



December 17, 2025
File No. 100628.040

City of Concord – Planning Board
41 Green Street
Concord, NH 03301
(603) 522-6205

Re: Project Narrative
New Concord Middle School – 144 South Street
Tax Map 7914Z, Lot 98-1
144 South Street
Concord, NH 03301

On behalf of the Concord School District, Nobis Group (Nobis) is submitting this project narrative to the City of Concord Planning Board along with project drawings in accordance with RSA 674.54. The proposed project is located at 144 South Street, Tax Map 7914Z, Lot 98-1 (Site).

BACKGROUND AND SITE CHARACTER

The approximate 21.2 acre site is currently occupied by the Rundlett Middle School including the parking area, access ways, and sports fields located at 144 South Street in Concord NH. The Site is located in the Single Family Residential District (RS) and is bounded by The Abbot Downing School to the South and Residential Units to the north, east, and west.

PROJECT DESCRIPTION

The proposed Concord Middle School is a new 3-story school building for grades 6-8 located on the site of the existing Rundlett Middle School at 144 South Street in Concord, NH. The new school will be located to the west of the existing school in an area currently occupied by athletic fields. The footprint area is approximately 96,000 sf and the total area is 205,562 sf. There is an additional 8,933 of mechanical enclosures on the roof. The school includes an auditorium with 450 seats, a gymnasium, cafeteria, music rooms and classrooms. The building has been designed to be net zero and will utilize ground source heat pumps, a rooftop photovoltaic array and photovoltaic parking canopies.

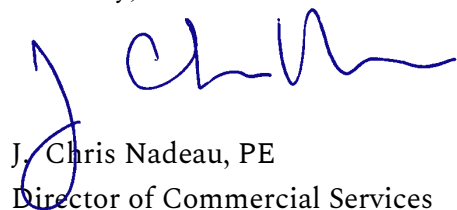


The primary access to the school will be from a reconfigured driveway off South Street. This driveway will access the parent drop-off and the primary parking lot for visitors and staff. A bus drop-off and secondary parking for staff will be created to the north of the school and accessed from Cypress Street. There are 134 parking spaces in the main parking lot on the south side of the building, 60 parking spots in the north lot. There are 30 parking spaces designated for the Abbot Downing school located along the entry drive that will be reconfigured. There will be 3 athletic fields on the site, 2 basketball courts, and a play area.

The project will be serviced by municipal sewer and water and will include an enhanced stormwater collection, storage, and treatment system prior to discharge to Bow Brook.

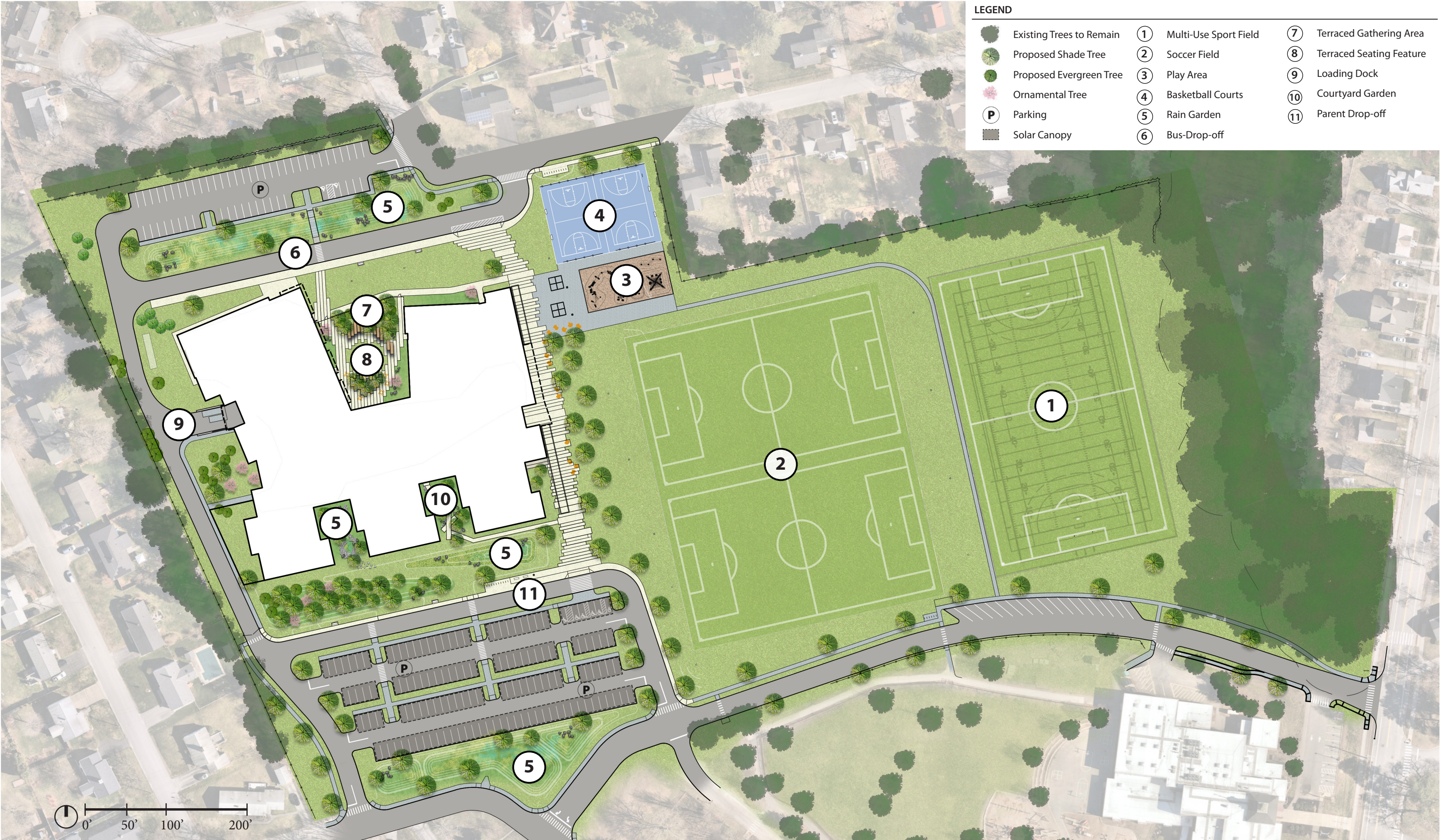
In accordance with RSA 674.54, we request a public hearing be held within 30 days of this notice, or the next regularly scheduled Planning Board meeting on January 21, 2025. We also request to be put on the agenda for the next regularly scheduled Conservation Commission and Architectural Design Review committee meetings. Please feel free to contact me with any questions or if you need additional documentation.

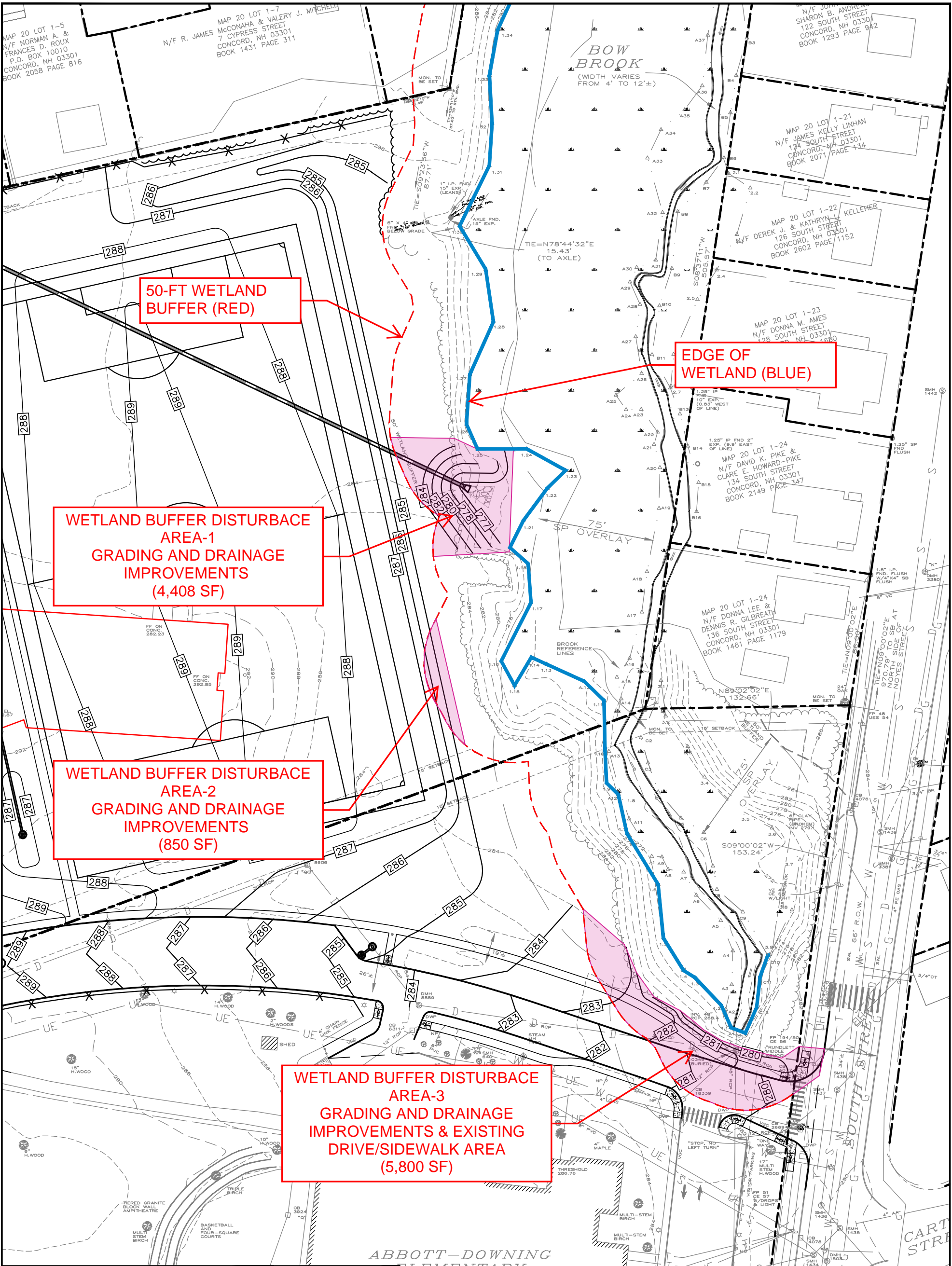
Sincerely,



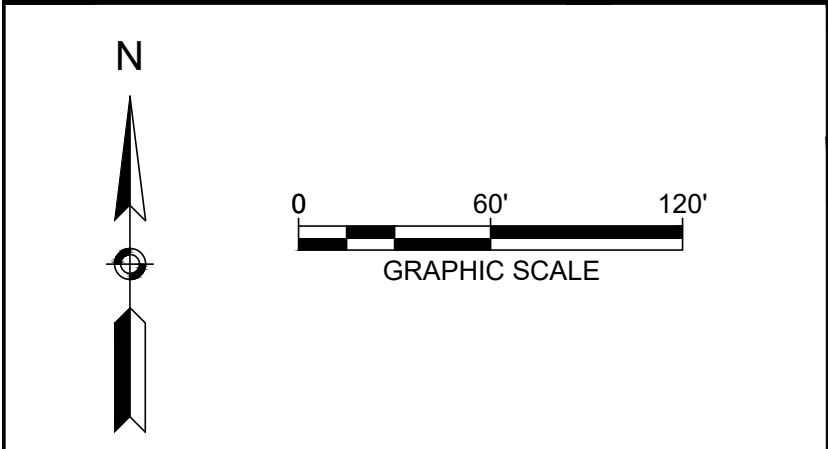
J. Chris Nadeau, PE
Director of Commercial Services

NOBIS GROUP®



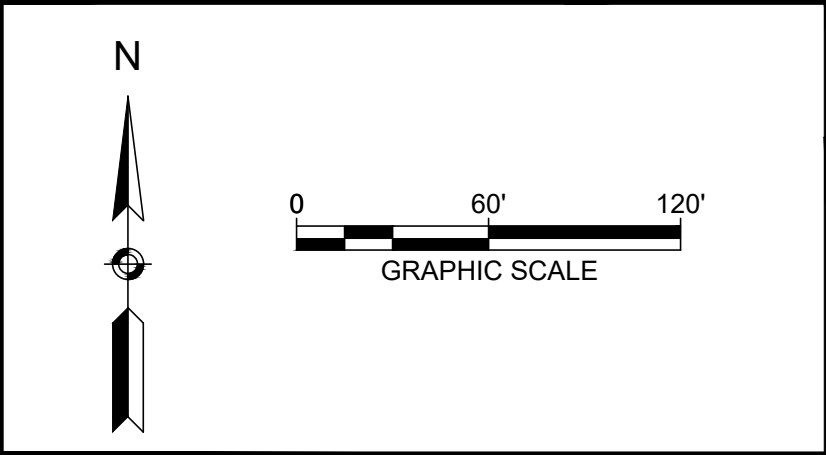
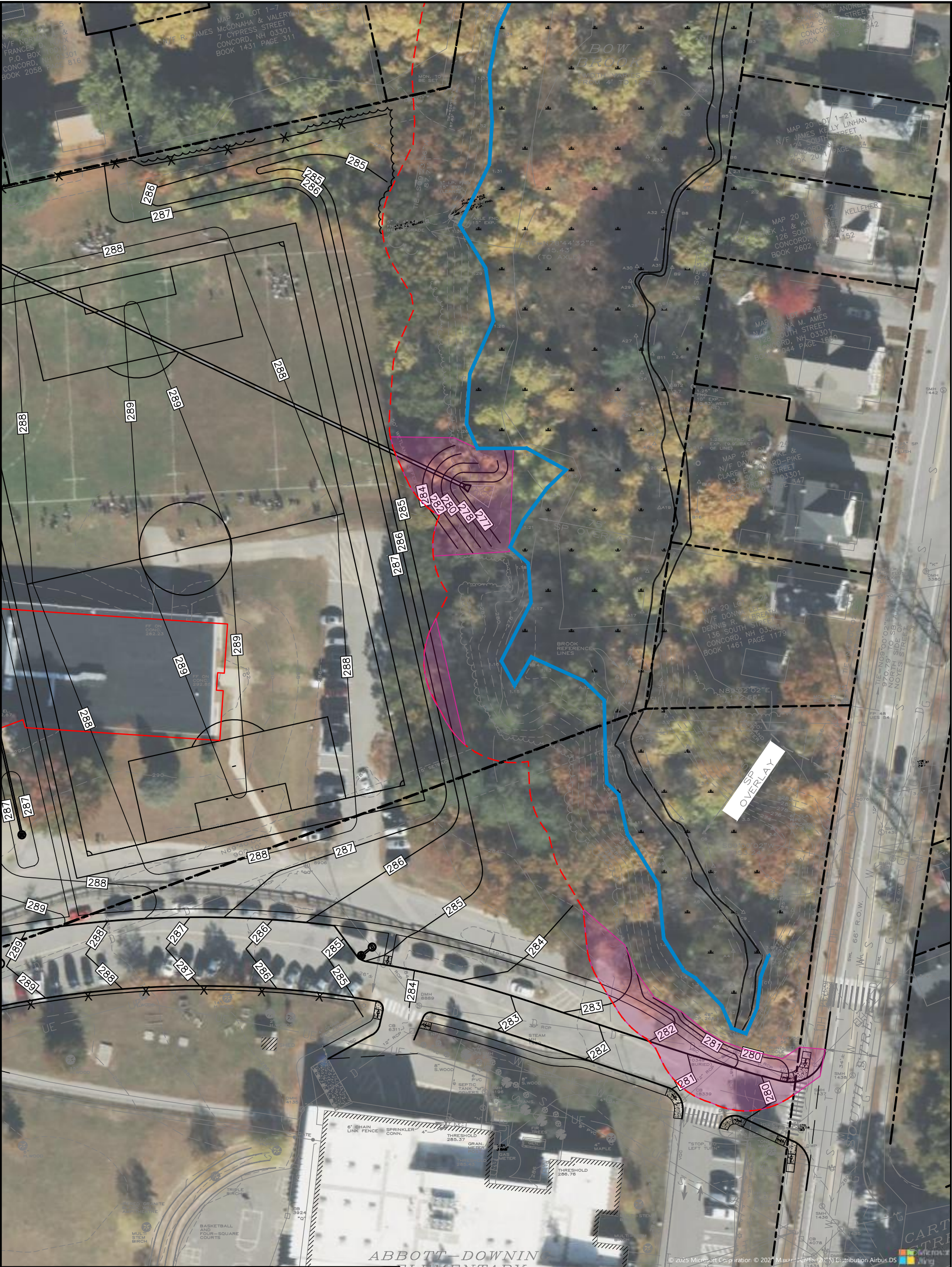


TOTAL DISTURBANCE WITHIN 50-FT WETLAND BUFFER = 11,058 SF




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EXHIBIT A	
WETLAND BUFFER DISTURBANCES CONCORD MIDDLE SCHOOL CONCORD, NH	
DRAWN BY:	MGD
CHECKED BY:	JCN
PROJECT NO.	100628.040
DATE:	JANUARY 2026





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WETLAND BUFFER DISTURBANCES CONCORD MIDDLE SCHOOL CONCORD, NH	
DRAWN BY:	MGD
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PROJECT NO.	100628.040
DATE:	JANUARY 2026

TECHNICAL MEMORANDUM

REF: NEX-2500336.00

DATE: December 19, 2025

TO: Ms. Holly Miller, AIA LEED AP BD+C
HMFH Architects
130 Bishop Allen Avenue
Cambridge, MA 02139

FROM: Ms. Rebecca L. Brown, P.E., Senior Project Manager
Ms. Cecilia J. Donaldson, EIT, Designer

RE: Traffic Study
Rundlett Middle School Redevelopment
144 South Street – Concord, New Hampshire



INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Study* for a proposed new middle school to replace the existing Rundlett Middle School in Concord, NH. The site currently contains the existing Rundlett Middle School with an approximate enrollment of 825 students. Access to the middle school is currently provided via an entrance-only driveway on South Street just north of the Abbott-Downing School. Egress is provided via an exit-only driveway on Conant Drive that is shared with the Abbott-Downing School egress. In addition, there is an additional parking lot north of Rundlett Field with two driveways on Cypress Street. Although not specifically signed, the driveways are intended to operate as entrance-only at the westerly driveway and exit-only at the easterly driveway to serve the angled parking within the lot. The existing school flow is demonstrated on Figure 1.

As part of the project, the existing middle school will be razed and a new middle school will be constructed on the westerly end of the site to allow the new school to be constructed while the existing school remains open. Once the new school is constructed, the existing school will be razed. In addition, as part of the project, the existing driveway connecting South Street to Conant Drive will be reconstructed to serve as the main access point for parent drop-off and pick-up traffic, as well as a portion of the staff entering the parking field on the southerly side of the school. A parent drop-off/pick-up loop will be created meeting the main driveway opposite the egress for Abbott-Downing School, circulating around the visitor and staff parking lot, and exiting onto Conant Drive. A separate drop-off/pick-up loop for buses will be created on the northerly side of the school where buses will enter from Cornell Street, circulate through a supplemental staff parking lot, and pass through the bus drop-off/pick-up area before egressing onto Cypress Street. A service driveway will be provided along the westerly side of the property connecting the parking lot at the northerly end of the school to the main exit onto Conant Drive. This drive aisle will be gated and restricted to service and emergency vehicles only. The new school will be designed to accommodate an enrollment of up to 900 students.

As the new school will be located on the site of the existing school and the existing school previously accommodated an enrollment of over 900 students, the project is not anticipated to add considerable traffic

to the surrounding roadways. However, the project will result in changes in traffic circulation and the need for buses to utilize Cypress Street and Cornell Street to access the new bus loop. Therefore, GPI has performed a review of the geometry of the intersections impacted by new bus routing, reviewed the safety of the site access and traffic circulation, evaluated the adequacy of the proposed parking supply and parent pick-up/drop-off area to accommodate anticipated queues, and identified measures to improve the safety and accessibility of the surrounding roadway network to better accommodate school traffic.



FIGURE 1
EXISTING TRAFFIC FLOW

EXISTING CONDITIONS

Study Area

A scoping meeting was held with the City of Concord staff on November 4, 2025 to identify the scope and study area for this traffic study. As the proposed school is anticipated to accommodate a similar enrollment to the existing school, it is not anticipated to have a significant impact on traffic operations at intersections outside of the immediate area surrounding the school. Therefore, the scope of the traffic study focuses on the existing and proposed site driveway intersections, as well as the intersections impacted by the change in traffic circulation, particularly the use of Noyes Street, Cornell Street, and Cypress Street for bus access to the site. Therefore, GPI reviewed the geometry, traffic control, and safety of the following study area intersections as part of this study:

- South Street / Noyes Street
- Noyes Street / Cypress Street
- Noyes Street / Cornell Street
- Cornell Street / Proposed Site Driveway
- Cypress Street / Proposed Site Driveway
- South Street / Rundlett Middle School Driveway
- South Street / Abbott Downing School Driveway
- South Street / Conant Drive
- Conant Drive / Existing Shared Rundlett / Downing School Driveway
- Conant Drive / Proposed Site Driveway
- Conant Drive / Springfield Street

Roadway Geometry

South Street

South Street is classified as a major collector under the jurisdiction of the City of Concord, and travels north-south between I-89 to the south and Route 202 to the north. In the vicinity of the Rundlett Middle School, South Street is approximately 36 feet wide, providing an 11.5-ft travel lane and 6.5-ft shoulder in each direction. The shoulder is generally used as an on-street parking area along both sides of the roadway. In addition, variable width sidewalks are provided along both sides of South Street north of Bow Street, which are separated from the roadway by a grass strip. South of Bow Street, sidewalk is provided on the west side of South Street only. The speed limit along South Street is posted as 30 miles per hour (MPH), with a school zone speed of 20 MPH.

A School Zone flasher assembly is provided on South Street approaching the Rundlett Middle School and Abbott Downing School from both directions, and the word SCHOOL is striped on the pavement near the school zone assemblies. The assembly for the southbound direction is posted on an abandoned utility pole, while the northbound assembly is posted on an active utility pole. Both assemblies provide only one flasher, and are equipped with a radar speed feedback sign to indicate the driver's speed when approaching the school. These devices do not comply with current Manual on Uniform Traffic Control Devices (MUTCD) guidelines for school zone flasher assemblies, and the existing SCHOOL pavement markings are faded.

There are school zone crosswalks located on South Street just north of the Rundlett Middle School driveway and just south of Bow Street. These crosswalks are equipped with static school crossing signage and provide ADA-accessible curb ramps with tactile warning devices.



Image 1: School Zone Assembly on South Street SB



Image 2: School Zone Assembly on South Street NB

Conant Drive

Conant Drive is a local roadway providing connections between South Street, Clinton Street and several residential side streets. The posted speed along Conant Drive is 25 MPH. Conant Drive is generally unstriped, but is approximately 28 feet wide, providing adequate space for a single travel lane in each direction. No parking is allowed along either side of Conant Drive. A sidewalk is located along the northerly side of Conant Drive, and there are no bicycle accommodations provided along the roadway.

There is a static school zone sign on Conant Drive approach the school from the west, which is no longer compliant with current MUTCD standards as the speed placard overlaps the school zone sign and the signs are the older orange/yellow color, instead of the current fluorescent yellow/green color used for school zones. There is a school crossing sign on Conant Drive traveling westbound approaching the school driveway, but there are no school zone signs to indicate that a driver is entering a school zone. The existing crosswalk east of the school driveway is essentially a crossing to nowhere as there are no sidewalks on the southerly side of Conant Drive. There are also no curb ramps or tactile warning devices at this crosswalk. GPI recommends the City consider removal of this non-compliant crosswalk and installation of a new crosswalk at the intersection with Winant Street equipped with curb ramps on both sides of the roadway to provide a pedestrian connection into the Winant Street and Rundlett Street neighborhoods.



Image 3: School Zone Sign on Conant Drive EB



Image 4: School Zone Sign on Conant Drive WB

Noyes Street

Noyes Street is a local roadway connecting Cornell Street at the westerly end with South Street at the easterly end. Noyes Street is generally unstriped aside from STOP lines at intersections, but ranges from 23 to 28 feet wide, providing adequate space for a single travel lane in each direction. There are no pedestrian or bicycle accommodations along Noyes Street. There is a posted speed of 30 MPH on Noyes Street. Although neither side of the roadway is signed, on-street parking occurs along the southerly side of Noyes Street in several areas, making it difficult for two-way traffic flow.

Cornell Street

Cornell Street is a local roadway connecting Clinton Street to the north with Cypress Street to the south. Cornell Street is also not striped aside from STOP lines at intersections, but is generally 24 to 28 feet wide, providing adequate width for a single travel lane in each direction. A sidewalk separated from the roadway by a grass strip is provided along the westerly side of Cornell Street. There are no bicycle accommodations on Cornell Street. North of Noyes Street, Cornell Street is signed and marked as a two-way roadway. According to the City's zoning ordinance, Cornell Street operates as one-way southbound between Noyes Street and Cypress Street. However, there are no signs or pavement markings to indicate this one-way pattern, and vehicles were observed traveling the wrong way on Cornell Street during the field visit. Additional signage and pavement markings are needed on Cornell Street to reinforce the one-way travel pattern. Although not signed, vehicles were observed parking along the westerly side of Cornell Street, particularly during the afternoon dismissal period as parents parked in this area to pick up students.

Cypress Street

Cypress Street is a local roadway connecting Cornell Street to the west with Noyes Street to the east. Cypress Street is not striped aside from a STOP line at the intersection with Noyes Street, but ranges from 26 to 35 feet wide. Cypress Street is a one-way roadway traveling in the eastbound direction and is signed with DO NOT ENTER (R5-1) and ONE-WAY (R6-1) signs at its intersection with Noyes Street to indicate the one-way traffic flow. There is also a ONE-WAY sign posted at the westerly end of the roadway where Cypress Street meets Cornell Street, as well as on a utility pole opposite the Rundlett School parking lot egress driveway. Parking is prohibited along the northerly side of Cypress Street, but permitted along the southerly side. Numerous school staff were observed parking along the southerly side of Cypress Street near the school. There are no pedestrian or bicycle accommodations on Cypress Street. There is no posted speed limit on Cypress Street.

Springfield Street

Springfield Street is a local roadway connecting Clinton Street at the north to Conant Drive at the south. It is not striped but is generally 28 feet wide, providing adequate width for a single travel lane in each direction. Springfield Street is signed for 25 MPH. All buses are directed to utilize Norwich Street to travel between the Rundlett Middle School and Clinton Street because there are sidewalks existing on Norwich Street. However, several parent vehicles were observed utilizing Springfield Street as a way of bypassing the buses and other school traffic. Residents of the Springfield Street neighborhood have also report frequent speeding, even during the summer months, on the roadway.

Intersection Geometry**South Street / Noyes Street**

Noyes Street intersects South Street from the west to form a three-way, unsignalized intersection. The Noyes Street eastbound approach operates under STOP control, while the South Street movements are

free-flowing. There are sidewalks provided along both sides of South Street in the vicinity of Noyes Street, and there is a crosswalk on the Noyes Street approach to the intersection. Although there are curb ramps with tactile warning devices provided to this crosswalk, there are no level landing areas at the base of the ramp and there is a steep slope on the ramp on the southwest corner of the intersection that is not ADA-compliant.

South Street / Rundlett Middle School Driveway

The Rundlett Middle School Driveway intersects South Street from the west to form this three-way intersection. The South Street approaches are both free-flowing and provide a single travel lane in each direction. The Rundlett School Driveway operates one-way westbound, away from the intersection, and serves as an entrance-only driveway to the school. Sidewalks are provided along both sides of South Street in the vicinity of the intersection and a crosswalk is provided across the Rundlett School Driveway and across South Street north of the intersection. The crosswalk on South Street appears to have been offset to the north of the intersection to avoid conflicts with residential driveways on the easterly side of the roadway. Although there are existing curb ramps with tactile warning devices at both ends of these crosswalks, none of the ramps are compliant with ADA guidelines as they do not provide level landing areas at the base of the ramps.

South Street / Abbott Downing School Driveway

The Abbott Downing School Driveway intersects South Street from the west to form this three-way, unsignalized intersection. The South Street approaches are both free-flowing, while the Abbott Downing Driveway operates under STOP control. All approaches to the intersection provide a single travel lane in each direction. A sidewalk is provided along the westerly side of South Street, and a crosswalk is provided across the Abbott Downing School Driveway. Although there are existing curb ramps with tactile warning devices at both ends of this crosswalk, the ramp on the southwest corner is not ADA-compliant as no level landing area is provided at the base of the ramp.

South Street / Conant Drive

Conant Drive intersects South Street from the west to form this three-way, unsignalized intersection. The South Street approaches are both free-flowing, while Conant Drive operates under an assumed STOP condition. There are currently no STOP lines or STOP signs provided on the Conant Drive approach to South Street. All approaches to the intersection provide a single travel lane in each direction. The Rundlett School Driveway operates one-way westbound, away from the intersection, and serves as an entrance-only driveway to the school. A sidewalk is provided along the westerly side of South Street, and a crosswalk is provided across the Conant Drive approach. The existing curb ramps do not comply with MUTCD standards as there is no level landing area at the base of the ramps and there are no tactile warning strips before entering the roadway.

Noyes Street / Cypress Street

Cypress Street intersects Noyes Street from the south and Princeton Street intersects Noyes Street from the north to form this offset four-way STOP controlled intersection. None of the roadways are striped but the Noyes Street and Princeton Street approaches each provide a single travel lane in each direction, while Cypress Street is one-way northbound. No pedestrian or bicycle accommodations are provided at this intersection.

Noyes Street / Cornell Street

Cornell Street intersects Noyes Street from the north and south to form this four-way, STOP controlled intersection. None of the roadways are striped aside from a STOP line, but the Noyes Street and Cornell

Street SB approaches each provide a single travel lane in each direction. The southerly Cornell Street leg is not signed or marked, but operates as one-way southbound away from the intersection. There are sidewalks provided along the westerly side of Cornell Street. Although curb ramps are provided, there is no crosswalk striped across the Noyes Street eastbound approach. There are no bicycle accommodations provided at this intersection. The existing STOP line on Noyes Street westbound is set back significantly from the intersection, causing drivers to make multi-stage stops through the intersection and creating driver confusion over right-of-way. The STOP line appears to have been set back this far to accommodate right-turns from Cornell Street northbound onto Noyes Street; however, this portion of Cornell Street is one-way southbound so this turning movement does not need to be accommodated. At the current location of the STOP line, drivers on Cornell Street SB and Noyes Street WB have difficulty seeing one another due to an ornamental fence on the property on the northeast corner of the intersection.

Conant Drive / Shared Rundlett & Abbott Downing School Driveway

The Shared Rundlett and Abbott Downing School Driveway intersections Conant Drive from the northeast to form this three-way, unsignalized intersection. The school driveway operates under STOP control while the Conant Drive approaches are free-flowing. None of the approaches are striped, but Conant Drive accommodates a single travel lane in each direction, while the school driveway was observed being utilized as a two-lane approach with dedicated left-turn and right-turn lanes during the school dismissal period, and generally as a one-lane approach during all other time periods. Although there are DO NOT ENTER signs located on the school driveway, these signs are improperly posted too low to the ground and at an angle where they are not visible to traffic. During the field visit, GPI noted several vehicles entering the school egress driveway on Conant Drive to access either the 18-space parking area on the southwest corner of the school or the grass area to the east of the driveway to pick up students. There is a sidewalk along the north side of Conant Drive and west side of the school driveway near the intersection. A crosswalk is provided across the school driveway approach. Although there are existing curb ramps to this crosswalk, the ramps are not compliant with ADA guidelines and do not provide tactile warning devices. There are no bicycle accommodations at this intersection.

Traffic Volumes

GPI utilized turning movement counts collected at the study area intersection by Vanasse Hange Brustlin, Inc (VHB) in 2023 to estimate the bus, staff, and parent vehicle traffic generated by the existing Rundlett Middle School. Automatic traffic recorders (ATR) were used to obtain daily traffic volumes and speeds on South Street north of the site driveway, and on Conant Street east of the site driveway. ATR counts were collected over a 24-hour period from Wednesday, November 8 to Thursday November 9, 2023 to obtain weekday daily traffic volumes.

The TMCs and vehicle classification counts were performed during the weekday morning (7:00 AM to 9:00 AM), the weekday afternoon dismissal/weekday evening (1:30 PM – 6:00 PM) peak periods on Wednesday, November 8, 2023 at the following intersections:

- South Street at Noyes Street
- South Street at Rundlett Middle School/Abbott Downing Elementary School Shared Driveway
- South Street at Abbott Downing Elementary School Southern Driveway
- South Street at Conant Drive
- Conant Drive at Rundlett Middle School/Abbott Downing Elementary School Shared Driveway
- Clinton Street at Springfield Street

All traffic-count data is provided in detail in the Appendix.

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. Typically, traffic volume counts would be upwardly adjusted to the peak-month conditions as part of a traffic impact study. However, as the traffic counts were utilized only to obtain existing school traffic volumes and the school traffic is expected to remain relatively consistent from day to day throughout the year, no seasonal adjustment of the traffic volumes has been applied.

The existing traffic volumes for the Weekday AM and Weekday Dismissal Peak on Figures 1 and 2, respectively.



FIGURE 2

2023 WEEKDAY AM EXISTING
PEAK HOUR TRAFFIC VOLUMES



FIGURE 3

2023 WEEKDAY DISMISSAL EXISTING
PEAK HOUR TRAFFIC VOLUMES

Collisions

Collision data were obtained from the Concord Police Department for the latest complete three years available (2022 through 2024). The detailed collision data is provided in the Appendix and a summary of the data is provided in Table 1.

As shown in Table 1, the section of Cypress Street between Cornell Street and Noyes Street experienced four collisions over the three-year study period, or an average of 1.33 collisions per year. All of the collisions were property damage only. Two of the collisions were single vehicle collisions, one was a rear-end collision and one was not reported. Two collisions were noted to be due to inattention/distracted drivers and one collision was noted to be congestion related. None of the collisions occurred during wet/icy conditions or commuter peak periods. Due to the low number of collisions, no safety issues are identified.

All other intersections experienced less than one collision per year, indicating no safety issues are identified.

TABLE 1
Collision Summary

Location	Number of Collisions		Severity ^a				Collision Type ^b						Percent During	
	Total	Average per Year	PD	PI	F	NR	SS	RE	CM	SV	HO	NR	Commuter Peak ^c	Wet/Icy Conditions ^d
South Street at Noyes Street	0	--	--	--	--	--	--	--	--	--	--	--	--	--
South Street at Rundlett Middle School Driveway	0	--	--	--	--	--	--	--	--	--	--	--	--	--
South Street at Conant Drive	1	0.33	1	--	--	--	--	--	--	1	--	--	0%	0%
Conant Drive at Rundlett Middle School Driveway	0	--	--	--	--	--	--	--	--	--	--	--	--	--
Cornell Street at Noyes Street	0	--	--	--	--	--	--	--	--	--	--	--	--	--
Cypress Street at Noyes Street	2	0.67	2	--	--	--	--	1	--	--	--	1	0%	0%
Cypress Street from Cornell Street to Noyes Street	4	1.33	4	--	--	--	--	1	--	2	--	1	0%	0%

Source: Concord Police Department (2022-2024).

^a PD = property damage only; PI = personal injury; F = fatality, NR = not reported.^b SS = sideswipe; RE = rear end; CM = cross movement/angle; SV = single vehicle; HO = head on; NR = not reported.^c Percent of vehicle incidents that occurred during the weekday AM (7:00 AM-9:00 AM) and weekday PM (4:00 PM -6:00 PM) commuter peak periods.^d Represents the percentage of only “known” collisions occurring during inclement weather conditions.

FUTURE CONDITIONS

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway intersections to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American Association of State Highway and Transportation Officials (AASHTO).¹ AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. In addition, the available sight distances were compared with the NHDOT requirement of 400-feet of All-Season Safe Sight Distance.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the intersections were measured and compared to minimum requirements as established by AASHTO. Based on the posted and observed speeds, the SSD and ISD requirements were calculated. The sight distance calculations are provided in the Appendix. The minimum required sight distances based on AASHTO were compared to the available distances, as shown in Table 2. The sight distance calculations are provided in the Appendix.

¹ A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2018.

TABLE 2
Sight Distance Summary

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required ^a	Measured	Minimum Required ^b	Desirable ^c
South Street at Rundlett Middle School Driveway: <i>North of intersection (SB)</i> <i>South of intersection (NB)</i>	+500 +500	220 200	N/A N/A	N/A N/A	N/A N/A
Conant Drive at Eastern (Shared) Site Driveway: <i>East of intersection (WB)</i> <i>West of intersection (EB)</i>	+500 153 (185) ^d	165 155	285 175	165 155	240 280
Conant Drive at Western Site Driveway: <i>East of intersection (WB)</i> <i>West of intersection (EB)</i>	200 +500	165 155	255 +500	165 155	240 280

^a Values based on AASHTO requirements for minimum SSD based on an assumed 85th percentile speed of 32 mph SB and the speed limit of 30 mph NB since the 85th percentile speed is less than the speed limit on South Street and 26 mph WB on Conant Drive and the speed limit of 25 mph EB since the 85th percentile speed is less than the speed limit on Conant Drive.

^b Values based on AASHTO requirements for SSD.

^c Values based on AASHTO requirements for ISD for posted speed of 30 mph on South Street and 25 mph on Conant Drive.

^d XXX (XXX) = ISD without crossing onto private property (ISD in fall/spring with crossing onto private property).

As shown in Table 2, the available intersection sight distances (ISD) at all of the proposed school driveway intersections will also exceed AASHTO's minimum recommendations for safe operations. Similarly, the stopping sight distances (SSD) at all of the proposed school driveway intersections will exceed AASHTO's recommendations for minimum SSD with the exception of the SSD traveling eastbound on Conant Drive approaching the Eastern (Shared) Site Driveway for the Rundlett and Abbott Downing Schools. There is a sharp horizontal curve on Conant Drive that limits this sight line. During the spring and fall, when few leaves are on the trees and no snow is present, the SSD exceeds AASHTO's minimum SSD, but requires visibility over private property boundaries. To improve sight lines for vehicles approaching the eastern site driveway on Conant Drive, GPI recommends modifications to the currently proposed driveway design. Currently, the driveway is proposed to provide two 16-ft travel lanes for right-turns and left-turns exiting the driveway. By shifting the centerline of the Shared Site Driveway approximately 2-feet to the northwest, the available SSD can be extended to the required 155-ft minimum. To accomplish this, GPI recommends holding the currently proposed northwesterly curb line and restriping the driveway to provide a 2-ft shoulder on the northwest side, a 12-ft right-turn lane, and a 12-ft left-turn lane. The driveway may be reduced in width by shifting the curb line on the southeast side of the driveway further west by up to 4-ft to provide a 2- to 6-ft shoulder on the southeast side. This would increase the SSD to the required 155 feet to meet AASHTO minimum requirements for safe operation.



Image 5: ISD looking east (left) exiting East Driveway onto Conant Drive



Image 6: ISD looking west (right) exiting East Driveway onto Conant Drive



Image 5: ISD looking east (left) exiting West Driveway onto Conant Drive



Image 6: ISD looking west (right) exiting West Driveway onto Conant Drive

In order to maintain the sight distances at the driveways after development of the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the roadway so as not to inhibit the available sight lines.

Proposed Traffic Flow

The project consists of razing the existing middle school and constructing a new middle school on the same site. The existing middle school was built to accommodate an enrollment of 900 students, and the proposed middle school will also be built to accommodate 900 students. As a result, the project is anticipated to result in minimal increases in traffic beyond the immediate study area surrounding the site. There will be some changes to traffic flows in the immediate area surrounding the site due to modifications in access and egress locations and on-site traffic circulation. These changes are discussed below, and the proposed traffic flow is demonstrated in Figure 4.

Currently, there are 19 buses that utilize the existing shared Rundlett and Abbott Downing School driveway on South Street to access the bus loop at the front of the site. As part of the proposed redevelopment, a

separate bus loop will be provided on the north side of the school, which will be accessible via Cornell Street. As a result, these 19 buses will utilize Noyes Street and Cornell Street to access the bus loop, and will then leave the site via Cypress Street and Noyes Street to access South Street.

Under current conditions, there are numerous smaller parking areas where school staff park. There is a small staff parking lot to the east of the school that can be accessed via the bus loop, which contains 10 striped parking spaces. There are also 32 parking spaces located along the main driveway through the site that can be utilized by Rundlett School staff. Another lot with 18 spaces is located at the southwest corner of the site near Conant Drive and is accessed via the shared driveway. An additional staff parking lot with 34 parking spaces is located on the north side of the school off Cypress Street. A service driveway on Cypress Street provides access to a small gravel area where another 10 vehicles were observed parking on the day of the field visit. In total, there are 94 striped parking spaces on the site with an additional 10 spaces in the gravel area to accommodate up to 104 vehicles parked on the site at one time. There are a total of 147 staff members at the existing school, which exceeds the available parking supply on the site and results in spillover onto the adjacent streets. On the day of the field visit, there were 20 apparent staff members parked along the southerly side of Cypress Street. Therefore, approximately 64 staff vehicles are currently using Cornell Street and Cypress Street to access the site, while 60 staff vehicles are using the main site driveway to access the parking on the south side of the site.

Under future conditions, a larger staff parking lot containing 60 parking spaces will be provided on the northerly side of the school with access via Cornell Street. This parking lot is anticipated to accommodate nearly all of the 64 existing staff vehicles that were observed parking along Cypress Street or within lots accessed via Cypress Street. The remaining 4 staff vehicles are anticipated to utilize the main driveway to access the larger staff parking lot with 134 parking spaces on the southerly side of the building. All other staff members are anticipated to park within the southerly lot.

To accommodate future enrollment increases, it was assumed that up to an additional 20 staff members may be hired for the proposed school. To provide a conservative (worst-case) analysis, it was assumed that all staff members would arrive and depart during the weekday AM and Weekday Dismissal peak hours. The changes in bus and staff vehicle trips anticipated as a result of the project are demonstrated in Figures 5 and 6 for the weekday AM and Dismissal periods, respectively.

Parent drop-off and pick-up vehicles are anticipated to follow a similar traffic pattern to how they arrive at the site today. Under existing conditions, parents enter via the Rundlett School Driveway on South Street, and exit via the Shared Rundlett & Abbott Downing School Driveway on Conant Drive. To avoid long waits in the parent pick-up queue, many parents were observed entering the site via the Abbott Downing School driveway on South Street and parking along the Abbott Downing School Driveway to wait for their students. Several parents were also observed parking in the grass area to the east of the driveway egress onto Conant Drive. Under future conditions, all parent traffic is expected to enter via the Rundlett School Driveway, travel through the parent loop, and exit via the Service / Parent Driveway onto Conant Drive. The resulting changes in parent traffic are demonstrated in Figures 5 and 6 for the Weekday AM and Dismissal peak periods, respectively.

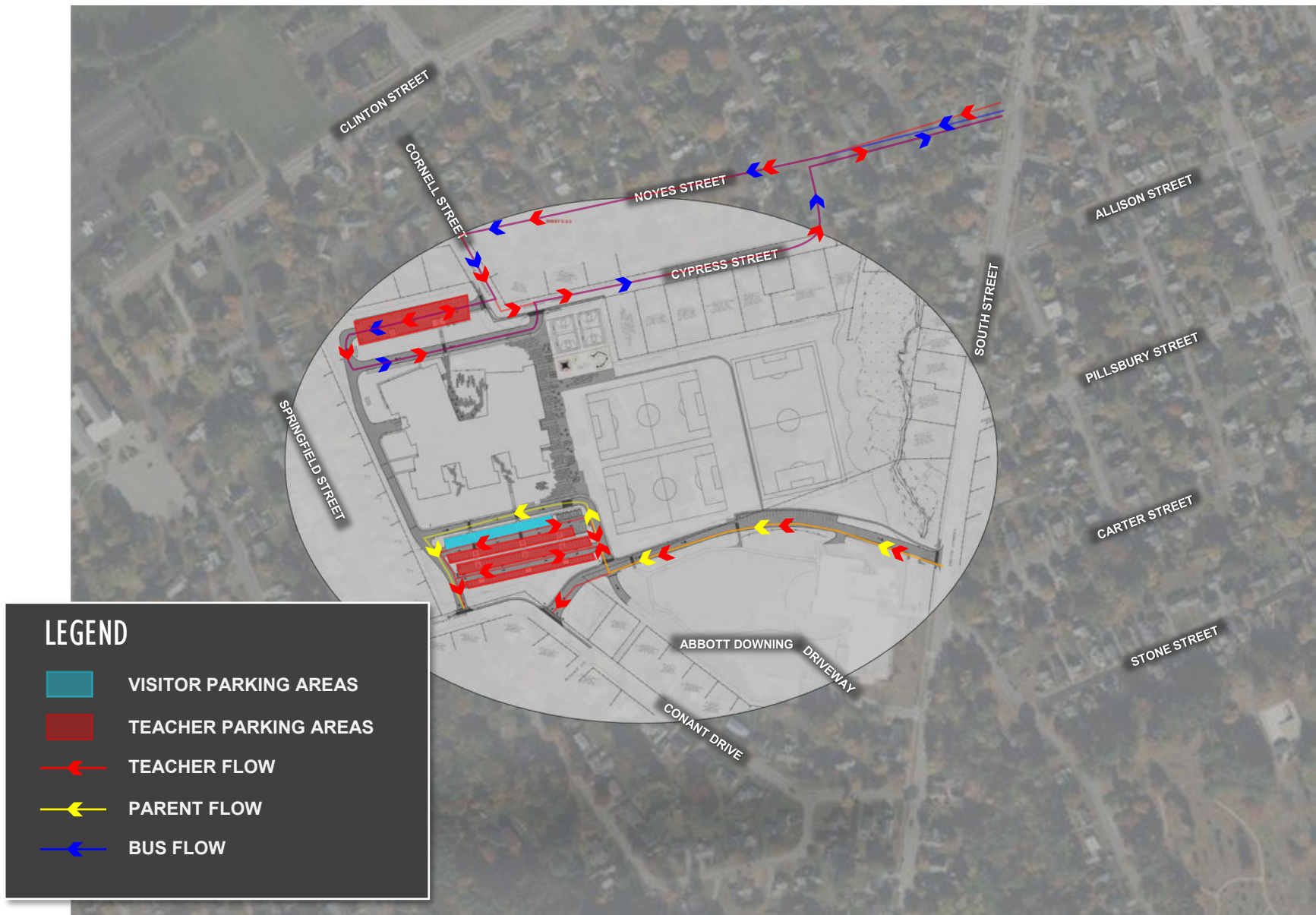


FIGURE 4

PROPOSED TRAFFIC FLOW



FIGURE 5

2023 WEEKDAY AM RE-DISTRIBUTED
PEAK HOUR TRAFFIC VOLUMES



FIGURE 6

2023 WEEKDAY DISMISSAL RE-DISTRIBUTED
PEAK HOUR TRAFFIC VOLUMES



FIGURE 7

2023 WEEKDAY AM
PEAK HOUR TRAFFIC VOLUMES



FIGURE 8

2023 WEEKDAY DISMISSAL
PEAK HOUR TRAFFIC VOLUMES

Parking

Proposed Parking Supply

As part of the new school project, two parking lots will be constructed on the site. One lot will be located on the northern side of the building with access via Cornell Street and will provide 60 parking spaces dedicated to staff parking. A second parking lot will be located on the southerly side of the building with access via Conant Drive and South Street, and will provide a total of 134 parking spaces, with some dedicated to staff and some dedicated to visitors. All staff will be assigned a specific parking lot to reduce excessive recirculation of vehicles looking for parking spaces. Visitor parking is expected to occur within the parking row closest to the building along the south side of the building. Six handicap accessible parking spaces and four electric vehicle (EV) charging stations will be located in the southerly lot, while two handicap accessible spaces and two EV spaces will be located in the southerly lot. In total, the site will provide 194 total parking spaces with 8 dedicated for handicap parking and 6 dedicated to EV charging.

Zoning Requirements

Ordinance 28-7-2(e) of the City of Concord Zoning Bylaws provides off-street parking supply requirements for various land uses. Based on the ordinance, for elementary and junior high school land uses, two parking spaces are required per classroom plus any required parking for a public assembly use. The public assembly parking is discussed below in the Event Parking Demand section. The school will provide a total of 48 classrooms, which will require a parking supply of 96 parking spaces to satisfy zoning bylaws. Therefore, the proposed parking supply of 193 parking spaces will be adequate to satisfy zoning requirements based on the number of classrooms.

The City's zoning requirements for parking supply for a public assembly use are outlined in ordinance 28-7-2(d), which states that *"The minimum parking standard for all such uses shall be one space for every three (3) fixed seats"*. GPI explored four different event scenarios based on the floor plan of the school. These scenarios are described below:

- Full Auditorium Event – The only area of the school with "fixed" seats is the auditorium, which can accommodate up to 450 seats. For an event that utilizes the auditorium, 150 parking spaces would be required. These events are not likely to occur while school is in session unless attended by many of the students of the school. Therefore, the available 194 parking spaces on the school site are anticipated to be able to accommodate the parking demand generated by a full auditorium event fully on-site without spillover onto the adjacent neighborhood streets.
- Sporting Event in the Gymnasium – The proposed gymnasium will provide a maximum of 708 seats, while also providing a full basketball court. This results in a parking requirement of 236 parking spaces to accommodate a full-court sporting event. Although the proposed middle school will only provide 194 parking spaces, the Abbott Downing Elementary School, which shares a driveway with the middle school, provides 102 *additional* parking spaces. With overflow of up to 40 vehicles into the Abbott Downing School parking lots, the parking requirements can be met without on-street parking being required. Thirty of these vehicles can be accommodated on the Rundlett School site within the parking along the site driveway.
- Full Seats in Gymnasium – The maximum number of seats that can be utilized in the gymnasium is 900 with the bleachers extended all the way. This layout does not allow for a full court, so this will most likely be utilized for school assemblies as opposed to spectator events. Regardless, given a seating capacity of 900, the required number of spaces would be 300. With the proposed parking at the middle school (194 spaces) and the additional parking provided at the elementary school (102 spaces) a total of 296 spaces are available. This would result in an overflow of 4 vehicles onto the surrounding roadways or parked along edges of the internal site driveways. It should be noted that

the probability of this scenario occurring is low, and this layout would most likely be used for an assembly/school event with mainly students and staff attending.

- Graduation in Gymnasium – For a graduation, it is proposed that 1,200 seats will fit into the gymnasium, consisting of 900 bleacher seats and 300 seats placed on the floor. For this special event, 400 parking spaces would be required. Given the maximum on-site parking of 296 in marked spaces on the Rundlett Middle School and Abbot Downing School sites, an overflow of 105 vehicles is expected during graduation. These vehicles can be accommodated along the edges of the internal site driveways and within on-street parking along South Street, Cypress Street, and other area roadways. Since graduation is a special event that only occurs once a year, special parking accommodations can be made to ensure all 105 overflow vehicles can be accommodated without impeding traffic flow on surrounding roadways. This may include establishing an off-site parking location with shuttle service to the site.

ITE Parking Rates

GPI also utilized parking demand generation rates contained in the Institute of Transportation Engineers (ITE) publication *Parking Generation, 6th Edition*² to estimate the peak parking demand to be generated by the proposed middle school. ITE does not provide parking demand rates specific to a middle school; therefore, GPI utilized rates from the most similar Land Use Code (LUC): LUC 522 (Middle School/Junior High School) for 900 students. Based on ITE data for LUC 522, the proposed middle school is anticipated to generate a weekday peak parking demand of 0.19 spaces per student. Based on the full enrollment of 900 students, the peak parking demand is 171 parking spaces. Therefore, the proposed parking supply of 193 parking spaces will be adequate to accommodate the peak parking demand generated by the proposed middle school redevelopment. The parking calculations are provided in the Appendix.

Projected Queue Analysis

Utilizing the existing volumes as further described below combined with basic queuing theory models, a queue analysis was performed to estimate the potential queues in the loading/unloading areas during morning arrival and afternoon dismissal. The detailed queue calculations are provided in the Appendix and the results of this analysis are described below.

- Parent Drop-off Queues – Based on the turning movement counts at the existing school driveways, the number of parents dropping students off for school was calculated for a school start time of 8:30 AM. Given that the northern driveway on South Street is for both students and staff, the driveway on Conant Drive was used to determine the number of parents leaving the school after dropping their child off. Starting 30-minutes before the start of school and extending 15-minutes after the start of school, 151 vehicles exited the driveway on Conant Drive. As the enrollment is not anticipated to change as part of the redevelopment, a similar number of parent vehicles are expected to drop-off their students in the morning under proposed conditions.

Based on arrival patterns at the existing Rundlett Middle School, all parent drop-off vehicles were assumed to arrive within a 30-minute window prior to the start of school. Although some parents entered/exited the school after school had already started, they were assumed to be included in the 30-minute arrival time, with the assumption that on a typical day no student will be dropped off late. This assumption provides a worse-case scenario. Each vehicle requires less than 20 seconds to unload once stopped in the unloading area, and the unloading area can accommodate up to eight vehicles unloading at one time. Based on basic queuing theory models using an arrival rate of 5.03 vehicles/minute (151 vehicles / 30 minutes = 5.03 vehicles/minute), a service time of three vehicles

² *Parking Generation Manual, 6th Edition*; Institute of Transportation Engineers; October 2023.

per minute, and eight servers, the average queue is expected to be two vehicles, while the 95th percentile queue is anticipated to be four vehicles. Therefore, the morning drop-off queue can be accommodated entirely within the parent loop without impacting operations along the site driveway.

- Parent Pick-up Queues – The existing Rundlett Middle School experienced approximately 74 parent pick-up vehicles during afternoon dismissal. Based on field observations, parents enter through the northern driveway on South Street and queue in two lines along the site driveway. Once the driveway queue becomes full, parents begin entering the southerly Abbott Downing School driveway and parking along the Abbott Downing School egress to wait for students to be released. Given this existing pattern, vehicles entering the northern driveway from 3:00 PM – 3:45 PM were assumed to be parents, and vehicles entering the southern driveway from 3:15-3:45 PM were also assumed to be middle school parents. Based on field observations, most parents had already arrived at the school by 3:40 PM for pick-up. As the enrollment is not anticipated to change as part of the redevelopment, a similar number of parent vehicles are expected to pick-up their students in the afternoon under proposed conditions.

Based on arrival patterns at the existing Rundlett Middle School, parents generally begin arriving and lining up for pick-up approximately 30 minutes prior to school being dismissed, with approximately 49 vehicles arriving before school is released. With single-stacking of vehicles, the parent pick-up loop provides approximately 572 feet of queuing space before overflowing onto the internal roadway connecting the middle and elementary schools. This provides stacking for approximately 23 vehicles. The additional 16 vehicles will queue back on the shared internal roadway. All vehicles can be accommodated without queueing back to South Street.

Assuming that parents begin arriving 30 minutes before the release of school and continue arriving over a 10-minute period following the end of the school day, a queue of 49 vehicles single-stacked is anticipated to occur just before school is released. Once school is released, the queue will begin dissipating at a rate of approximately ten (10) vehicles per minute, requiring approximately five minutes to fully clear the queue following the start of the dismissal. All vehicles can be accommodated on the site within a single lane without spilling onto South Street.

VEHICLE TURNING PATH ANALYSIS

Currently, buses utilize the main Rundlett School Driveway on South Street to enter the property and then enter the bus loop at the front of the school before exiting onto Conant Drive via the shared egress driveway. As part of the new school configuration, a dedicated bus loop will be provided on the northerly side of the school, which will be separated from the parent drop-off/pick-up loop on the southerly side of the school. Buses will be directed to enter Noyes Street at the intersection with South Street, then utilize Cornell Street to travel through the northerly staff parking lot to the dedicated bus loop. Upon unloading/loading, buses will then exit the property via the dedicate bus driveway onto Cypress Street, then turn right onto Noyes Street to access South Street. Noyes Street, Cornell Street, and Cypress Street are all fairly narrow, residential roadways that currently do not accommodate a large volume of bus traffic. To ensure that buses will be able to safely and efficiently navigate turning movements through the Noyes Street, Cornell Street, and Cypress Street intersections, GPI conducted vehicle turning path analyses for the following proposed bus movements utilizing a standards S-BUS-40 vehicle, which is a large 84-passenger school bus:

- South Street / Noyes Street
 - Right-turn from South Street SB to Noyes Street
 - Left-turn from South Street NB to Noyes Street
 - Left-turn from Noyes Street to South Street
 - Right-turn from Noyes Street to South Street
- Noyes Street / Cypress Street
 - Right-turn from Cypress Street to Noyes Street

- Noyes Street / Cornell Street
 - Left-turn from Noyes Street to Cornell Street
- Cornell Street / Site Driveway
 - Right-turn from Cornell Street to Site Driveway
- Cypress Street / Site Driveway
 - Right-turn from Site Driveway to Cypress Street
- Cypress Street 90-Degree Turn
 - Left-turn from Cypress Street EB to Cypress Street NB

In addition to bus movements, delivery vehicles and emergency vehicles will also need to be able to access the site. Therefore, GPI also performed vehicle turning path analysis for an SU-40 truck and the City of Concord's largest ladder truck (Arrow XT 100-ft Tower) for the following movements:

- South Street / Rundlett School Driveway
 - Right-turn from South Street SB to Driveway
 - Left-turn from South Street NB to Driveway
- Conant Drive / Shared Rundlett & Abbott Downing School Driveway
 - Right-turn from Driveway to Conant Drive
 - Left-turn from Driveway to Conant Drive
- Conant Drive / Proposed Rundlett Service Driveway
 - Left-turn from Conant Drive to Service Driveway
 - Right-turn from Conant Drive to Service Driveway
 - Right-turn from Service Driveway to Conant Drive
 - Left-turn from Service Driveway to Conant Drive

The detailed vehicle turning path diagrams are included in Appendix A. The following summarizes the results of the bus turning path diagrams.

South Street / Noyes Street

A large 84-passenger school bus will be able to safely navigate all turns through the South Street / Noyes Street intersection within its own lane with the exception of turning right from Noyes Street onto South Street. A bus making this movement would be required to encroach upon the opposing travel lane on Noyes Street and South Street in order to make this movement within the existing paved surface. As South Street is a major collector roadway with a high traffic volume during school arrival and dismissal periods, it is preferable for safety that buses not encroach on the opposing travel lane on South Street. To avoid such encroachment, a modification to the curb radius on the southwest corner of the intersection is required to allow the bus to navigate the right-turn within its own lane. Therefore, GPI recommends widening of the roadway on this corner to increase the curb radius. This will require reconstruction of the curb ramp on the southwest corner, which is currently not compliant with ADA-guidelines.

Noyes Street / Cypress Street

To avoid driving off the roadway or encroaching into the opposing travel lane, a bus turning right from Cypress Street onto Noyes Street will need to start its turn on the far left (west) side of the Cypress Street NB approach. Cypress Street is currently a one-way roadway, but is approximately 35 feet wide as it meets Noyes Street. On-street parking is allowed along the south and east side of Cypress Street. To reinforce the one-way traffic flow, force buses and other vehicles further to the left, and protect the parking along the east side of the roadway, GPI recommends that a hatched area be striped along the easterly side of Cypress Street approaching the intersection with Noyes Street.

Noyes Street / Cornell Street

An 84-passenger bus will be able to navigate the left-turn from Noyes Street to Cornell Street within its own lane on Noyes Street and utilizing the majority of the roadway width on Cornell Street. As such, it will be important to reinforce the one-way travel pattern on Cornell Street, as adequate maneuvering space will not be provided for two-way traffic flow.

Cornell Street / Proposed Site Driveway

An 84-passenger bus will be able to navigate the right-turn from Cornell Street into the site driveway within its own lane on site driveway and utilizing the majority of the roadway width on Cornell Street. As such, it will be important to reinforce the one-way travel pattern on Cornell Street, as adequate maneuvering space will not be provided for two-way traffic flow.

Cypress Street / Proposed Site Driveway

An 84-passenger bus will be able to navigate the right-turn from the site driveway onto Cypress Street utilizing the majority of the width of the driveway and slightly more than half the width of Cypress Street. Cypress Street is already a one-way roadway, so use of the entire roadway width is allowed. However, there are currently staff vehicles parking along the south side of Cypress Street that create a sight line issue for vehicles exiting the driveway, and may impede bus movements exiting the driveway. Therefore, parking along the southerly side of Cypress Street within 50 feet of the bus egress driveway should be prohibited.

RECOMMENDATIONS

Based on the results of the safety, geometry, and traffic control review of the study area intersections and roadways, GPI recommends the following improvements be implemented to accommodate the change in traffic flow associated with the Rundlett Middle School redevelopment and to enhance the safety of the area surrounding the school. These improvements are depicted in the Conceptual Improvement Plans included in Appendix B of this report.

South Street / Noyes Street

- Widen the curb radius on the southwest corner of the intersection to accommodate buses turning right from Noyes Street to South Street.
- Reconstruct the curb ramp on the southwest corner to meet ADA guidelines.
- Install a new STOP sign and STOP line on the Noyes Street approach to the intersection.

Noyes Street / Cypress Street

- Stripe a hatched area along the easterly side of Cypress Street to effectively narrow the travel lane, prevent on-street parking near the intersection with Noyes Street, reinforce the one-way flow, and push vehicles further to the left for better turning paths at the intersection with Noyes Street.
- Replace the existing DO NOT ENTER, ONE-WAY, and STOP signs on the Cypress Street approach to Noyes Street.
- Install new STOP bars and STOP word markings on all approaches to the intersection for better visibility.
- Relocate the STOP line on Noyes Street WB further east to allow for efficient turning movements within the intersection without conflicts between a bus turning right exiting Cypress Street and a vehicle stopped at the STOP line on Noyes Street.
- Install a NO LEFT TURN on Noyes Street westbound and NO RIGHT TURN on Noyes Street eastbound approaching Cypress Street.

Noyes Street / Cornell Street

- Install ONE-WAY (R6-1) signs and an arrow pavement marking on Cornell Street at the intersection with Noyes Street to reinforce the one-way travel.
- Relocate the STOP line on Noyes Street WB closer to the intersection.

Cornell Street / Proposed Site Driveway

- Install DO NOT ENTER and ONE-WAY signs on Cornell Street north of the site driveway to indicate the one-way traffic flow.
- Install NO LEFT TURN sign on the site driveway approach to Cornell Street.

Cypress Street / Proposed Site Driveway

- Install DO NOT ENTER and ONE-WAY signs on Cypress Street west of the site driveway to indicate the one-way traffic flow.
- Install NO LEFT TURN sign on the site driveway approach to Cypress Street.
- Prohibit parking along Cypress Street within 50 feet of the bus egress driveway.

South Street / Conant Drive

- Install a STOP sign and STOP line on the Conant Drive approach.
- Install tactile warning strips on the curb ramps crossing Conant Drive.

South Street

- Remove the existing non-compliant school zone flasher assemblies and install new school zone flasher assemblies with radar speed feedback indication on South Street approaching the school from both directions.
- Restripe the SCHOOL pavement markings approaching the school from both directions.
- Install new school zone crossing signs with pedestrian push-button activated rectangular rapid flashing beacons (RRFBs) at the crosswalks on South Street north of the Rundlett School Driveway and south of Bow Street to alert drivers to pedestrians crossing the roadway.

Conant Drive

- Remove the existing non-compliant school zone signage on Conant Drive eastbound.
- Install new school zone flasher assemblies with radar speed feedback indications on Conant Drive approaching the school from both directions.
- Install END SCHOOL ZONE signs at the end of the school zone in both directions.
- Remove the existing crosswalk on Conant Drive east of Winant Street and install a new crosswalk on Conant Drive to the west of Conant Drive to provide a pedestrian connection between the school and the Winant Street and Rundlett Street neighborhoods.
- Obtain a sight line easement over the property at #23 Conant Drive to ensure adequate SSD and ISD for the Eastern (Shared) Rundlett & Abbott Downing School Driveway.

Springfield Street

Springfield Street is a local roadway connecting Clinton Street at the north to Conant Drive at the south. It is not striped but is generally 28 feet wide, providing adequate width for a single travel lane in each direction. Springfield Street is signed for 25 MPH. All buses are directed to utilize Norwich Street to travel between the Rundlett Middle School and Clinton Street because there are sidewalks existing on Norwich Street. However, several parent vehicles were observed utilizing Springfield Street as a way of bypassing the buses and other school traffic. Residents of the Springfield Street neighborhood have also reported frequent speeding, even during the summer months, on the roadway. To calm traffic on Springfield Street and improve safety for pedestrians, GPI recommends the City consider restriping Springfield Street to give the illusion of a narrower travel space and provide a dedicated area for pedestrians to travel outside of the flow of vehicles. The roadway would be restriped with 10-ft travel lanes and double-yellow centerline with 4- to

7-ft wide shoulders provided along each side of the roadway. The narrow travel lanes would provide an indication to drivers of where they are to travel and prevent drivers from traveling fast on the roadway by utilizing the entire width of the roadway. The wide shoulders would provide a dedicated space for pedestrians to walk.

CONCLUSIONS

Existing and future conditions in the study area have been described and evaluated with respect to traffic operations and the impact of the proposed middle school redevelopment. Conclusions of this effort are presented below.

- The site currently contains the existing Rundlett Middle School with an approximate enrollment of 825 students. Access to the middle school is currently provided via an entrance-only driveway on South Street just north of the Abbott-Downing School. Egress is provided via an exit-only driveway on Conant Drive that is shared with the Abbott-Downing School egress. In addition, there is an additional parking lot north of Rundlett Field with two driveways on Cypress Street. Although not specifically signed, the driveways are intended to operate as entrance-only at the westerly driveway and exit-only at the easterly driveway to serve the angled parking within the lot.
- As part of the project, the existing middle school will be razed and a new middle school will be constructed on the westerly end of the site to allow the new school to be constructed while the existing school remains open. Once the new school is constructed, the existing school will be razed. In addition, as part of the project, the existing driveway connecting South Street to Conant Drive will be reconstructed to serve as the main access point for parent drop-off and pick-up traffic, as well as a portion of the staff entering the parking field on the southerly side of the school. A parent drop-off/pick-up loop will be created meeting the main driveway opposite the egress for Abbott-Downing School, circulating around the visitor and staff parking lot, and exiting onto Conant Drive. A separate drop-off/pick-up loop for buses will be created on the northerly side of the school where buses will enter from Cornell Street, circulate through a supplemental staff parking lot, and pass through the bus drop-off/pick-up area before egressing onto Cypress Street. A service driveway will be provided along the westerly side of the property connecting the parking lot at the northerly end of the school to the main exit onto Conant Drive. This drive aisle will be gated and restricted to service and emergency vehicles only. The new school will be designed to accommodate an enrollment of up to 900 students.
- As the new school will be located on the site of the existing school and the existing school previously accommodated an enrollment of over 900 students, the project is not anticipated to result in a significant impact to traffic volumes on the surrounding roadways.
- Based on collision data from Concord Police Department for the latest three years available (2022 through 2024), all of the roadway segments along the site frontage experienced an average of fewer than four collisions per year, indicating no significant safety issue exists.
- The available sight lines at all proposed site driveways will exceed AASHTO recommendations for minimum SSD and ISD with the exception of the SSD to the west of the Eastern (Shared) Rundlett and Abbott Downing School Driveway. The sight lines in this area are restricted by the sharp horizontal curvature of the roadway. To improve sight lines for vehicles approaching the eastern site driveway on Conant Drive, GPI recommends modifications to the currently proposed driveway design. Currently, the driveway is proposed to provide two 16-ft travel lanes for right-turns and left-turns exiting the driveway. By shifting the centerline of the Shared Site Driveway approximately 2-feet to the northwest, the available SSD can be extended to the required 155-ft minimum. To accomplish this, GPI recommends holding the currently proposed northwesterly curb line and restriping the driveway to provide a 2-ft shoulder on the northwest side, a 12-ft right-turn lane, and a 12-ft left-turn lane. The driveway may be reduced in width by shifting the curb line on the southeast side of the driveway further west by up to 4-ft to provide a 2- to 6-ft shoulder on the southeast side. This would increase the SSD to the required 155 feet to meet AASHTO minimum requirements for safe operation.

- In order to maintain the sight distances at the driveways after development of the site, it is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from the roadway so as not to inhibit the available sight lines.
- Ordinance 28-7-2(e) of the City of Concord Zoning Bylaws provides off-street parking supply requirements for various land uses. Based on the ordinance, for elementary and junior high school land uses, two parking spaces are required per classroom plus any required parking for a public assembly use. Based on a total of 48 classrooms, the proposed school would require 96 parking spaces for the classroom space. The City also requires one parking space per three (3) “fixed” seats of public assembly space. The auditorium provides seating for up to 450 people, which would require 150 parking spaces. Therefore, the total parking supply required to meet zoning guidelines is 246 parking spaces. While only 194 parking spaces are proposed on the Rundlett Middle School site for use by the middle school, an additional 30 parking spaces will be provided along the Rundlett School driveway for the Abbott Downing School that could be utilized to accommodate event parking. A total of 102 spaces are provided on the Abbott Downing School site to accommodate event overflow parking.
- Occasional sporting events or large assemblies may occur in the gymnasium outside of regular school hours. The gymnasium can accommodate up to 900 seats with the bleachers fully extended, which would require a parking supply of 300 spaces. These vehicles could be nearly entirely accommodated within the 296 parking spaces on the Rundlett School and Abbott Downing School properties with a maximum overflow of 4 vehicles onto surrounding area roadways or internal site driveways.
- During graduation, the gymnasium can accommodate up to 1,200 seats, resulting in a parking demand of 400 spaces. As previously noted, 296 vehicles can be accommodated within the two school sites, resulting in a potential overflow of 104 vehicles. During this once a year event, special parking accommodations may be required, such as providing off-site parking with shuttle service to the site.
- A dedicated parent drop-off/pick-up loop will be provided on the southerly side of the school. Based on current pick-up and drop-off volumes at the existing Rundlett Middle School, there are anticipated to be 151 parent drop-off vehicles in the morning and 74 parent pick-up vehicles in the afternoon utilizing this parent loop. The parent loop will contain an active loading/unloading area for up to 8 vehicles at one time. Based on basic queuing theory models, the maximum queue in the morning arrival is anticipated to extend up to 4 vehicles beyond the loading/unloading area. During the afternoon, 49 vehicles are anticipated to be queued on-site as school is released at 3:30 PM and the queue will begin dissipating at a rate of 10 vehicles per minute once school is released. The entire queue will dissipate within five minutes of school being released.

Based on the results contained within this *Traffic Study*, the proposed redevelopment can be safely and efficiently accommodated along the study area roadways with implementation of the following improvements. No additional project-specific mitigation is warranted based on the incremental impact of the project of the adjacent roadway network.

South Street / Noyes Street

- Widen the curb radius on the southwest corner of the intersection to accommodate buses turning right from Noyes Street to South Street.
- Reconstruct the curb ramp on the southwest corner to meet ADA guidelines.
- Install a new STOP sign and STOP line on the Noyes Street approach to the intersection.

Noyes Street / Cypress Street

- Stripe a hatched area along the easterly side of Cypress Street to effectively narrow the travel lane, prevent on-street parking near the intersection with Noyes Street, reinforce the one-way flow, and push vehicles further to the left for better turning paths at the intersection with Noyes Street.
- Replace the existing DO NOT ENTER, ONE-WAY, and STOP signs on the Cypress Street approach to Noyes Street.
- Install new STOP bars and STOP word markings on all approaches to the intersection for better visibility.
- Relocate the STOP line on Noyes Street WB further east to allow for efficient turning movements within the intersection without conflicts between a bus turning right exiting Cypress Street and a vehicle stopped at the STOP line on Noyes Street.
- Install a NO LEFT TURN on Noyes Street westbound and NO RIGHT TURN on Noyes Street eastbound approaching Cypress Street.

Noyes Street / Cornell Street

- Install ONE-WAY (R6-1) signs and an arrow pavement marking on Cornell Street at the intersection with Noyes Street to reinforce the one-way travel.
- Relocate the STOP line on Noyes Street WB closer to the intersection.

Cornell Street / Proposed Site Driveway

- Install DO NOT ENTER and ONE-WAY signs on Cornell Street north of the site driveway to indicate the one-way traffic flow.
- Install NO LEFT TURN sign on the site driveway approach to Cornell Street.

Cypress Street / Proposed Site Driveway

- Install DO NOT ENTER and ONE-WAY signs on Cypress Street west of the site driveway to indicate the one-way traffic flow.
- Install NO LEFT TURN sign on the site driveway approach to Cypress Street.
- Prohibit parking along Cypress Street within 50 feet of the bus egress driveway.

South Street / Conant Drive

- Install a STOP sign and STOP line on the Conant Drive approach.
- Install tactile warning strips on the curb ramps crossing Conant Drive.

South Street

- Remove the existing non-compliant school zone flasher assemblies and install new school zone flasher assemblies with radar speed feedback indication on South Street approaching the school from both directions.
- Restripe the SCHOOL pavement markings approaching the school from both directions.
- Install new school zone crossing signs with pedestrian push-button activated rectangular rapid flashing beacons (RRFBs) at the crosswalks on South Street north of the Rundlett School Driveway and south of Bow Street to alert drivers to pedestrians crossing the roadway.

Conant Drive

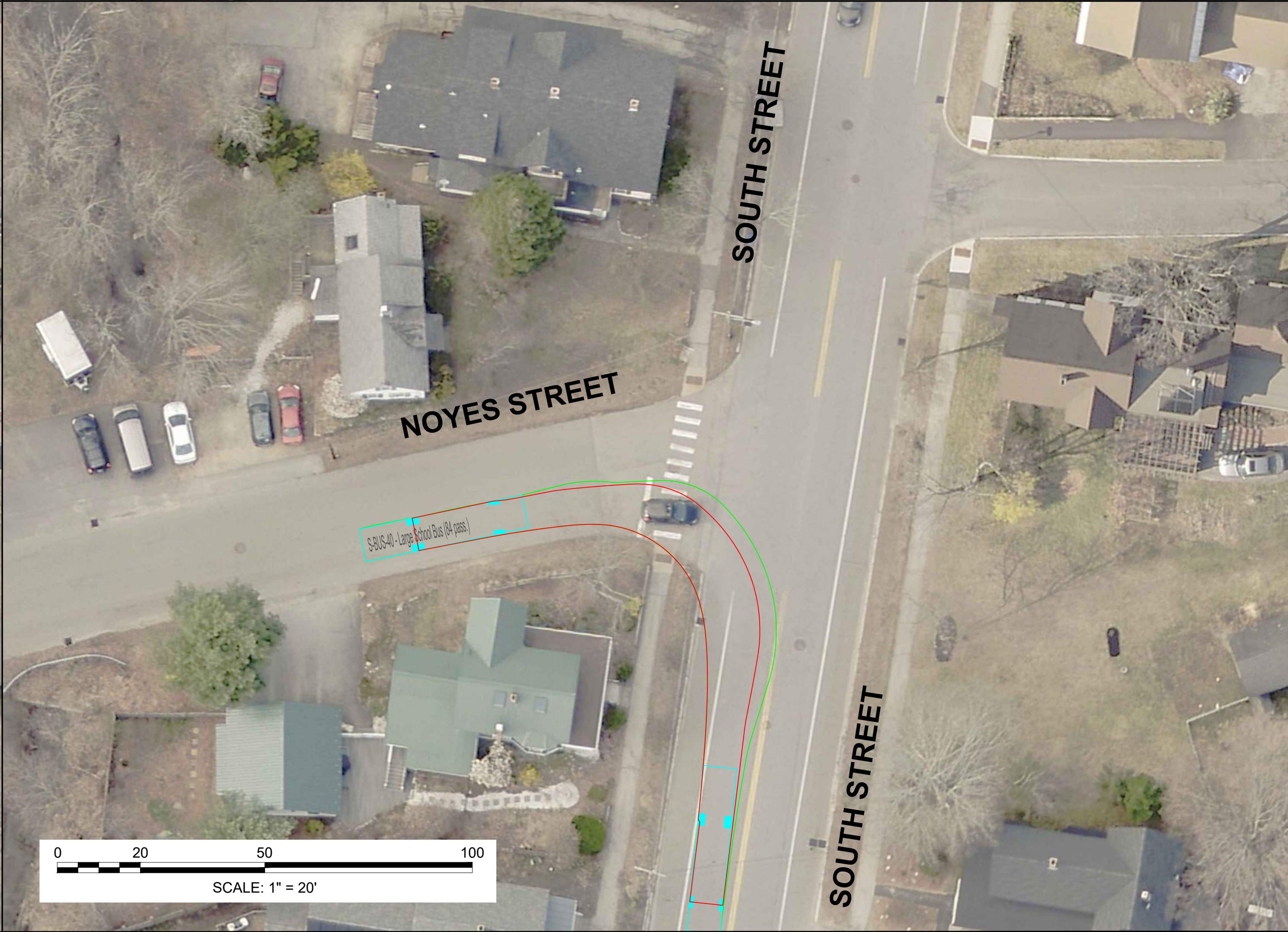
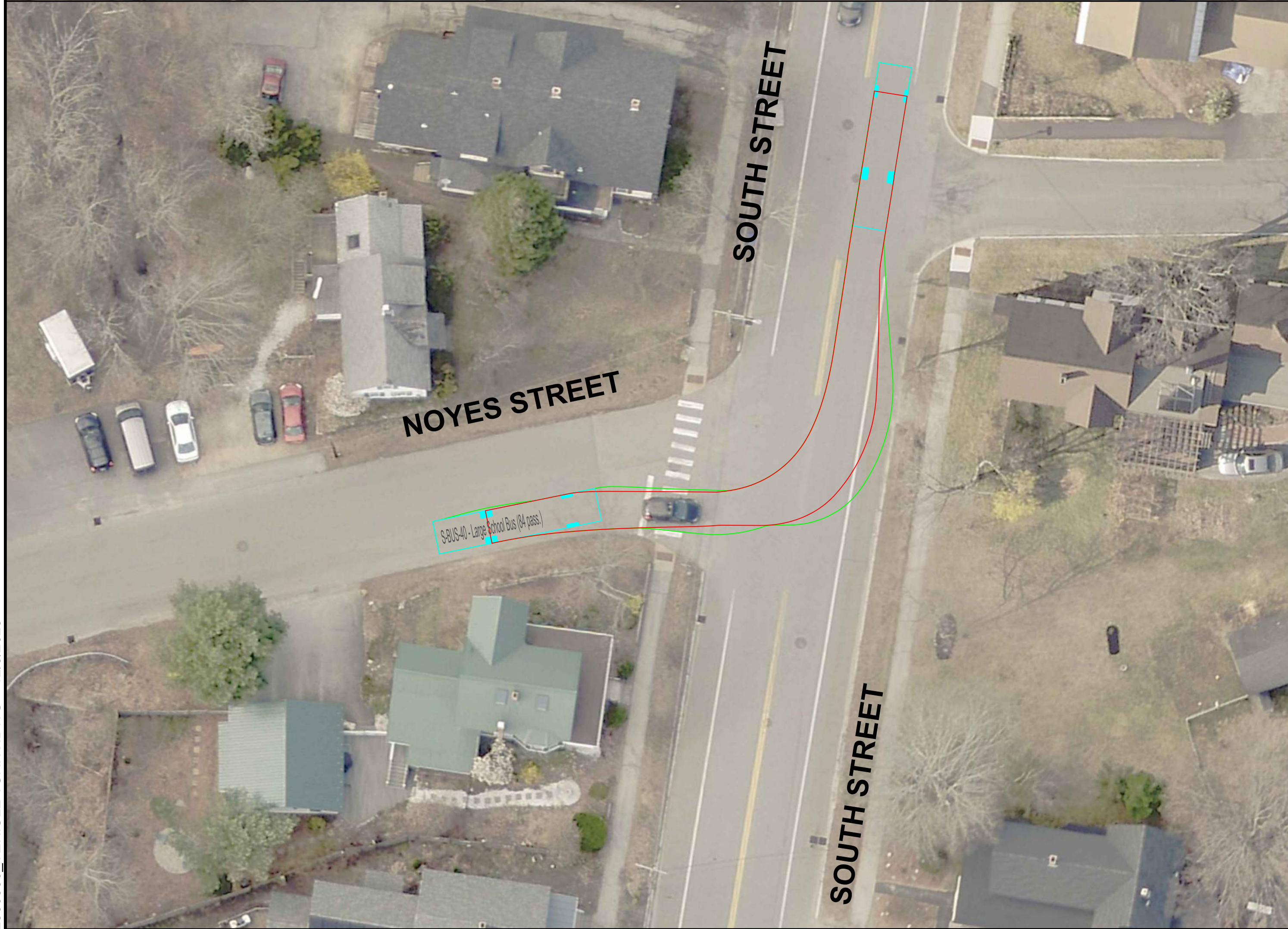
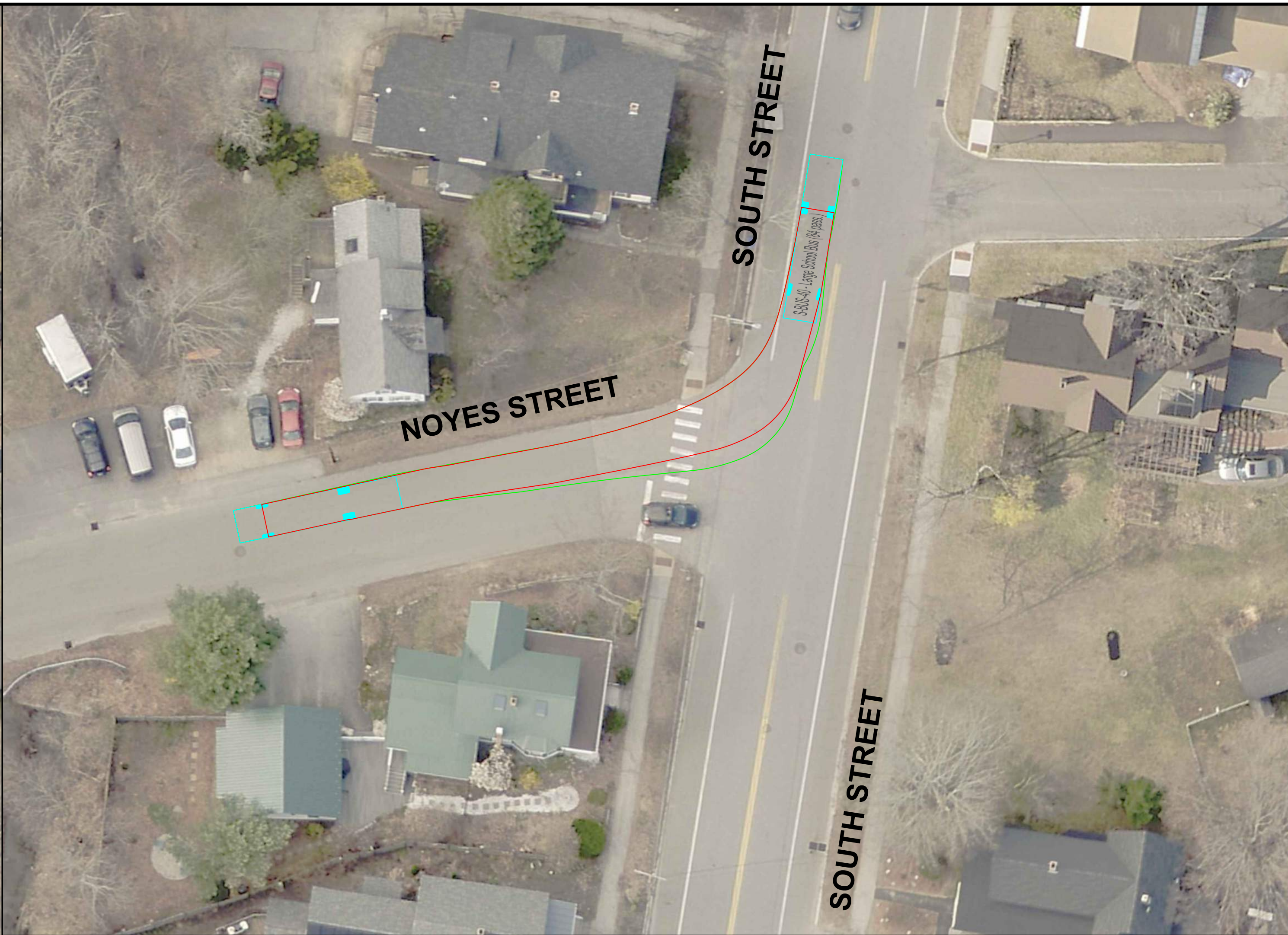
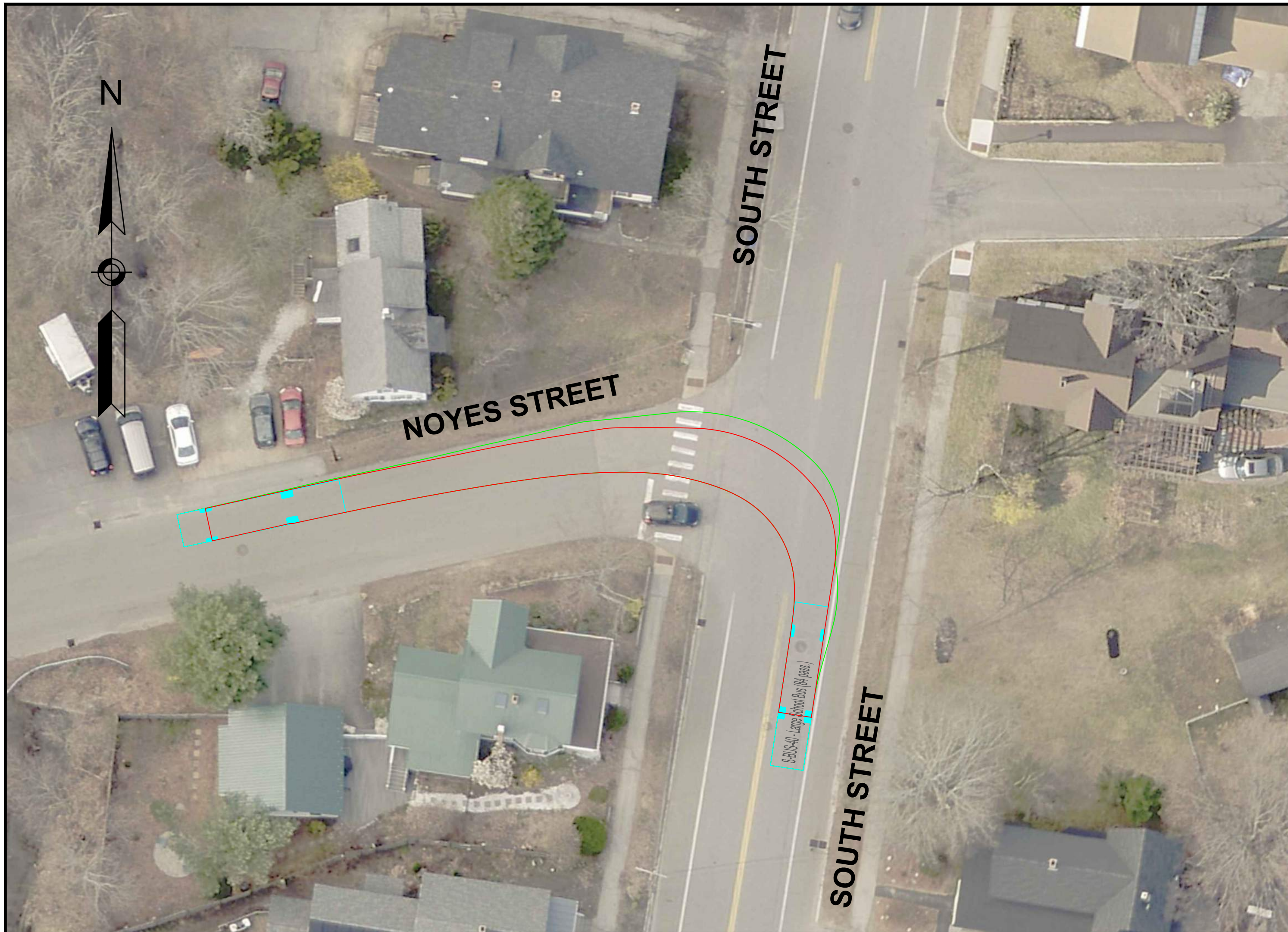
- Remove the existing non-compliant school zone signage on Conant Drive eastbound.
- Install new school zone flasher assemblies with radar speed feedback indications on Conant Drive approaching the school from both directions.
- Install END SCHOOL ZONE signs at the end of the school zone in both directions.
- Remove the existing crosswalk on Conant Drive east of Winant Street and install a new crosswalk on Conant Drive to the west of Conant Drive to provide a pedestrian connection between the school and the Winant Street and Rundlett Street neighborhoods.

- APPENDIX

- *Vehicle Turning Path Diagrams*
- *Conceptual Improvement Plans*
 - *Traffic Volume Data*
 - *Sight Distance Calculations*
- *Parking Demand Calculations*
- *Queue Estimate Calculations*

VEHICLE TURNING PATH DIAGRAMS

2500336 VEHICLE TURNS DWG 12/5/2025



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Greenman-Pedersen, Inc.
181 Ballardvale Street, Suite 202
Wilmington, MA 01887

PREPARED FOR
HMFH Architects, Inc.
130 Bishop Allen Drive
Cambridge, MA 02139

RUNDLETT MIDDLE SCHOOL
144 SOUTH STREET
CONCORD, NEW HAMPSHIRE

REVISIONS		
NO.	REVISION	DATE

DRAWN/DESIGN BY
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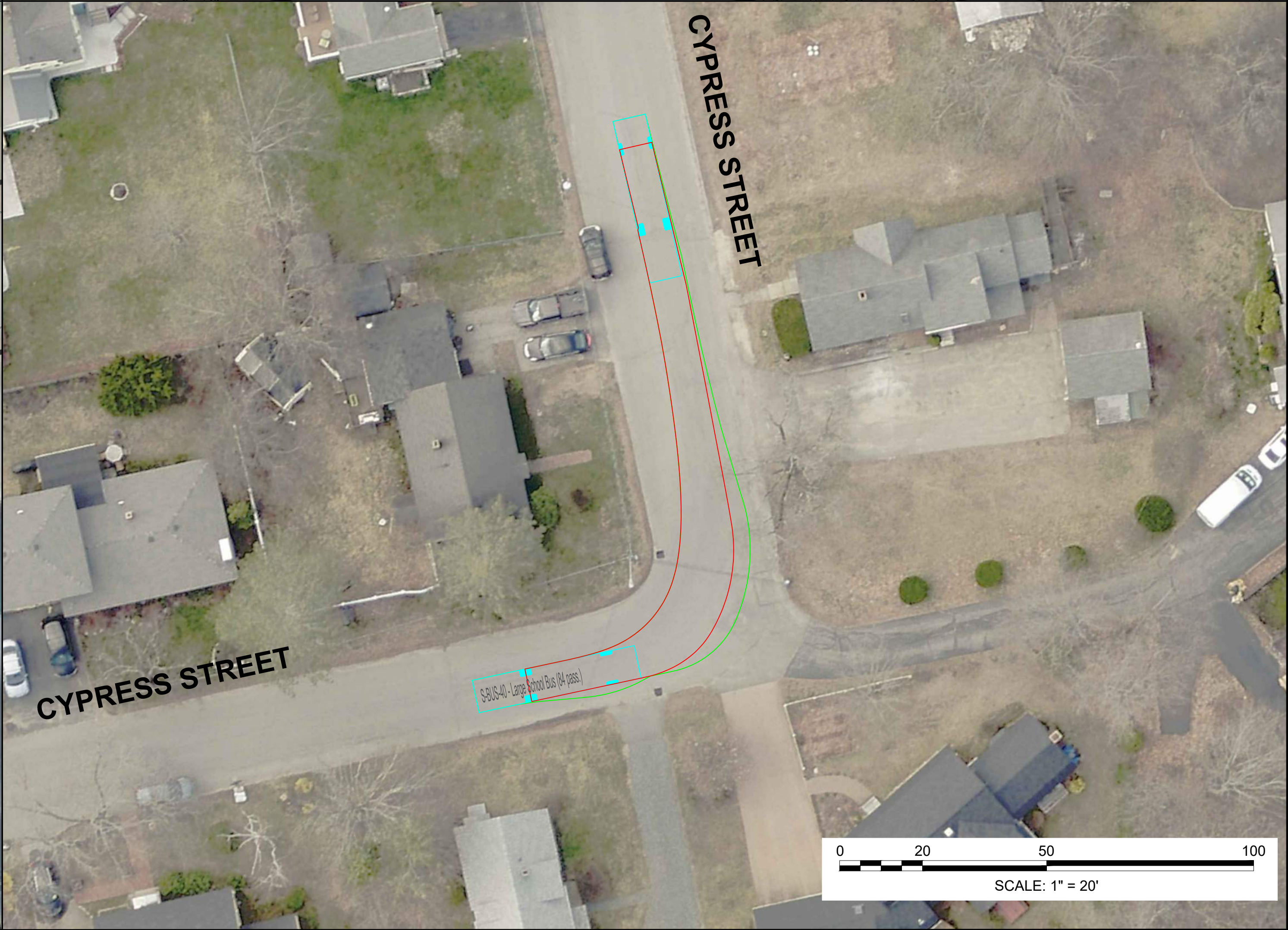
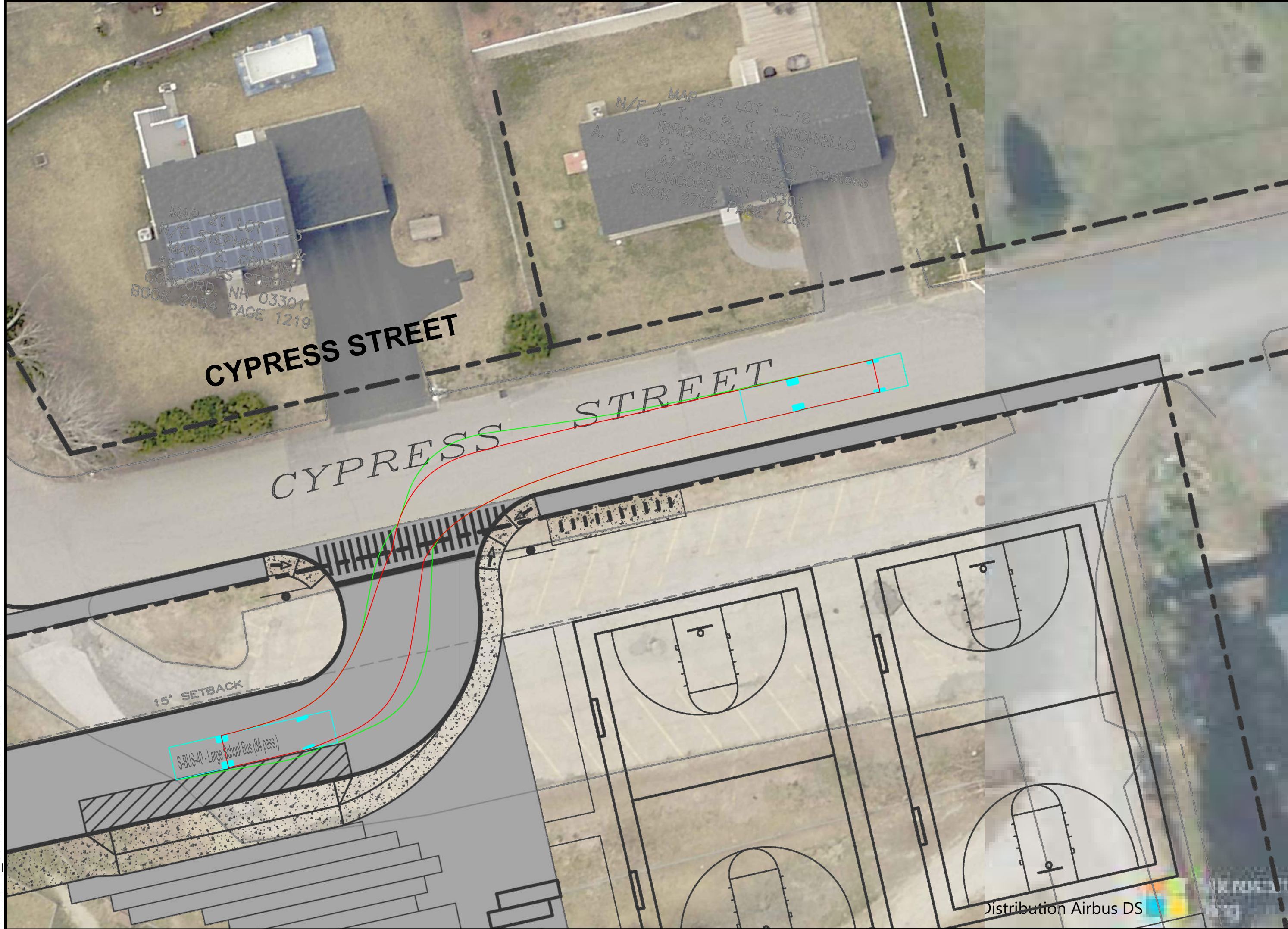
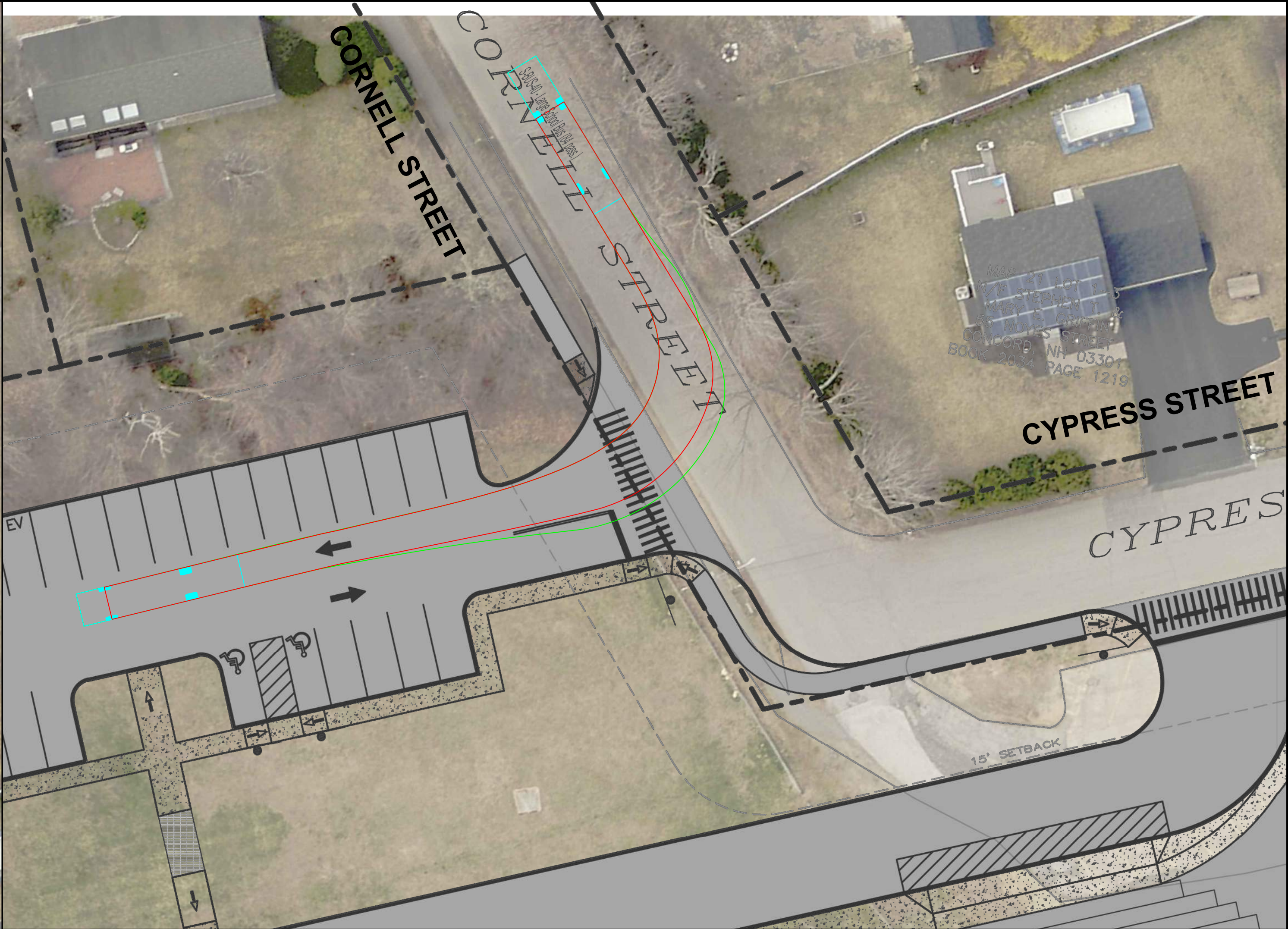
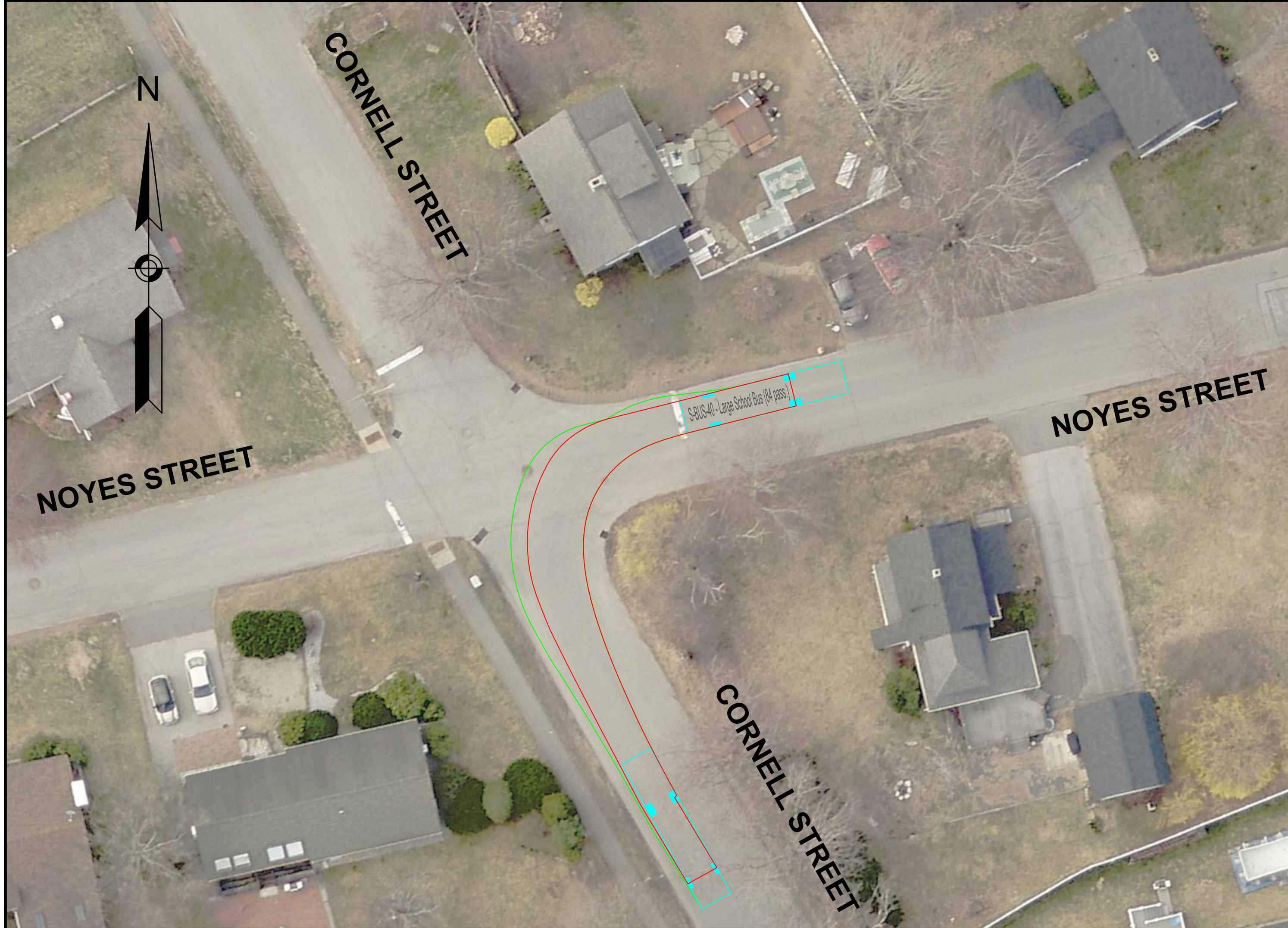
12/05/2025

SCHOOL BUS
TURNING PATH
PLAN

SCALE:
1"=20'

NEX-2500336.00

1 OF 7



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Cambridge, MA 02139

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144 SOUTH STREET
CONCORD, NEW HAMPSHIRE

NO.

REVISION

DATE

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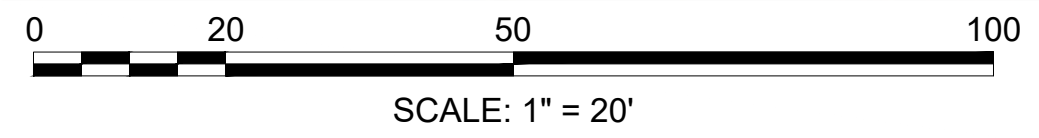
SCHOOL BUS
TURNING PATH
PLAN

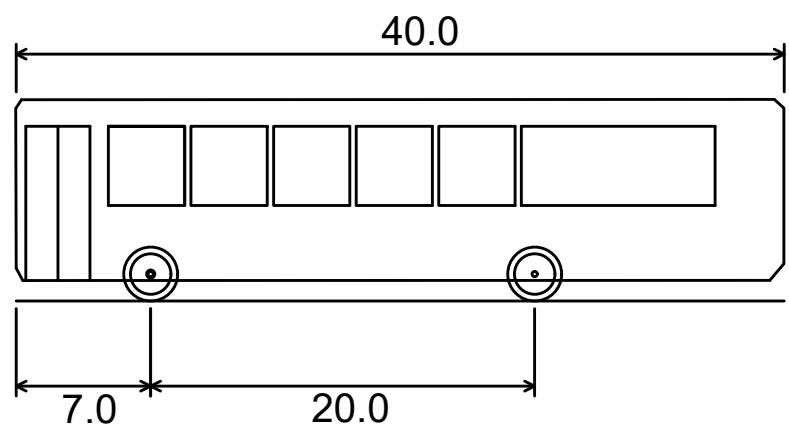
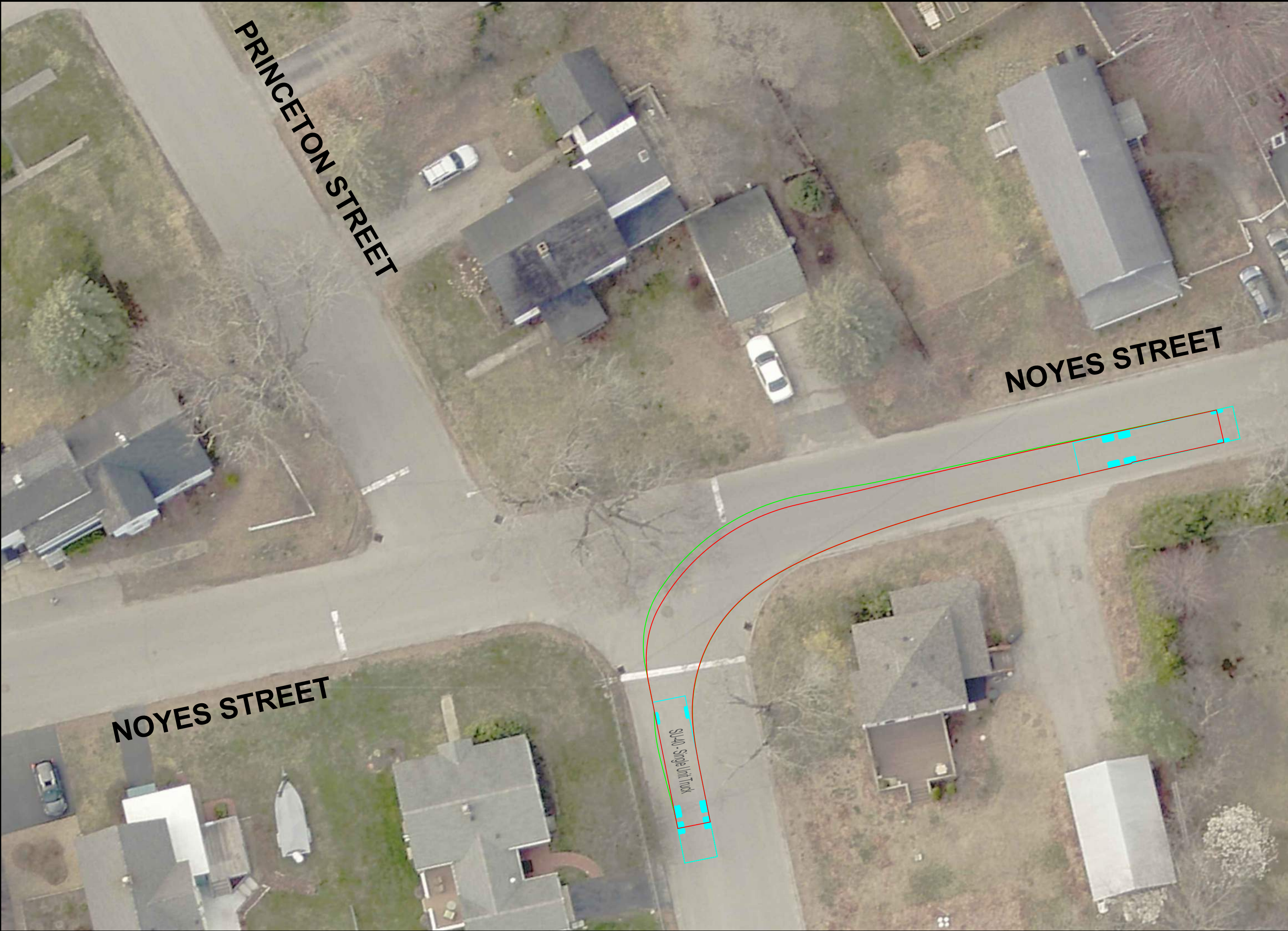
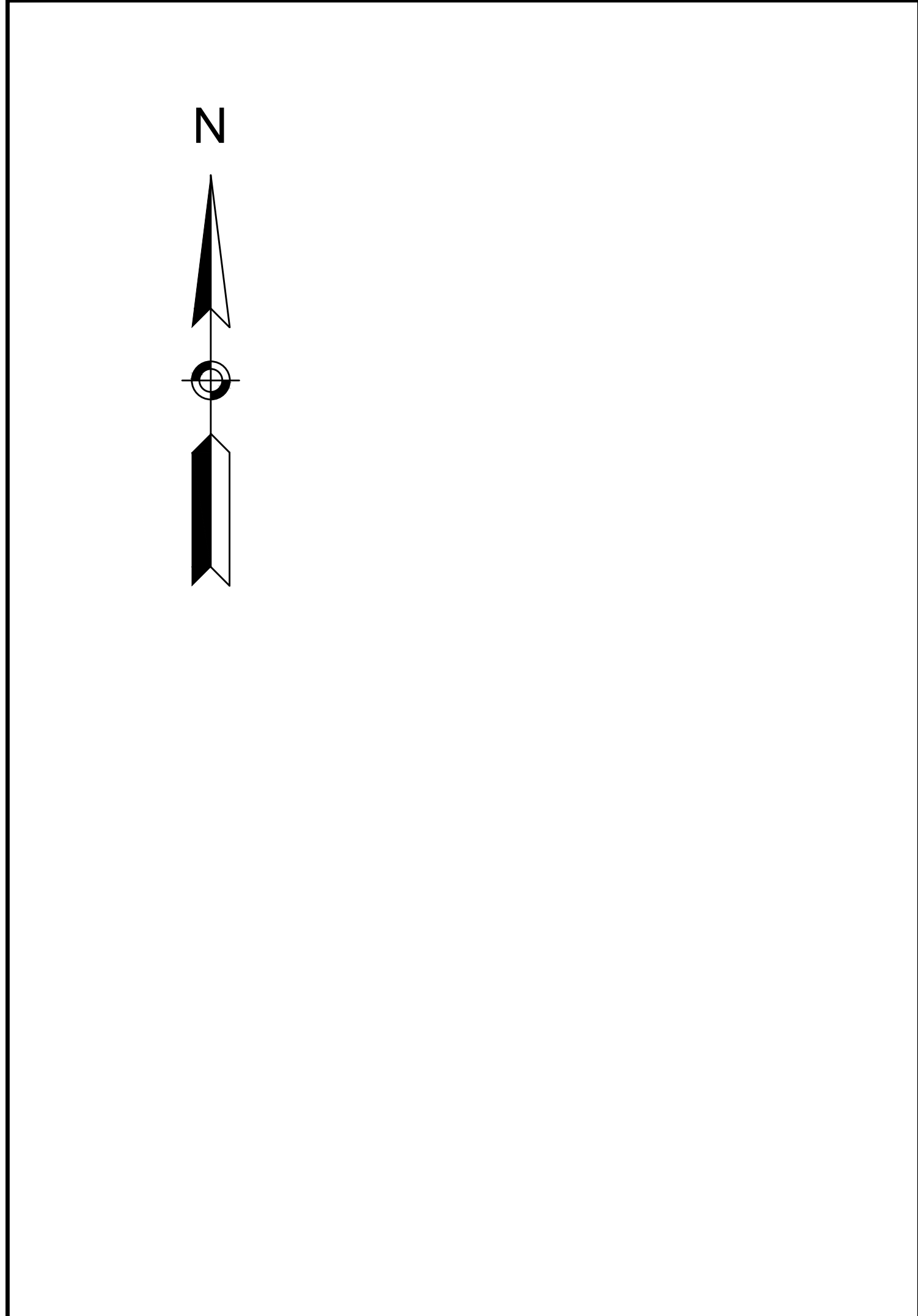
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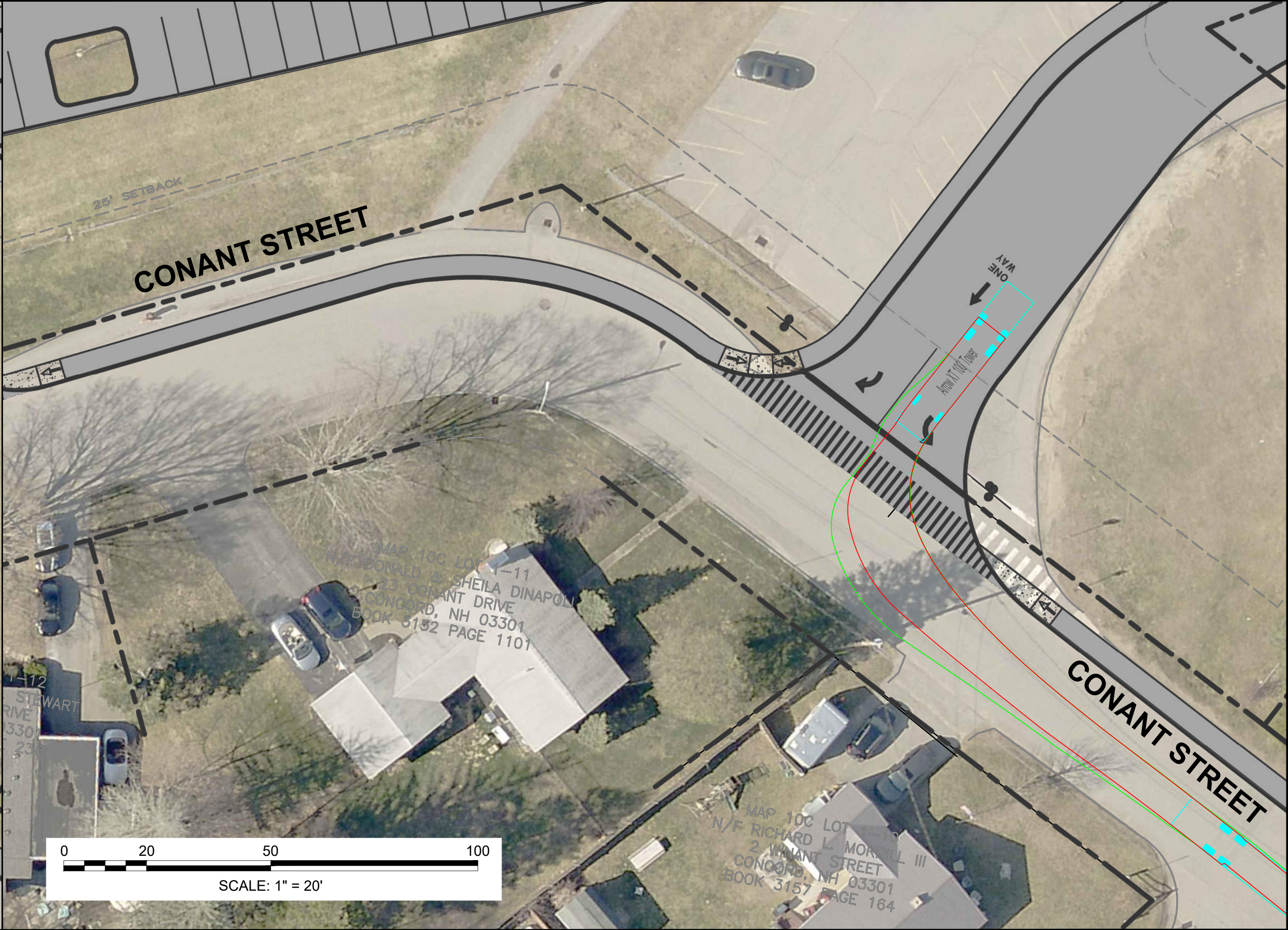
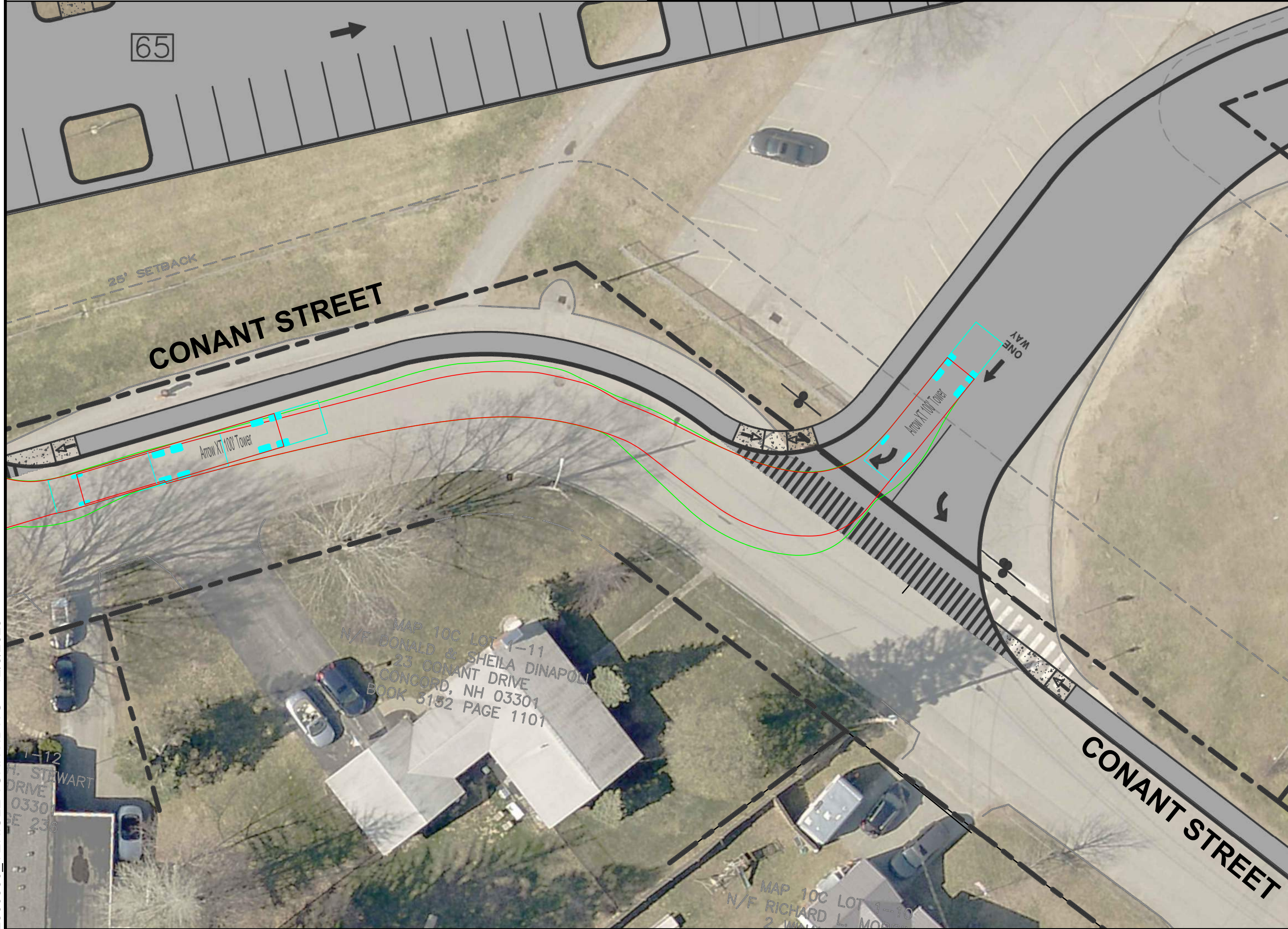
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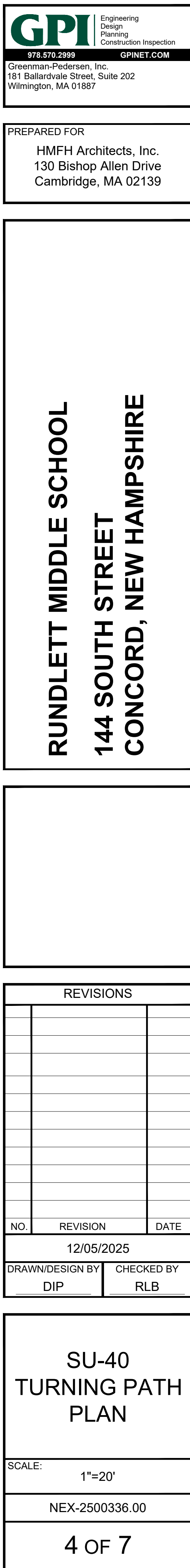
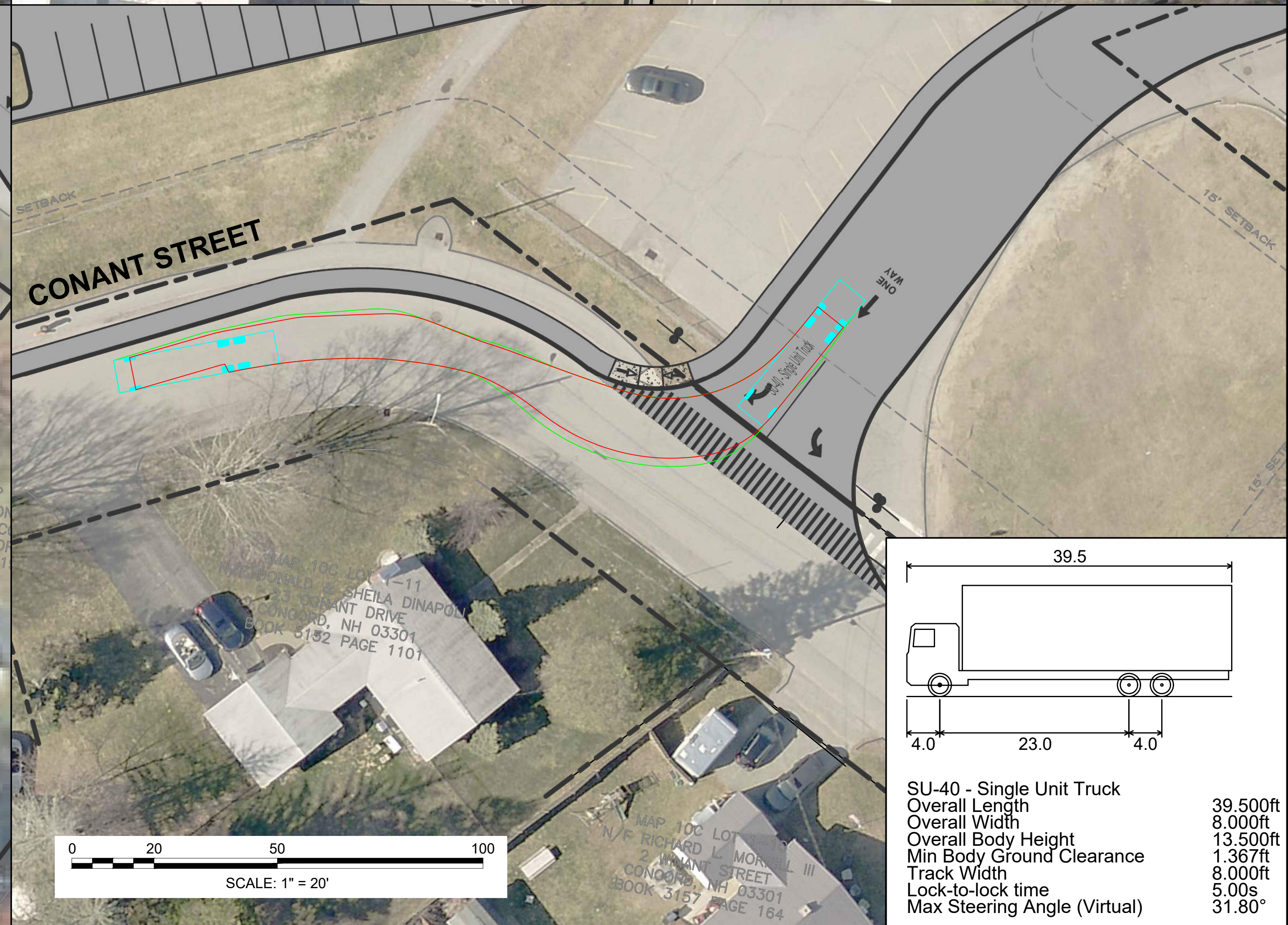
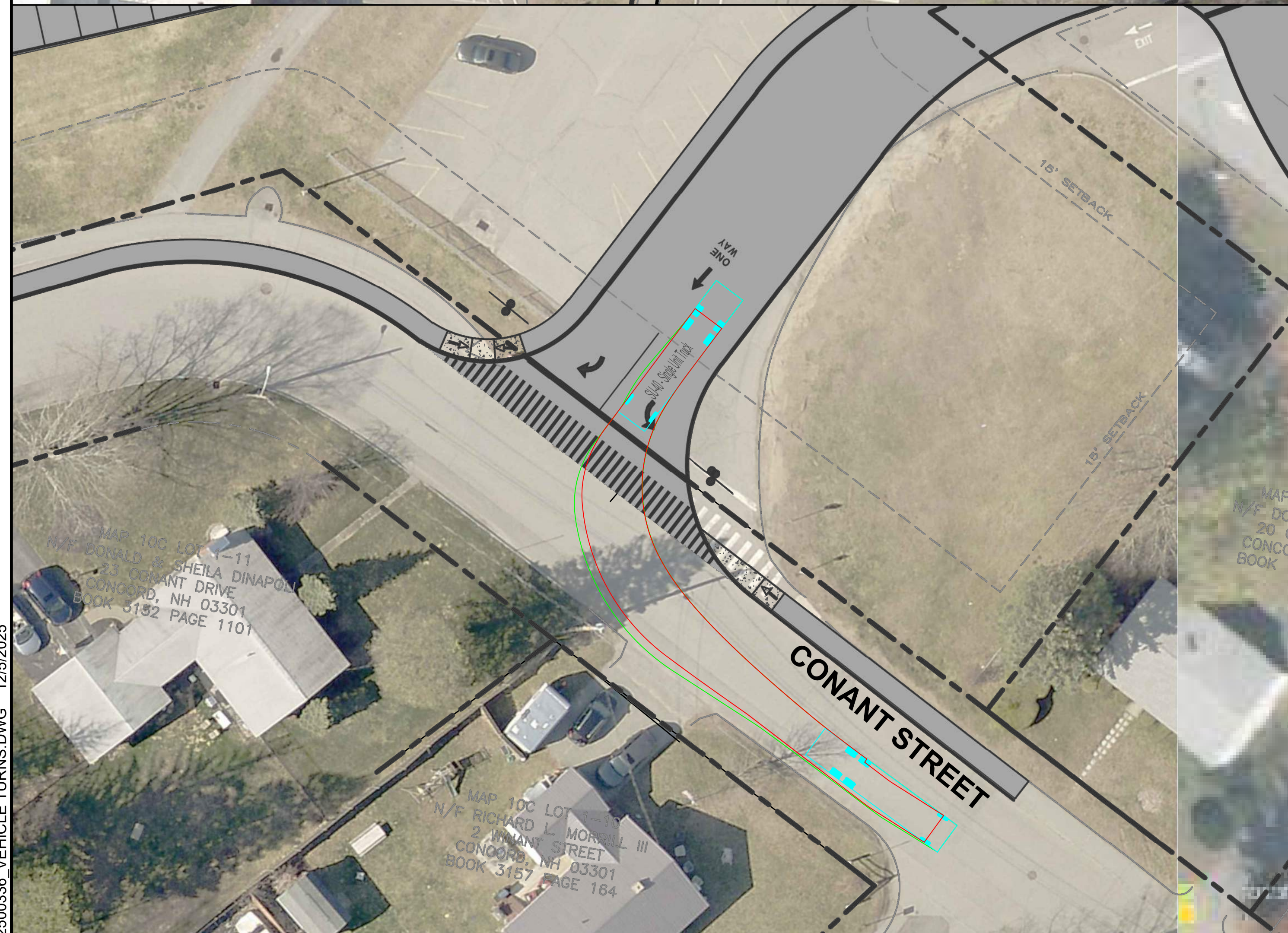
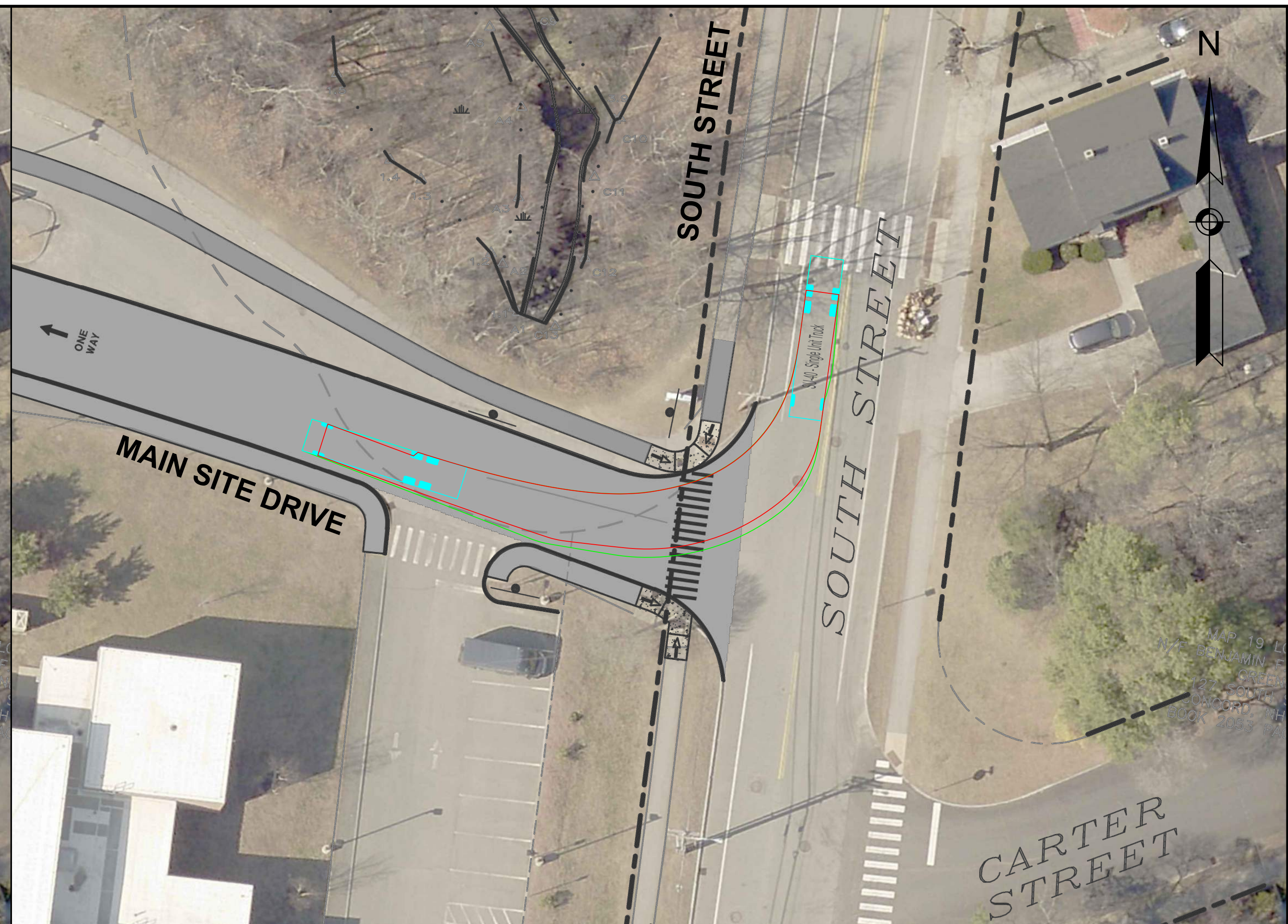
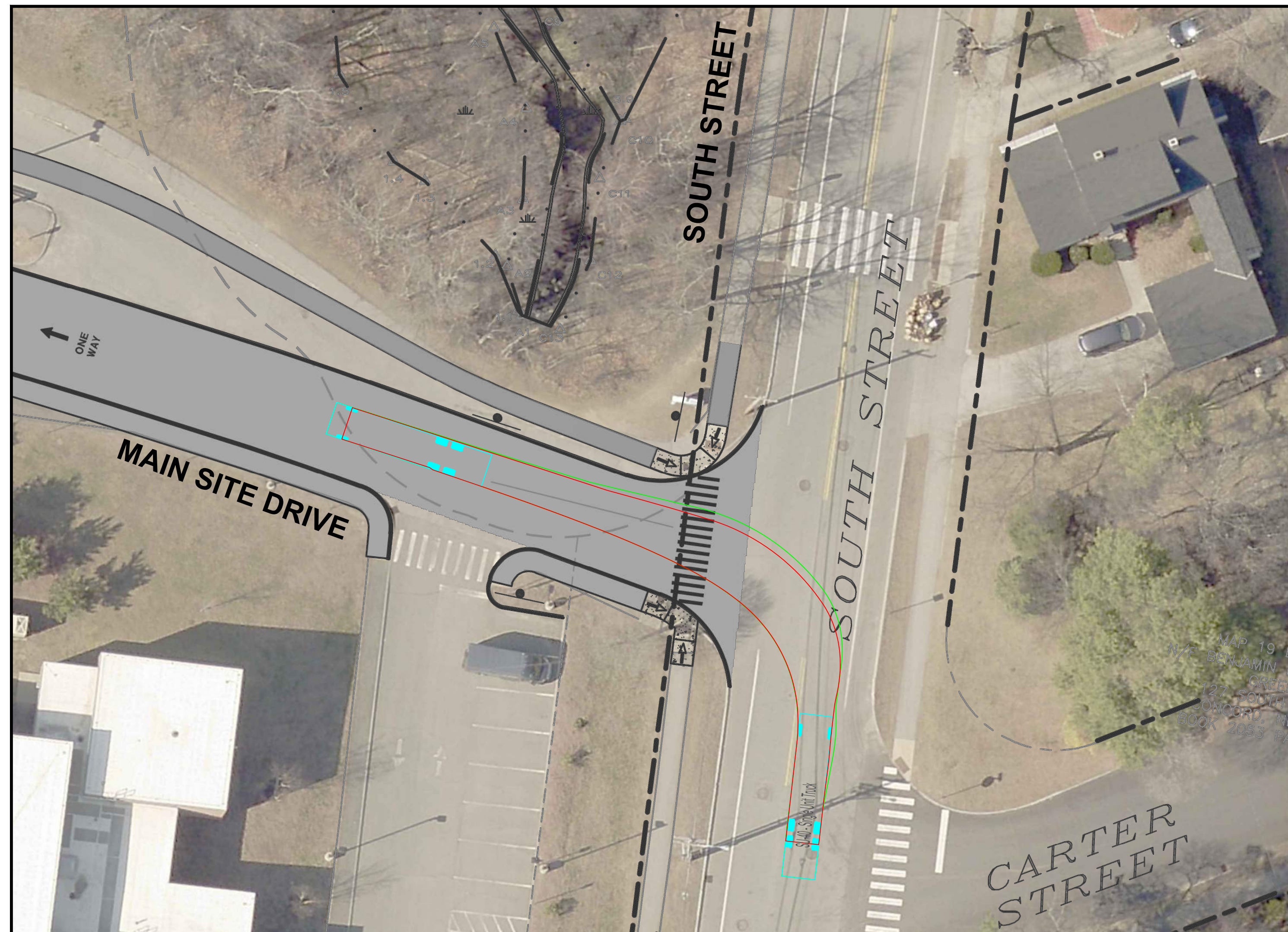
2500336 VEHICLE TURNS DWG 12/5/2025



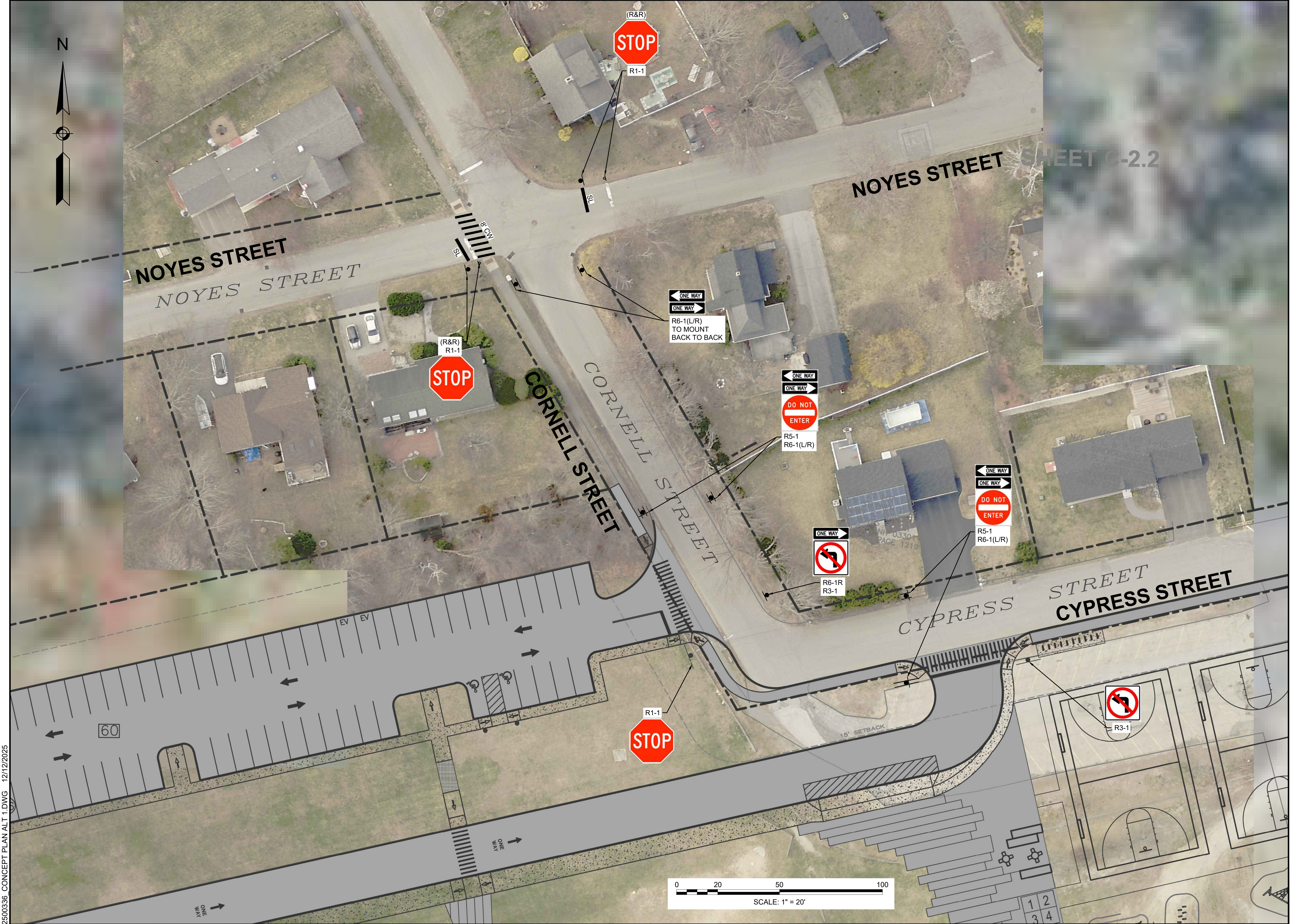


S-BUS-40 - Large School Bus (84 pass.)	
Overall Length	40.000ft
Overall Width	8.000ft
Overall Body Height	10.500ft
Min Body Ground Clearance	1.070ft
Track Width	8.000ft
Lock-to-lock time	5.00s
Max Steering Angle (Virtual)	34.40°





CONCEPTUAL IMPROVEMENT PLANS



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Greenman-Pedersen, Inc.
181 Ballardvale Street, Suite 202
Wilmington, MA 01887

PREPARED FOR
HMFH Architects, Inc.
130 Bishop Allen Drive
Cambridge, MA 02139

RUNDLETT MIDDLE SCHOOL
REDEVELOPMENT

144 SOUTH STREET
CONCORD, NEW HAMPSHIRE

REVISIONS		
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CONCEPT PLAN

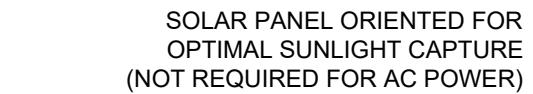
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NEX-2500336.00

2 OF 7

2500336 CONCEPT PLAN ALT 1.DWG 12/12/2025

DETAIL "A"



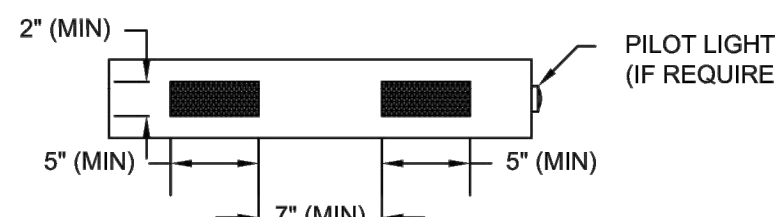
OPERATION:
UPON PUSH BUTTON ACTUATION, RRFB SHALL
FLASH FOR FOR A DURATION OF 23 SECONDS.
THERE SHALL BE NO 'WAIT TIME' BETWEEN ACTUATIONS

- NOTES:**
1. CROSSWALK AND ADA-COMPLIANT RAMPS NOT SHOWN. SEE PLANS FOR LOCATIONS.
 2. REFER TO THE SPECIAL PROVISIONS FOR SIGN DIMENSIONS.
 3. ALL CONDUIT, PULL BOXES, SERVICE CONNECTIONS, AND EQUIPMENT GROUNDING REQUIRED FOR AC POWER IS NOT SHOWN IN THIS DETAIL AND SHALL BE PAID FOR SEPARATELY UNDER THEIR RESPECTIVE PAY ITEMS.
 4. ACCESS TO ALL PEDESTRIAN ACTUATED CONTROLS SHALL BE ADA/AB COMPLIANT.
 5. 0.5% CONSTRUCTION TOLERANCE FOR CROSS-SLOPE.

MAJOR ITEMS LIST

- 2 CEMENT CONCRETE FOUNDATIONS
- 2 TRAFFIC SIGNAL POSTS & PEDESTALS (18" MIN.)
- 2 APS PUSHBUTTON SYSTEMS
- 4 DUAL RECTANGULAR YELLOW LED BEACONS IN NEMA ENCLOSURES
- 2 R10-25 SIGNS
- 4 S11-1 SIGNS
- 2 W16-TPL SIGNS
- 2 W16-TPL SIGNS
- 2 SOLAR PANEL SYSTEMS (NOT REQUIRED FOR AC POWER)
- 2 NEMA ENCLOSURES FOR ALL COMPONENTS NEEDED TO MEET FUNCTIONAL REQUIREMENTS PER SPECIAL PROVISIONS
- 2 BATTERY SYSTEMS (NOT REQUIRED FOR AC POWER)
- 2 LUMINAIRES
- PLUS ALL MOUNTING AND SUPPORTING HARDWARE AND WIRING NECESSARY TO COMPLETE A WORKING SYSTEM

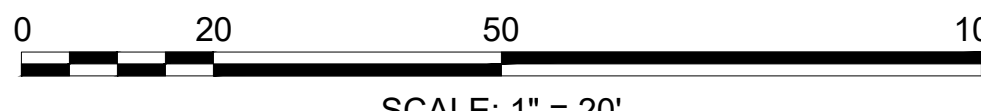
DETAIL A: DUAL YELLOW BEACO



PROP. RECTANGULAR RAPID
FLASHING BEACON (RRFB)
w/S1-1 & W16-7P(L/R)
SIGN ASSEMBLY (SEE DETAIL "A")



PROP. R1-

R&R STREET NAME
SIGN

**RUNDLETT MIDDLE SCHOOL
REDEVELOPMENT
144 SOUTH STREET
CONCORD, NEW HAMPSHIRE**

REVISIONS		
NO.	REVISION	DATE

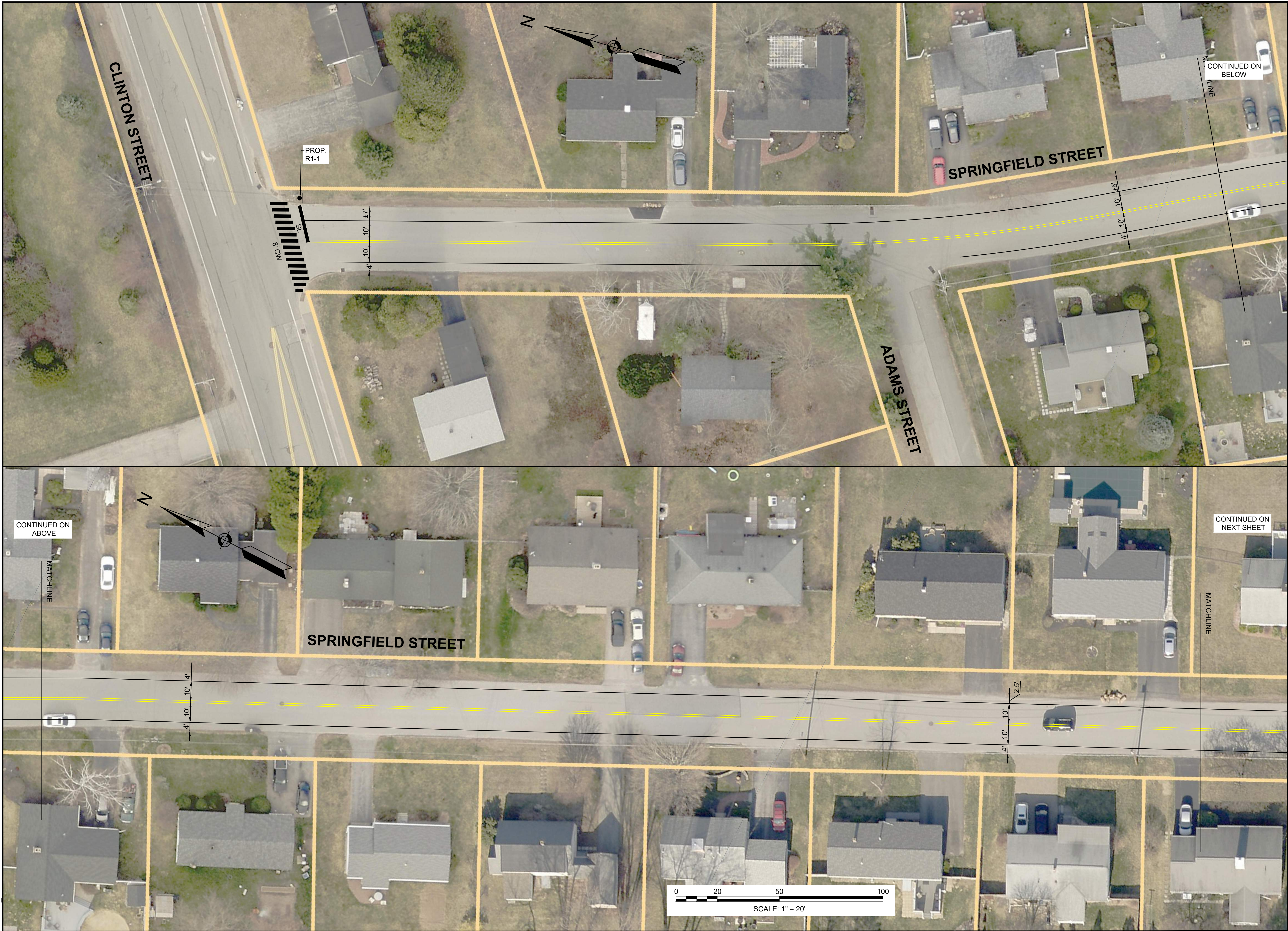
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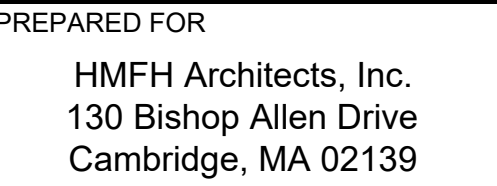
CONCEPT PLAN ALTERNATIVE 1

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NEX-2500336.00

4 OF 7



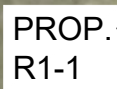
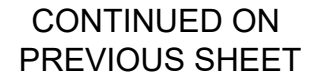


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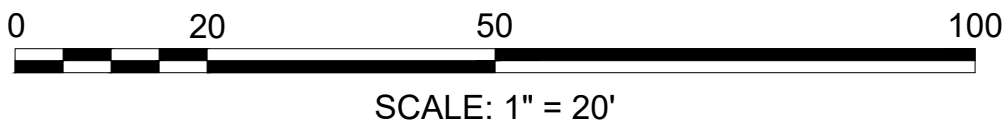
5 OF 7



SPRINGFIELD STREET

MATCHLINE

3' CW



TRAFFIC VOLUME DATA

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Start Time: 7:00:00 AM

Site Code: 04610001

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Comment 2: E/W Street : Noyes Street

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

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7:45:00 AM	46	12	0	20	83	0	3	3	0
8:00:00 AM	43	10	0	6	62	0	0	2	0
8:15:00 AM	57	7	0	8	62	0	5	2	0
8:30:00 AM	31	7	0	1	53	0	5	4	0
8:45:00 AM	22	3	0	2	37	0	1	1	0
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Start Time: 7:00:00 AM

Site Code: 04610002

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Comment 2: E/W Street : Rundlett Middle School Dwy

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

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7:45:00 AM	30	31	0	14	99	0	0	0	0
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Comment 4: Weather : Clear

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Start Time: 7:00:00 AM

Site Code: 04610003

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Comment 2: E/W Street : Abbott-Downing School Dwy

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

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Start Date: 11/8/2023

Start Time: 7:00:00 AM

Site Code: 04610004

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Comment 2: E/W Street : Conant Drive

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

Start Time	South St From North			South St From South			Conant Dr From West		
	Thru	Right	Peds	Left	Thru	Peds	Left	Right	Peds
7:00:00 AM	13	1	0	6	30	0	9	3	0
7:15:00 AM	11	1	0	8	49	0	20	5	0
7:30:00 AM	17	3	0	8	79	0	48	45	0
7:45:00 AM	21	1	0	4	72	0	35	26	0
8:00:00 AM	12	1	0	3	65	0	20	9	0
8:15:00 AM	17	1	0	2	56	0	53	20	0
8:30:00 AM	17	1	0	1	37	0	26	19	0
8:45:00 AM	14	3	0	3	33	0	9	2	0
9:00:00 AM	0	0	0	0	0	0	0	0	0
9:15:00 AM	0	0	0	0	0	0	0	0	0
9:30:00 AM	0	0	0	0	0	0	0	0	0
9:45:00 AM	0	0	0	0	0	0	0	0	0
10:00:00 AM	0	0	0	0	0	0	0	0	0
10:15:00 AM	0	0	0	0	0	0	0	0	0
10:30:00 AM	0	0	0	0	0	0	0	0	0
10:45:00 AM	0	0	0	0	0	0	0	0	0
11:00:00 AM	0	0	0	0	0	0	0	0	0
11:15:00 AM	0	0	0	0	0	0	0	0	0
11:30:00 AM	0	0	0	0	0	0	0	0	0
11:45:00 AM	0	0	0	0	0	0	0	0	0
12:00:00 PM	0	0	0	0	0	0	0	0	0
12:15:00 PM	0	0	0	0	0	0	0	0	0
12:30:00 PM	0	0	0	0	0	0	0	0	0
12:45:00 PM	0	0	0	0	0	0	0	0	0
1:00:00 PM	0	0	0	0	0	0	0	0	0
1:15:00 PM	0	0	0	0	0	0	0	0	0
1:30:00 PM	29	1	0	2	42	0	3	0	0
1:45:00 PM	24	1	0	4	35	0	2	0	0
2:00:00 PM	22	4	0	3	27	0	3	0	0
2:15:00 PM	29	5	0	2	31	0	2	0	0
2:30:00 PM	30	4	0	1	37	0	16	0	0
2:45:00 PM	26	3	0	3	40	0	12	0	0
3:00:00 PM	40	3	0	1	33	0	8	0	0
3:15:00 PM	31	8	0	3	42	0	6	0	0
3:30:00 PM	27	1	0	1	49	0	26	0	0
3:45:00 PM	31	2	0	4	37	0	19	0	0
4:00:00 PM	43	11	0	3	34	0	9	0	0
4:15:00 PM	44	3	0	3	37	0	10	0	0
4:30:00 PM	44	5	0	3	50	0	7	0	0
4:45:00 PM	40	8	0	7	33	0	3	0	0
5:00:00 PM	46	2	0	6	45	0	10	0	0
5:15:00 PM	44	9	0	2	50	0	13	0	0
5:30:00 PM	28	3	0	3	40	0	14	0	0
5:45:00 PM	26	5	0	3	20	0	2	0	0

File Name: C:\Users\delis\OneDrive\Documents\Petra\Concord, NH\530046-1\04610005.ppd

Start Date: 11/14/2023

Start Time: 7:00:00 AM

Site Code: 04610005

Comment 1: N/S Street : Rundlett Middle School Dwy

Comment 2: E/W Street : Conant Drive

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

	Rundlett Middle School Dwy From North			Conant Dr From East			Conant Dr From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
7:00:00 AM	2	1	0	6	0	0	0	6	0
7:15:00 AM	15	6	0	12	0	0	0	9	0
7:30:00 AM	91	41	0	6	0	0	0	12	0
7:45:00 AM	44	10	0	4	0	0	0	1	0
8:00:00 AM	34	9	0	7	0	0	0	5	0
8:15:00 AM	63	21	0	7	0	0	1	7	0
8:30:00 AM	19	5	0	4	0	0	1	2	0
8:45:00 AM	5	0	0	4	0	0	0	1	0
9:00:00 AM	0	0	0	0	0	0	0	0	0
9:15:00 AM	0	0	0	0	0	0	0	0	0
9:30:00 AM	0	0	0	0	0	0	0	0	0
9:45:00 AM	0	0	0	0	0	0	0	0	0
10:00:00 AM	0	0	0	0	0	0	0	0	0
10:15:00 AM	0	0	0	0	0	0	0	0	0
10:30:00 AM	0	0	0	0	0	0	0	0	0
10:45:00 AM	0	0	0	0	0	0	0	0	0
11:00:00 AM	0	0	0	0	0	0	0	0	0
11:15:00 AM	0	0	0	0	0	0	0	0	0
11:30:00 AM	0	0	0	0	0	0	0	0	0
11:45:00 AM	0	0	0	0	0	0	0	0	0
12:00:00 PM	0	0	0	0	0	0	0	0	0
12:15:00 PM	0	0	0	0	0	0	0	0	0
12:30:00 PM	0	0	0	0	0	0	0	0	0
12:45:00 PM	0	0	0	0	0	0	0	0	0
1:00:00 PM	0	0	0	0	0	0	0	0	0
1:15:00 PM	0	0	0	0	0	0	0	0	0
1:30:00 PM	4	1	0	2	0	0	0	4	0
1:45:00 PM	4	1	0	5	0	0	0	1	0
2:00:00 PM	3	3	0	1	0	0	0	3	0
2:15:00 PM	3	3	0	1	0	0	1	2	0
2:30:00 PM	66	19	0	2	0	0	0	3	0
2:45:00 PM	16	4	0	6	0	0	1	5	0
3:00:00 PM	17	8	0	3	0	0	0	5	0
3:15:00 PM	16	1	0	7	0	0	2	7	0
3:30:00 PM	58	25	0	7	0	0	0	5	0
3:45:00 PM	22	10	0	1	0	0	0	2	0
4:00:00 PM	18	9	0	4	0	0	0	7	0
4:15:00 PM	26	11	0	4	0	0	0	5	0
4:30:00 PM	7	4	0	4	0	0	0	6	0
4:45:00 PM	5	5	0	8	0	0	1	6	0
5:00:00 PM	20	11	0	9	0	0	1	6	0
5:15:00 PM	28	17	0	3	0	0	2	5	0
5:30:00 PM	32	6	0	1	0	0	0	3	0
5:45:00 PM	4	2	0	8	0	0	0	2	0

Comment 4: Weather : Clear

[illegible]

File Name: C:\Users\delis\OneDrive\Documents\Petra\Concord, NH\530046-1\04610005.ppd

Start Date: 11/14/2023

Start Time: 7:00:00 AM

Site Code: 04610005

Comment 1: N/S Street : Rundlett Middle School Dwy

Comment 2: E/W Street : Conant Drive

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

	Rundlett Middle School Dwy From North			Conant Dr From East			Conant Dr From West		
Start Time	Left	Right	Peds	Thru	Right	Peds	Left	Thru	Peds
7:00:00 AM	0	0	0	0	0	0	0	0	0
7:15:00 AM	0	0	0	0	0	0	0	0	0
7:30:00 AM	2	0	0	0	0	0	0	0	0
7:45:00 AM	0	0	0	0	0	0	0	0	0
8:00:00 AM	0	1	0	0	0	0	0	0	0
8:15:00 AM	5	14	0	0	0	0	0	0	0
8:30:00 AM	0	0	0	0	0	0	0	0	0
8:45:00 AM	0	0	0	0	0	0	0	0	0
9:00:00 AM	0	0	0	0	0	0	0	0	0
9:15:00 AM	0	0	0	0	0	0	0	0	0
9:30:00 AM	0	0	0	0	0	0	0	0	0
9:45:00 AM	0	0	0	0	0	0	0	0	0
10:00:00 AM	0	0	0	0	0	0	0	0	0
10:15:00 AM	0	0	0	0	0	0	0	0	0
10:30:00 AM	0	0	0	0	0	0	0	0	0
10:45:00 AM	0	0	0	0	0	0	0	0	0
11:00:00 AM	0	0	0	0	0	0	0	0	0
11:15:00 AM	0	0	0	0	0	0	0	0	0
11:30:00 AM	0	0	0	0	0	0	0	0	0
11:45:00 AM	0	0	0	0	0	0	0	0	0
12:00:00 PM	0	0	0	0	0	0	0	0	0
12:15:00 PM	0	0	0	0	0	0	0	0	0
12:30:00 PM	0	0	0	0	0	0	0	0	0
12:45:00 PM	0	0	0	0	0	0	0	0	0
1:00:00 PM	0	0	0	0	0	0	0	0	0
1:15:00 PM	0	0	0	0	0	0	0	0	0
1:30:00 PM	0	0	0	0	0	0	0	0	0
1:45:00 PM	0	0	0	0	0	0	0	0	0
2:00:00 PM	0	0	0	0	0	0	0	0	0
2:15:00 PM	0	2	0	0	0	0	0	0	0
2:30:00 PM	3	1	0	0	0	0	0	0	0
2:45:00 PM	0	0	0	0	0	0	0	0	0
3:00:00 PM	0	0	0	0	0	0	0	1	0
3:15:00 PM	0	0	0	0	0	0	0	0	0
3:30:00 PM	7	5	0	0	0	0	0	1	0
3:45:00 PM	2	1	0	0	0	0	0	0	0
4:00:00 PM	0	0	0	0	0	0	0	0	0
4:15:00 PM	0	0	0	0	0	0	0	0	0
4:30:00 PM	0	0	0	0	0	0	0	0	0
4:45:00 PM	0	0	0	0	0	0	0	0	0
5:00:00 PM	0	0	0	0	0	0	0	0	0
5:15:00 PM	0	0	0	0	0	0	0	0	0
5:30:00 PM	2	0	0	0	0	0	0	0	0
5:45:00 PM	1	0	0	0	0	0	0	0	0

File Name: C:\Users\delis\OneDrive\Documents\Petra\Concord, NH\530046-1\04610006.ppd

Start Date: 11/8/2023

Start Time: 7:00:00 AM

Site Code: 04610006

Comment 1: N/S Street : Springfield Street

Comment 2: E/W Street : Clinton Street

Comment 3: City/State : Concord, NH

Comment 4: Weather : Clear

	Clinton St From East			Springfield St From South			Clinton St From West		
Start Time	Left	Thru	Peds	Left	Right	Peds	Thru	Right	Peds
7:00:00 AM	1	52	0	2	7	0	110	1	0
7:15:00 AM	6	58	0	5	12	0	168	0	0
7:30:00 AM	5	106	0	19	22	0	201	1	0
7:45:00 AM	0	94	0	6	11	0	213	0	0
8:00:00 AM	1	60	0	3	8	0	152	1	0
8:15:00 AM	6	50	0	3	15	0	141	1	0
8:30:00 AM	4	73	0	2	11	0	133	0	0
8:45:00 AM	3	66	0	2	7	0	111	0	0
9:00:00 AM	0	0	0	0	0	0	0	0	0
9:15:00 AM	0	0	0	0	0	0	0	0	0
9:30:00 AM	0	0	0	0	0	0	0	0	0
9:45:00 AM	0	0	0	0	0	0	0	0	0
10:00:00 AM	0	0	0	0	0	0	0	0	0
10:15:00 AM	0	0	0	0	0	0	0	0	0
10:30:00 AM	0	0	0	0	0	0	0	0	0
10:45:00 AM	0	0	0	0	0	0	0	0	0
11:00:00 AM	0	0	0	0	0	0	0	0	0
11:15:00 AM	0	0	0	0	0	0	0	0	0
11:30:00 AM	0	0	0	0	0	0	0	0	0
11:45:00 AM	0	0	0	0	0	0	0	0	0
12:00:00 PM	0	0	0	0	0	0	0	0	0
12:15:00 PM	0	0	0	0	0	0	0	0	0
12:30:00 PM	0	0	0	0	0	0	0	0	0
12:45:00 PM	0	0	0	0	0	0	0	0	0
1:00:00 PM	0	0	0	0	0	0	0	0	0
1:15:00 PM	0	0	0	0	0	0	0	0	0
1:30:00 PM	3	79	0	2	7	0	74	1	0
1:45:00 PM	0	80	0	1	10	0	74	3	0
2:00:00 PM	2	69	0	0	3	0	67	2	0
2:15:00 PM	1	91	0	0	1	0	87	0	0
2:30:00 PM	1	110	0	4	11	0	75	1	0
2:45:00 PM	3	134	0	6	7	0	96	0	0
3:00:00 PM	8	150	0	3	6	0	116	1	0
3:15:00 PM	5	125	0	1	5	0	93	2	0
3:30:00 PM	8	135	0	12	20	0	92	1	0
3:45:00 PM	5	120	0	5	9	0	85	4	0
4:00:00 PM	4	177	0	5	7	0	82	3	0
4:15:00 PM	3	164	0	3	1	0	98	2	0
4:30:00 PM	4	195	0	0	3	0	96	1	0
4:45:00 PM	7	148	0	2	3	0	76	1	0
5:00:00 PM	5	133	0	2	9	0	87	0	0
5:15:00 PM	7	142	0	1	11	0	87	4	0
5:30:00 PM	3	106	0	8	12	0	63	2	0
5:45:00 PM	6	90	0	1	4	0	62	0	0

Site Code: 53046101

Accurate Counts
978-664-2565

Direction: NB

11/8/2023						> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39			Total
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	> 39 MPH		
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	1	1	1	0	0	1	4	
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	
5:00	0	0	1	0	1	1	2	2	2	2	0	1	0	0	0	10	
6:00	0	0	0	0	0	0	0	4	6	0	0	0	1	0	0	11	
7:00	0	0	0	0	1	2	8	11	13	4	3	0	1	0	0	43	
8:00	0	0	2	4	21	63	90	35	37	5	3	1	0	0	0	261	
9:00	0	0	37	13	23	36	33	38	29	6	5	1	0	0	0	221	
10:00	0	0	1	0	5	5	13	29	29	13	7	2	3	0	0	107	
11:00	0	0	2	1	3	4	16	40	26	17	12	5	0	0	0	126	
12:00 PM	0	0	0	0	0	5	16	34	37	22	11	9	3	0	0	137	
1:00	0	0	1	0	0	3	14	32	35	33	21	5	1	3	0	148	
2:00	0	0	0	0	1	7	21	21	43	35	13	5	4	0	0	150	
3:00	0	0	0	3	5	36	53	37	37	20	5	1	1	0	0	214	
4:00	0	0	8	11	36	49	63	40	25	7	1	0	0	0	0	240	
5:00	0	0	0	0	7	14	36	50	73	47	7	2	3	0	0	239	
6:00	0	0	1	1	12	13	44	69	64	31	8	6	2	0	0	251	
7:00	0	0	0	1	0	2	13	36	34	21	5	0	0	0	0	112	
8:00	0	0	0	0	9	10	30	39	19	16	7	1	3	0	0	134	
9:00	0	0	0	0	2	5	12	17	12	12	3	1	0	0	0	64	
10:00	0	0	0	0	0	2	2	5	4	6	1	0	0	0	0	20	
11:00	0	0	0	0	0	0	3	0	3	4	1	1	0	0	0	12	
	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	3	
Total	0	0	53	34	126	257	469	556	530	301	115	41	22	4	2508		

Percentile	15th	50th	85th	95th
Speed	17	23	28	31
Mean Speed (Average)	22.7			
10 MPH Pace Speed	18-27			
Number in Pace	1654			
Percent in Pace	65.9%			
Number > 24 MPH	1013			
Percent > 24 MPH	40.4%			

Site Code: 53046101

Accurate Counts
978-664-2565

Direction: NB

[illegible]

Site Code: 53046101

Accurate Counts
978-664-2565

Direction: SB

[illegible]

Site Code: 53046101

Direction: SB

11/9/2023						> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39			Total
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	> 39 MPH		
1:00	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	3
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	3
4:00	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
5:00	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	1	6
6:00	0	0	0	0	0	0	2	2	5	0	0	0	2	2	0	0	13
7:00	0	0	0	0	0	1	4	6	7	21	12	10	3	0	1	65	
8:00	0	0	0	0	0	9	35	72	95	40	9	0	1	0	0	261	
9:00	0	0	0	0	3	10	24	54	85	45	28	5	1	1	1	256	
10:00	0	0	0	0	0	0	3	8	38	35	31	12	10	2	139		
11:00	0	0	0	0	0	0	2	7	25	40	26	13	7	4	124		
12:00 PM	0	0	0	0	0	0	1	6	19	38	27	13	8	6	118		
1:00	0	0	0	0	0	1	0	8	40	57	46	14	4	1	171		
2:00	0	0	0	0	0	0	3	6	28	48	29	18	14	1	147		
3:00	0	0	3	2	2	2	25	36	56	38	15	1	2	2	184		
4:00	0	0	2	0	2	10	37	52	55	24	11	8	1	1	203		
5:00	0	0	0	0	0	1	8	37	77	64	17	5	1	2	212		
6:00	0	0	0	0	0	1	10	45	65	63	19	5	1	0	209		
7:00	0	0	0	0	4	0	7	12	29	27	11	4	1	2	97		
8:00	0	0	0	0	0	0	0	9	23	18	8	6	0	0	64		
9:00	0	0	0	0	0	0	0	6	13	16	11	5	0	2	53		
10:00	0	0	0	0	0	0	1	2	7	12	9	4	0	1	36		
11:00	0	0	0	0	0	0	0	0	7	2	5	1	1	0	16		
	0	0	0	0	0	0	0	0	0	2	2	1	1	0	6		
Total	0	0	6	2	12	38	165	371	691	584	316	120	56	27	2388		

Grand Total	0	0	10	8	25	73	341	700	1302	1250	704	261	115	54	4843
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Stats	Percentile	15th	50th	85th	95th
Speed		22	27	32	35
Mean Speed (Average)		28.2			
10 MPH Pace Speed		23-32			
Number in Pace		3489			
Percent in Pace		72.0%			
Number > 24 MPH		3686			
Percent > 24 MPH		76.1%			

Site Code: 53046101

Accurate Counts
978-664-2565

Direction: Combined

11/8/2023						> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39	> 39 MPH	Total
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	
1:00	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	4
2:00	0	0	0	0	0	0	0	0	0	2	2	1	0	0	1	6
3:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	3
5:00	0	0	1	0	1	1	2	2	2	4	0	2	0	0	0	13
6:00	0	0	0	0	0	0	3	5	8	9	3	2	2	1	0	31
7:00	0	0	0	0	1	3	8	13	28	32	12	6	4	0	0	107
8:00	0	0	2	4	25	72	145	112	105	52	16	3	0	0	0	536
9:00	0	0	37	13	24	46	66	82	88	60	32	12	5	1	0	466
10:00	0	0	1	0	5	5	16	37	65	69	36	12	10	4	0	260
11:00	0	0	3	2	5	6	19	53	59	53	35	20	1	5	0	261
12:00 PM	0	0	0	1	0	5	18	43	76	72	34	19	6	2	0	276
1:00	0	0	2	0	0	4	16	44	63	72	63	26	14	9	0	313
2:00	0	0	0	0	2	7	22	30	82	88	46	16	10	1	0	304
3:00	0	0	0	3	5	38	68	84	111	74	23	6	3	1	0	416
4:00	0	0	10	14	39	56	111	98	70	36	22	4	1	0	0	461
5:00	0	0	0	0	7	15	41	72	115	96	43	17	6	3	0	415
6:00	0	0	1	2	13	15	45	88	120	97	54	17	10	1	0	463
7:00	0	0	0	1	1	2	15	43	58	57	24	8	2	0	0	211
8:00	0	0	0	0	9	10	31	47	39	41	29	5	4	0	0	215
9:00	0	0	0	0	2	5	13	22	30	36	19	4	2	1	0	134
10:00	0	0	0	0	0	2	2	7	6	9	4	3	1	0	0	34
11:00	0	0	0	0	0	0	3	1	3	8	2	1	0	0	0	18
	0	0	0	0	0	0	0	0	1	5	2	2	1	1	2	14
Total	0	0	57	40	139	292	645	885	1141	967	503	182	81	31	0	4963

Percentile	15th	50th	85th	95th
Speed	19	25	30	34
Mean Speed (Average)	25.5			
10 MPH Pace Speed	20-29			
Number in Pace	3197			
Percent in Pace	64.4%			
Number > 24 MPH	2905			
Percent > 24 MPH	58.5%			

Site Code: 53046101

Accurate Counts
978-664-2565

Direction: Combined																
11/9/2023																
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total	
1:00	0	0	0	0	0	0	0	0	2	1	2	0	1	0	6	
2:00	0	0	0	0	0	0	0	1	1	1	0	0	0	0	4	
3:00	0	0	2	0	0	0	0	0	1	2	0	0	0	0	5	
4:00	0	0	0	0	0	0	1	1	0	1	0	0	0	0	3	
5:00	0	0	0	0	0	0	3	2	3	1	1	0	0	1	11	
6:00	0	0	0	0	1	0	4	4	6	1	0	2	2	0	20	
7:00	0	0	0	0	3	9	13	16	25	16	11	3	0	1	97	
8:00	0	0	4	12	29	73	117	117	114	43	9	0	1	0	519	
9:00	0	0	41	28	37	49	62	84	102	54	34	5	2	1	499	
10:00	0	0	0	0	3	11	23	30	62	50	35	13	10	2	239	
11:00	0	0	3	0	0	2	13	30	50	62	31	16	8	5	220	
12:00 PM	0	0	0	0	1	0	22	36	47	65	35	16	11	6	239	
1:00	0	0	1	0	2	3	20	40	81	93	63	16	6	1	326	
2:00	0	0	0	0	0	6	23	33	57	90	39	24	14	1	287	
3:00	0	0	3	5	24	37	83	82	80	52	19	1	2	2	390	
4:00	0	0	14	18	40	55	93	80	69	25	11	8	1	1	415	
5:00	0	0	0	0	7	21	62	104	128	89	27	6	2	2	448	
6:00	0	0	0	3	15	31	79	109	105	79	27	7	1	0	456	
7:00	0	0	1	2	9	16	38	43	55	39	19	6	1	2	231	
8:00	0	0	0	0	2	2	21	25	35	29	15	6	0	0	135	
9:00	0	0	0	0	2	5	12	23	28	26	13	9	0	3	121	
10:00	0	0	0	0	1	1	9	8	14	23	10	5	0	1	72	
11:00	0	0	0	0	0	1	3	3	10	5	6	1	1	0	30	
	0	0	0	0	0	0	0	1	1	3	2	1	2	0	10	
Total	0	0	69	68	176	322	701	872	1076	850	410	145	65	29	4783	
Percentile				15th	50th	85th	95th									
Speed				18	24	30	33									
Mean Speed (Average)				24.8												
10 MPH Pace Speed				20-29												
Number in Pace				3027												
Percent in Pace				63.3%												
Number > 24 MPH				2575												
Percent > 24 MPH				53.8%												
Grand Total	0	0	126	108	315	614	1346	1757	2217	1817	913	327	146	60	9746	
Stats				15th	50th	85th	95th									
Speed				19	25	30	34									
Mean Speed (Average)				25.2												
10 MPH Pace Speed				20-29												
Number in Pace				6224												
Percent in Pace				63.9%												
Number > 24 MPH				5480												
Percent > 24 MPH				56.2%												

Location : South Street
Location : North of Rundlett Middle School
City/State: Concord, NH

Site Code: 53046101

Accurate Counts
978-664-2565

11/8/2023	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	38			3	45				
12:15	0	42			1	35				
12:30	0	32			0	39				
12:45	0	36			0	46				
1:00	0	35			0	33				
1:15	1	37			1	35				
1:30	2	37			1	44				
1:45	1	41			0	42				
2:00	0	50			0	28				
2:15	0	71			2	37				
2:30	0	42			0	91				
2:45	0	51			0	46				
3:00	0	61			0	48				
3:15	0	74			1	42				
3:30	0	52			0	77				
3:45	1	53			1	54				
4:00	1	63			0	43				
4:15	5	54			1	42				
4:30	3	63			0	47				
4:45	1	59			2	44				
5:00	1	80			4	57				
5:15	3	99			3	56				
5:30	4	36			8	65				
5:45	3	36			5	34				
6:00	2	26			5	27				
6:15	7	37			13	27				
6:30	15	25			22	23				
6:45	19	24			24	22				
7:00	32	27			33	17				
7:15	53	40			50	15				
7:30	116	26			91	35				
7:45	60	41			101	14				
8:00	59	26			73	21				
8:15	96	22			74	19				
8:30	40	7			58	26				
8:45	26	9			40	4				
9:00	28	7			38	2				
9:15	25	7			39	6				
9:30	33	2			36	4				
9:45	21	4			40	2				
10:00	32	1			34	1				
10:15	35	5			25	2				
10:30	24	2			45	3				
10:45	35	4			31	0				
11:00	33	0			33	3				
11:15	28	2			34	2				
11:30	33	0			37	2				
11:45	43	1			35	4				
Total	921	1587			1044	1411			0	0
Percent	36.7%	63.3%			42.5%	57.5%			*	*

Location : South Street
 Location : North of Rundlett Middle School
 City/State: Concord, NH

Site Code: 53046101

Accurate Counts
 978-664-2565

11/9/2023	NB		Hour Totals		SB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	34			1	48				
12:15	1	35			0	42				
12:30	0	47			0	37				
12:45	1	39			2	44				
1:00	2	40			0	39				
1:15	1	40			0	36				
1:30	0	32			0	33				
1:45	1	28			0	39				
2:00	1	52			0	24				
2:15	0	53			1	45				
2:30	0	43			0	70				
2:45	1	58			2	45				
3:00	0	46			1	40				
3:15	0	73			0	38				
3:30	0	57			1	60				
3:45	1	36			0	65				
4:00	0	53			1	51				
4:15	1	60			1	52				
4:30	4	52			1	53				
4:45	0	71			3	56				
5:00	2	70			1	54				
5:15	1	80			4	47				
5:30	2	54			4	63				
5:45	2	43			4	45				
6:00	2	35			10	26				
6:15	3	35			14	33				
6:30	8	36			11	14				
6:45	19	28			30	24				
7:00	29	20			23	16				
7:15	64	18			57	17				
7:30	112	14			79	18				
7:45	53	19			102	13				
8:00	60	15			67	5				
8:15	114	12			76	11				
8:30	35	22			64	13				
8:45	34	19			49	24				
9:00	24	14			43	25				
9:15	21	11			28	7				
9:30	22	7			34	1				
9:45	33	4			34	3				
10:00	23	8			28	5				
10:15	28	2			31	4				
10:30	25	2			36	5				
10:45	20	2			29	2				
11:00	31	4			23	6				
11:15	33	1			35	3				
11:30	28	1			30	3				
11:45	29	0			30	2				
Total	872	1525			990	1406			0	0
Percent	36.4%	63.6%			41.3%	58.7%			*	*
Grand Total	1793	3112			2034	2817			0	0
Percent	36.6%	63.4%			41.9%	58.1%			*	*

ADT ADT: 4,878 AADT: 4,878

City/State: Concord, NH

Site Code: 53046101

Accurate Counts

978-664-2565

[illegible]

Location : Conant Street
Location : Between School Driveway and South St
City/State: Concord, NH

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: EB

11/8/2023																
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total	
1:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6:00	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2	
7:00	0	0	0	1	0	2	0	1	0	0	0	0	0	0	4	
8:00	0	0	0	2	15	39	82	38	10	4	0	0	0	0	190	
9:00	0	0	1	0	8	32	64	34	13	3	0	0	0	0	155	
10:00	0	0	0	0	4	4	10	6	0	2	0	0	0	0	26	
11:00	0	0	0	1	8	12	8	4	0	0	0	0	0	0	33	
12:00 PM	0	0	2	2	10	3	6	1	1	1	0	0	0	0	26	
1:00	0	0	0	1	2	8	7	4	3	1	0	0	0	0	26	
2:00	0	0	1	0	2	9	13	4	3	0	0	0	0	0	32	
3:00	0	0	0	1	23	27	36	18	5	1	0	0	0	0	111	
4:00	0	0	0	0	10	28	50	43	13	5	0	0	0	0	149	
5:00	0	0	0	1	4	11	19	13	6	2	1	0	0	0	57	
6:00	0	0	0	5	14	32	41	18	5	0	0	0	0	0	115	
7:00	0	0	0	1	2	2	3	1	0	4	0	0	0	0	13	
8:00	0	0	0	1	2	6	22	11	4	1	0	0	0	0	47	
9:00	0	0	0	0	6	13	15	3	4	0	0	0	0	0	41	
10:00	0	0	0	0	0	0	1	1	1	0	0	0	0	0	3	
11:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2	
	0	0	0	0	0	2	1	1	0	0	0	0	0	0	4	
Total	0	0	4	16	110	231	381	202	70	24	1	0	0	0	1039	

Percentile	15th	50th	85th	95th
Speed	15	19	22	25
Mean Speed (Average)	19.3			
10 MPH Pace Speed	14-23			
Number in Pace	848			
Percent in Pace	81.6%			
Number > 18 MPH	678			
Percent > 18 MPH	65.3%			

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: EB

11/9/2023						> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39			
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	> 39 MPH	Total	
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	3
6:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:00	0	0	0	2	2	0	3	2	1	0	0	0	0	0	0	0	10
8:00	0	0	0	7	15	43	69	41	7	1	1	0	0	0	0	0	184
9:00	0	0	0	0	12	31	62	40	12	4	0	0	0	0	0	0	161
10:00	0	0	0	2	8	7	12	7	1	3	0	0	0	0	0	0	40
11:00	0	0	0	0	4	3	6	8	2	0	0	0	0	0	0	0	23
12:00 PM	0	0	0	1	3	7	6	9	1	1	0	0	0	0	0	0	28
1:00	0	0	0	0	2	3	7	13	5	4	0	0	0	0	0	0	34
2:00	0	0	0	2	0	3	11	10	2	0	0	0	0	0	0	0	28
3:00	0	0	0	1	7	13	37	38	7	3	0	0	0	0	0	0	106
4:00	0	0	0	1	12	24	60	35	11	1	0	0	0	0	0	0	144
5:00	0	0	0	1	6	17	28	20	4	1	0	0	0	0	0	0	77
6:00	0	0	0	1	15	28	50	18	0	0	0	0	0	1	0	0	113
7:00	0	0	0	0	3	6	5	2	1	0	0	0	0	0	0	0	17
8:00	0	0	0	0	3	3	7	6	2	1	0	0	0	0	0	0	22
9:00	0	0	0	0	4	10	12	3	0	0	0	0	0	0	0	0	29
10:00	0	0	0	0	2	9	9	5	1	0	0	0	0	0	0	0	26
11:00	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	3
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	18	98	207	387	262	59	19	1	0	1	0	1	0	1052
	Percentile			15th	50th	85th	95th										
	Speed			16	19	22	25										
	Mean Speed (Average)			19.5													
	10 MPH Pace Speed			14-23													
	Number in Pace			883													
	Percent in Pace			83.9%													
	Number > 18 MPH			729													
	Percent > 18 MPH			69.3%													
Grand Total	0	0	4	34	208	438	768	464	129	43	2	0	1	0	0	2091	
Stats	Percentile			15th	50th	85th	95th										
	Speed			15	19	22	25										
	Mean Speed (Average)			19.4													
	10 MPH Pace Speed			14-23													
	Number in Pace			1731													
	Percent in Pace			82.8%													
	Number > 18 MPH			1407													
	Percent > 18 MPH			67.3%													

Location : Conant Street
Location : Between School Driveway and South St
City/State: Concord, NH

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: WB

11/8/2023															Total
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
8:00	0	0	0	0	2	4	7	10	1	3	2	0	0	0	29
9:00	0	0	0	1	0	3	4	8	1	1	0	0	0	0	18
10:00	0	0	0	0	2	3	3	3	1	0	1	0	0	0	13
11:00	0	0	0	2	2	0	2	1	1	0	0	0	0	0	8
12:00 PM	0	0	4	2	4	0	5	1	1	1	0	1	0	0	19
1:00	0	0	0	1	2	3	3	3	4	1	2	0	1	0	20
2:00	0	0	0	0	0	4	1	3	3	1	0	0	0	0	12
3:00	0	0	0	0	0	3	4	6	3	0	1	0	0	0	17
4:00	0	0	0	0	1	4	10	5	1	1	1	1	0	0	24
5:00	0	0	0	0	0	6	5	6	7	2	1	0	0	0	27
6:00	0	0	0	0	0	1	7	6	6	0	0	0	0	0	20
7:00	0	0	0	1	0	2	1	6	6	0	0	0	0	0	16
8:00	0	0	0	1	0	2	5	2	3	1	0	0	0	0	14
9:00	0	0	0	0	0	2	0	4	1	0	1	0	0	0	8
10:00	0	0	0	0	0	1	0	0	1	1	0	0	0	0	3
11:00	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3
	0	0	1	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	0	5	8	13	38	60	66	42	12	9	2	1	0	256

Percentile	15th
Speed	16
Mean Speed (Average)	21
10 MPH Pace Speed	25
Number in Pace	30
Percent in Pace	181
Number > 18 MPH	70.7%
Percent > 18 MPH	192
	75.0%

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: WB

11/9/2023																			
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total				
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1				
6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:00	0	0	0	0	2	0	0	1	0	2	0	0	0	0	5				
8:00	0	0	0	0	3	0	2	8	8	0	0	0	0	0	21				
9:00	0	0	1	0	1	2	2	7	1	1	0	0	0	0	15				
10:00	0	0	0	0	0	1	1	3	6	0	1	0	0	0	12				
11:00	0	0	0	0	0	1	6	4	0	1	0	0	0	0	12				
12:00 PM	0	0	0	0	0	2	1	3	2	2	0	0	0	0	10				
1:00	0	0	1	0	1	1	4	3	2	1	0	0	0	0	13				
2:00	0	0	0	0	2	1	3	2	6	1	0	0	0	0	15				
3:00	0	0	0	0	1	2	1	1	5	1	1	0	0	0	12				
4:00	0	0	1	0	2	2	8	8	1	2	0	0	0	0	24				
5:00	0	0	0	0	1	2	3	7	6	2	0	0	0	0	21				
6:00	0	0	0	0	0	0	7	6	4	1	1	0	0	0	19				
7:00	0	0	0	0	1	0	3	4	2	2	0	0	0	0	12				
8:00	0	0	0	0	0	0	3	4	3	0	0	0	0	0	10				
9:00	0	0	0	0	0	0	1	2	1	0	0	0	0	0	4				
10:00	0	0	0	0	1	0	1	2	0	0	0	0	0	0	4				
11:00	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Total	0	0	3	0	15	14	46	67	47	16	3	0	0	0	211				

Percentile	15th	50th	85th	95th
Speed	17	22	26	29
Mean Speed (Average)	21.9			
10 MPH Pace Speed	18-27			
Number in Pace	165			
Percent in Pace	78.2%			
Number > 18 MPH	179			
Percent > 18 MPH	84.8%			

Grand Total	0	0	8	8	28	52	106	133	89	28	12	2	1	0	467
-------------	---	---	---	---	----	----	-----	-----	----	----	----	---	---	---	-----

Stats	Percentile	15th	50th	85th	95th
Speed		17	22	26	29
Mean Speed (Average)		21.4			
10 MPH Pace Speed		17-26			
Number in Pace		344			
Percent in Pace		73.7%			
Number > 18 MPH		371			
Percent > 18 MPH		79.4%			

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: Combined

11/8/2023																		
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	> 12 - 15 MPH	> 15 - 18 MPH	> 18 - 21 MPH	> 21 - 24 MPH	> 24 - 27 MPH	> 27 - 30 MPH	> 30 - 33 MPH	> 33 - 36 MPH	> 36 - 39 MPH	> 39 MPH	Total			
1:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1			
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
3:00	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1			
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1			
5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
6:00	0	0	0	0	0	0	1	2	0	0	0	0	0	0	3			
7:00	0	0	0	1	0	2	0	1	2	0	0	0	0	0	6			
8:00	0	0	0	2	17	43	89	48	11	7	2	0	0	0	219			
9:00	0	0	1	1	8	35	68	42	14	4	0	0	0	0	173			
10:00	0	0	0	0	6	7	13	9	1	2	1	0	0	0	39			
11:00	0	0	0	3	10	12	10	5	1	0	0	0	0	0	41			
12:00 PM	0	0	6	4	14	3	11	2	2	2	0	1	0	0	45			
1:00	0	0	0	2	4	11	10	7	7	2	2	0	1	0	46			
2:00	0	0	1	0	2	13	14	7	6	1	0	0	0	0	44			
3:00	0	0	0	1	23	30	40	24	8	1	1	0	0	0	128			
4:00	0	0	0	0	11	32	60	48	14	6	1	1	0	0	173			
5:00	0	0	0	1	4	17	24	19	13	4	2	0	0	0	84			
6:00	0	0	0	5	14	33	48	24	11	0	0	0	0	0	135			
7:00	0	0	0	2	2	4	4	7	6	4	0	0	0	0	29			
8:00	0	0	0	2	2	8	27	13	7	2	0	0	0	0	61			
9:00	0	0	0	0	6	15	15	7	5	0	1	0	0	0	49			
10:00	0	0	0	0	0	1	1	1	2	1	0	0	0	0	6			
11:00	0	0	0	0	0	1	4	0	0	0	0	0	0	0	5			
	0	0	1	0	0	2	1	2	0	0	0	0	0	0	6			
Total	0	0	9	24	123	269	441	268	112	36	10	2	1	0	1295			

Percentile	15th	50th	85th	95th
Speed	15	19	24	26
Mean Speed (Average)	19.6			
10 MPH Pace Speed	15-24			
Number in Pace	1016			
Percent in Pace	78.5%			
Number > 18 MPH	870			
Percent > 18 MPH	67.2%			

Site Code: 53046002

Accurate Counts
978-664-2565

Direction: Combined

11/9/2023						> 12 - 15	> 15 - 18	> 18 - 21	> 21 - 24	> 24 - 27	> 27 - 30	> 30 - 33	> 33 - 36	> 36 - 39			
Time	0 - 3 MPH	> 3 - 6 MPH	> 6 - 9 MPH	> 9 - 12 MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	MPH	> 39 MPH	Total	
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	2
4:00	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
5:00	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	4
6:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:00	0	0	0	2	4	0	3	3	1	2	0	0	0	0	0	0	15
8:00	0	0	0	7	18	43	71	49	15	1	1	0	0	0	0	0	205
9:00	0	0	1	0	13	33	64	47	13	5	0	0	0	0	0	0	176
10:00	0	0	0	2	8	8	13	10	7	3	1	0	0	0	0	0	52
11:00	0	0	0	0	4	4	12	12	2	1	0	0	0	0	0	0	35
12:00 PM	0	0	0	1	3	9	7	12	3	3	0	0	0	0	0	0	38
1:00	0	0	1	0	3	4	11	16	7	5	0	0	0	0	0	0	47
2:00	0	0	0	2	2	4	14	12	8	1	0	0	0	0	0	0	43
3:00	0	0	0	1	8	15	38	39	12	4	1	0	0	0	0	0	118
4:00	0	0	1	1	14	26	68	43	12	3	0	0	0	0	0	0	168
5:00	0	0	0	1	7	19	31	27	10	3	0	0	0	0	0	0	98
6:00	0	0	0	1	15	28	57	24	4	1	1	0	0	1	0	0	132
7:00	0	0	0	0	4	6	8	6	3	2	0	0	0	0	0	0	29
8:00	0	0	0	0	3	3	10	10	5	1	0	0	0	0	0	0	32
9:00	0	0	0	0	4	10	13	5	1	0	0	0	0	0	0	0	33
10:00	0	0	0	0	3	9	10	7	1	0	0	0	0	0	0	0	30
11:00	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	4
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	3	18	113	221	433	329	106	35	4	0	1	0	0	1263	
	Percentile		15th	50th	85th	95th											
	Speed		16	20	24	26											
	Mean Speed (Average)		19.9														
	10 MPH Pace Speed		15-24														
	Number in Pace		1019														
	Percent in Pace		80.7%														
	Number > 18 MPH		908														
	Percent > 18 MPH		71.9%														
Grand Total	0	0	12	42	236	490	874	597	218	71	14	2	2	0	0	2558	</

Location : Conant Street
Location : Between School Driveway and
City/State: Concord, NH

Site Code: 53046002

Accurate Counts
978-664-2565

11/8/2023	EB		Hour Totals		WB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	1	3			0	5				
12:15	0	7			0	7				
12:30	0	10			0	1				
12:45	0	6			0	7				
1:00	0	8			0	4				
1:15	0	8			0	1				
1:30	0	9			0	3				
1:45	0	7			0	4				
2:00	0	8			0	4				
2:15	1	10			0	4				
2:30	0	73			0	3				
2:45	0	20			0	6				
3:00	0	24			0	4				
3:15	1	16			0	12				
3:30	0	68			0	2				
3:45	0	41			0	6				
4:00	0	20			0	7				
4:15	0	12			0	6				
4:30	0	8			0	5				
4:45	0	17			0	9				
5:00	0	26			0	3				
5:15	0	33			0	8				
5:30	1	46			0	2				
5:45	1	10			1	7				
6:00	1	6			0	5				
6:15	1	3			1	2				
6:30	1	0			0	7				
6:45	1	4			1	2				
7:00	12	5			8	7				
7:15	28	4			6	4				
7:30	99	28			11	2				
7:45	51	10			4	1				
8:00	33	14			5	3				
8:15	71	10			4	0				
8:30	39	16			1	4				
8:45	12	1			8	1				
9:00	5	1			3	3				
9:15	4	2			4	0				
9:30	8	0			6	0				
9:45	9	0			0	0				
10:00	7	0			1	0				
10:15	7	0			3	2				
10:30	14	1			3	1				
10:45	5	1			1	0				
11:00	5	0			4	0				
11:15	6	2			7	1				
11:30	7	2			2	1				
11:45	8	0			6	0				
Total	439	600			90	166			0	0
Percent	42.3%	57.7%			35.2%	64.8%			*	*

Location : Conant Street
Location : Between School Driveway and
City/State: Concord, NH

Site Code: 53046002

Accurate Counts
978-664-2565

11/9/2023	EB		Hour Totals		WB		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	2			0	3				
12:15	0	10			0	3				
12:30	0	10			0	6				
12:45	0	12			0	1				
1:00	0	3			0	6				
1:15	0	4			0	1				
1:30	0	10			0	3				
1:45	0	11			0	5				
2:00	0	7			0	1				
2:15	0	12			0	1				
2:30	1	58			0	5				
2:45	1	29			0	5				
3:00	0	24			0	7				
3:15	0	13			0	6				
3:30	1	71			0	7				
3:45	0	36			0	4				
4:00	0	34			0	4				
4:15	2	16			1	7				
4:30	1	14			0	2				
4:45	0	13			0	8				
5:00	0	28			0	5				
5:15	0	28			0	9				
5:30	1	42			0	4				
5:45	0	15			0	1				
6:00	5	6			0	3				
6:15	3	3			1	5				
6:30	0	3			0	3				
6:45	2	5			4	1				
7:00	6	1			1	2				
7:15	32	7			10	3				
7:30	98	10			6	2				
7:45	48	4			4	3				
8:00	39	1			5	1				
8:15	68	0			5	0				
8:30	47	2			2	2				
8:45	7	26			3	1				
9:00	13	25			3	3				
9:15	7	1			3	1				
9:30	16	0			1	0				
9:45	4	0			5	0				
10:00	6	0			4	1				
10:15	3	3			2	0				
10:30	10	0			3	0				
10:45	4	0			3	0				
11:00	6	0			1	0				
11:15	10	1			5	0				
11:30	9	0			2	0				
11:45	3	0			2	0				
Total	453	600			76	135			0	0
Percent	43.0%	57.0%			36.0%	64.0%			*	*
Grand Total	892	1200			166	301			0	0
Percent	42.6%	57.4%			35.5%	64.5%			*	*

ADT ADT: 1,280 AADT: 1,280

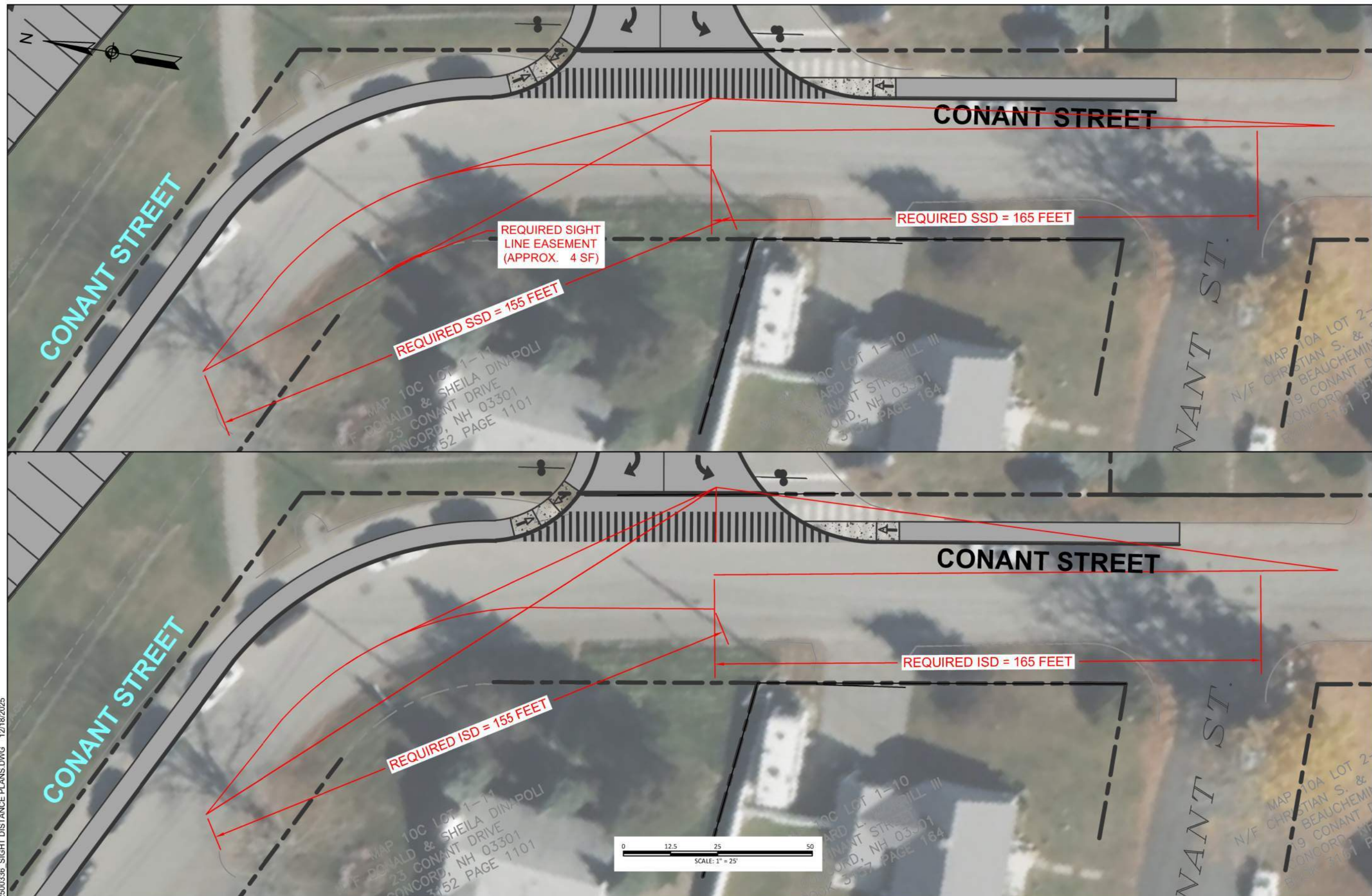
Site Code: 53046002

Accurate Counts

978-664-2565

[illegible]

SIGHT DISTANCE CALCULATIONS



REVISIONS		
NO.	REVISION	DATE

DECEMBER 18, 2025

DRAWN/DESIGN BY CJD	CHECKED BY RLB
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AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: South Street at Site Driveway

Side Street Direction: EB
 Number of Lanes on Mainline = 2
 Median Width (Feet) = 0

STOPPING SIGHT DISTANCE

Mainline Direction: SB
 85th Percentile Speed (V) = 32 MPH
 Grade (G) = -0.8%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 216 \text{ FT}$

SSD =	220 FT
--------------	---------------

Mainline Direction: NB
 85th Percentile Speed (V) = 30 MPH
 Grade (G) = 0.8%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 197 \text{ FT}$

SSD =	200 FT
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INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: North of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 $ISD (\text{Right Turn from Stop}) = 1.47 * t_g * V = 287 \text{ FT}$

ISD (Right Turn from Stop) =	290 FT
-------------------------------------	---------------

LEFT TURN FROM STOP: South of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 $ISD (\text{Left Turn from Stop}) = 1.47 * t_g * V = 331 \text{ FT}$

ISD (Left Turn from Stop) =	335 FT
------------------------------------	---------------

AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: Conant Drive at Site Driveways

Side Street Direction: SB
 Number of Lanes on Mainline = 2
 Median Width (Feet) = 0

STOPPING SIGHT DISTANCE

Mainline Direction: WB
 85th Percentile Speed (V) = 26 MPH
 Grade (G) = 0.0%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 161 FT
SSD = 165 FT

Mainline Direction: EB
 85th Percentile Speed (V) = 25 MPH
 Grade (G) = 0.0%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 152 FT
SSD = 155 FT

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: East of Driveway
 Posted Speed (V) = 25 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 ISD (Right Turn from Stop) = 1.47 * t_g * V = 239 FT
ISD (Right Turn from Stop) = 240 FT

LEFT TURN FROM STOP: West of Driveway
 Posted Speed (V) = 25 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 ISD (Left Turn from Stop) = 1.47 * t_g * V = 276 FT
ISD (Left Turn from Stop) = 280 FT

PARKING DEMAND CALCULATIONS

Institute of Transportation Engineers (ITE)

6th Edition Parking Generation

Land Use Code (LUC) 522 - Middle School/Junior High School

General Urban/Suburban

Independent Variable (X):	900.000	/ Students
<u>Weekday Demand</u>		
Average Peak Demand	0.10	vehicles per 1,000 Sq. Feet GFA
=	90	vehicles
85th Percentile Peak Demand	0.19	vehicles per 1,000 Sq. Feet GFA
=	171	vehicles

QUEUE ESTIMATE CALCULATIONS

Number of Parent Drop-Off Vehicles =	151 vehicles
Arrival Period (in minutes) =	30 minutes
[A] Arival Rate (vehicles / min)	5.033333 veh/min
[S] Number of Unloading Spaces (Servers)	8 servers
Service Time per server per vehicle	20 seconds
[U] Service Rate (vehicles per minute)	3.0 veh / min

Traffic Intensity ($\rho = A / U$) = 1.677778

Probability of No Customers in Queue = 18.679%

Average Number of Customers in Queue = 9.77E-05 vehicles
 $L_q = ((\rho^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 1.677875 vehicles
 $L_s = L_q + \rho$

Average Time spent in queue = 1.94E-05 minutes
 $W_q = L_q / A$
 0.001164 seconds

Probability on N customers in system:

$P_n = (\rho^n / N!) * P_0$ for $n < S$

$P_n = (\rho^n / (S! * S^{n-S})) * P_0$ for $n = S$ or $n > S$

Probability of XX customers in System:	Vehicles	Probability	Cumulative Probability
P1 =	1	31.34%	50.02%
	2	26.29%	76.31%
	3	14.70%	91.01%
	4	6.17%	97.18%
	5	2.07%	99.25%
	6	0.58%	99.82%
	7	0.14%	99.96%
	8	0.03%	99.99%
	9	0.01%	100.00%
	10	0.00%	100.00%
	11	0.00%	100.00%
	12	0.00%	100.00%
	13	0.00%	100.00%
	14	0.00%	100.00%
	15	0.00%	100.00%
	16	0.00%	100.00%
	17	0.00%	100.00%
	18	0.00%	100.00%
	19	0.00%	100.00%
	20	0.00%	100.00%
	21	0.00%	100.00%
	22	0.00%	100.00%
	23	0.00%	100.00%
	24	0.00%	100.00%
	25	0.00%	100.00%
	26	0.00%	100.00%
	27	0.00%	100.00%
	28	0.00%	100.00%
	29	0.00%	100.00%
	30	0.00%	100.00%

Number of Parent Drop-Off Vehicles = 25 vehicles
 Arrival Period (in minutes) = 10 minutes
 [A] Arival Rate (vehicles / min) 2.5 veh/min
 [S] Number of Unloading Spaces (Servers) 8 servers
 Service Time per server per vehicle 30 seconds
 [U] Service Rate (vehicles per minute) 2.0 veh / min

Denotes field to be completed by user.

Traffic Intensity ($p = A / U$) = 1.25

Probability of No Customers in Queue = 28.650%

Average Number of Customers in Queue = 9.3E-06 vehicles
 $L_q = ((p^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 1.250009 vehicles
 $L_s = L_q + p$

Average Time spent in queue = 3.72E-06 minutes
 $W_q = L_q / A$
 0.000223 seconds

Probability on N customers in system:

$P_n = (p^n / N!) * P_0$ for $n < S$
 $P_n = (p^n / (S! * S^{n-S})) * P_0$ for $n = S$ or $n > S$

Arrived Before Dismissal = 49 vehicles
 Active Loading Storage = 8 vehicles
 Queued Before Dismissal = 41 vehicles
 Queue Clearance Rate = 12 veh / min

Probability of XX customers in System: P1 =	Vehicles	Probability	Cumulative
			Probability
	1	35.81%	64.46%
	2	22.38%	86.85%
	3	9.33%	96.17%
	4	2.91%	99.09%
	5	0.73%	99.82%
	6	0.15%	99.97%
	7	0.03%	99.99%
	8	0.00%	100.00%
	9	0.00%	100.00%
	10	0.00%	100.00%
	11	0.00%	100.00%
	12	0.00%	100.00%
	13	0.00%	100.00%
	14	0.00%	100.00%
	15	0.00%	100.00%
	16	0.00%	100.00%
	17	0.00%	100.00%
	18	0.00%	100.00%
	19	0.00%	100.00%
	20	0.00%	100.00%
	21	0.00%	100.00%
	22	0.00%	100.00%
	23	0.00%	100.00%
	24	0.00%	100.00%
	25	0.00%	100.00%
	26	0.00%	100.00%
	27	0.00%	100.00%
	28	0.00%	100.00%
	29	0.00%	100.00%
	30	0.00%	100.00%

T0 = 41 vehicles
 T1 = 31.5 vehicles
 T2 = 22 vehicles
 T3 = 12.5 vehicles
 T4 = 3 vehicles
 T5 = 0 vehicles
 T6 = 0 vehicles
 T7 = 0 vehicles
 T8 = 0 vehicles
 T9 = 0 vehicles
 T10 = 0 vehicles
 T11 = 0 vehicles
 T12 = 0 vehicles
 T13 = 0 vehicles
 T14 = 0 vehicles
 T15 = 0 vehicles
 T16 = 0 vehicles
 T17 = 0 vehicles
 T18 = 0 vehicles
 T19 = 0 vehicles
 T20 = 0 vehicles