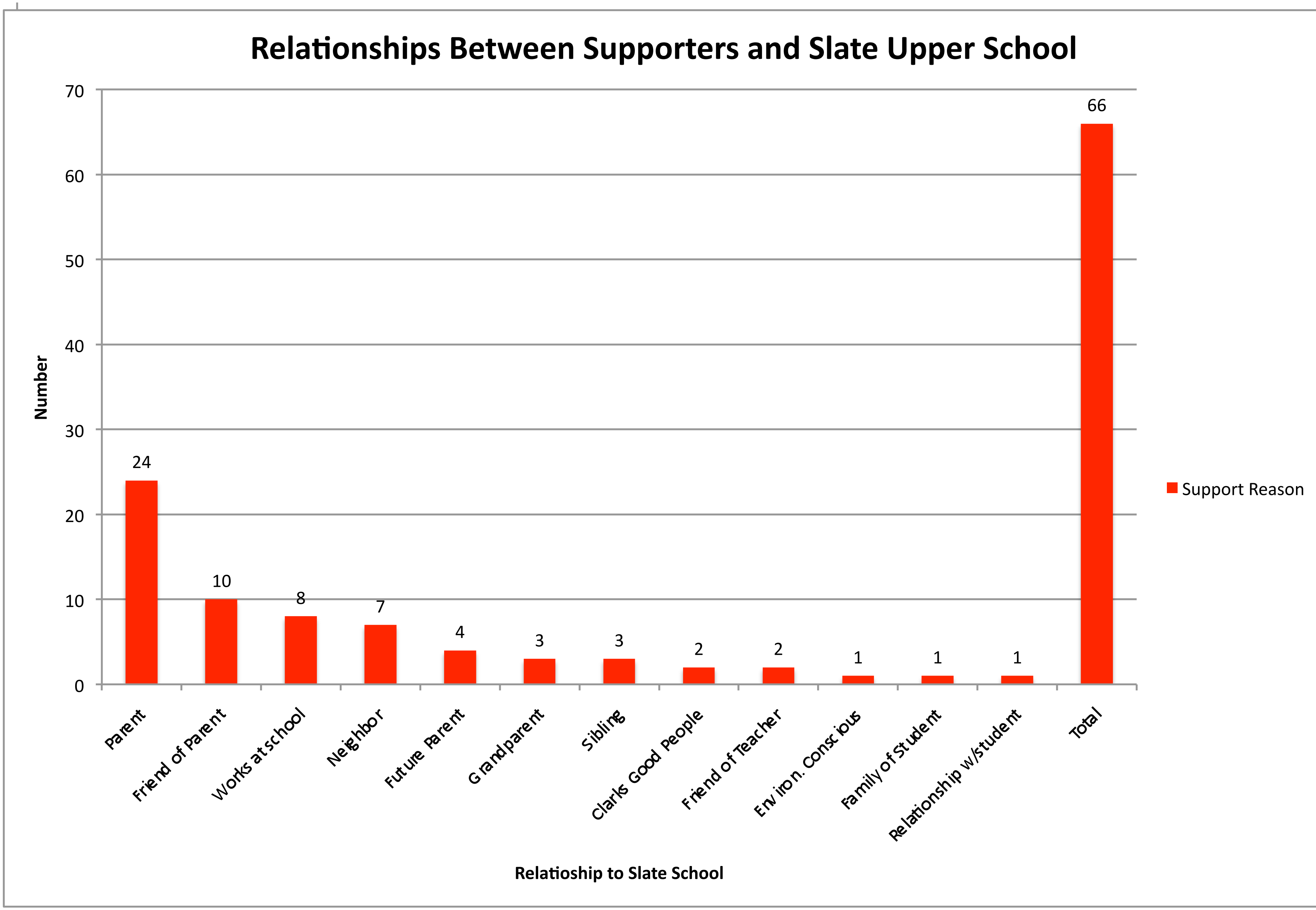
Rev 1.0

Slate Upper School Opposition

Supporter Data – See Large Spreadsheet

Last Name	First Name	Number	Street	Town	State	Reason	Notes
Gibson	Lynn U	1520	Schoffers Road	Birdsboro	PA	good school	interesting
Hayes	Chris (Tracy)			Cromwell		good school	parent
Kuka	Sherry (Arber)			Derby		good school	parent
Vora	Prema (Dinesh Perera)	66-4	Cosey Beach Ave	East Haven		good school	parent
Pflug	Dan (Stephanie Ball)	25	Palmer Place	Easton		good school	parent/looking to move closer
Picanso	Kathryn	321	Blake Circle	Hamden		good school	friend of parent
Kessler	Katy	55	Clifford St	Hamden		good school	parent
Chelgren	Madison	168	Davis St?	Hamden		good school	
Ditman	Bruce	45	Delsole Rd	Hamden		good school	
DeLucia	Michelle	16	Dorrance Pl	Hamden		good school	friend of parent
DeLucia	William	16	Dorrance Pl	Hamden		good school	friend of parent
Nezat	Kelly	26	Dorrance Pl	Hamden		good school	parent
Nezat	Andrea	26	Dorrance Pl?	Hamden		good school/good stewards	parent
Leach	Maryann	26	Dorrance Pl?	Hamden		good school	grandparent of student
Kaminskas	Kellie	170	Fans Rock Rd	Hamden		good school	future parent
Rinck	Jesse	114	Gillies Rd	Hamden		good school	parent
Casbarro	Daniel	81	Haverford St	Hamden		good stewards	environmentally conscious; spent time at school
Casbarro	Nicole	81	Haverford St	Hamden		good school/good stewards	
Aurora	Nick	19	Howard Drive	Hamden		good school	
Germain-Williams	Terri	12	Hunting Ridge	Hamden		good school	parent
Ginnetti	John	34	Mather St	Hamden		good school	
Nelson	Thomas (Rachel Cooper)	53	Michael Rd	Hamden		good school	parent
Edwards	Sam/Kazue/Eri	35	Renshaw Rd	Hamden		good school/good stewards/small business	parent
Crowder	Loralee	270	Ridgewood Ave	Hamden			potential parent
Brantley	Sheila	45	Rolfe Rd	Hamden		good school	
Nickel	Lauren	300	Six Rod Hwy	Hamden		good school	visits school with therapy dog
Nickel	Stephen	300	Six Rod Hwy	Hamden		good school	
Aurora	Greg	144	South New Road	Hamden		good school	looking to move to North Haven
Maturo	Mary Jane (Edward)	28	Westminster St	Hamden		good school	family of student
Mortali	Renee	82	Westminster St?	Hamden		good school	friend of parent
Rivera	Elizabeth	30	Woodlawn St	Hamden		good neighbor	not a neighbor
Meyer	Kristen			Hamden		good school	parent
Nezat	Sophie			Hamden		good school	12 yo sister of student
Meyer	Colin			Hamden		good school	parent
Young	Erika	58 (Unit 102)	Leonard St	Meriden		good school	parent
Rushka	Doina			Meriden		good school/good stewards	friend of parent


Distance of Slate Upper School Opponents and Supporters From 5100 Ridge Road
Number of Residents
140
120
100
80
60
40
20
0
38
3
36
5
74
8
49
116
123
124
Within <=0.5 mi
Within 1/2-1.0 mi
Total ,<= 1.0 mi
Total > 1.0 mi
Totals
Distance from 5100 Ridge Road, North Haven, CT
Opponents
Supporters


Relationships Between Supporters and Slate Upper School
Number
70
60
50
40
30
20
10
0
24
10
8
7
4
3
3
2
2
1
1
1
66
Parent
Friend of Parent
Works at school
Neighbor
Future Parent
Grandparent
Sibling
Clarks Good People
Friend of Teacher
Environ. Conscious
Family of Student
Relationship w/student
Total
Relatioship to Slate School
Support Reason

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Planning & Zoning Requirements

Evidence of Non-Compliance with North Haven Planning and Zoning Requirements and Impacts on the Neighborhood

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
1.1.1 **For the purpose of promoting** the health, safety, and **general welfare of the community; for the purpose of lessening congestion in the streets**; for the purpose of securing safety from fire, panic and other dangers; for the purpose of **preventing the overcrowding of land and avoiding undue concentration of population**; for the purpose of facilitating adequate provisions for transportation, water, sewerage, schools, parks, and other public requirements; for the purpose of conserving the value of buildings and **encouraging the most appropriate use of land throughout the town**: (emphasis added) BE IT RESOLVED that the following zoning regulation be and hereby are adopted by the North Haven Planning and Zoning Commission.	The proposed project: - Violates the POCD - Is steep and composed of fine silty loam prone to erosion - Will cause sedimentation and nitrogen pollution of wetlands and watercourses - Will require the removal of 40 mature trees and shrubs and a total of 8,152 cu. yds. of soil to be moved - The buildings will be intrusive - Parking lot lights will be within 100' of a neighbor's house - Will have 82 lights - Will increase peal traffic from 35-50 cars/day to 137-192/day - Outer Ridge Road is not designed to current roadway standards - The current sight line from the driveway looking south is insufficient (~327'), the proposed road widening is inadequate and will require cutting a steep embankment, and it cannot be widened further within the limits of the available rights-of-way - There is no room to put plowed snow which will narrow the road - The increased traffic is a hazard to walkers, joggers, bicyclists - Home values decline 25-30%	The proposed project is too large for the site and is an inappropriate use of the land. It will destroy the rural and pastoral character of the neighborhood, increase traffic and noise, and degrade the general welfare of the neighborhood.	North Haven Plan of Conservation and Development Applicant's Site Plans, Drainage Report, and Traffic Reports The Miller Planning Group Report, April 15, 2021 Louriero Engineering Associates (LEA) Volume Calculations, Existing vs. Proposed, December 15, 2020 LEA reports 1/25/21, 2/23/21, and 4/14/21 REMA Ecological Services reports 1/25/21 and 2/25/21 Phoenix Environmental Laboratories water quality test report 2/23/21 Bubaris Traffic Report, April 15, 2021 Vliet and O'Neill Traffic Report, April 14, 2021 John Lo Monte Appraisals, March 17, 2021 & April 5 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
2.1.1.8 All exterior lighting shall be designed, located, installed, and directed in such a manner that there is no offensive glare or light trespass beyond the property line of its origin and in such a manner that it does not impair the value and enjoyment of any other lot.	The applicant has not provided a Photometric Plan for the opponents to review and critique.	The 14' pole lights in the proposed parking lot will be ~100-ft from the home at 5060 Ridge Road.	Lighting Plan, Sheet LA-1 Email from George Andrews, Jr, PE, LEP, Vice President, Civil/Survey, Loureiro Engineering Associates, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
2.1.1.9 The maximum building coverage area in an R-40 zone is not to exceed 15%.	The applicant claims coverage is only 8%, but 40%-45% of the entire site is impervious area.	Disregards recommendations in the Plan of Conservation and Development to minimize impervious area.	North Haven POCD POCD Requirements Table

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.1.3 The legislation's purpose is to minimize soil erosion and sedimentation that occur as a result of the construction of residential, industrial, and commercial development. Accelerated soil erosion caused by land use changes necessitates costly repairs to gullies, washed out fills, roads, and embankments. In addition, **erosion destroys the soils capabilities to support vegetation**. The resulting **sediment entering water bodies and wetlands is a major pollutant and reduces water quality and supply**.	The application does not comply with the requirement to limit 24-hour, post-development, peak storm water discharge flow to 50% of the pre-development runoff level. The applicant calculates post-development will be 4.5 cu. ft/sec, almost twice the recommended level of 2.35 cfs.	An existing stream on the northern edge of the site cannot currently accommodate the existing runoff and the bank is already eroding naturally. The additional runoff and discharge from the site will erode the current, diffuse, well-distributed flows throughout the watercourses and replace them with eroded, incised channels.	Milone & MacBroom Drainage Report REMA Ecological Services report to North Haven IWC. (www.sleepinggiantneighbors.net)

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.1.4 Aesthetic, recreational and fish and wildlife habitat values are also degraded. Sediment deposition clogs storm sewers and road ditches, reduces channel capacities which can result in flooding, reduces water depth and volume, may **cause subsequent erosion and may damage adjoining properties**. The expense of sediment removal alone identifies prevention as the cost effective alternative.	The site is upgradient from sensitive wetlands and watercourses. The post-development storm water will discharge into these resources. The major impacts will occur on properties which are in Hamden.	The sediment caused by the increased erosion due to additional storm water runoff will largely be deposited in Hamden, leading to degradation of the quality of those wetlands and watercourses.	Milone & MacBroom Drainage Report REMA Ecological Services report to North Haven IWC. (www.sleepinggiantneighbors.net)

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.4 To be eligible for certification, a soil erosion and sediment control plan shall contain proper protections to adequately control accelerated erosion and sedimentation and reduce the danger from storm water runoff on the proposed site based on the best available technology. Such methods and practices are necessary for certification are found in the Connecticut Guidelines for Soil Erosion and Sediment Control (1985) as amended. Alternative principle, methods and practices may be used with prior approval of the Commission.	On-site soil test pits identified fine silty loam and clay over hardpan. The size range of silt particles is typically 2-50 microns; clay particles are typically less than 2 microns. The majority of these particles will pass through a standard silt fence and hay bale combination. The combination on this site of highly erodible soils, slopes ranging from 8%-15%, and the magnitude of proposed earthwork will lead to erosion and deposition of sediment in the watercourses adjacent to and downgradient of the site.	There will be a significant and adverse impact upon the downgradient regulated resources, specifically through the erosion of stream banks, and sedimentation of aquatic habitat within the streams.	Milone & MacBroom Erosion Drainage Report, 10/27/20 REMA reports to North Haven IWC, dated 1/25/21 and 2/23/21

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.4.1 (1) Said plan shall contain, but not be limited to: (c) The design criteria for proposed soil erosion and sediment control measures and storm water management facilities. (d) The proposed area alterations including cleared, excavated, filled, or graded areas and proposed structures, utilities, roads, and if applicable, new property lines.	The combination on this site of highly erodible soils, slopes ranging from 8%-15%, and the magnitude of proposed earthwork will lead to erosion and deposition of sediment in the watercourses adjacent to and downgradient of the site. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	There will be a significant and adverse impact upon the downgradient regulated resources, specifically through the erosion of stream banks, and sedimentation of aquatic habitat within the streams.	REMA reports to North Haven IWC, dated 1/25/21 and 2/23/21 Louriero Engineering Associates reports 1/25/21 and 2/23/21 LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.5.1 Plans for soil erosion and sediment control shall be developed in accordance with these regulations using the principles as outlined in Chapters 3 and 4 of the Connecticut Guidelines for Soil Erosion and Sediment Control (1985), as amended. Soil erosion and sediment control pans shall result in a development that minimizes erosions and sedimentation during construction; is stabilized and protected from erosion when completed; and **does not cause off-site erosion and/or sedimentation**.	The combination on this site of highly erodible soils, slopes ranging from 8%-15%, and the magnitude of proposed earthwork will lead to erosion and deposition of sediment in the watercourses adjacent to and downgradient of the site. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	There will be a significant and adverse impact upon the downgradient regulated resources, specifically through the erosion of stream banks, and sedimentation of aquatic habitat within the streams	REMA reports to North Haven IWC, dated 1/25/21 and 2/23/21 Louriero Engineering Associates reports 1/25/21 and 2/23/21 LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.5.3 The appropriate method from Chapter 9 of the Connecticut Guidelines for Soil Erosion and Sediment Control (1985), as amended, shall be used in determining peak flow rates and volumes of runoff unless an alternative method is approved by the Commission.	The soil on the site is composed of fine, silty loam over hardpan, which is highly erodible. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	An existing stream on the northern edge of the site cannot currently accommodate the existing runoff and the bank is already eroding naturally. The additional runoff and discharge from the site will erode the current, diffuse, well-distributed flows throughout the watercourses and replace them with eroded, incised channels.	REMA report January 25, 2021 LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.6.1 The Planning & Zoning Commission shall either certify that the soil erosion and sediment control plan, as filed, complies with the requirements and objectives of this regulation or deny certification when the development proposal does not comply with these regulations.	The soil on the site is composed of fine, silty loam over hardpan, which is highly erodible. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	The size range of silt particles is 2 to 50 microns, while for clay particles it is less than 2 microns. The majority of these particles will pass through a standard silt fence and hay bale combination into the wetlands.	REMA report, January 25, 2021 LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.9.1 The grading shall provide for proper drainage of the area. No embankment shall exceed a slope of 1 foot of vertical rise in 2 feet of horizontal distance.	The sides of the proposed detention pond and the slope of the property from the septic galleys to the level spreader are very steep. The site is prone to eroding.		LEA reports January 25, 2021 and February 23, 2021 REMA reports January 25, 2021 and February 23, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.9.2 At the conclusion of the regarding operation, the area regraded, except portions affected by improvements, shall be covered with not less than 4 inches of soil suitable to support a perennial cover crop which shall be sown.	The soil composition and varying water level in the detention pond will prevent the plantings on the sides of the detention basis from growing during the summer.	Plants are a primary source of uptake of nitrogen and nitrate pollutants, and the design of this detention pond will prevent plants from growing and performing this function.	Milone & MacBroom site plans and Drainage Plan, October 27, 2020 REMA reports, January 25, 2021 and February 23, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.1.9.3 The grading, or regrading, shall be done in such a manner so as not to damage any adjoining property, including but not limited to, damage caused by the diversion of surface waters upon said adjoining property.	The proposed septic system discharges upstream of the level spreader which discharges storm water. All of this flows into the wetlands and watercourses in Hamden	The additional runoff and discharge from the site will erode the current, diffuse, well-distributed flows throughout the watercourses and replace them with eroded, incised channels. The amount of excavation will damage the roots of the white pine trees on the northern border, causing them to die and removing what little buffer that exists between the site and the home to the north.	Milone & MacBroom site plans and Drainage Plan, October 27, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.5.1.1 Off-street parking facilities, with adequate driveways for entrance and egress connected to a street, shall be provided and suitably maintained on all premises, sufficient to accommodate the motor vehicles of all occupants, employees, customers, and persons normally visiting the premises at any one time.	The P&Z parking requirements do not list the number of parking spaces required for private schools. Many students in the two upper grades will drive their cars to school.	There are 36 parking spaces identified. These are barely adequate during normal business hours. When students begin to drive to school, and during special events, parking may spill onto the narrow street, which is a no-parking zone.	The Miller Planning Group report, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.2.4 An estimate of the number and types of trucks and other machinery to be used on the site, hours of operation, and the locations and types of any buildings to be erected.	The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	This is equivalent to 582 14-cu. yd. dump trucks and the roads are not suited to this kind of traffic.	LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.2.5 Proposed truck access and egress to the excavation.	Construction will require hundreds of dump truck loads. The only site access is via Outer Ridge Road and Mount Carmel Avenue.	The roads leading to the site are not suited to this kind of traffic.	Bubaris Traffic Associates Report, April 15, 2021 V&O Traffic Report, April 14, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.3.1 Before issuing an Excavation Permit, the Planning and Zoning Commission shall hold a public hearing, duly advertised and conducted according to State Statutes. The Commission in considering and reviewing the application and in arriving at its decision shall be guided by and take into consideration the public health, safety, general welfare, and general effect of the same on the neighborhood, the duration of operations, future usefulness of the premises, the impact on vehicular traffic in the area, and such other factors as may bear upon or relate do the coordinate adjusted and harmonious physical development of the Town of North Haven.	Hundreds of dump truck loads of fill will disrupt traffic flow, and the weight of these heavy vehicles will further degrade the quality of the roads leading to the site.	The extent of excavation, grading, and construction is incompatible with the rural, residential character of the neighborhood, and will disrupt the health, welfare, and safety of the neighborhood.	Bubaris Traffic Associates Report, April 15, 2021 V&O Traffic Report, April 14, 2021 The Miller Planning Group Report, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.5.3 Excavation below the level of an abutting property or street line shall be at a distance from said property or street line to be determined by the Planning and Zoning Commission, which Commission in establishing said distance shall take into consideration the same provisions and guidelines as set forth in Section 8.9.3 above.	Hamden's IWC has requested that North Haven protect its wetlands by requiring a buffer area on this site that is consistent with Hamden's regulatory standards (a minimum 100-ft Non-Disturbance Buffer Zone from any of its wetlands or watercourses, per Hamden Inland Wetlands & Watercourses Regulation 10.2.k).	Factors to be considered in the determination of a sufficient buffer include, but are not limited to, "intensity of adjacent land use" and "soil erodibility." We concur with Hamden IWC's request and would recommend a minimum non-disturbance buffer of eighty (80) feet.	Letter from Chair of Hamden IWC to Chair of North Haven IWC REMA report 1/25/21

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.5.7 Truck access and egress to the excavation shall be so arranged and truckloads shall be so trimmed as to minimize danger to traffic on adjacent roads and nuisance to surrounding properties.	The extent of excavation alone will require 582 14-cu. yd. dump trucks	The access roads are not suited to this kind of traffic, and the sheer number of trucks will increase danger to traffic and nuisance to surrounding properties.	Bubaris Traffic Associates Report, April 15, 2021 Vliet &O'Neill Traffic Report, April 14, 2021 The Miller Planning Group Report, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.5.8 Proper measures shall be taken to minimize the nuisance of noise and flying dust or rock.	The applicant has not provided any noise information.	A school such as this is an intense activity that is incompatible with the rural residential environment. It will generate disruptive and intrusive noise levels.	The Miller Planning Group Report, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
8.9.13.2 **Filling where the resulting grade shall be higher than an abutting property line or street line or have an effect on any existing watercourse or established flood plain shall be kept at a distance from said property or street line to be determined by the Planning and Zoning Commission,** which Commission in establishing said distance shall take into consideration the same provisions and guidelines as set forth in Section 8.3 above.	Hamden's IWC has requested that North Haven protect its wetlands by requiring a buffer area on this site that is consistent with Hamden's regulatory standards (a minimum 100-ft Non-Disturbance Buffer Zone from any of its wetlands or watercourses, per Hamden Inland Wetlands & Watercourses Regulation 10.2.k).	Factors to be considered in the determination of a sufficient buffer include, but are not limited to, "intensity of adjacent land use" and "soil erodibility." We concur with Hamden IWC's request and would recommend a minimum non-disturbance buffer of eighty(80) feet.	Letter from Joan F. Lakin, Chair, Hamden Inland Wetlands Commission, December 11, 2020 REMA report 1/25/21

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.2 The Planning and Zoning Commission shall not approve a duly submitted site plan unless it finds that such plan conforms to the requirements of these regulations. In reviewing the site plan, the Planning and Zoning Commission **shall also take into consideration the public health, safety and general welfare**, and shall set appropriate conditions and safeguards which are in harmony with the general purpose and intent of these regulations, particularly in regard to the following:	This project is too much development for too small a site. It ignores the recommendations of the POCD (traffic, rural character of area – see POCD charts).	If approved, the project will cause significant, adverse impacts to the health of the area's watercourses and wetlands, create traffic safety problems, drastically reduce property values, and disrupt the tranquility and welfare of the neighborhood.	North Haven Plan of Conservation and Development (POCD) Requirements Table Louriero Engineering Associates reports 1/25/21 and 2/23/21 REMA reports to North Haven IWC, dated 1/25/21 and 2/23/21 John Lo Monte appraisals March 17 and April 5, 2021 Bubaris Traffic Associates report April 15, 2021 Vliet & O'Neill Traffic Report, April 14, 2021 The Miller Planning Group Report, April 15, 2021 www.SleepingGiantNeighbors.net

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.2.1 An adequate, convenient, and safe vehicular and pedestrian system, so that traffic generated by the development will be properly handled both within the site and in relation to the adjoining street system.	Peak traffic to the proposed site is projected to increase from 35-50 cars/hour to 137-192 cars/hour, completely inconsistent with the strategies and goals of the North Haven POCD. Sight line to the south from the driveway is 327-ft, not 370-ft. The applicant ignored sight lines along Mt. Carmel Avenue (204-ft west and 254-ft east). This is deficient. 90% of site traffic will come from Mount Carmel Avenue, not 30%.	Regardless of the weather, walkers, joggers, bicyclists, students, parents, and neighbors will be in danger from the volume of vehicular activity that is far and above anything currently in the neighborhood. This situation is an accident waiting to happen.	Milone & MacBroom Traffic Study and Frederick P. Clark Traffic Access & Impact Study North Haven Plan of Conservation and Development (POCD) Requirements Table Bubaris Traffic Associates report April 15, 2021 Vliet & O'Neill Traffic Report, April 14, 2021 www.SleepingGiantNeighbors.net

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.2.2 A site layout that will have the minimum potential adverse effect upon the established character or potential use of any adjoining properties.	The aggressive development of this site will destroy the rural and pastoral nature of the area.	Property values of area homes will decrease by 17.6% to 26.7% if the school is built on this site.	John Lo Monte appraisal report The Miller Planning Group Report, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.2.3 Considerations of the project's impact on the natural environment, with emphasis on minimizing any potential adverse effects thereon. The applicable requirements specified in Section 6 shall be met.	40 mature trees and shrubs are slated for removal. The sight line looking south from the proposed driveway is currently only 327-feet**.** The applicant ignored sight lines along Mt. Carmel Avenue (204-ft west and 254-ft east). This is deficient. 90% of site traffic will come from Mount Carmel Avenue, not 30%.	The applicant proposes to widen the road locally to achieve a sightline of 370-feet. To the south, this will necessitate cutting back an embankment or building a large retaining wall. The proposed widening is insufficient for the increased traffic; there is no room to put plowed snow; there is no room to widen the road further within the limits of the available rights-of-way; the increased volume and road widening are inconsistent with the pastoral character of the neighborhood, and in contradistinction to the POCD's recommendation that Outer Ridge Road become a scenic road.	LEA Report, April 15, 2021 Milone & MacBroom Traffic Study and Frederick P. Clark Traffic Access & Impact Study Burbaris Traffic Associates report, February 8, 2021 Vliet & O'Neill Traffic Report, April 14, 2021 North Haven Plan of Conservation and Development (POCD) POCD Requirements Table The Miller Planning Group Report, April 15, 2021 www.SleepingGiantNeighbors.net

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.2.4 The reasonable screening at all seasons of the year from the view of adjacent residential properties and streets of all parking and loading areas or other features, that, in the opinion of the PZC, require such screening. The applicable requirements specified for buffer areas shall be met.	The applicant has not submitted a Photometric Plan. The new building will be 50-feet from the road, as high as 27-feet above the average grade, and about 160-feet from the closest home. The new parking lot and its 9 pole lights will be about 100-feet from and directly beneath one home, and both buildings will be visible from adjacent homes at all times.	Disruption of quiet, safe, pastoral, rural character of the neighborhood. Disruption of nearest neighbor's life.	Site Plan Survey Map The Miller Planning Group Report, April 15, 2021 Email from George Andrews, Jr, PE, LEP, Vice President, Civil/Survey, Loureiro Engineering Associates, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.3.20 Expected storm drainage loads, including off-site conditions where considered appropriate by the PZC.	Peak storm water discharge loads will be almost twice the recommended levels. The storm water management system is inadequate for filtering out the amount of sediment and pollutants contained in the storm water.	Stream bank erosion will be exacerbated by the additional runoff. The additional runoff and discharge from the proposed site will erode the current diffuse, well-distributed flow, much of it subsurface, and replace that with an eroded, incised channel. Silt will be deposited into the adjacent wetlands and watercourses.	REMA report, January 25, 2021 Sigrun Gadwa letter, March 12, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.3.21 Estimate of all earthwork, including the quantity of any material to be imported to or removed from the site, or a statement that no material is to be removed or imported.	The soil on the site is composed of fine, silty loam over hardpan, which is highly erodible. The project requires 6,629 cu. yds. of soil to be cut, and the importing of another 1,523 cu. yds. of soil (total volume of 8,152 cu. yds.).	The size range of silt particles is 2 to 50 microns, while for clay particles it is less than 2 microns. The majority of these particles will pass through a standard silt fence and hay bale combination into the wetlands. Truck traffic will disrupt neighbors' lives.	REMA report, January 25, 2021 LEA Letter to North Haven P&ZC, April 14, 2021 LEA Volume Calculations, Existing vs. Proposed, December 15, 2020

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.3.23 Detailed landscaping plans, including type, size, and location of all materials used and plans for buffer screening and fencing. All commercial and industrial and multi-family developments will have underground sprinkler systems installed and shown on plan.	The detention pond will be excavated down through silty loam to a red, sandy, hardpan with minimal infiltration. The pond will be a wet-bottom pond with fluctuating water levels, depending on the season. Seeded vegetation on the sides of the pond will not grow.	Plants are a primary source of uptake of nitrogen and nitrate pollutants, and the design of this detention pond will prevent plants from growing and performing this function.	Milone & MacBroom Erosion Drainage Report, 10/27/20 REMA reports to North Haven IWC, dated 1/25/21 and 2/23/21

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
10.1.3.27 Proposed type, design, mounting height, location, direction, power and timing of all outdoor lighting.	The applicant has not provided a Photometric Plan detailing its light installations which include 82 Lights, as follows: 9 Pole-mounted Lights 11 Bollard Lights 12 Landscape Uplights 22 Step Lights in Walls 10 Inground Uplights 6 Inground Uplights in Tree Grates 12 Inground Flush Paver Lights	The 9 pole lights around the parking lot perimeter will be directly visible from the windows of one home, and about 100' from them.	Site Plan Sheet LA-1 (Lighting Plan) Email from George Andrews, Jr, PE, LEP, Vice President, Civil/Survey, Loureiro Engineering Associates, April 15, 2021

North Haven P&Z Requirement	Non-Compliance	Impact on Neighborhood	References
11.1.2.1 The Commission shall give consideration to the specific use requested; the affect such use will have on present and future uses in the vicinity; the proposed site plan and landscaping; the effectiveness of buffer strips and planting in protecting and providing aesthetics to adjoining properties; the conditions affecting traffic safety; and, the provisions for off- street parking.	The entire project is too large for such a small space, and no amount of clever engineering will overcome the plan's deficiencies. The plan obliterates the North Haven Plan of Conservation and Development's recommendations for the Outer Ridge Road area.	It is surprising - and disappointing - that a school organization which describes itself as "one of the most environmentally friendly schools in the country" would propose a plan that experts and evidence shows will be detrimental to the local environment and neighborhood.	Site Plans North Haven POCD Table The Miller Planning Group Report, April 15, 2021 www.SleepingGiantNeighbors.net

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School

Closing Statements

Rev 1.0

North Haven P&ZC Hearing
April 19, 2021

Opposition to Slate Upper School
Closing Statements

Rev 1.0

Slate Upper School Opposition

SUMMARY AND CONCLUSIONS

- The Zoning Commission Should DENY This Application. The Application:
  - Is too intense a development for such a small site
    - Will disturb 87% of the site's area & have a 26% impervious surface percentage
    - Will import and re-grade 8,152 cubic yards of soil
    - Will remove 40 mature trees & shrubs and not provide a real vegetative buffer
    - Is too intense activity & is incompatible with the rural residential environment
    - Will destroy the character of the neighborhood
  - The sight line distances at Mount Carmel and looking south on Ridge are seriously deficient; 90% of traffic to the site will come from Mount Carmel
  - Does not comply with numerous zoning regulations
  - Adversely impacts adjacent properties in North Haven and Hamden
  - Is in contravention to the Town's POCD
  - Will reduce property values by an average of -22.4%
  - Jeopardizes safety of residents, walkers, joggers, etc