



# Slate Upper School

Town of North Haven Planning & Zoning Commission

April 19, 2021

Slate Upper School  
5100 Ridge Road, North Haven



An aerial rendering of the Slate Upper School building, a large, modern structure with a flat roof and large windows, set in a lush, green landscape. The building is surrounded by trees and a parking lot. In the background, there are rolling hills and a body of water.

**Introduction-** Tim Lee, Fasano, Ippolito, Lee & Florentine, LLC

**Mission & Vision-** Julie Mountcastle, Slate School

**Site Plan-** Jason Williams, SLR Consulting

**Traffic-** David Sullivan, SLR Consulting

Michael Galante, Hardesty & Hanover

**Architecture-** Paolo Campos, Patriquin Architects

# Slate Upper School



**Slate Upper School**  
5100 Ridge Road, North Haven

Mission & Vision



**100%**

**Slate School**  
meets **100%** of  
demonstrated  
financial need

**89%**  
of students  
receive  
financial  
aid

**71%**  
of students pay  
less than \$10k

**39%**  
of students pay  
less than \$5k





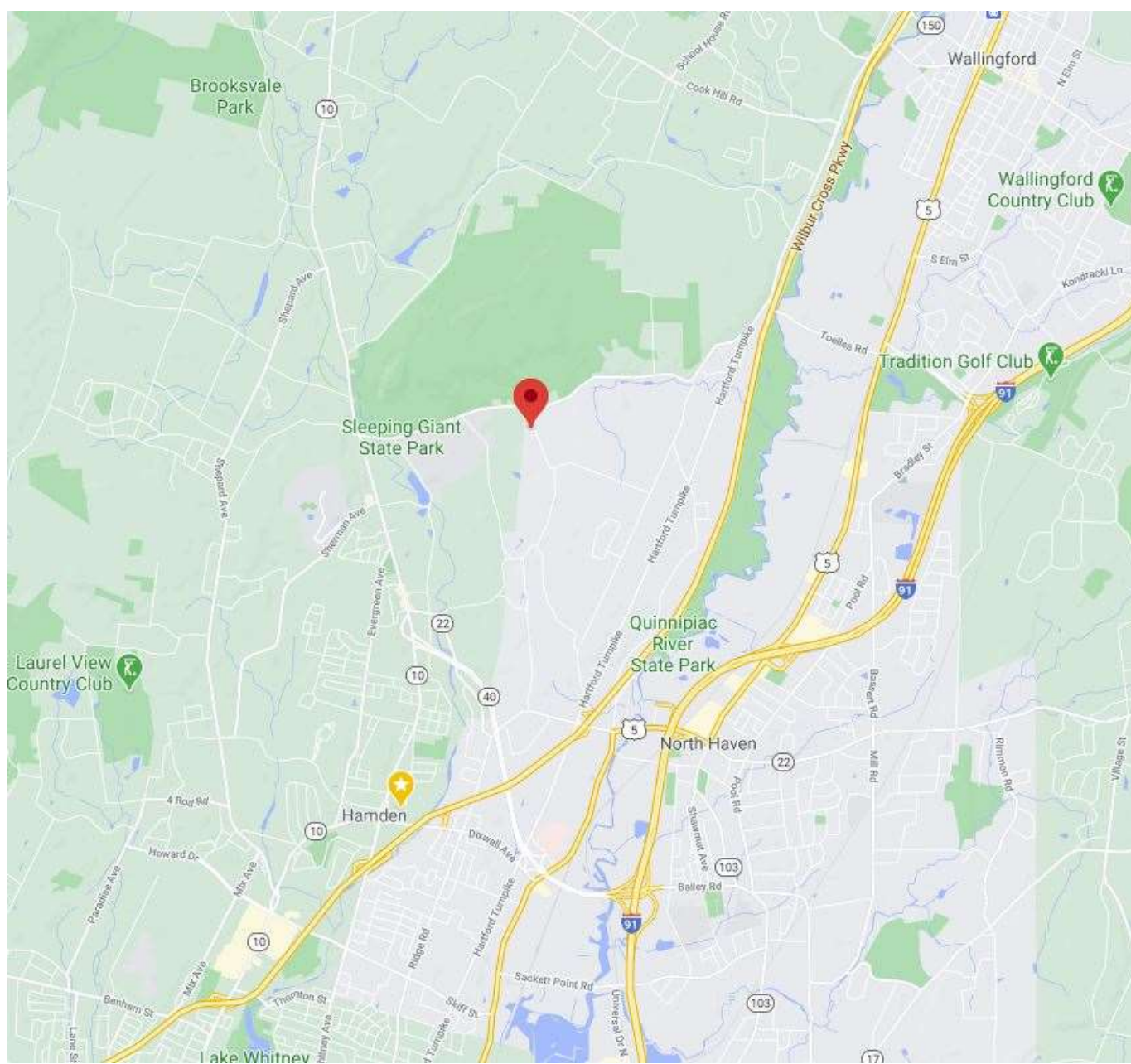
**Slate Upper School**  
5100 Ridge Road, North Haven







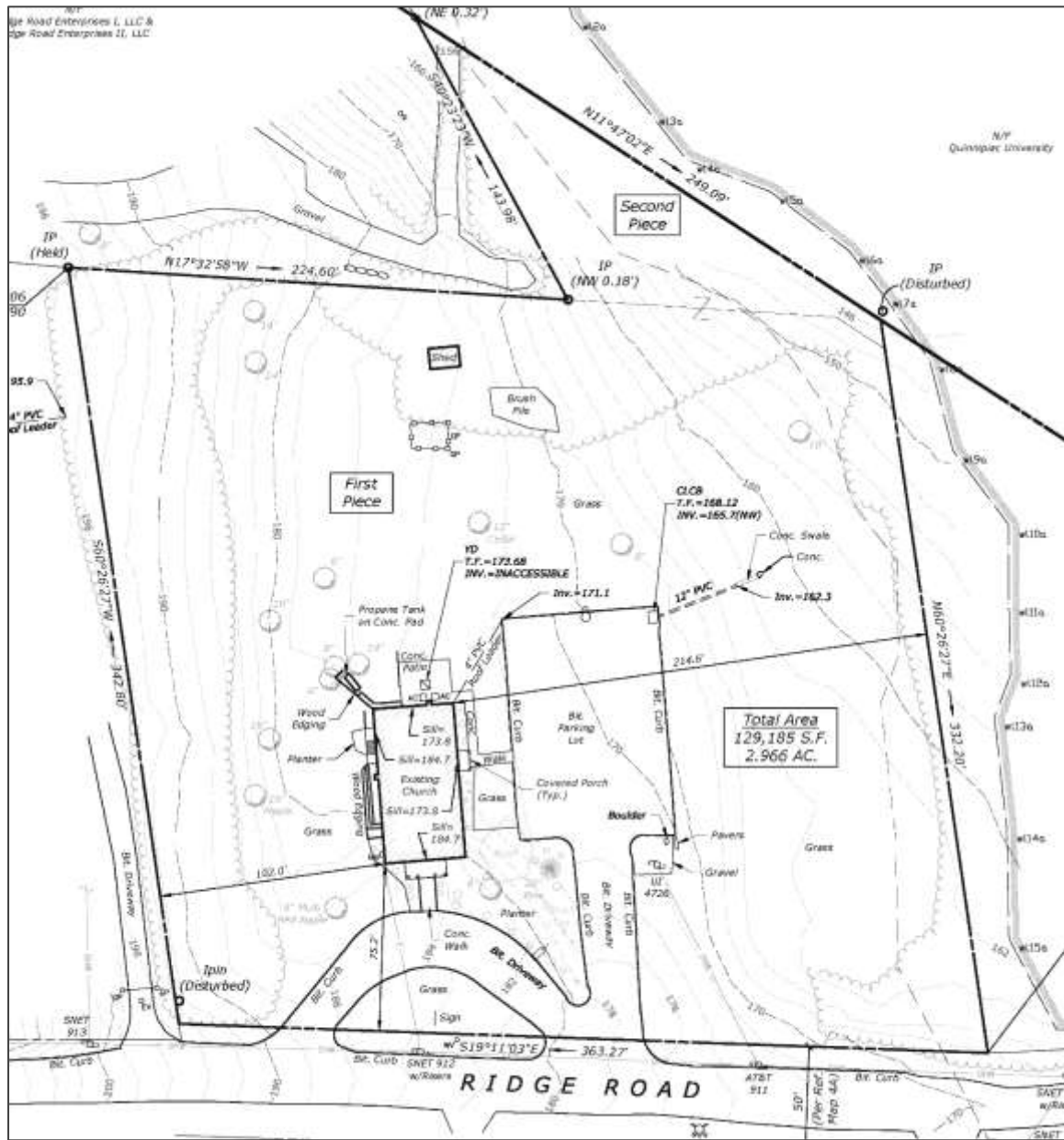




**Slate Upper School**  
5100 Ridge Road, North Haven

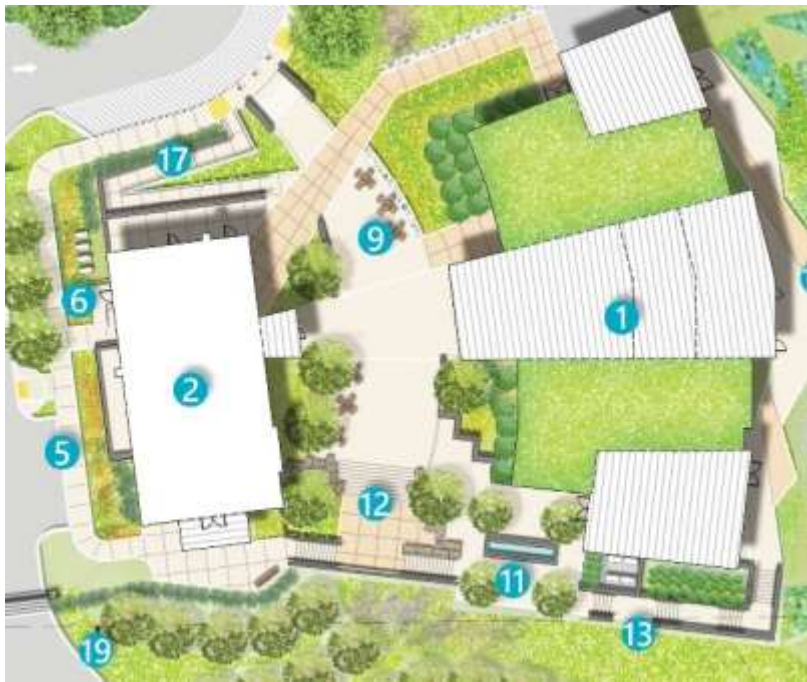
Site Location







- 1 PROPOSED ACADEMIC BUILDING
- 2 EXISTING BUILDING
- 3 BITUMINOUS CONCRETE PARKING LOT (36 SPACES)
- 4 STREET PRINT COLORED/TEXTURED ASPHALT DROP-OFF/ PICKUP AREA (TO ACCOMMODATE 5-6 CARS)
- 5 COLORED CONCRETE WALK (TYP.)
- 6 NEW STAIRS TO BUILDING ENTRANCE
- 7 BITUMINOUS CONCRETE ACCESS DRIVE
- 8 SEATING OVERLOOK S.W. INFILTRATION AREA
- 9 PAVED PLAZA SPACE WITH SEATING AND TREES
- 10 COLORED CONCRETE LOWER PLAZA SPACE
- 11 STABILIZED DECOMPOSED GRANITE PLAZA WITH LINEAR REFLECTING POOL OR SCULPTURE ELEMENT
- 12 COLORED CONCRETE STAIRS AND SEATING BLOCKS
- 13 STAIRS CONVEY STUDENTS BETWEEN BUILDINGS
- 14 EVERGREEN SCREENING
- 15 MODULAR BLOCK RETAINING WALLS
- 16 GENERATOR AND A/C CONDENSERS
- 17 COLORED CONCRETE RAMP (5% SLOPE)
- 18 STORM WATER DETENTION BASIN
- 19 SCHOOL SIGN
- 20 ROADWAY WIDENING TO 22'-0"
- 21 CHEERY TREE ORCHARD/ SCREENING
- 22 WILDFLOWER/ NATIVE TALL GRASS MEADOW







- Site has been designed to create more green stormwater practices and reduce impervious coverage
- Addition of green roof on top of new academic building and reduction in walkways





(59) TREES PLANTED

PLANT SCHEDULE		NO.	DATE	STATUS
1	SOUP GALT Spiraea xanthocarpa	1	10/15/18	PLANTED
2	HERITAGE RIVER BECH Betula 'Heritage River'	2	10/15/18	PLANTED
3	AMERICAN HULLY Ilex glabra	3	10/15/18	PLANTED
4	FULMOON MAPLE Acer palmatum	4	10/15/18	PLANTED
5	NORWAY SPRUCE Picea abies	5	10/15/18	PLANTED
6	KWAZAN CHERRY Prunella serrata	6	10/15/18	PLANTED
7	JAPANESE SNOWBALL Viburnum plicatum	7	10/15/18	PLANTED
8	VARIEGATED COMMON BOSWOD Buxus sempervirens	8	10/15/18	PLANTED
9	MANESI DOUBLE FILE YOUNGUM Yucca filamentosa	9	10/15/18	PLANTED
10	LIMELIGHT HYDRANGEA Hydrangea paniculata	10	10/15/18	PLANTED
11	DARK KNIGHT BLUEBERRY Lonicera caerulea	11	10/15/18	PLANTED
12	ROSE HAY Rosa rugosa	12	10/15/18	PLANTED
13	FEATHER REED GRASS Phalaris arundinacea	13	10/15/18	PLANTED
14	GRASS LEAFED GOLDEN ROD Solidago nemoralis	14	10/15/18	PLANTED
15	LITTLE BLUESTEM GRASS Sporobolus vaginifolius	15	10/15/18	PLANTED
16	WEIGELA Weigela florida	16	10/15/18	PLANTED
17	TUFFED HAIR GRASS Deschampsia cespitosa	17	10/15/18	PLANTED
18	BLUE SEDGE Carex flacca	18	10/15/18	PLANTED



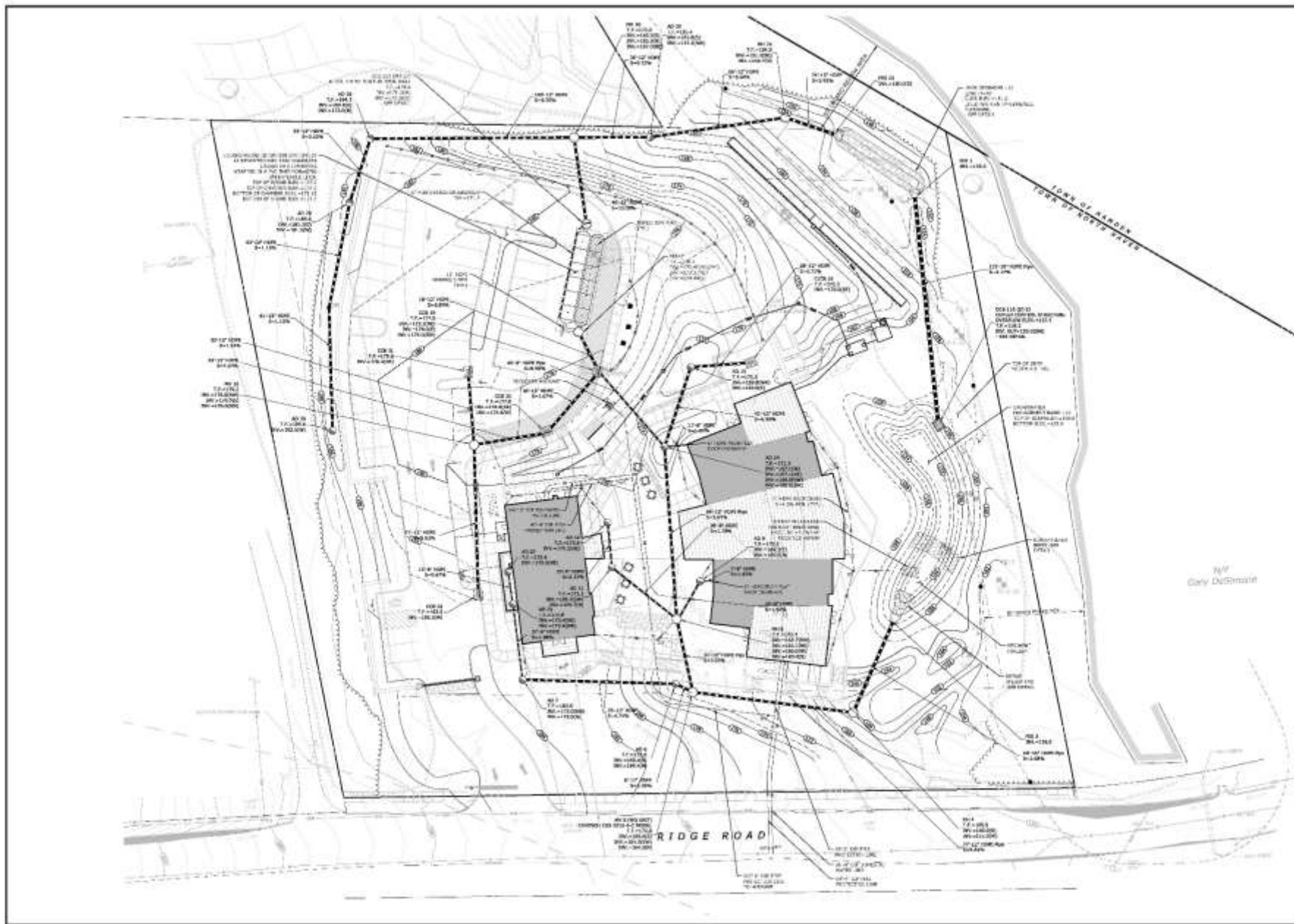
LIGHTING LEGEND		
	POLE MOUNTED LIGHTING	0
	BOLLARD LIGHT	12
	LANDSCAPE LIGHTS	10
	STEP LIGHTS IN WALK	22
	NO ROUND UP LIGHTS	8
	NO ROUND UP LIGHTS (INTEGRAL WITH TRAFFIC GRATE)	4
	EMERGENCY LIGHT FIXTURE LIGHTS	2



Early Evening



Overnight



## Scope of Traffic Study

- Review existing conditions
- Estimate future conditions
- Determine traffic impact
- Make recommendations





**15**  
Teacher  
Population



**90**  
Student  
Population



**7-12**  
Grade  
Levels

Land Use	Number of Vehicle Trips					
	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
	In	Out	Total	In	Out	Total
Upper School, 100 students (Grades 7-12)	90	80	170	75	80	155

Conservative trip generation:

- Estimated based on 100 students, rather than 90
- No bus activity
- Assumed all students were dropped off and picked up
- Vehicle occupancy of 1.25 students per vehicle
- ITE (Land Use Code #530, High School)
  - Morning: 37 in, 18 out
  - Afternoon: 11 in, 22 out

### Trip Distribution

- 70%** to/from the south via Outer Ridge Road
- 10%** to/from the west via Mount Carmel Avenue
- 20%** to/from the east via Mount Carmel Avenue

MOVEMENTS	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
	Background	Combined
<i>Unsignalized</i>		
Outer Ridge Road at proposed school driveway		
Eastbound Left	A	A
Northbound Left	A	A

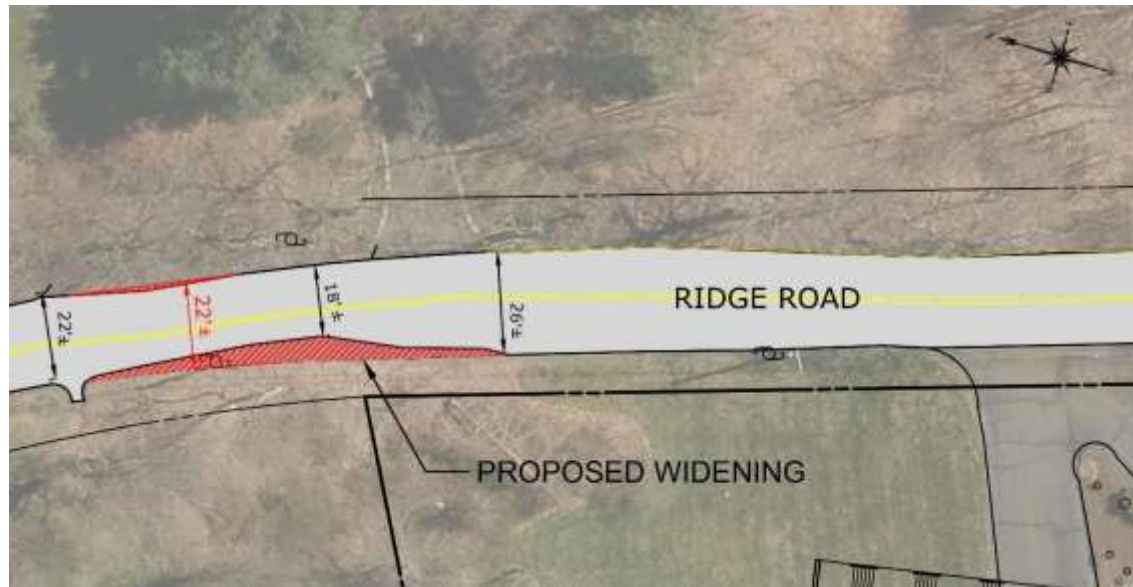
LEVEL-OF SERVICE CRITERIA FOR AWSC INTERSECTIONS	
LOS <sup>1</sup>	CONTROL DELAY (s/veh)
A	≤ 10
B	> 10 AND ≤ 15
C	> 15 AND ≤ 25
D	> 25 AND ≤ 35
E	> 35 AND ≤ 50
F	> 50

# Sight Line Summary

From Site Driveway	Sight Line Met?	
	Posted Speed Limit (280 feet)	85th Percentile Speed (370 feet)
Looking Left	✓	✓
Looking Right	✓	✓

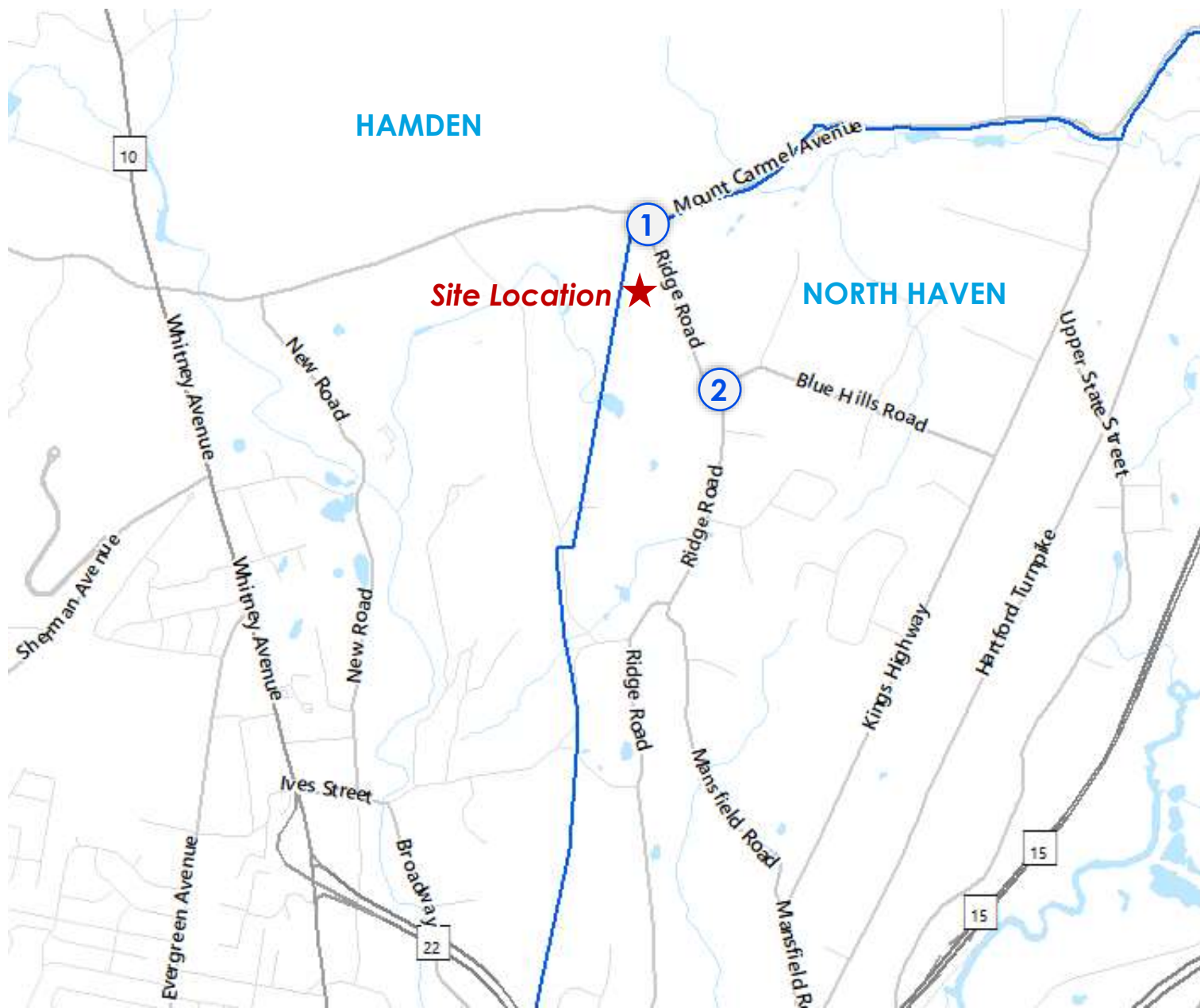
## Widening Concepts on Ridge Road

North of Site Driveway



South of Site Driveway





Add study intersections of Ridge Road at Mount Carmel Avenue and Blue Hills Road

Conduct traffic counts at intersections

Adjust traffic counts to account for COVID-19 impact

Add future school traffic

Determine traffic impact at intersections



MOVEMENTS	WEEKDAY MORNING PEAK HOUR		WEEKDAY AFTERNOON PEAK HOUR	
	BACKGROUND	COMBINED	BACKGROUND	COMBINED
<i>Unsignalized</i>				
<b>Outer Ridge Road at Mount Carmel Avenue (Two Way Stop-Control)</b>				
Westbound Left	A	A	A	A
Northbound Left/Right	A	A	B	B
<b>Outer Ridge Road at Blue Hills Road (All Way Stop-Control)</b>				
Eastbound Through/Right	A	A	A	A
Westbound Left/Through	A	A	A	A
Northbound Left/Right	A	A	A	A

# Findings

- Study intersections are expected to operate at acceptable LOS during both peak periods
- No change in LOS with site-generated traffic in place



Slate Upper School  
5100 Ridge Road, North Haven

VISSIM at School Driveway

## Lower School Follow-Up Analysis

- Site traffic was less than anticipated in the 2017 study
- Impact at study intersections is negligible, as projected
- Sight lines at the school driveway were established and are being maintained
- No reported crashes at the school driveway



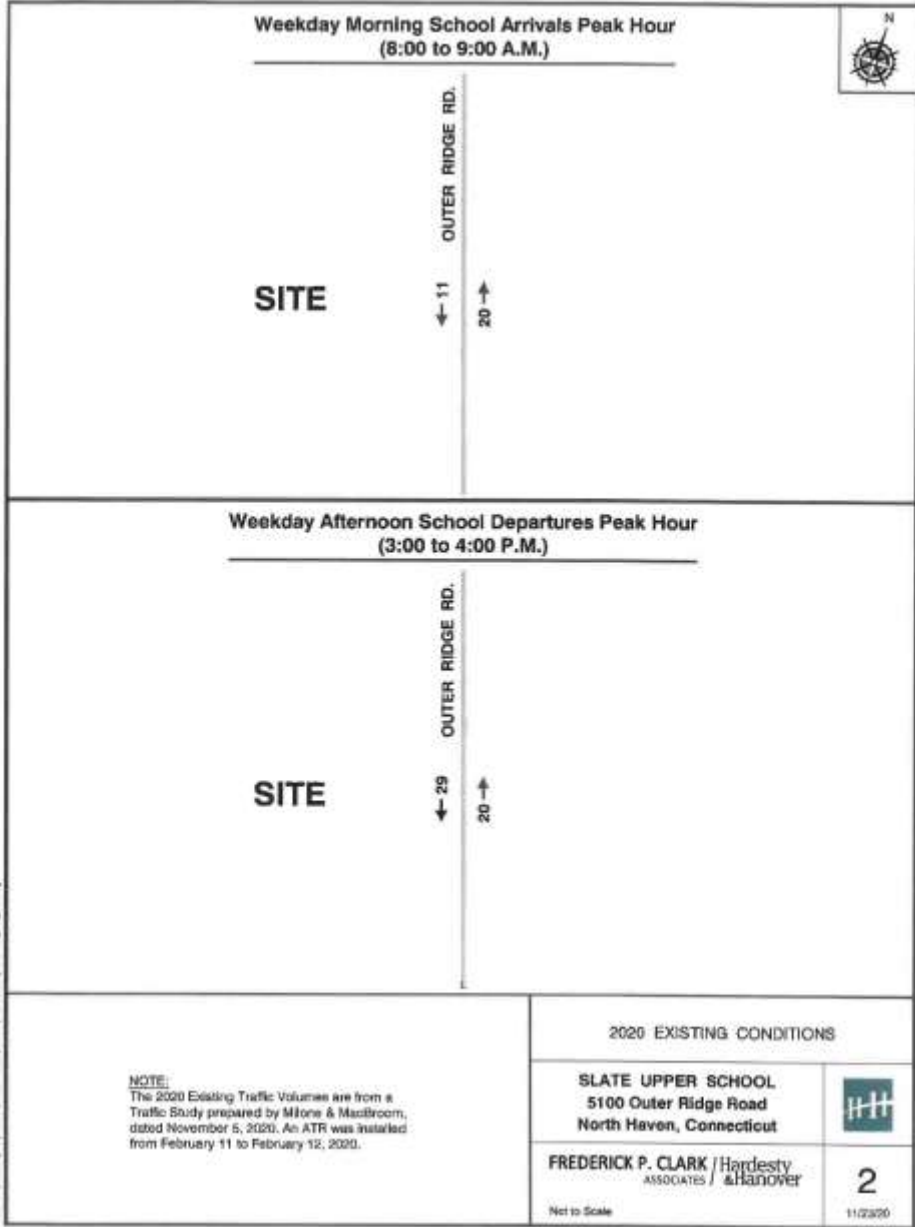


Table 1  
 ACCIDENT EXPERIENCE – OUTER RIDGE ROAD  
 Slate Upper School  
 5100 Outer Ridge Road  
 North Haven, Connecticut

ACCIDENT CHARACTERISTICS	OUTER RIDGE ROAD					
	At Mount Carmel Avenue		Between Mount Carmel Avenue and Blue Hills Road		At Blue Hills Road	
	Total	%	Total	%	Total	%
<b>Year</b>						
• 2017/2018	0	0	0	0	0	0
• 2018/2019	1	50	0	0	0	0
• 2019/2020	1	50	0	0	0	0
• Total	2	100	0	0	0	0
<b>Accident Severity</b>						
• Property Damage	2	100	0	0	0	0
• Injury	0	0	0	0	0	0
<b>Collision Type</b>						
• Fixed Object	2	100	0	0	0	0
<b>Contributing Factor</b>						
• Ran Off Road	1	50	0	0	0	0
• Improper Backing	1	50	0	0	0	0
<b>Light Condition</b>						
• Daylight	1	50	0	0	0	0
• Dark – Lighted	1	50	0	0	0	0
<b>Surface Condition</b>						
• Dry	2	100	0	0	0	0
<b>Weather Conditions</b>						
• Clear	2	100	0	0	0	0

Source: Connecticut Crash Data Repository.

Notes:

- 1) The latest accident data available before COVID-19 conditions is from February 1, 2017 to January 31, 2020.
- 2) 2017/2018 = February 1, 2017 to January 31, 2018.
- 3) 2018/2019 = February 1, 2018 to January 31, 2019.
- 4) 2019/2020 = February 1, 2019 to January 31, 2020.

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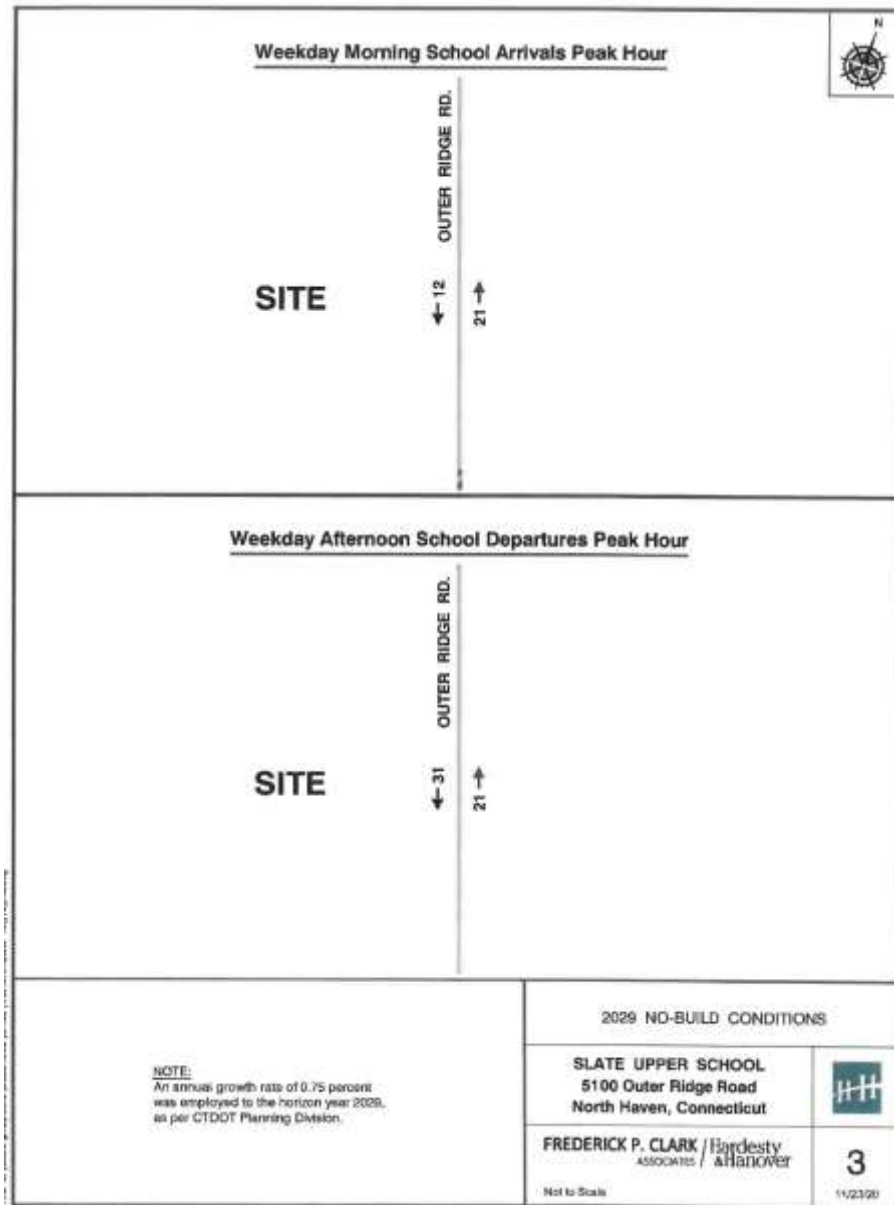




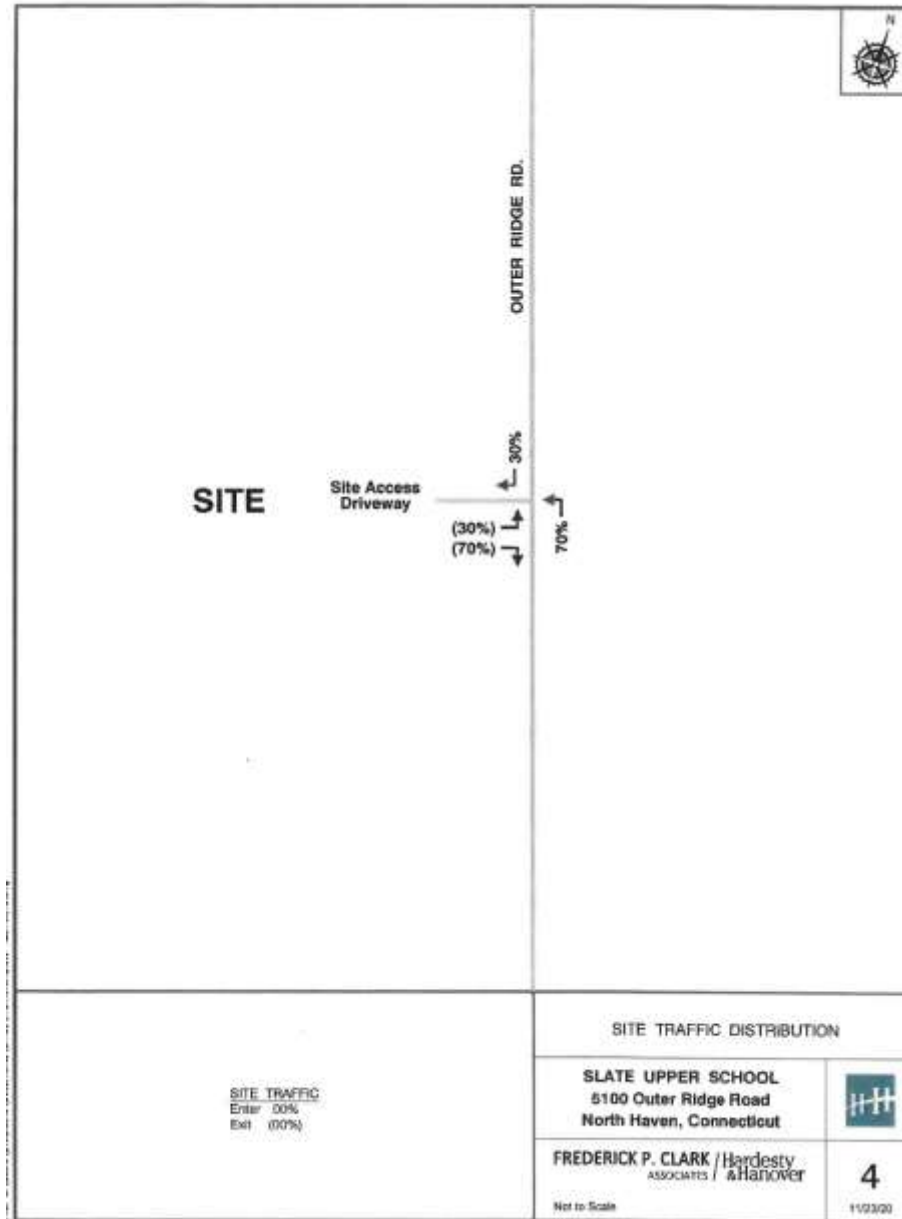
Table 2  
 SCHOOL TRAFFIC GENERATION – PEAK HOURS  
 Slate Upper School  
 5100 Outer Ridge Road  
 North Haven, Connecticut

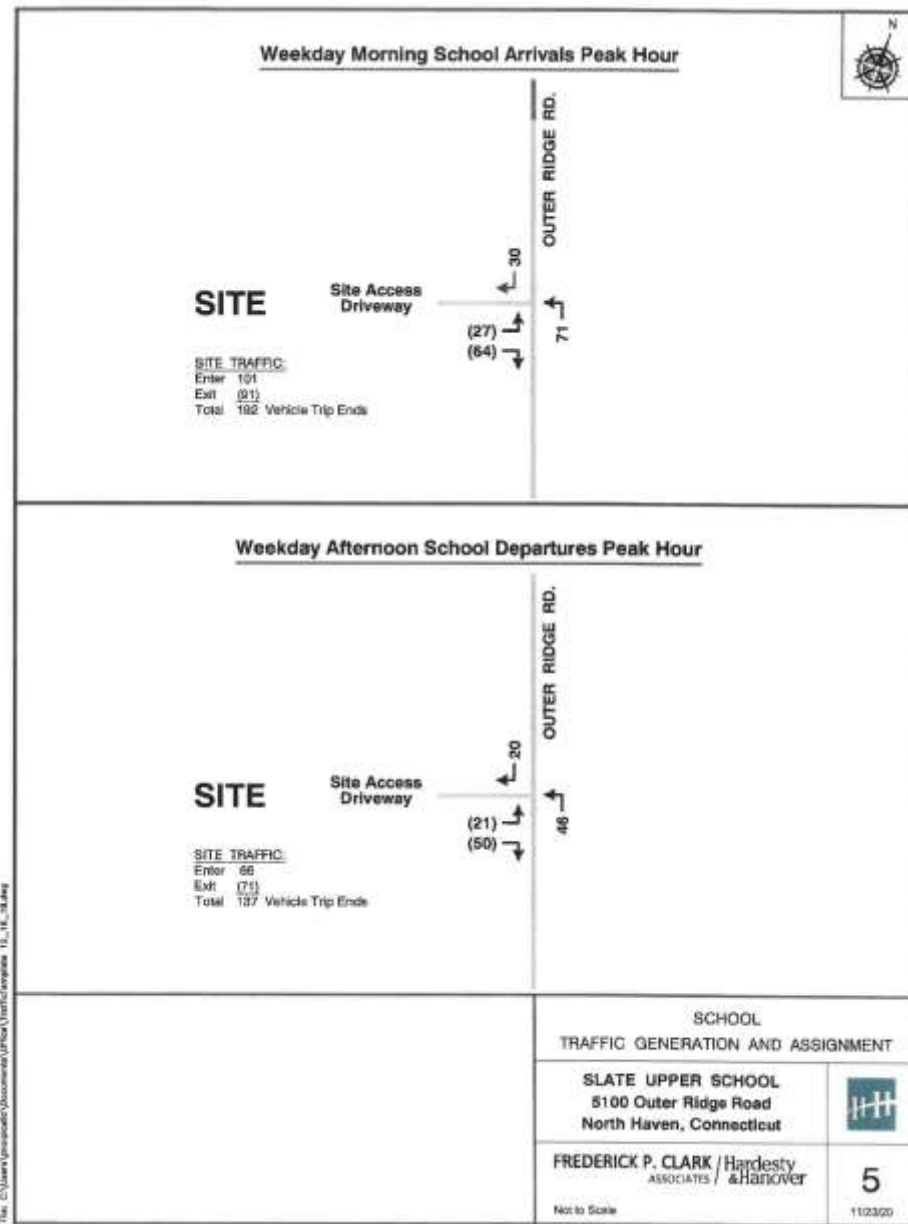
LAND USE	SIZE	VEHICLE OCCUPANCY	TRAFFIC DIRECTION	VEHICLE TRIP ENDS	
				Weekday Morning School Arrivals	Weekday Afternoon School Departures
Private School	100 Students	1.10	Enter	91	66
			Exit	<u>91</u>	<u>66</u>
			Total	182	132
	15 Staff Members	1.00	Enter	10	0
			Exit	<u>0</u>	<u>5</u>
			Total	10	5
Total School Traffic			Enter	101	66
			Exit	<u>91</u>	<u>71</u>
			Total	192	137

Source:

- 1) Based on our analysis of the Slate School, 124 Mansfield Road in North Haven, it was estimated that 10 percent of the students are from the same household and/or will carpool, which was considered a conservative assumption. There were no school buses proposed at that School. Therefore, the same assumptions were used for the proposed Slate Upper School. The proposed School will have a flexible start and end times for students; therefore, arrivals and departures will be spread out almost evenly throughout the peak hours. Based on a review of the Institute of Transportation Engineers (ITE) "Trip Generation," 10<sup>th</sup> Edition, trip rates for land use code #536, Private School (K-12), the weekday afternoon trip rates are 73 percent of the weekday morning trip rates; therefore, it is assumed that 27 percent of the students will remain on-campus for after School activities.
- 2) There will be a total of 15 staff members (17 staff used in the analysis). It is assumed that 10 of the 15 staff members will arrive during the weekday morning arrivals peak hour, while 5 of the 15 staff members will depart during the weekday afternoon departure peak hour.

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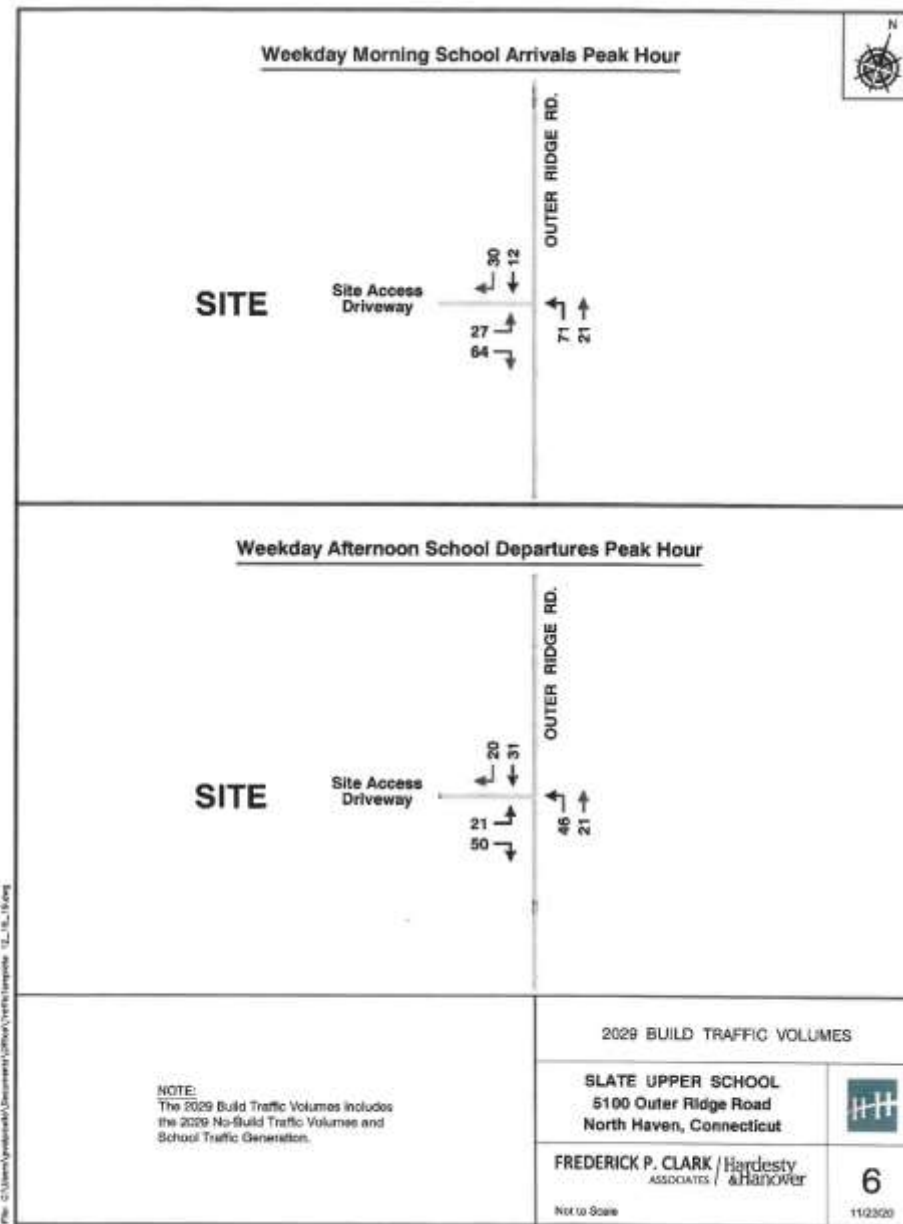


Table 3  
CAPACITY AND STORAGE/QUEUE ANALYSIS RESULTS – MEASURE OF EFFECTIVENESS (MOE) –  
SCHOOL PEAK HOURS  
Slate Upper School  
5100 Outer Ridge Road  
North Haven, Connecticut

INTERSECTION	CONTROL TYPE	STORAGE/ LINK LENGTH	PHYSICAL UNITS	2029 BUILD CONDITIONS					
				Weekday Morning Arrivals			Weekday Afternoon Departures		
				LOS/ Delay	V/C Ratio	Queue Length	LOS/ Delay	V/C Ratio	Queue Length
Outer Ridge Road at Site Access Drive	TWSC	50	EB Ln1	A/9.3	0.106	10	A/9.2	0.082	8
		1,680	NB L	A/7.4	0.049	5	A/7.4	0.032	3

Notes:

- Synchro 10.0/HCM 6<sup>th</sup> Edition results are used for capacity analysis.
- Level of Service determining parameter is called the service measure.
- For TWSC Intersections: Level of Service/Average Control delay per vehicle (seconds/vehicle).
- V/C ratio indicates the amount of congestion for each Movement and Lane. Any V/C ratio greater than or equal to one indicates that the Movement and Lane are operating at above capacity.
- The Queue Length rows show the 95<sup>th</sup> percentile maximum queue length in feet.
- The Queue Length is for each lane. The total queue length is divided by the number of lanes and the lane utilization factor.
- The 95<sup>th</sup> percentile queue is the maximum back of the queue with the 95<sup>th</sup> percentile traffic volumes.
- **Bolded** 95<sup>th</sup> percentile queue exceeds the storage available.
- TWSC = Two-Way STOP Control.
- Physical Units consist of the following:
  1. TWSC Intersections: Critical Lane and Critical Movement.

NB = Northbound      EB = Eastbound      SB = Southbound      WB = Westbound  
L = Left Turn      T = Through      R = Right Turn      Ln = Lane

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Table 4  
 INTERSECTION SIGHT DISTANCE (ISD) ANALYSIS  
 Slate Upper School  
 5100 Outer Ridge Road  
 North Haven, Connecticut

INTERSECTION	ISD TO THE LEFT			ISD TO THE RIGHT		
	Distance Available (Feet)	Distance Required (Feet)		Distance Available (Feet)	Distance Required (Feet)	
		Posted Speed	85 <sup>th</sup> Percentile Speed		Posted Speed	85 <sup>th</sup> Percentile Speed
	Left	25 MPH	33.7 MPH	Right	25 MPH	33.1 MPH
Outer Ridge Road at Site Access Drive	370	280	372	370	280	365

Source: Connecticut Department of Transportation Highway Design Manual 2003 Edition, Revised January 2011, Section 11-2.03.01 Figure 11-2C and Section 11-2.03.02.

Noted:

1. Outer Ridge Road is a two-travel lane roadway in the vicinity of the site.
2. The speed limit is 25 miles per hour on Outer Ridge Road in the vicinity of the site.
3. The 85<sup>th</sup> percentile speed of vehicles at the site access drive was measured to be 33.7 and 33.1 miles per hour in the northbound and southbound directions, respectively. A Speed Study using an ATR was conducted by Milone & MacBroom from February 11 to February 12, 2020.
4. Available intersection sight distance volumes were obtained through a survey shown in the Sight Distance Exhibit prepared by Milone and MacBroom.

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Slate Upper School  
5100 Ridge Road, North Haven

Architecture





**70**  
Student  
Population



**10**  
Students per  
Class



**K-6**  
Grade Levels



**24.16**  
Acres



**7,500**  
Square Feet





90  
Student  
Population



15  
Students per  
Class



7-12  
Grade Levels



2.966  
Acres



Renovated Church  
Building  
5,240  
Square Feet



New Academic  
Building  
13,745  
Square Feet



Projected Opening: September 2024

10-15 students in 2024

90 students max by 2029

Preservation / Renovation & New Construction

Red List Free, Naturally Derived Materials & Finishes

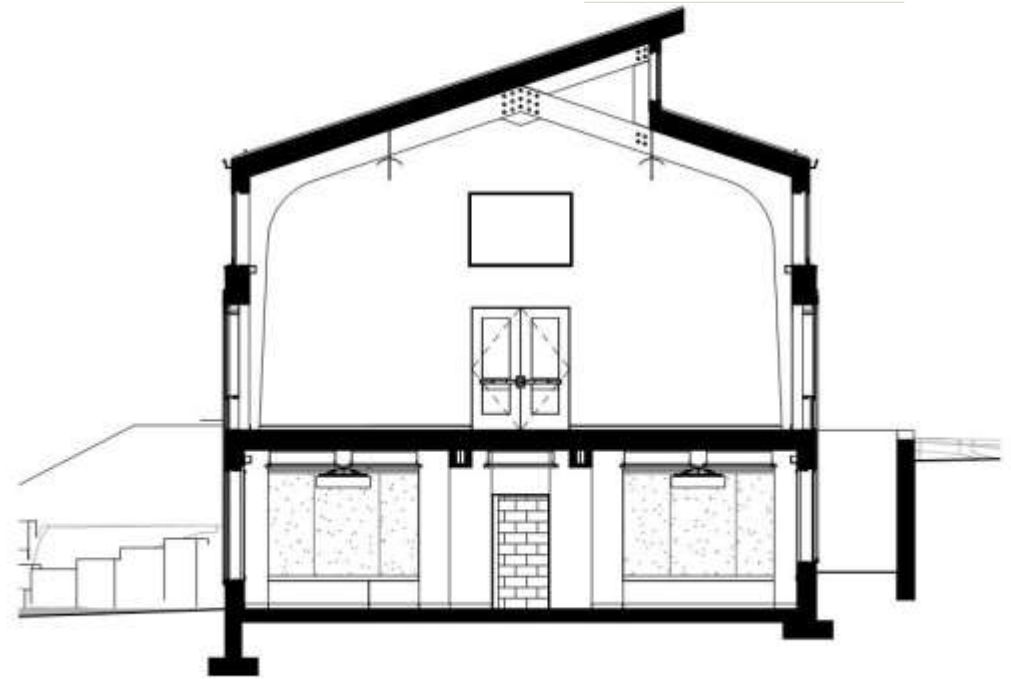
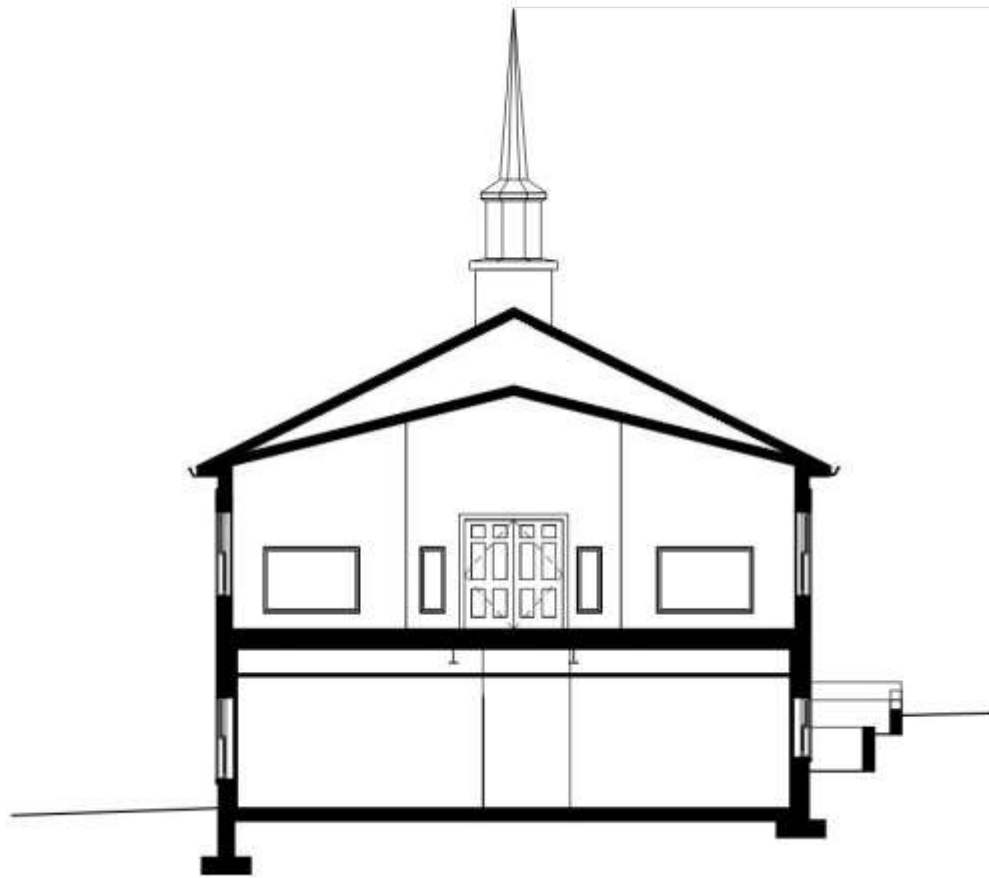
Daylight Autonomy for Major Occupied Spaces

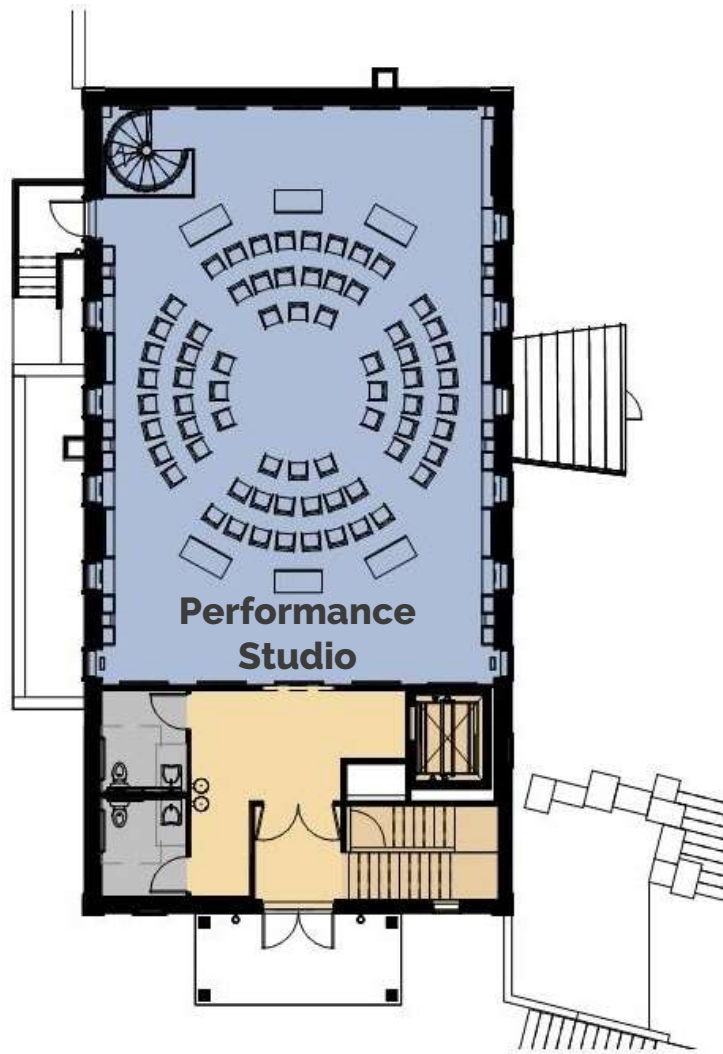
High MERV Ventilation & Humidification Systems

All Electric Heating, Cooling & Hot Water Systems

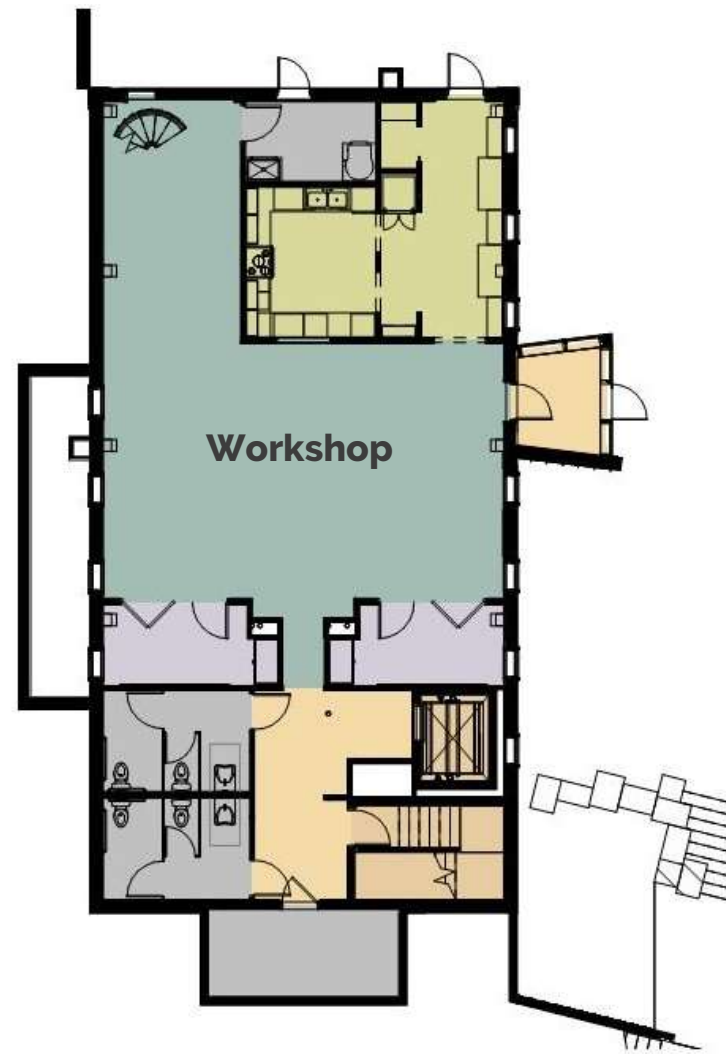
High-R Value Thermal Envelope



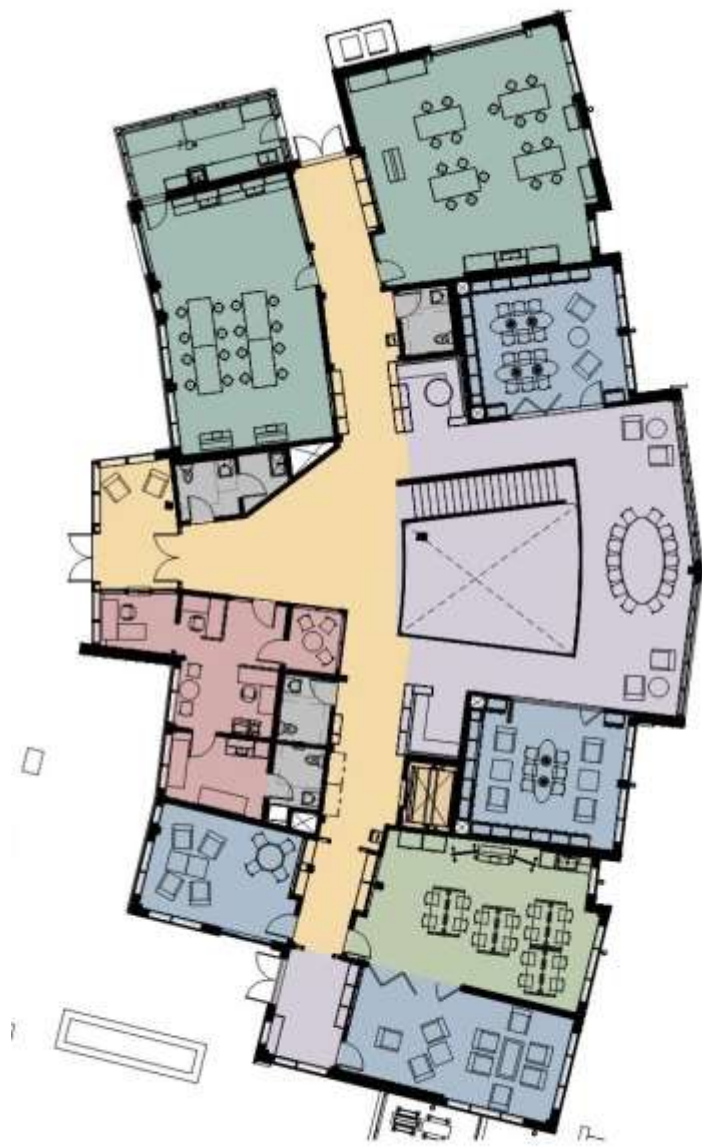




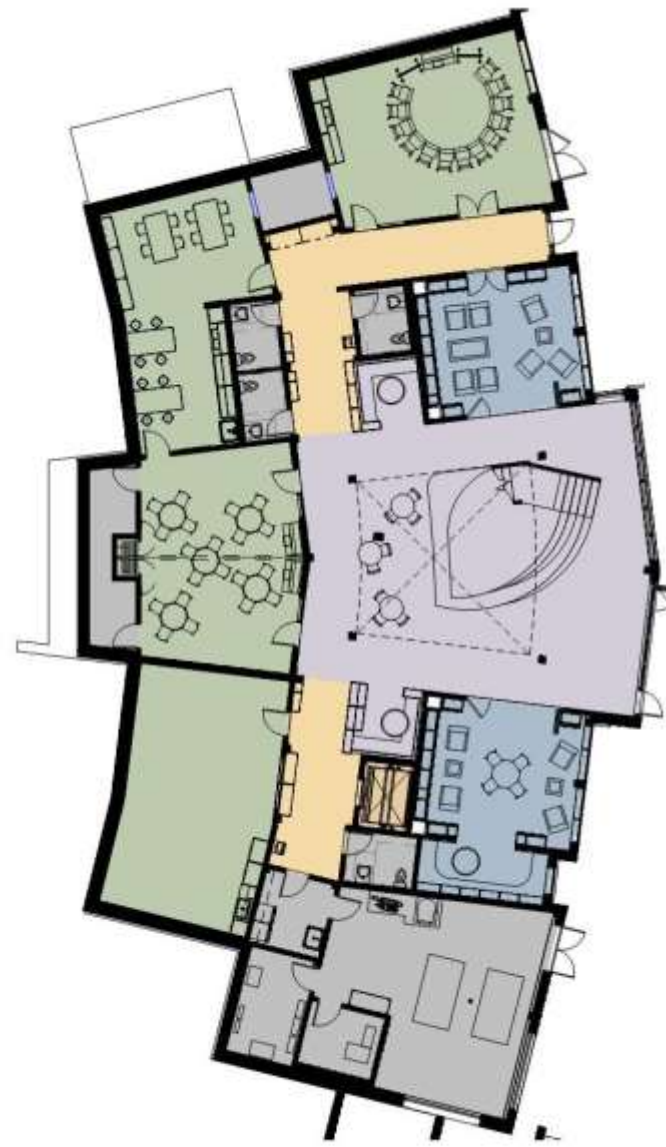
Upper Level



Courtyard Level

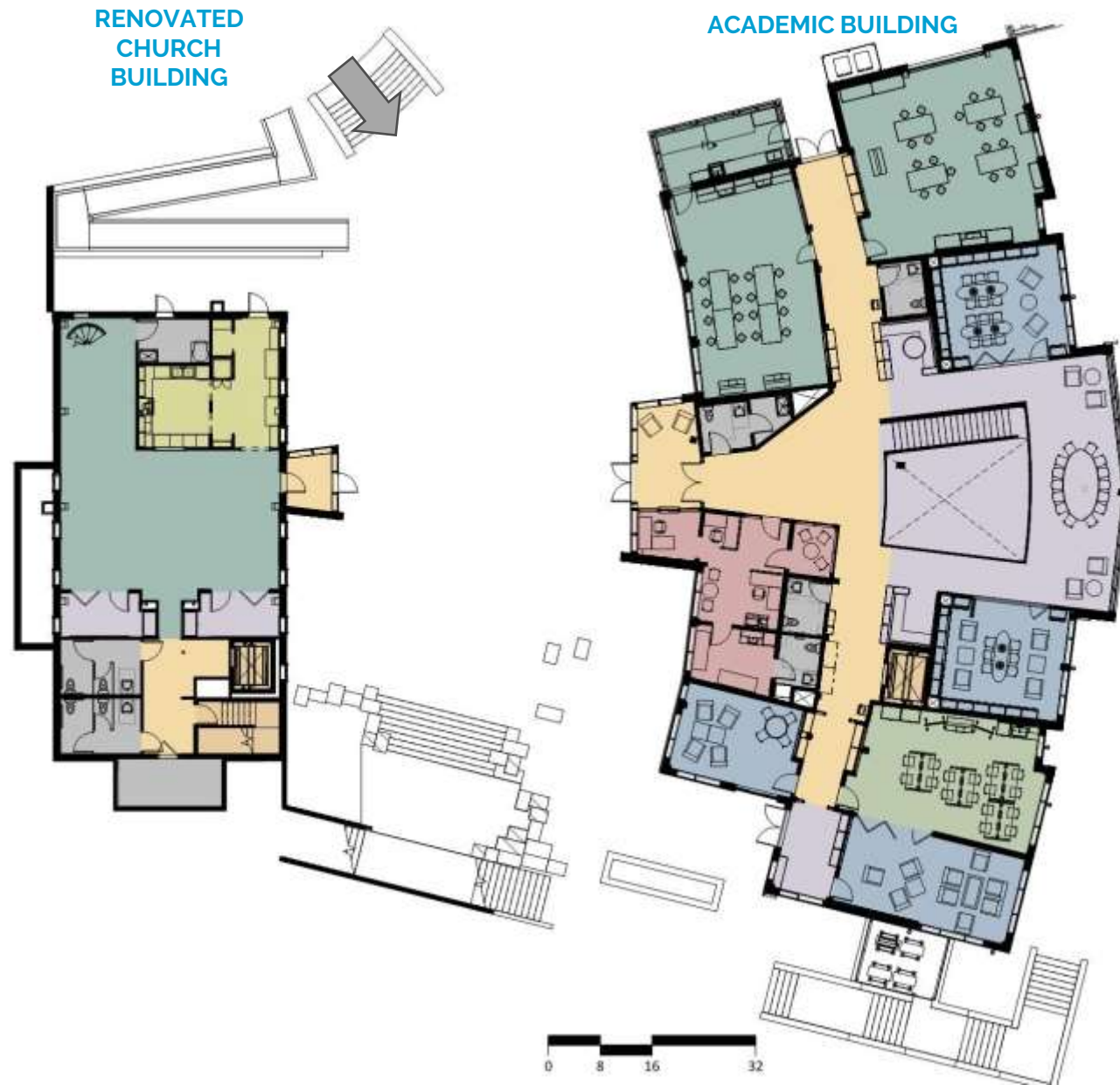


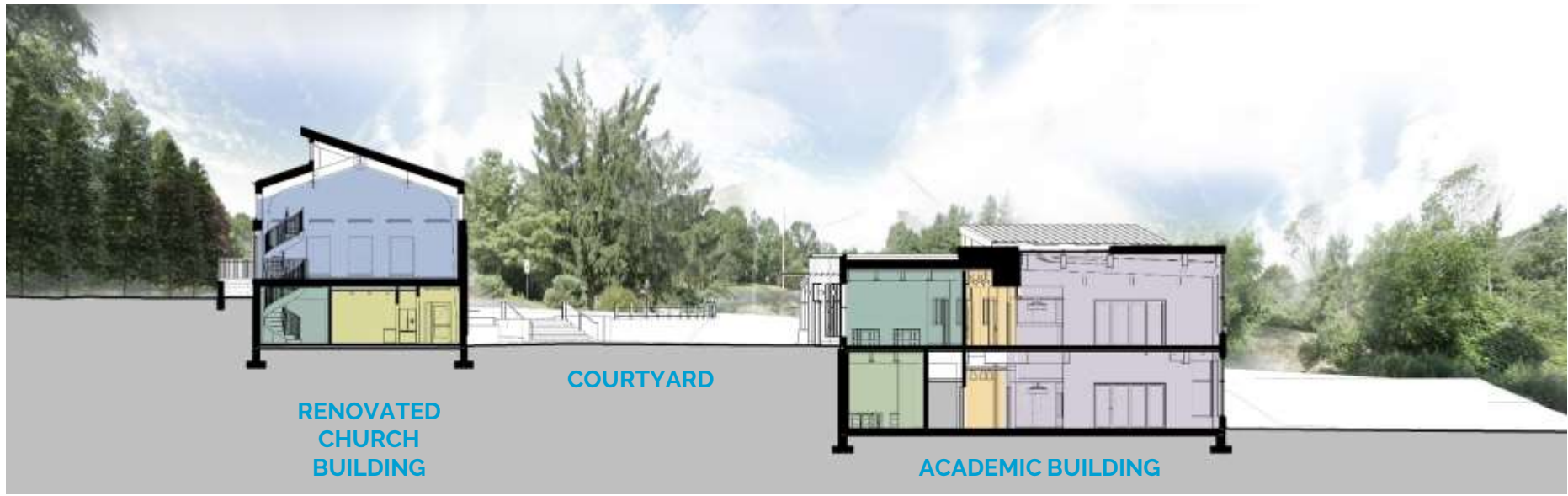
Courtyard Level



Lower Level











EXISTING  
CHURCH  
BUILDING

EXISTING  
PARKING LOT



PLANTED SCREENING

EVERGREEN  
BUFFER

RENOVATED  
CHURCH  
BUILDING

LANDSCAPED  
COURTYARD

ACADEMIC  
BUILDING

EVERGREEN  
SCREENING



LOOKING NORTH FROM  
RIDGE ROAD



BIRD'S EYE PERSPECTIVE



LOOKING SOUTH FROM  
RIDGE ROAD



BIRD'S EYE PERSPECTIVE

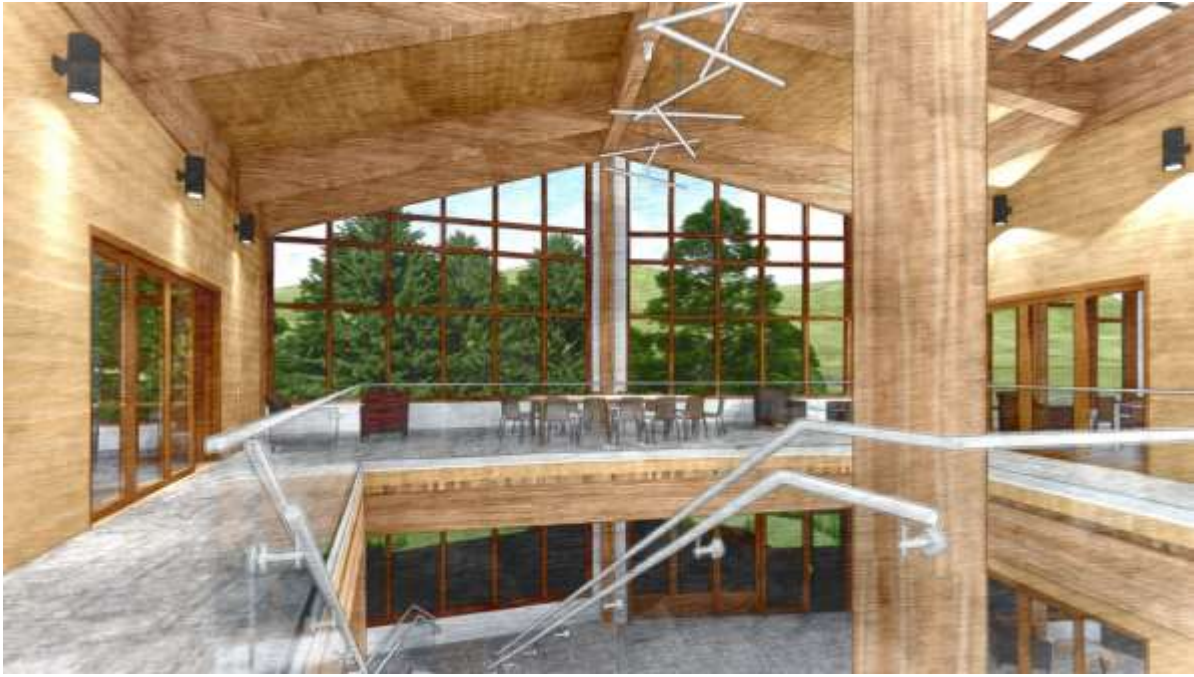


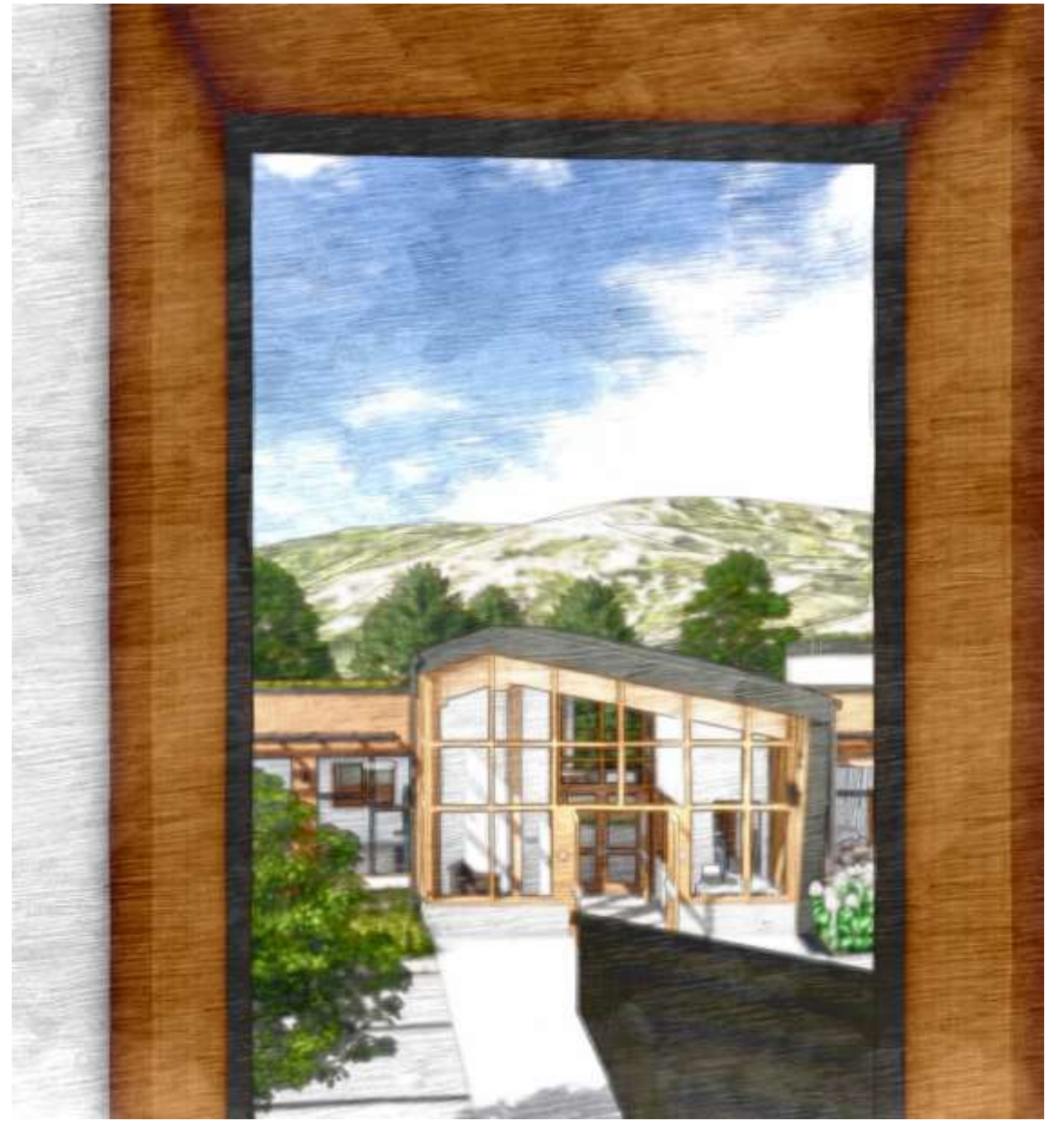
LOOKING SOUTH FROM  
RIDGE ROAD



LOOKING NORTH FROM  
RIDGE ROAD







**Slate Upper School**  
5100 Ridge Road, North Haven

Church Building



# Slate School

Slate Upper School  
5100 Ridge Road, North Haven

Thank You

