Ron Müller & Associates
Traffic Engineering and Consulting Services

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Ref.: 16001

April 6, 2018

Ms. Emily Wentworth, Senior Planner
Town of Hingham
210 Central Street
Hingham, MA 02043

Reg.: Response to Peer Review February 6 and April 3, 2018 Comments
River Stone Condominiums, Hingham, MA

Dear Ms. Wentworth:

Ron Müller & Associates (RMA) has prepared this letter to respond to the traffic peer review comments by Vanasse & Associates, Inc. (VAI) in their letters dated February 6, 2018 and April 3, 2018. The VAI comments regarding the Comprehensive Permit Plan will be addressed under separate cover by McKenzie Engineering Group, Inc. The traffic-related comments are re-written below for ease of reading, followed by our responses.

Comment: *"The Applicant's engineer should review the MassDOT crash data for the remaining study intersections for the period 2013 through 2015, inclusive, in order to determine if there has been any material change in the number of motor vehicle crashes occurring at the study intersections from the data that was presented in the April 2016 TIAS."*

Response: Crash records for the remaining study intersections were obtained from MassDOT records for the latest three years of available data (2013 through 2015). A summary of this accident research is provided in Table 1 below and the accident data along with the crash rate worksheets are attached to this letter.

Table 1
Accident Summary

Location	Number of Accidents			Severity [a]			Accident Type [b]					
	Total	Avg./ Year	Accident Rate [c]	PD	PI	F	CM	RE	HO	FO	Ped	Other
Ward Street at Cushing St.	4	1.3	0.42	4	0	0	2	1	0	1	0	0
Ward Street at Ward St. Ext.	1	0.3	0.16	1	0	0	0	0	0	1	0	0

Source: MassDOT Traffic Operations Safety Management System 2013 - 2015.
[a] PD = property damage only; PI = personal injury; F = fatality.
[b] CM = cross movement/angle; RE = rear end; HO = head on; FO = fixed object; Ped = pedestrian.
[c] Measured in accidents per million entering vehicles.

As shown in this table, the Ward Street and Cushing Street intersection experienced an average of just over one accident per year. While this is slightly higher than the 2011 through 2013 findings contained in the original traffic study (0.7 accidents per year), the calculated crash rate is 0.42 accidents per million entering vehicles (acc/mev), which is lower than the statewide and district-wide average of 0.58 acc/mev for unsignalized intersections. The Ward Street at Ward Street Extension intersection experienced the same crash results as documented in the original study.

Comment: *"The Applicant's engineer should obtain motor vehicle crash data/incident logs (crash reports are not required) for the remaining study area intersections from the Hingham Police Department for the most recent 3-year period available."*

Response: Crash data for these intersections were requested and obtained from the Hingham Police Department and are attached to this letter for reference. These data show that the Ward Street and Cushing Street intersection experienced an average of 2.3 accidents per year between 2015 and 2017. No accidents were reported during this time period at the Ward Street and Ward Street Extension intersection.

Comment: *"The Applicant's engineer should discuss how the proposed connection and the resulting additional traffic would impact pedestrian safety along Autumn Circle….The [applicant] should propose additional traffic calming features, pedestrian improvements and other appropriate measures to address the increased traffic that will be using Autumn Circle."*

Response: As presented in our January 25, 2018 response letter, the project is expected to add only 3 vehicle trips to Autumn Circle during peak hours. This volume of additional traffic is not expected to affect pedestrian safety along Autumn Circle. A number of traffic calming measures have been incorporated on the revised site plan to reduce vehicular speeds, discourage potential cut-through traffic, and increase pedestrian safety. These include:

- relocating access to the site that no longer provides a straight-line connection with Autumn Circle that otherwise could have encouraged cut-through traffic;
- installation of a speed hump on Road C;
- installation of all-way stop control at the intersection of Road C with Viking Lane;
- converting the existing Autumn Circle cul-de-sac into a mini roundabout; and
- installing all-way stop control at the first internal intersection on Autumn Circle just south of High Street (although not shown on the site plan, the applicant has agreed to implement this improvement).

These traffic calming measures along with the many turns that would be required along this route are expected to minimize or eliminate any potential cut-through traffic from using Road C, Viking Lane, and Autumn Circle.

Road C and Viking Lane are proposed to be 20 feet in width with 1-foot wide asphalt berms and 5-foot wide sidewalks to accommodate pedestrian traffic. While sidewalks do not currently exist along Autumn Circle, this street is 24 feet in width and therefore provides additional room for the street to be shared between vehicles, bicycles, and pedestrians.

The American Association of State Highway and Transportation Officials (AASHTO)[1] specifies that very low volume, low speed residential roads (defined as roads with 400 vehicles per day or less and speeds of less than 40 mph) should provide a minimum roadway width of 18 feet. The Massachusetts Department of Transportation (MassDOT) Project Development and Design Guide[2] specifies that shared use of the roadway is *"appropriate where user demands and motor vehicle speeds are very low or where severe constraints limit the feasibility of providing separate accommodation."* Based on the Institute of Transportation Engineers

[1] *Geometric Design of Very Low-Volume Local Roads;* American Association of State Highway and Transportation Officials; 2001. Chapter 4 - Design Guidelines.
[2] *Project Development & Design Guide;* Massachusetts Highway Department; 2006. Chapter 5 - Cross Section and Roadside Elements.

(ITE) Trip Generation Manual,[3] the 20 existing homes on Autumn Circle generate 240 daily vehicle trips. The project is expected to add 30 daily vehicle trips to portions of Autumn Circle (15% of 200 total daily vehicle trips). Therefore, the maximum volume of traffic on any portion of Autumn Circle is expected to be 270 vehicles per day, well below the 400 vehicle per day threshold qualifying as a very low-volume roadway. Although a vehicle speed study was not performed along Autumn Circle, given the horizontal and vertical alignment of the street, speeds are likely in the 15 to 25 mph range, also well below the 40 mph threshold qualifying as a low-speed roadway. Accordingly the above-referenced criteria apply to Autumn Circle and the proposed roadways.

Comment: *"The Applicant did not provide an assessment of traffic operations at the intersection of Ward Street at the relocated Project site access."*

Response: As acknowledged by VAI, traffic operations at the relocated site driveway intersection will be the same as documented in our January 25, 2018 letter as neither the site volumes nor the volume of traffic on Ward Street have changed. All movements into and out of the site driveway are projected to operate at level B or better during peak hours.

Comment: *"The object height and the driver eye height should both be set at 3.5-feet above the pavement surface. This revision will increase the line of sight that is shown and reduce the extent of the regrading that is required."*

Response: The object heights have been corrected on the attached sight line plan Sheet C-3A prepared by McKenzie Engineering Group.

Comment: *"Given that the sight line to the west from 'Road C' will cross the ground surface and not an area that will be cleared during a snow storm, the ground surface should be established a minimum of 1-foot below the sight line elevation in order to allow for snow accumulation."*

Response: The attached sight line plans Sheet C-3A (showing intersection sight lines) and Sheet C-3B (showing stopping sight lines) now show the lines of sight at least 1 foot above the proposed ground elevation.

[3] *Trip Generation Manual, 10th Edition;* Institute of Transportation Engineers; Washington, DC; 2017. Land Use Code 210.

Comment: *"The stopping sight distance along Ward Street approaching 'Road C' and along 'Road C' approaching 'Road D' should also be provided in both plan and profile view, and included as a part of the Comprehensive Permit Plan. The stopping sight distance is required in order to demonstrate that a motorist traveling along Ward Street and 'Road C' (assumed eye height of 3.5-feet above the pavement surface) can see an object (established as 2-feet above the pavement surface) in the roadway at the intersections. A grade correction factor should be applied to the calculated stopping sight distance requirements for 'Road C' approaching 'Road D' based on an 8 percent grade along 'Road C'".*

Response: Stopping sight distances in both plan and profile view along Ward Street approaching Road C and along Road C approaching Road D are shown on the attached Sheet C-3B. This plan shows that the minimum required sight distances along both Ward Street and along Road C are met or exceeded. The minimum requirement along Ward Street is 290 feet based on speeds up to 39 mph. The minimum requirements along Road C are 105 feet in the northbound direction and 125 feet in the southbound direction based on an assumed speed of 20 mph and correcting for the 8 percent grade along Road C. Both the intersection sight distance plan (Sheet C-3A) and the stopping sight distance plan (Sheet C-3B) will be incorporated into the final Comprehensive Permit Plan set.

Comment: *"Given the extent of the regrading activities that will be required to provide the necessary sight lines from both 'Road C' and 'Road D', it is recommended that the Applicant submit an affidavit from a Professional Engineer certifying that the required minimum sight lines are met at the Project site roadway intersections after the completion of the improvements. It is suggested that this requirement be included in any Decision that may be advanced for the Project."*

Response: Comment acknowledged.

Comment: *"A Road Safety Audit (RSA) shall be performed at the High Street/Ward Street/French Street intersection following the MassDOT Road Safety Audit Guidelines and conducted by an independent consultant with experience in preparing RSAs retained by the Applicant. The RSA shall be performed within 6-months of the issuance of a Comprehensive Permit for the Project, with copies of the Draft and Final RSA to be provided to the ZBA, the Department of Public Works, the Town Engineer and the Police Department. Prior to the issuance of any Certificate of Occupancy for the Project, the Applicant shall either: i) design and construct the short-term improvements identified as a part of the RSA; or ii) provide funds (in an amount to be determined by the ZBA) to the Town to implement the short-term improvements.*

Response: As a condition for approval of the project, the applicant is willing to retain an independent and experienced consultant to prepare the requested Road Safety Audit (RSA). The applicant, however, is not willing to commit any funds to the Town to implement any improvements recommended as a result of the RSA. The project is projected to add only 6 to 7 peak hour vehicles to this intersection, representing an increase in intersection entering traffic of only 0.5 to 0.6 percent. The applicant believes that the commitment to fund the RSA more than offsets any impacts that this additional traffic would have on the intersection.

Comment: *"The revised Comprehensive Permit Plan included the addition of a speed table ('speed hump') on 'Road C' and proposed the reconfiguration of the cul-de-sac at the end of Autumn Circle to a modern roundabout, both of which are intended as traffic calming features to reduce travel speeds and cut-through traffic. While we agree that the suggested measures will address vehicle travel speeds through the Project and reduce the potential for cut-through traffic, these features do not reduce the impact that will result from the proposed connection to Autumn Circle. The Applicant should propose additional traffic calming features, pedestrian improvements and other appropriate measures to address the increased traffic that will be using Autumn Circle."*

Response: As documented in our response on Page 3 of this letter, the project will add only 3 peak hour vehicle trips to Autumn Circle as a result of the proposed connection. This volume of traffic will not have an operational or safety impact on Autumn Circle. In addition to the traffic calming measures shown on the comprehensive permit plan, the applicant has agreed to install all-way stop control at the first internal intersection on Autumn Circle just south of High Street. This improvement will help to further discourage any cut-through traffic, reduce vehicle speeds, and improve pedestrian safety.

Please feel free to contact me if you have any questions or comments regarding this additional information.

Sincerely,

Ron Müller & Associates

Ronald Müller, P.E.
Principal

Attachments

cc: Brian Murphy
Brad McKenzie
Warren Baker

Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Nonfatal Injuries	Total Fatal Injuries	Manner of Collision	Vehicle Action Prior to Crash	Vehicle Travel Directions	Most Harmful Events	Vehicle Configuration	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection
3452886	HINGHAM	25-May-2013	3:16 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with light pole or other post/support	V1: Passenger car	Wet	Dark - lighted roadway	Rain	10 WARD STREET
4016074	HINGHAM	23-Dec-2014	10:14 AM	Property damage only (none injured)	1	0	0	Single vehicle crash	V1: Travelling straight ahead	V1:Northbound	V1: Collision with unknown fixed object	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires	Wet	Daylight	Cloudy	CUSHING STREET / WARD STREET
4019706	HINGHAM	14-Feb-2015	1:56 PM	Property damage only (none injured)	2	0	0	Sideswipe, same direction	V1: Travelling straight ahead / V2:Not reported	V1:Southbound / V2:Not reported	V1: Collision with motor vehicle in traffic / V2: Not reported	V1: Passenger car / V2:Single-unit truck (2-axle, 6-tire)	Snow	Daylight	Clear	CUSHING STREET / WARD STREET
4063735	HINGHAM	20-Mar-2015	9:46 PM	Property damage only (none injured)	2	0	0	Angle	V1: Travelling straight ahead / V2:Travelling straight ahead	V1:Northbound / V2:Southbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car	Ice	Dark - lighted roadway	Snow	CUSHING STREET / WARD STREET
4072103	HINGHAM	24-May-2015	3:08 PM	Property damage only (none injured)	2	0	0	Rear-end	V1: Travelling straight ahead / V2:Slowing or stopped in traffic	V1:Northbound / V2:Northbound	V1: Collision with motor vehicle in traffic / V2: Collision with motor vehicle in traffic	V1: Light truck(van, mini-van, panel, pickup, sport utility) with only four tires / V2:Passenger car	Dry	Daylight	Clear	CUSHING STREET / WARD STREET

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hingham COUNT DATE : Apr-16

DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Cushing Street

MINOR STREET(S) : Ward Street

INTERSECTION DIAGRAM
(Label Approaches)

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB		SB		
PEAK HOURLY VOLUMES (AM/PM) :	458	255		298		1,011

" K " FACTOR : **0.117** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **8,641**

TOTAL # OF CRASHES : 4 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **1.33**

CRASH RATE CALCULATION : 0.42

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : Volumes represent weekday PM peak hour

Project Title & Date: 16001/Hingham

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hingham COUNT DATE : Apr-16

DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

~ INTERSECTION DATA ~

MAJOR STREET : Ward Street

MINOR STREET(S) : Ward Street Extension

INTERSECTION DIAGRAM
(Label Approaches)

North

PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB		NB	SB		
PEAK HOURLY VOLUMES (AM/PM) :	77		324	269		670

" K " FACTOR : **0.117** INTERSECTION ADT (**V**) = TOTAL DAILY APPROACH VOLUME : **5,726**

TOTAL # OF CRASHES : 1 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR (**A**) : **0.33**

CRASH RATE CALCULATION : 0.16

$$\text{RATE} = \frac{(A * 1{,}000{,}000)}{(V * 365)}$$

Comments : Volumes represent weekday PM peak hour

Project Title & Date: 16001/Hingham

Crash Search Results

CrimeWeb™
Queues Enforth Development, Inc.

Search Again

Go To Sql Statement

Crash Search Results

(Use Popup Window ☐)

Crash #	Date/Time	Station/Precinct	Street/Road Name
1500000231	05/24/2015 15:08:00		CUSHING ST
1500000161	03/22/2015 08:00:00		CUSHING ST
1500000148	03/20/2015 21:46:00		CUSHING ST
1500000082	02/14/2015 13:56:00		CUSHING ST

SQL Statement Used in Search

select distinct xacreports.agencyname, xacreports.crashnum, xacreports.dtcrash, xacreports.station, xacreports.intrdwy1name from xacreports where (xacreports.agencyname like "HIN-PD%") and ((xacreports.dtcrash between "2015-01-01 00:00" and "2015-12-31 23:59")) and (xacreports.intrdwy1name like "CUSHING%") and (xacreports.intrdwy2name like "WARD%") order by xacreports.agencyname, xacreports.crashnum desc, xacreports.dtcrash;

Search Again

Number of Crash Reports Listed 4

Crash Search Results

CrimeWeb™
Queues Enforth Development, Inc.

Search Again

Go To Sql Statement

Crash Search Results

(Use Popup Window ☐)

Crash #	Date/Time	Station/Precinct	Street/Road Name
1600000150	04/21/2016 14:28:00		CUSHING STREET

SQL Statement Used in Search

select distinct xacreports.agencyname, xacreports.crashnum, xacreports.dtcrash, xacreports.station, xacreports.intrdwy1name from xacreports where (xacreports.agencyname like "HIN-PD%") and ((xacreports.dtcrash between "2016-01-01 00:00" and "2016-12-31 23:59")) and (xacreports.intrdwy1name like "CUSHING%") and (xacreports.intrdwy2name like "WARD%") order by xacreports.agencyname, xacreports.crashnum desc, xacreports.dtcrash;

Search Again

Number of Crash Reports Listed 1

Crash Search Results

CrimeWeb™ Quuwex Enforth Development, Inc.

Search Again

Go To Sql Statement

Crash Search Results

(Use Popup Window ☐)

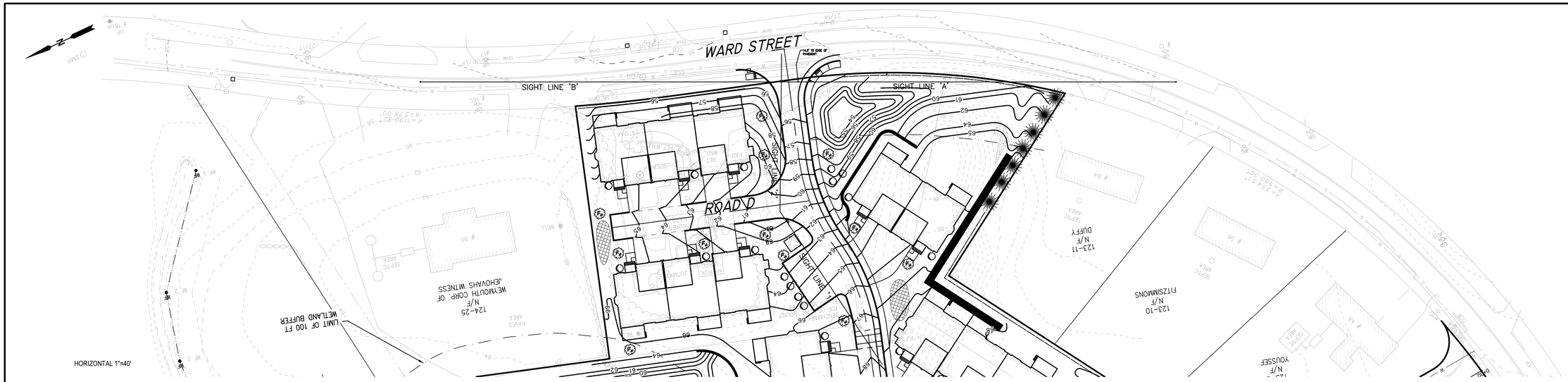
Crash #	Date/Time	Station/Precinct	Street/Road Name
1700000326	08/17/2017 21:46:00		CUSHING ST
1700000057	02/11/2017 01:17:00		CUSHING ST

SQL Statement Used in Search

select distinct xacreports.agencyname, xacreports.crashnum, xacreports.dtcrash, xacreports.station, xacreports.intrdwy1name from xacreports where (xacreports.agencyname like "HIN-PD%") and ((xacreports.dtcrash between "2017-01-01 00:00" and "2017-12-31 23:59")) and (xacreports.intrdwy1name like "CUSHING%") and (xacreports.intrdwy2name like "WARD%") order by xacreports.agencyname, xacreports.crashnum desc, xacreports.dtcrash;

Search Again

Number of Crash Reports Listed 2



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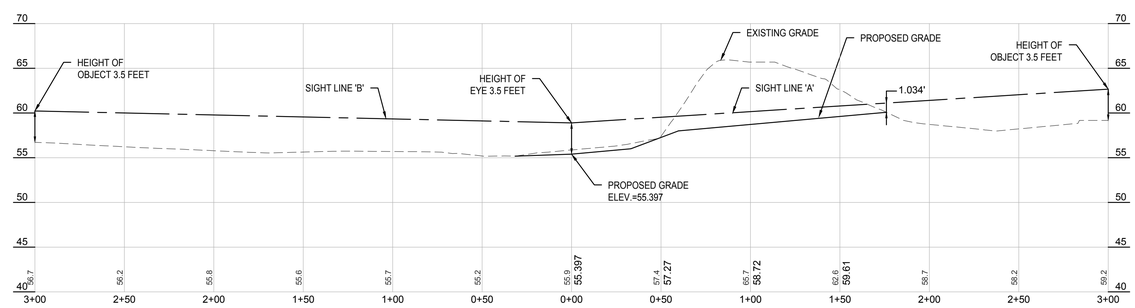
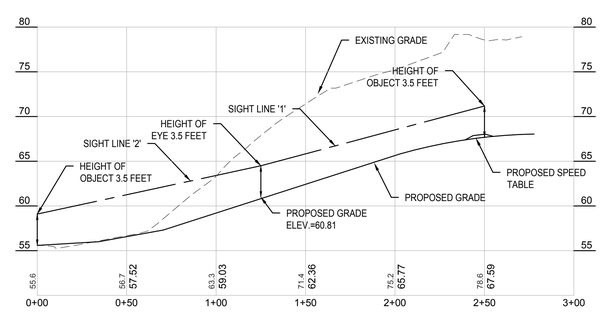


WARD STREET SIGHT LINE 'B' LEFT *WARD STREET SIGHT LINE 'A' RIGHT*

HORIZONTAL 1"=40'
VERTICAL 1"=8'



ROAD D SIGHT LINE '2' LEFT *ROAD D SIGHT LINE '1' RIGHT*

HORIZONTAL 1"=40'
VERTICAL 1"=8'

NOTE:
SIGNS, LANDSCAPING AND OTHER FEATURES LOCATED WITHIN THE SIGHT TRIANGLE AREAS SHALL BE DESIGNED, INSTALLED AND MAINTAINED SO AS NOT TO EXCEED 2.5 FEET IN HEIGHT. SNOW WINDROWS LOCATED WITHIN THE SIGHT TRIANGLE AREAS THAT EXCEED 3.5 FEET IN HEIGHT OR WOULD OTHERWISE INHIBIT SIGHT LINES SHALL BE PROMPTLY REMOVED.

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REV	DATE	DESCRIPTION	BY	APP
1	1/8/18	RECONFIGURATION	SBS	BCM
2	1/19/18		SBS	BCM
3	2/2/18		SBS	BCM
4	3/9/18	NEW SHEET	SBS	BCM
5	4/9/18	REVIEW COMMENTS	SBS	BCM

MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
Ph: 781-792-3900
www.mckeng.com

COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:

ZBA PERMIT PLAN

APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY:	JLS
DESIGNED BY:	– –
CHECKED BY:	– –
APPROVED BY:	– –
DATE:	10/7/2015
SCALE:	1"=40'
PROJECT NO.:	27–135

DWG. TITLE:
Sight Triangles

DWG. NO:
C-3A

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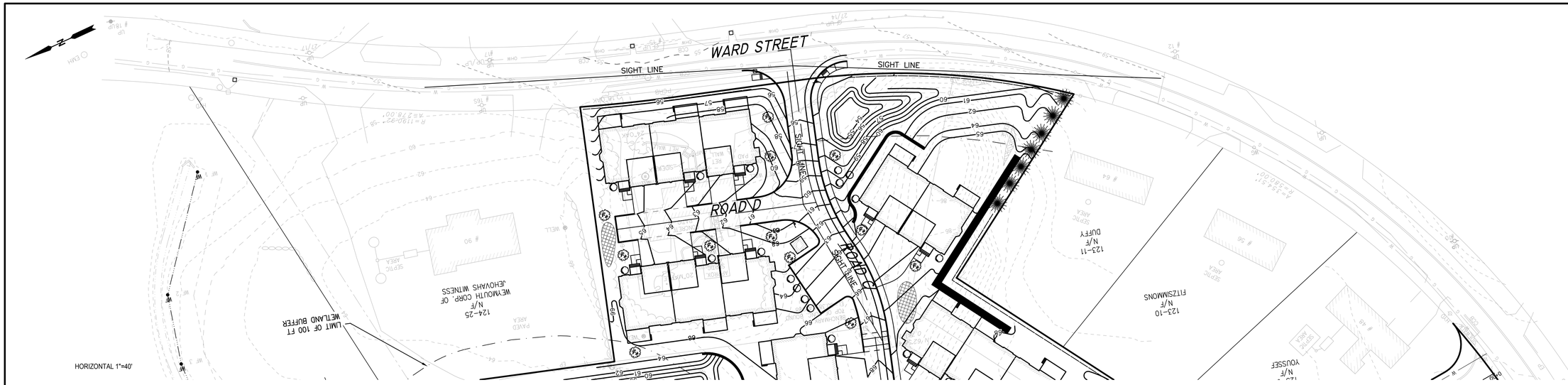
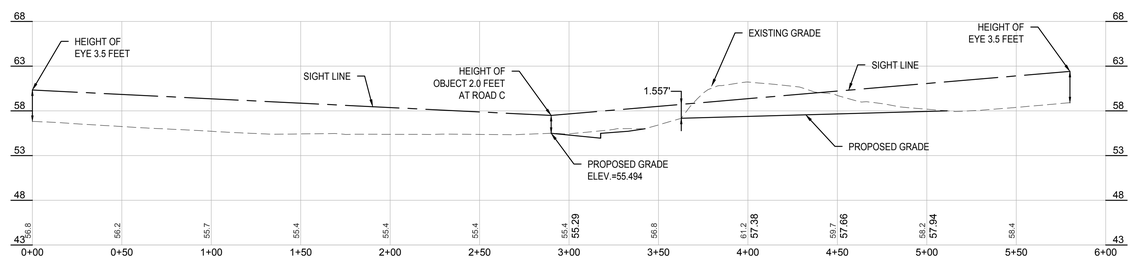
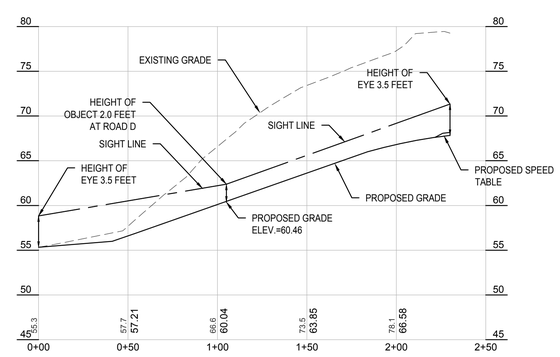




WARD STREET STOPPING SIGHT DISTANCE

HORIZONTAL 1"=40'
VERTICAL 1"=8'



ROAD C STOPPING SIGHT DISTANCE

HORIZONTAL 1"=40'
VERTICAL 1"=8'

NOTE:
SIGNS, LANDSCAPING AND OTHER FEATURES LOCATED WITHIN THE SIGHT TRIANGLE AREAS SHALL BE DESIGNED, INSTALLED AND MAINTAINED SO AS NOT TO EXCEED 2.5 FEET IN HEIGHT. SNOW WINDROWS LOCATED WITHIN THE SIGHT TRIANGLE AREAS THAT EXCEED 3.5 FEET IN HEIGHT OR WOULD OTHERWISE INHIBIT SIGHT LINES SHALL BE PROMPTLY REMOVED.

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COMPREHENSIVE PERMIT PLAN

KNOWN AS
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PROFESSIONAL ENGINEER:

ZBA PERMIT PLAN

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DWG. TITLE:
Sight Triangles

DWG. NO:
C-3B

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