



Thoreau Residences

275 Forest Ridge Rd – Concord, MA

237-Unit Multifamily Rental Community

Concord Zoning Board of Appeals

December 5, 2024

Site Plan – Current 237 Unit Plan

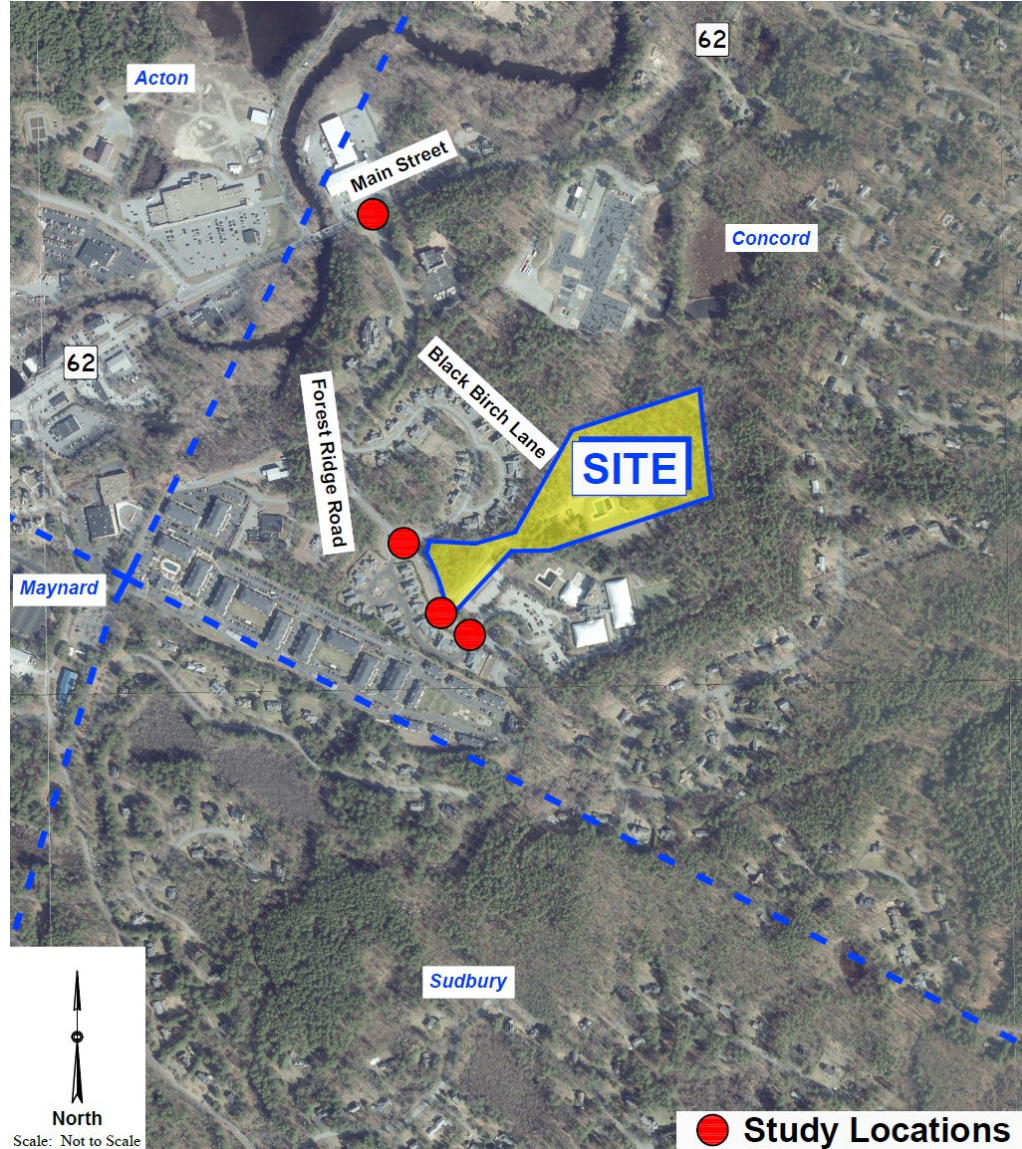


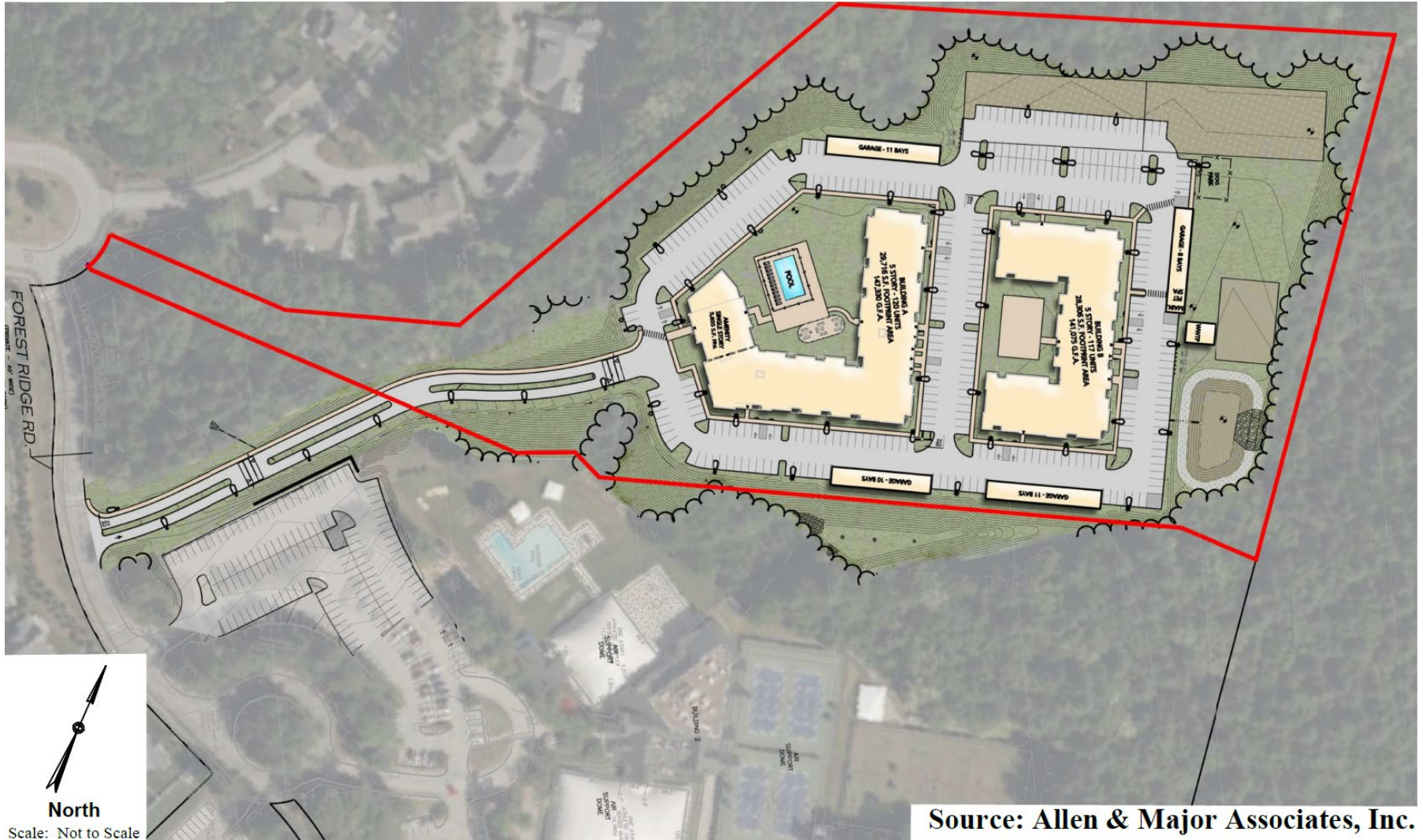
The Residence at Thoreau
Concord, Massachusetts



- **TIAS Prepared in October 2024**
- **Adequate Safety:** All sight lines meet AASHTO criteria. No High-Crash (HSIP) Locations.
- **Modest Traffic Generator:** Approximately 1 additional directional trip per minute. 75% of trips to/from the east.
- **Adequate Capacity:** Main at Forest Ridge operates at Level of Service D or better. Key approaches to the traffic circle operate at approximately 16% capacity. No offsite improvements warranted.
- **Ample Parking:** 1.66 Spaces per unit. Exceeds both ITE and Empirical parking standards.
- **Signal Warrant Not Met:** Based on Peak Hour and 4-Hour (Warrants 2 & 3) a traffic signal at Main at Forest Ridge is not warranted.
- **Transportation Demand Management**

Site Locus/Study Locations





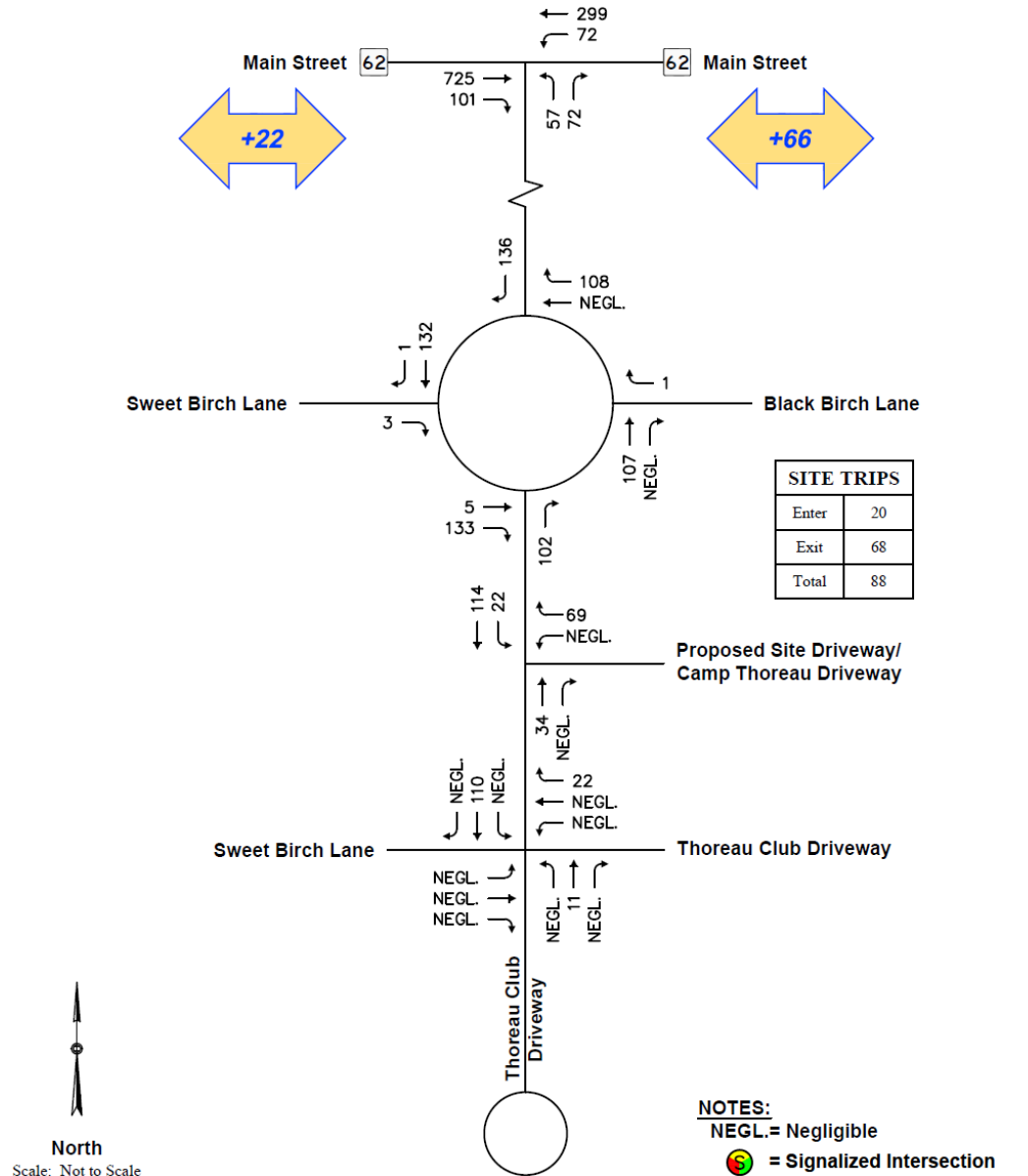
Source: Allen & Major Associates, Inc.

Peak Hour/Direction	Site Trips¹
<i>Weekday Morning Peak Hour:</i>	
Entering	20
<u>Exiting</u>	<u>68</u>
Total	88
<i>Weekday Evening Peak Hour:</i>	
Entering	56
<u>Exiting</u>	<u>36</u>
Total	92
 <i>Weekday Daily (24 hours)</i>	 1,076

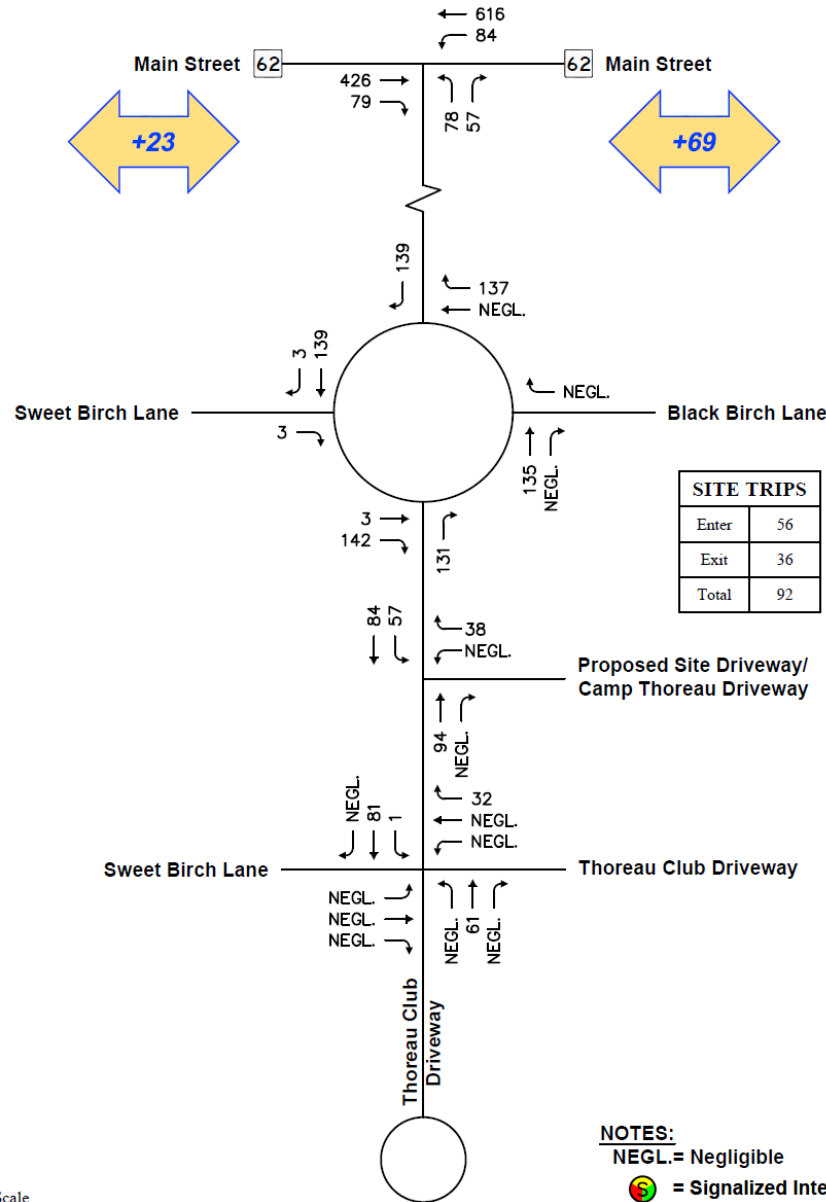
Source: ITE Trip Generation, 11th Edition; 2021.

¹ITE LUC 237 – Multifamily Housing (Mid-Rise) to 237 units.

Site Trip Generation – Weekday Morning Peak Hour



Site Trip Generation – Weekday Evening Peak Hour



Capacity Analysis Results

Time Period	Approach	2024 Baseline			2031 No-Build			2031 Build		
		v/c ¹	Delay ²	LOS ³	v/c	Delay	LOS	v/c	Delay	LOS
<i>Weekday Morning Peak Hour</i>										
Main Street (Route 62) at Forest Ridge Road	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Westbound	0.07	<5	A	0.08	<5	A	0.10	<5	A
	NB Left ⁵	0.17	23	C	0.20	26	D	0.31	32	D
	NB Right ⁵	0.03	10	A	0.03	10	A	0.11	11	B
Forest Ridge Road at Sweet Birch Lane/ Black Birch Lane/ Thoreau Club Dwy	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Northbound	0.03	<5	A	0.03	<5	A	0.08	<5	A
	Southbound	0.09	<5	A	0.09	<5	A	0.11	<5	A
<i>Weekday Evening Peak Hour</i>										
Main Street (Route 62) at Forest Ridge Road	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Westbound	0.04	<5	A	0.04	<5	A	0.08	<5	A
	NB Left ⁵	0.25	22	C	0.29	26	D	0.40	34	D
	NB Right ⁵	0.03	9	A	0.04	9	A	0.07	9	A
Forest Ridge Road at Sweet Birch Lane/ Black Birch Lane/ Thoreau Club Dwy	Eastbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Westbound	0.00	<5	A	0.00	<5	A	0.00	<5	A
	Northbound	0.10	<5	A	0.11	<5	A	0.15	<5	A
	Southbound	0.10	<5	A	0.10	<5	A	0.16	<5	A

¹Volume-to-capacity ratio

²Average control delay per vehicle (in seconds)

³Level of service

⁴n/a = not applicable

⁵Calibrated based on delay study during the critical weekday evening peak hour.

ITE Basis

Source	Peak Parking Rate	Peak Parking Demand
ITE Average Peak ¹	1.23 (per Unit)	292
ITE 95% Confidence ²	1.31 (per Unit)	311
ITE 85 th Percentile ³	1.45 (per Unit)	344

¹Average peak period demand per LUC 221 (Mid-Rise Apartment) for a General Urban/Suburban location applied to 237 Units.

²95% Confidence Interval for ITE LUC 221 peak parking generation rate applied to 237 Units.

³85th Percentile Parking Demand for ITE LUC 221 peak parking generation rate. applied to 237 Units.

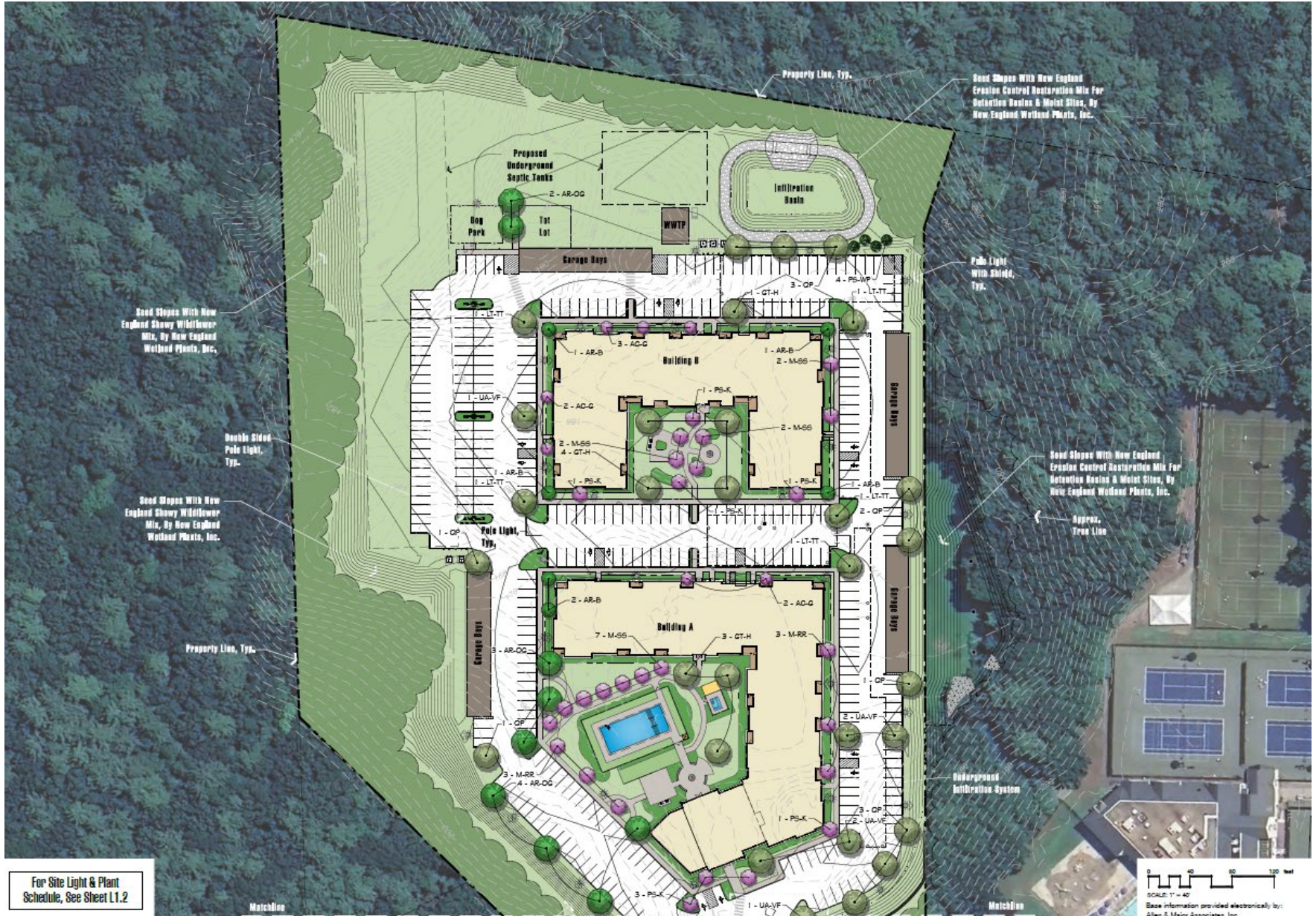
Empirical Basis

Development	City/Town	# Units	Peak Parking Usage	Peak Parking Rate (spaces per unit)
West Village ¹	Mansfield	204	283	1.39
Concord Mews	Concord	350	504	1.44
Cloverleaf	Natick	183	236	1.29
Chapel Hill West	Framingham	168	220	1.31
Chapel Hill East	Framingham	174	225	1.29
Martins Landing	North Reading	97	129	1.33
AVERAGE		208	294	1.34

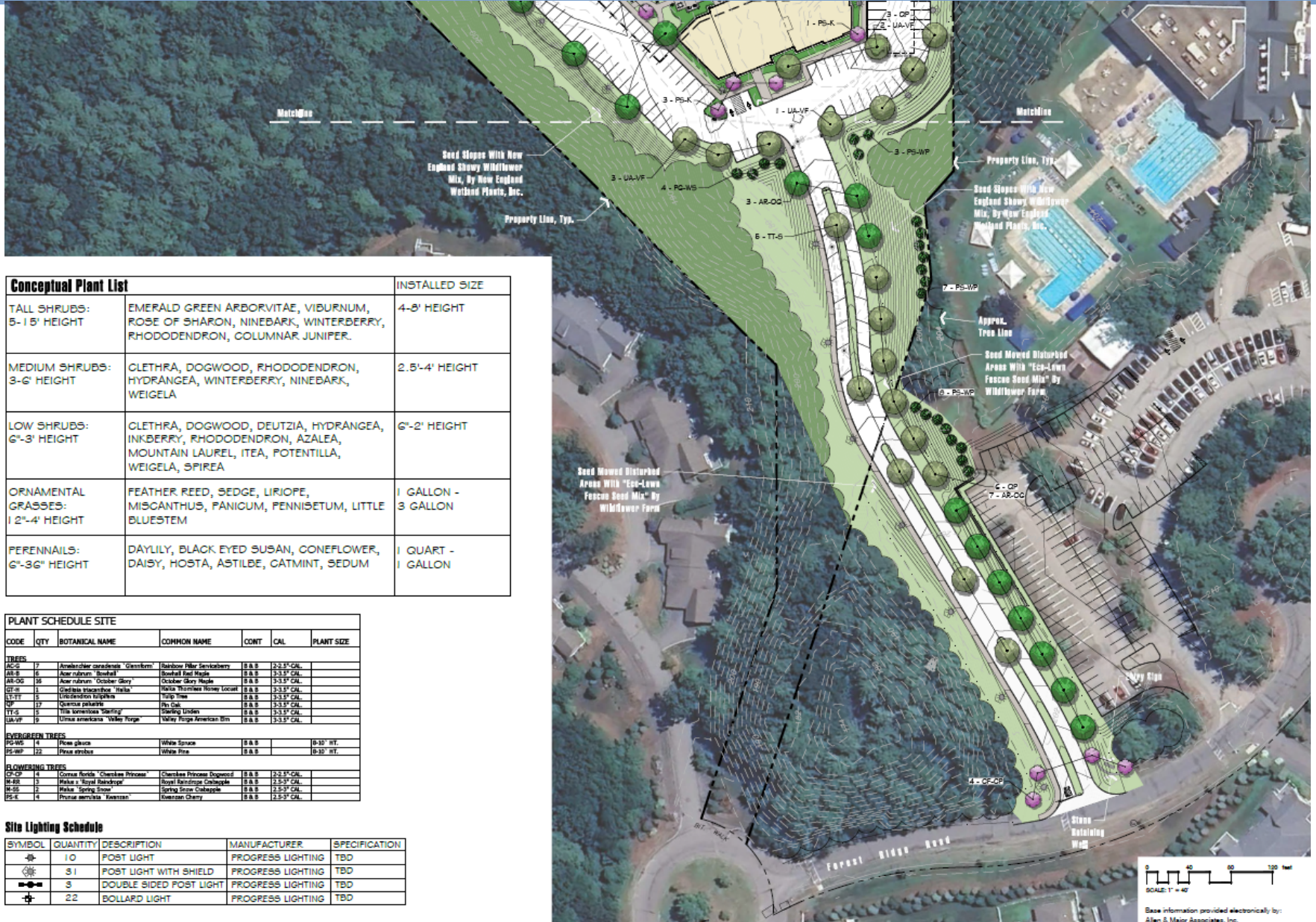
¹Access to garage spaces was restricted; as a conservative measure, all garage units were assumed to be occupied at the time of the count. Peak demand includes observed surface parking activity plus all garage units as each garage is assumed to be occupied.

The proposed 394 spaces at 1.66 spaces per unit is adequate to meet the peak parking demand, includes residents and visitors

- Vehicle Charging Stations
- Bicycle Facilities
- On-Site Amenities
- Pedestrian Infrastructure



Landscape



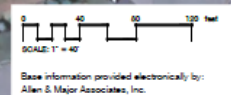
Conceptual Plant List		INSTALLED SIZE
TALL SHRUBS: 5-15' HEIGHT	EMERALD GREEN ARBORVITAE, VIBURNUM, ROSE OF SHARON, NINEBARK, WINTERBERRY, RHODODENDRON, COLUMNAR JUNIPER.	4-5' HEIGHT
MEDIUM SHRUBS: 3-6' HEIGHT	CLETHRA, DOGWOOD, RHODODENDRON, HYDRANGEA, WINTERBERRY, NINEBARK, WEIGELA	2.5'-4' HEIGHT
LOW SHRUBS: 6"-3' HEIGHT	CLETHRA, DOGWOOD, DEUTZIA, HYDRANGEA, INKBERRY, RHODODENDRON, AZALEA, MOUNTAIN LAUREL, ITEA, POTENTILLA, WEIGELA, SPIREA	6"-2' HEIGHT
ORNAMENTAL GRASSES: 12"-4' HEIGHT	FEATHER REED, SEDGE, LIROPE, MISCANTHUS, PANICUM, PENNISETUM, LITTLE BLUESTEM	1 GALLON - 3 GALLON
PERENNIALS: 6"-36" HEIGHT	DAYLILY, BLACK EYED SUSAN, CONEFLOWER, DAISY, HOSTA, ASTILBE, CATMINT, SEDUM	1 QUART - 1 GALLON

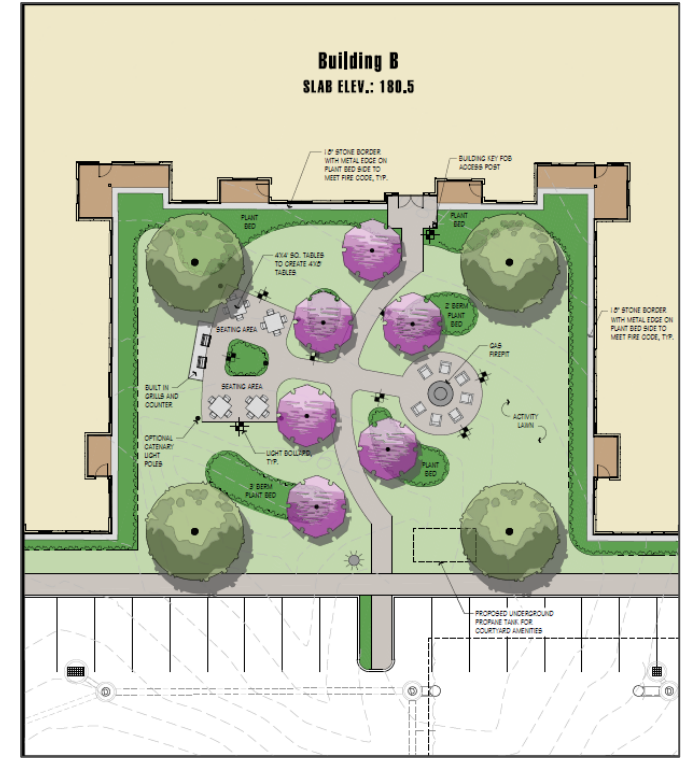
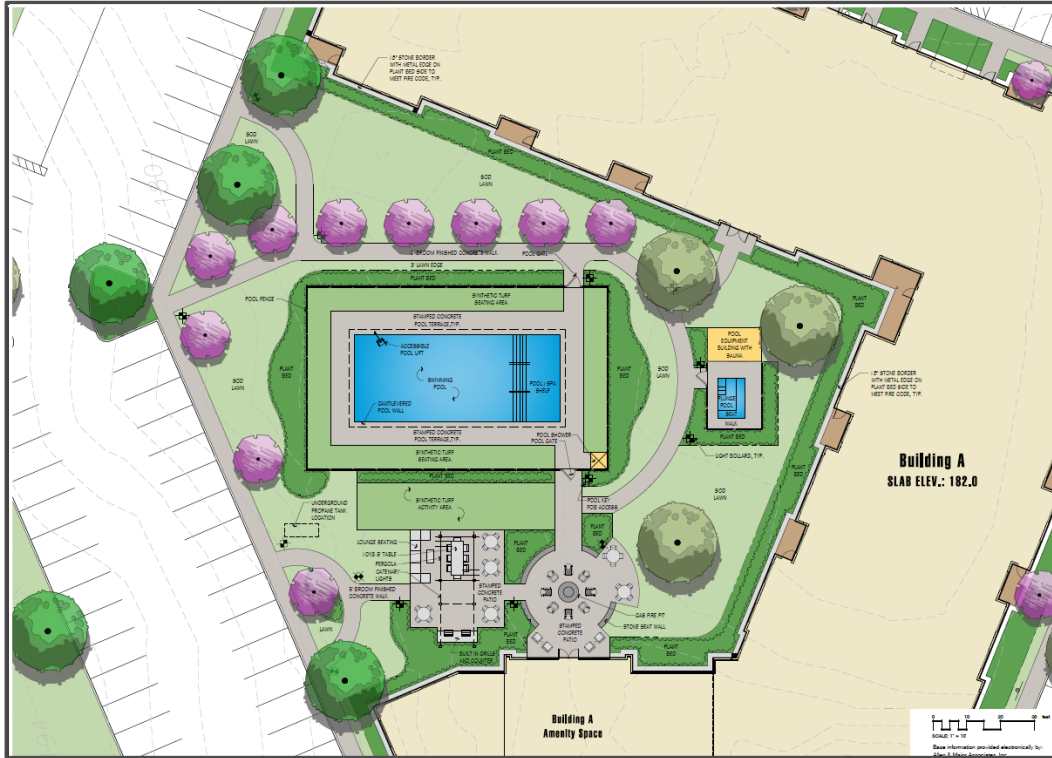
PLANT SCHEDULE SITE

CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	CAL	PLANT SIZE
TREES						
AC-S	17	<i>Amelanchier canadensis</i> 'Glossier'	Rainbow Elder Serviceberry	0.8.8	22.5" CAL	
AR-S	6	<i>Acer rubrum</i> 'Sensation'	Redbud Red Maple	0.8.8	23.5" CAL	
AR-OC	56	<i>Acer rubrum</i> 'October Glory'	October Glory Maple	0.8.8	33.5" CAL	
GT-W	3	<i>Gleditsia triacanthos</i> 'Halea'	Halea Thornless Honey Locust	0.8.8	33.5" CAL	
TT-T	5	<i>Taxodium floridense</i>	Yucca Tree	0.8.8	33.5" CAL	
OP	17	<i>Quercus palustris</i>	Pin Oak	0.8.8	33.5" CAL	
TT-S	5	<i>Vitis rotundifolia</i> 'Seemii'	Seemii Vitis	0.8.8	33.5" CAL	
UA-WP	19	<i>Ulmus americana</i> 'Walter Forge'	Walter Forge American Elm	0.8.8	33.5" CAL	
EVERGREEN TREES						
PG-W	1	<i>Pinus glauca</i>	White Spruce	0.8.8		0-10' HT.
PS-WP	22	<i>Pinus strobus</i>	White Pine	0.8.8		0-10' HT.
FLOWERING TREES						
CP-P	6	<i>Cornus florida</i> 'Charles Prinos'	Charles Prinos Dogwood	0.8.8	22.5" CAL	
W-S	1	<i>Malus 'Spring Snow'</i>	Spring Snow Crabapple	0.8.8	23.5" CAL	
W-S	2	<i>Malus 'Spring Snow'</i>	Spring Snow Crabapple	0.8.8	23.5" CAL	
PS-E	4	<i>Prunus americana</i> 'Kwanan'	Kwanan Cherry	0.8.8	23.5" CAL	

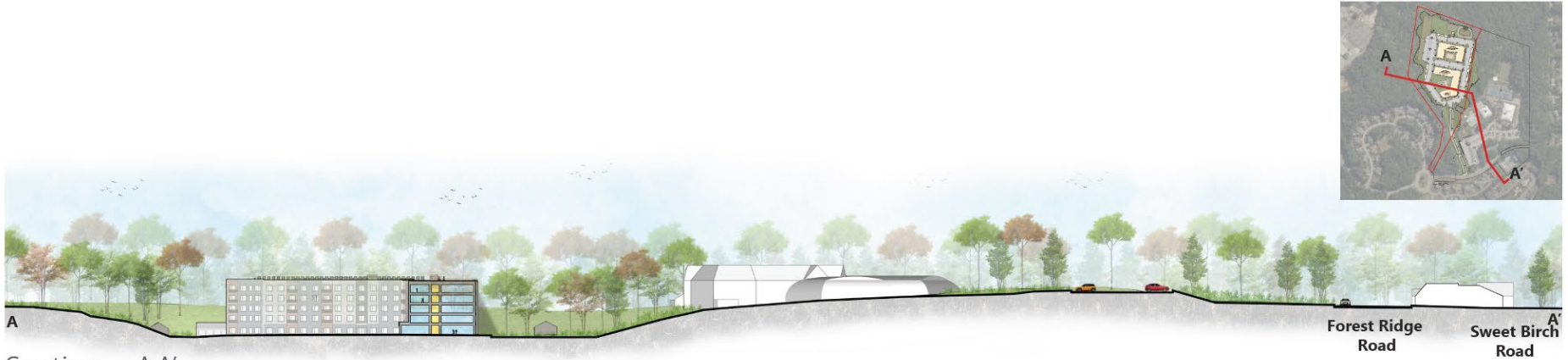
Site Lighting Schedule

SYMBOL	QUANTITY	DESCRIPTION	MANUFACTURER	SPECIFICATION
	10	POST LIGHT	PROGRESS LIGHTING	TBD
	31	POST LIGHT WITH SHIELD	PROGRESS LIGHTING	TBD
	3	DOUBLE SIDED POST LIGHT	PROGRESS LIGHTING	TBD
	22	BOLLARD LIGHT	PROGRESS LIGHTING	TBD





Site Section



Section - AA'



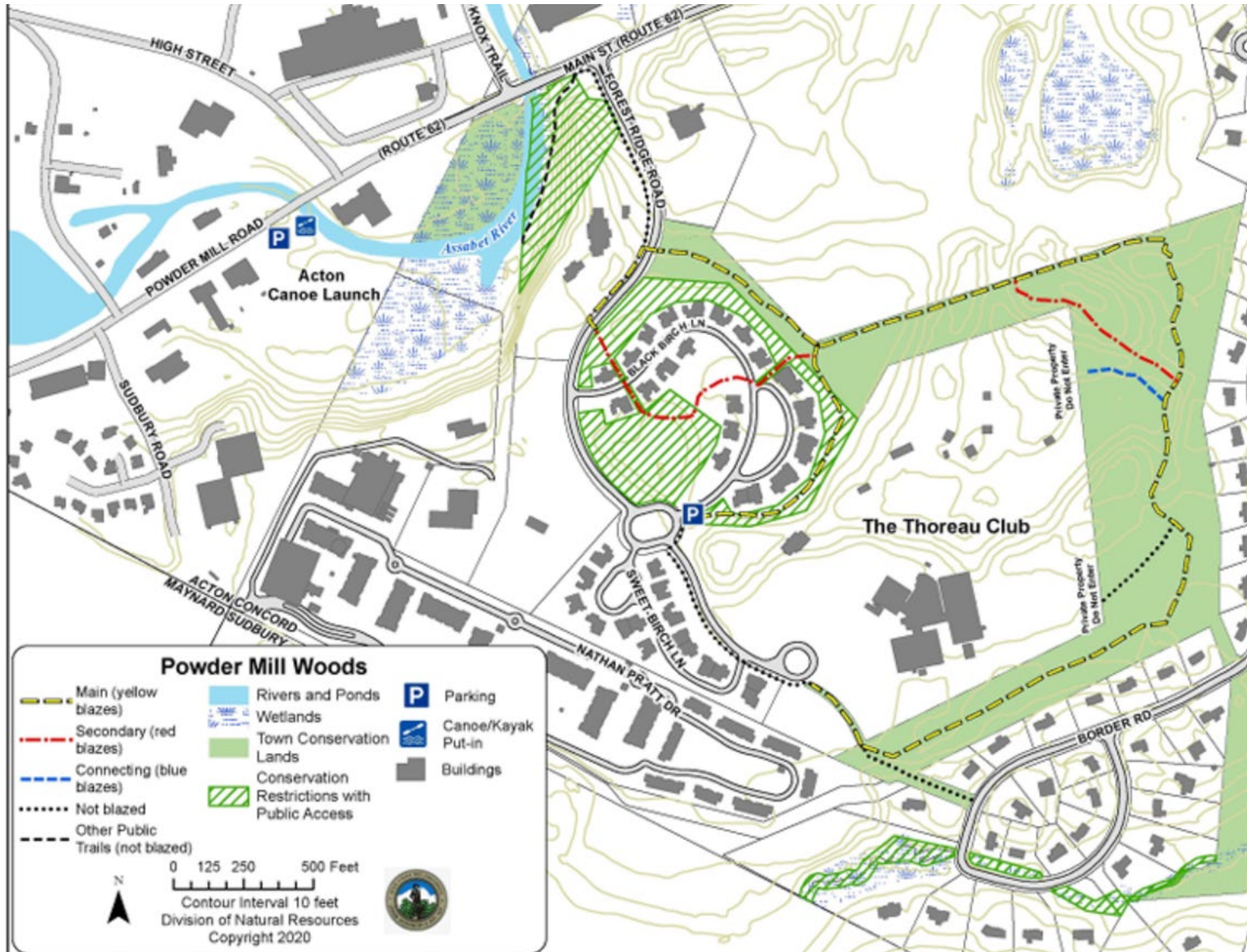
Section - BB'



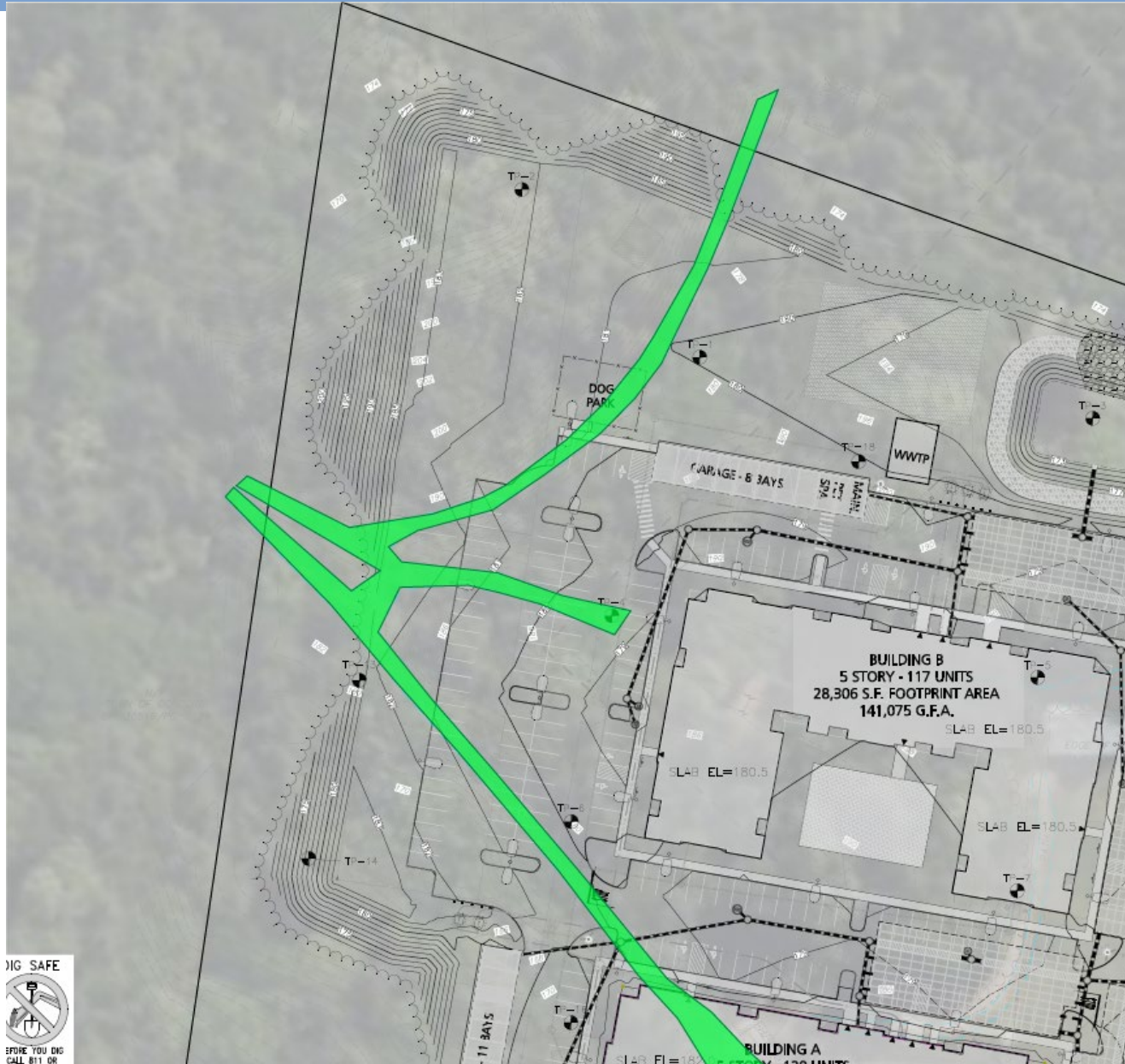




Powder Mill Woods – Trail Network



Powder Mill Woods – Trail Network



Architectural Rendering – Front Entrance





Questions and Discussion