Table 1 list the established electromagnetic field exposure limit values. Note that "Public" limits have not been listed by the ACGIH as it relates to "worker" exposures only.

Table 1: Electromagnetic Field Exposure Limits from Modulated Magnetic Fields that Include 60 Hz

Limit Setting Agency	Frequency Range	Field Intensity Limit	
		Members of the Public	Workers
ICNIRP (Reference levels)*	0.025–0.82 kHz (25–820 Hz)	$5/f^{\dagger}$ mT (833 mG)	$25/f^{\dagger}$ mT (4167 mG)
ANSI/IEEE C95.6‡	20 – 759 Hz	0.904 mT (9,400 mG)	2.71 mT (27,100 mG)
ACGIH	≤ 10 MHz	*N/A*	80 A/m (1,000 mG)

Table Notes:

*: Reference levels of exposure are provided for comparison with measured values of physical quantities; compliance with all reference levels will ensure compliance with basic restrictions.

†: f as indicated in the frequency range column.

‡: For the head and torso

MEASUREMENT PROTOCOL

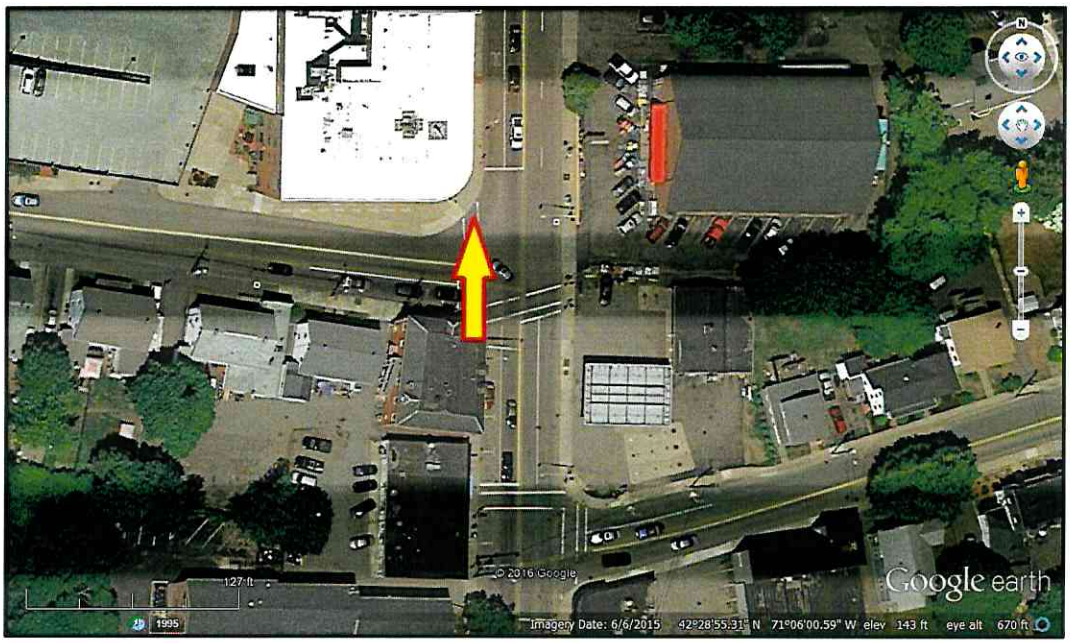
Electromagnetic field measurements were obtained on July 12, 2016, using currently accepted scientific procedures. [vi] The measuring equipment was within manufacturer's recommended calibration intervals (calibrated 4/8/15; due 12/3/16) and included the following:

- NARDA model 8532-60 *Precision ELF/VLF Gaussmeter*; S/N 2572. The *Precision ELF/VLF Gaussmeter* has a single-axis detector which can be selected to respond accurately to magnetic fields in the following frequency range: 57-63 Hz. The 57 - 63 Hz range allowed for data analysis of the 60± 3 Hz fields as the primary source. Note: 1 kHz = 1,000 cycles per second.

The electromagnetic field measurements were obtained at each location by continuously scanning an area approximately 1 meter by 1 meter at a height of 1 meter above ground level. The **highest reading in each of the three orthogonal axes** was observed with the *Precision ELF/VLF Gaussmeter* in the 57 - 63 Hz range, and recorded in tabular form. For root-sum-square (RSS) values, peak readings in each of the three axes are evaluated by taking the square root of the sum of the squares of the means (See Equation below). The recorded RSS values below Figures 2 - 4 represent the "worst case" values. Care was exercised not to move the probe to within 20 cm of the any surface to minimize probe-proximity errors. The results of the electromagnetic field survey are included in pictorial form following Figures 1-3.

$$RSS = \sqrt{Z^2 + X^2 + Y^2}$$

LOCATIONS & RESULTS



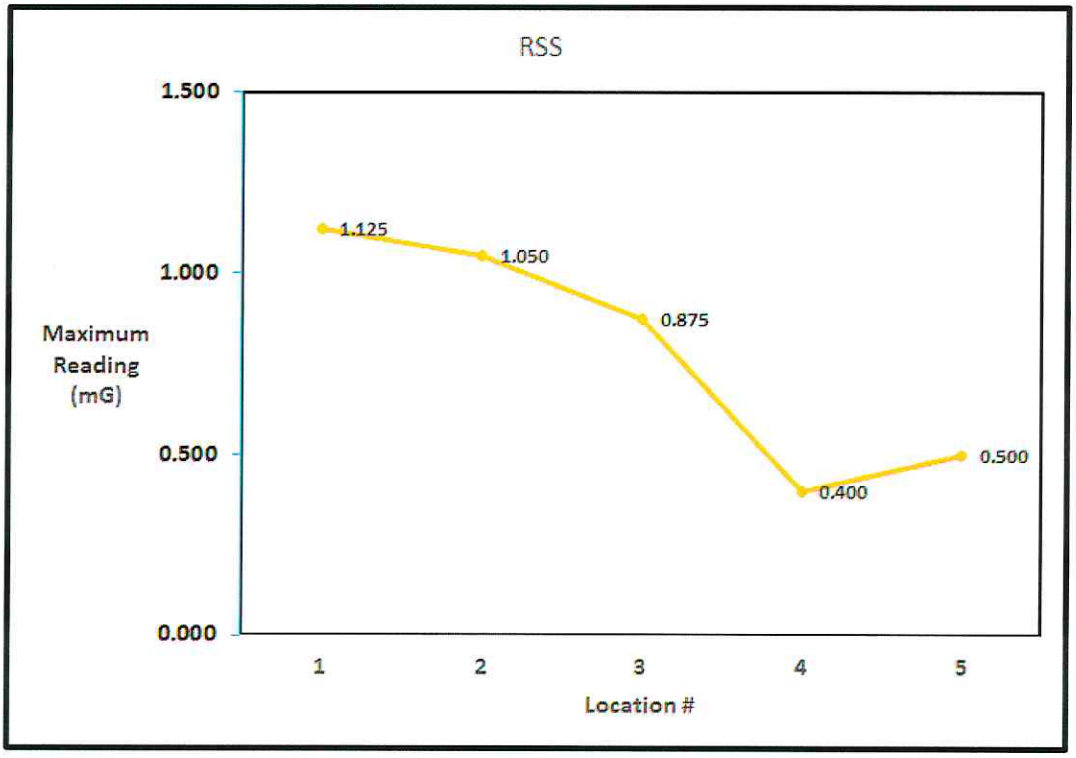
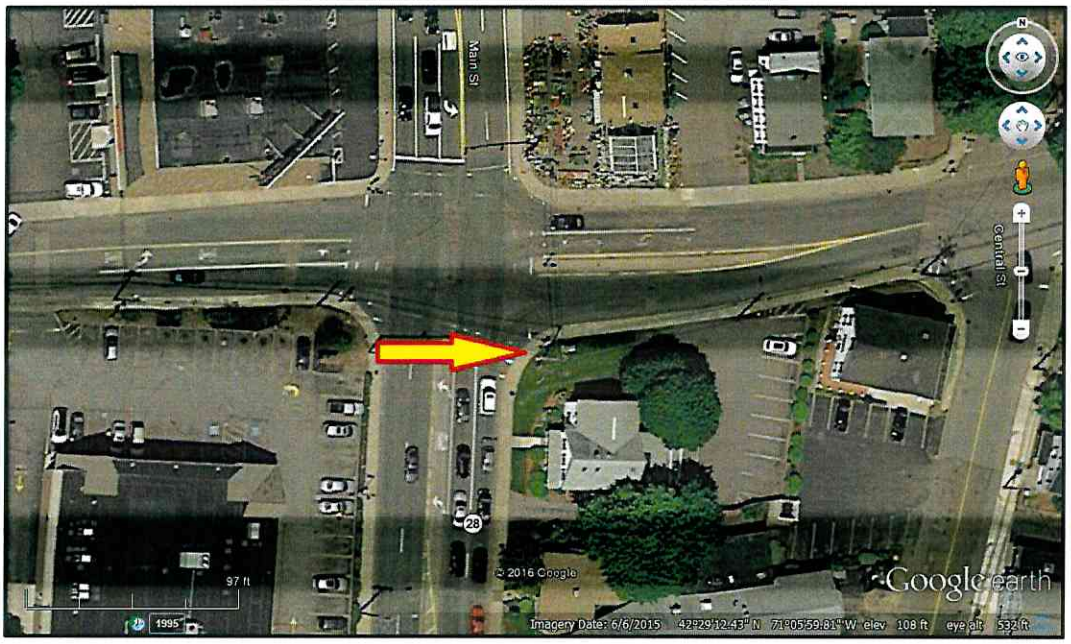


Figure 2: Locations & Results for Electromagnetic Field Survey
#1: Middle of Sidewalk, #2: Middle of Near Lane, #3: Middle of Road, #4: Middle of Far Lane, #5: Edge of Sidewalk
Intersection of Montvale Ave & Main Street; Stoneham, MA



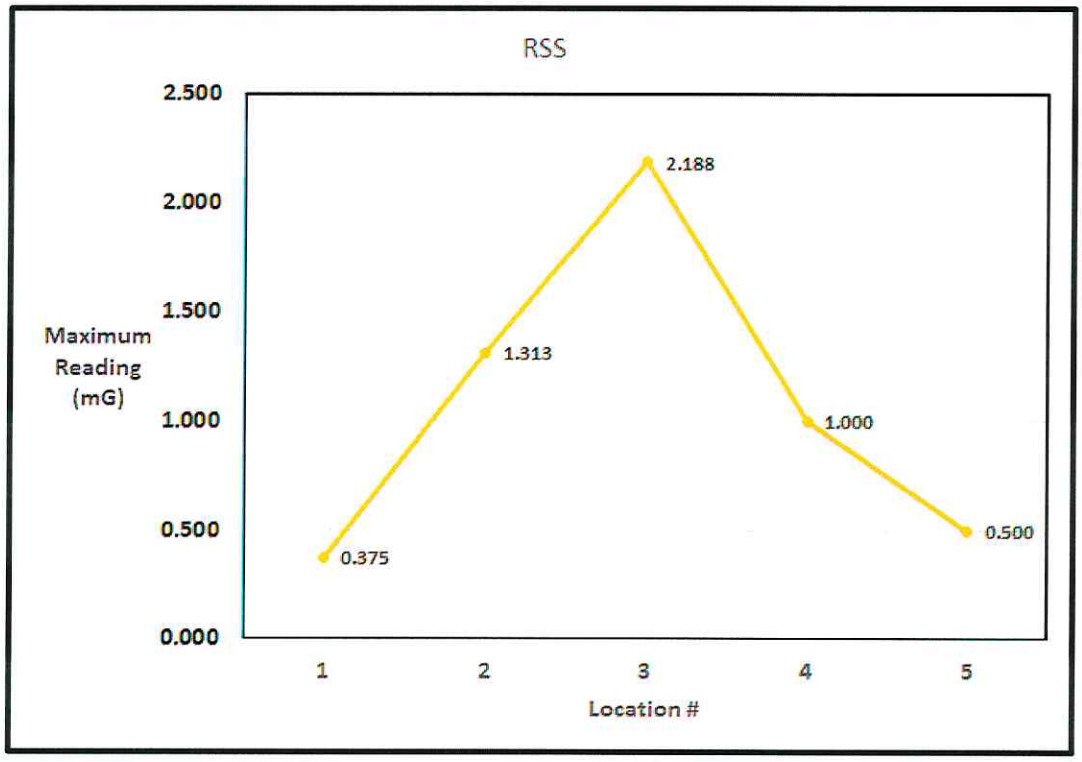


Figure 3: Locations & Results for Electromagnetic Field Survey
#1: Middle of Sidewalk, #2: Middle of Near Lane, #3: Middle of Road, #4: Middle of Far Lane, #5: Edge of Sidewalk
Intersection of Montvale Ave & Elm Street; Stoneham, MA

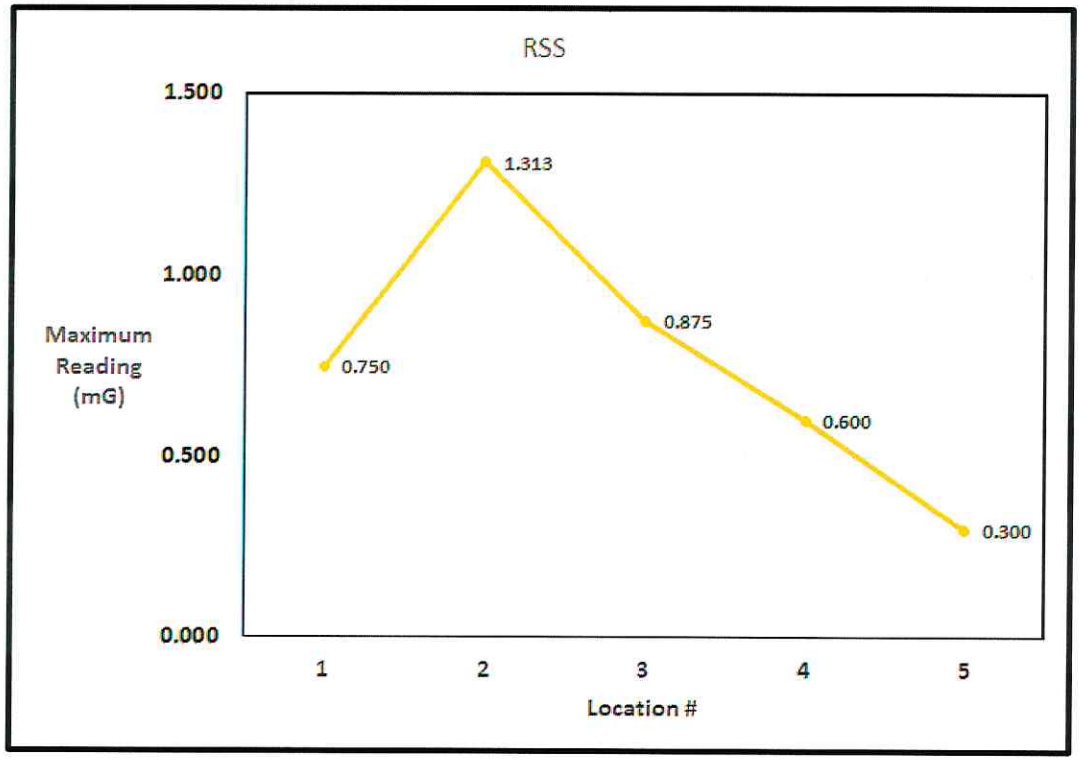


Figure 4: Locations & Results for Electromagnetic Field Survey
#1: Middle of Sidewalk, #2: Middle of Near Lane, #3: Middle of Road, #4: Middle of Far Lane, #5: Edge of Sidewalk
Montvale Ave (Montvale Plaza); Stoneham, MA

CONCLUSION

An electromagnetic field (EMF) survey was performed at three (3) individual locations along the proposed Woburn-to-Wakefield Junction Underground 345-kV running through sections of Stoneham, MA. These readings were performed to verify that exposure limits and/or guidelines would not be exceeded post site work, and memorialized baseline conditions. The results of the surveys demonstrate that existing electromagnetic fields strengths were well below established limits and/or guidelines for public exposure, and below interference thresholds for implanted medical devices. Average estimated alternating current (AC) magnetic field levels within homes are approximately 1 mG (0.001 G) (0.1 μT), and measured values range from 9 to 20 mG (0.009 to 0.020 G) (0.9 to 2 μT) near appliances.

A total of 15 EMF measurements were made. The maximum measured value was **2.2 mG**. Based on my extensive experience in the field of non-ionizing radiation safety, and the results and examination of the measured ambient electromagnetic fields, I can render the following expert opinions:

- Existing measured electromagnetic field strengths are below the established limits and/or guidelines for public exposure.
- The measured values indicate existing EMF levels present a negligible impact on personnel health and safety.

Feel free to contact me with any questions.

Sincerely,

Donald L. Haes, Jr., Ph.D
Certified Health Physicist

Note: The analyses, conclusions and professional opinions are based upon the precise parameters and conditions of this particular site; **three (3) individual locations along the proposed Woburn-to-Wakefield Junction Underground 345-kV transmission lines running through sections of Stoneham, MA.** Utilization of these analyses, conclusions and professional opinions for any other location, existing or proposed other than the aforementioned has not been sanctioned by the author, and therefore should not be accepted as evidence of regulatory compliance.

DONALD L. HAES, JR., PH.D., CHP
Radiation Safety Specialist
MA Radiation Control Program Health Physics Services Provider Registration #65-0017
PO Box 198, Hampstead, NH 03841 603-303-9959 Email: donald_haes_chp@comcast.net

STATEMENT OF CERTIFICATION

1. I certify to the best of my knowledge and belief, the statements of fact contained in this report are true and correct.

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are personal, unbiased professional analyses, opinions and conclusions.

3. I have no present or prospective interest in the property that is the subject of this report and I have no personal interest or bias with respect to the parties involved.

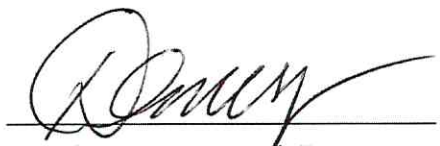
4. My compensation is not contingent upon the reporting of a predetermined energy level or direction in energy level that favors the cause of the client, the amount of energy level estimate, the attainment of a stipulated result, or the occurrence of a subsequent event.

5. This assignment was not based on a requested minimum environmental energy level or specific power density.

6. My compensation is not contingent on an action or event resulting from the analyses, opinions, or conclusions in, or the use of, this report.

7. The consultant has accepted this assessment assignment having the knowledge and experience necessary to complete the assignment competently.

8. My analyses, opinions, and conclusions were developed and this report has been prepared, in conformity with the *American Board of Health Physics* (ABHP) statements of standards of professional responsibility for Certified Health Physicists.



Date: July 12, 2016

Donald L. Haes, Jr., Ph.D
Certified Health Physicist

ENDNOTES

[i]. ICNIRP *Guidelines For Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields (Up to 300 GHz);* Published in: Health Physics 74 (4):494-522; 1998.

[ii]. ICNIRP Statement on the "*Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (Up to 300 GHz)*"; Published in: Health Physics 97(3):257-258; 2009.

[iii]. ANSI/IEEE C95.6-2002; *Standard for Safety Levels With Respect to Human Exposure to Electromagnetic Fields, 0 to 3 kHz;* The Institute of Electrical and Electronics Engineers, Inc., 3 Park Avenue, New York, NY 10016-5997, USA, October 2002. **This document is being combined with ANSI/IEEE C95.1; expected publication 2015/16.**

[iv]. ACGIH, Threshold Limit Values and Biological Exposure Indices; *ACGIH TLVs*, 2015.

[v]. FINAL California High-Speed Train Project Environmental Impact Report/Environmental Impact Statement and Final Section 4(f) Statement and Draft General Conformity Determination; Merced to Fresno Section; VOLUME I:REPORT. Prepared by: California High-Speed Rail Authority, 770 L Street, Suite 800, Sacramento, CA 95814. POC: Mr. Thomas Fellenz, 916-324-1541. USDOT Federal Railroad Administration, 1200 New Jersey Avenue SE, MS-20, W38-314, Washington, D.C. 20590. POC: Mr. David Valenstein, 202-493-6381.

[vi]. NIOSH (National Institute for Occupational Safety and Health) *Manual for Measuring Occupational Electric and Magnetic Field Exposures*; U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, Division of Biomedical and Behavioral Sciences, October 1998.

COMMONWEALTH OF MASSACHUSETTS

ENERGY FACILITIES SITING BOARD

Petition of NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid for Approval to Construct and Maintain a New 345 kV Underground Transmission Line in Woburn, Winchester, Stoneham and Wakefield Pursuant to G.L. c. 164 § 69J	)	EFSB 15-04
Petition of NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid for Approval to Construct and Operate a New 345 kV Underground Transmission Line in Woburn, Winchester, Stoneham and Wakefield Pursuant to G.L. c. 164 §72	)	D.P.U. 15-140
Petition of NSTAR Electric Company d/b/a Eversource Energy and New England Power Company d/b/a National Grid for Individual and Comprehensive Zoning Exemptions from the Zoning Ordinance of the City of Woburn and the Zoning By-law of the Town of Wakefield Pursuant to G.L. c. 40A § 3	)	D.P.U. 15-141

TESTIMONY OF Kenneth P. Cram

ON BEHALF OF THE

TOWN OF WINCHESTER

August 18, 2016

Q: Please state your name, position and business address.

A. My name is Kenneth P. Cram. I am the Director, Traffic Engineering for Bayside Engineering, Inc. Our office address is 600 Unicorn Park Drive, Woburn, MA 01801.

Q; On whose behalf are you testifying?

A. I am testifying on behalf of the Town of Winchester.

Q: Please summarize your professional and educational background.

A. I received a B.S. degree in Civil Engineering from Northeastern University in 1982. I began working as a civil engineer in Boston in 1982 at Howard Needles Tammen and Bergendoff in Boston, MA. In 1986 I joined the firm of Keyes Associates in Elmsford, NY as a Project Manager. In 1990, I joined the firm of Vanasse Hangen Brustlin or two years prior to joining Vanasse and Associates for the next 18.5 years. I am currently employed as the Director of traffic engineering at Bayside Engineering. MY CV is attached.

Q: Have you previously testified before the Energy Facilities Siting Board?

A. No.

Q: Prior to offering your testimony, what have you done to prepare for your testimony?

A: Prior to preparing this testimony, Bayside performed a site visit and travelled the Washington Street and Cross Street corridors. Measurements of the widths of each street were performed at various locations along each street and at the locations of the proposed manholes. Research was conducted into available traffic volume data. Bayside reviewed the Black & Veatch Corporation's plans dated September 8, 2015 and titled "Station 211, Woburn to National Grid Wakefield Substation 345kV Line", stamped "Issued to Town of Winchester on" October 27, 2015". Also reviewed were updated sheets for the Town of Winchester (Sheets 6, 7 and 15-20, dated June 17, 2016). On Friday, August 5, 2016 Bayside met with representatives of the Town of Winchester to review the proposed Eversource project.

Q: What is the purpose of your testimony?

A. To provide information relative to the transportation impacts of the proposed electric utility construction within the municipal jurisdiction of the Town of Winchester, Massachusetts.

Q: Please describe those impacts.

A. I have prepared a letter report dated August 18, 2016 which contains a review of the traffic impacts associated with the construction of the 345 kV line through Winchester. A copy of the letter is attached and incorporated by reference in my testimony. Following is a summary of our findings.

Washington and Cross Streets serve as local and regional transportation routes, providing east-west and north-south corridors through the Town of Winchester. Washington Street carries approximately 15,000 vehicles per day and Cross Street carries approximately 9,450

vehicles per day. These are substantial volumes for two-lane roadways and any full or partial closures as a result of conduit installation or jack and bore operations associated with the 345kV line construction will cause these vehicles to divert to other streets in the area causing further traffic congestion.

As detailed in our memo, closure of Cross Street at the railroad/Aberjona River crossing for jack and bore operations would add between 2 and 2.8-miles of additional travel for vehicles being detoured. Closure of Washington Street at the Aberjona River for the jack and bore work would add between 2.8 and 3-miles of additional travel, and would cause approximately 10 residential properties in Winchester and Winchester Hospital's Ambulatory Care/Cancer Care at 620 Washington Street to be completely cut off from the rest of Town, with the only access through Woburn. Closure of Washington Street may also require ambulances to use Interstate Route 93 (I-93) to access Winchester Hospital, which could add significant travel time during period of heavy traffic.

A traffic management plan has not been provided for review by Eversource. This is an essential key to maintaining traffic flow during construction for any type of roadway project. However, even with a traffic management plan, there will be significant disruption to travel within the region, including impacts to public safety response times and disruption of existing ambulance routes to Winchester Hospital.

There are a number of sensitive generators in the area for which access must be maintained, including Winchester Hospital's Ambulatory Care/Cancer Care Center located at 620 Washington Street; the Muraco Elementary School located just south of the preferred route

on Washington Street; and various private daycares, preschools, the Acera School, a private multi-sport athletic facility, Town-owned parks and playfields, and various educational, commercial, and industrial uses along the preferred route. No plan has been provided to show how access to these areas will be maintained.

Lastly, alternate routes for the 345kV line should be revisited. With three potential road closures on two key roads in northern Winchester, serious traffic impacts are expected.

Q. Does this conclude your testimony?

A. Yes

Signed under the penalties of perjury this 19th day of August 2016.

Kenneth P. Cram, P.E.

BAYSIDE ENGINEERING

August 18, 2016

Ms. Beth Rudolph, P.E., Town Engineer
Town of Winchester
71 Mount Vernon Street
Winchester, MA 01890

Re: ***Transportation Review for Proposed 345kV Line***
Winchester, MA

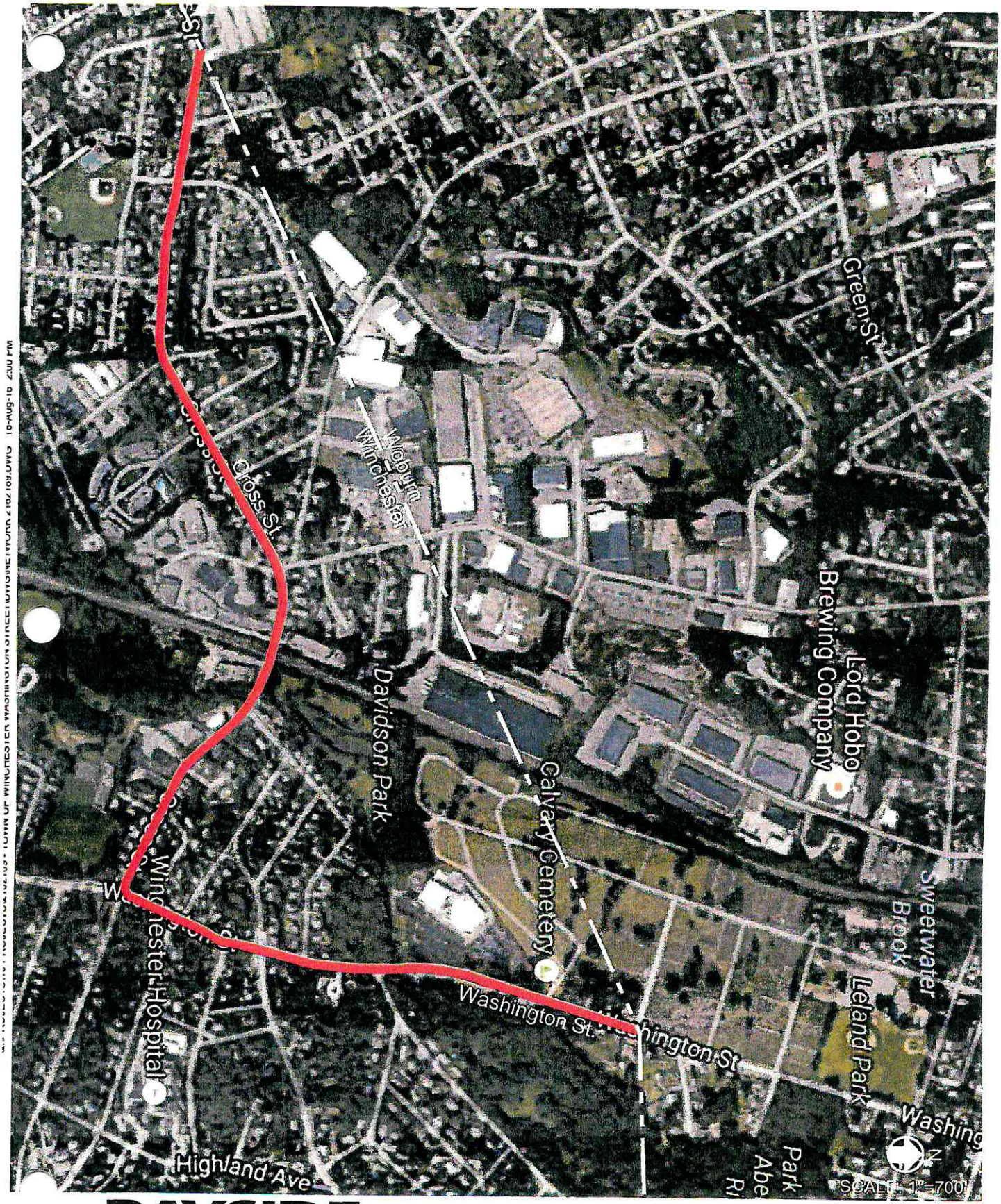
Dear Ms. Rudolph:

Bayside Engineering, Inc. (Bayside) has performed a review of the Black & Veatch Corporation's plans dated September 8, 2015 and titled "Station 211, Woburn to National Grid Wakefield Substation 345kV Line", stamped "Issued to Town of Winchester on" October 27, 2015". Also reviewed were updated sheets for the Town of Winchester (Sheets 6, 7 and 15-20, dated June 17, 2016). Our review is limited to a review of the potential transportation impacts associated with the location and construction of the 345kV line. The proposed location of the 345kV line in Winchester is shown on Figure 1.

As part of our review, Bayside visited the site and compiled existing traffic volume data and land uses along the Washington Street and Cross Street corridors where Eversource proposes to construct the 345kV line. Bayside also reviewed the pre-file testimony of Fire Chief John Nash, Police Chief Peter MacDonnell, DPW Director Jay Gill, and Town Engineer Beth Rudolph, P.E.

The preferred route of the 345kV line will connect Eversource's substation off Pond Street in Woburn and the New England Power Company substation on Montrose Avenue in Wakefield, Massachusetts. In Winchester, the proposed 345kV line will enter Cross Street from Main Street and continue in an easterly direction into Winchester. Along Cross Street, the route will pass beneath the MBTA Lowell line future rail tracks and continue to the intersection with Washington Street. Here the route will then follow Washington Street northerly until it reaches Montvale Avenue in Woburn.

600 Unicorn Park Drive ▲ Woburn, MA 01801 ▲ Phone: 781.932.3201 ▲ Fax: 781.932.3413



BAYSIDE ENGINEERING
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Phone: 781.932.3201 ▲ Fax: 781.932.3413
www.baysideengineering.com

Proposed 345 kV Line
Winchester, MA

Figure 1

Eversource Proposed
Winchester Route

EXISTING CONDITIONS

Roadways

Washington Street

Washington Street is a two-lane, Urban Principal Arterial under the jurisdiction of the Town of Winchester. Washington Street is a major transportation route through Winchester, paralleling Interstate 93 (I-93) and provides access to major sensitive generators (Cancer Care Center, Winchester Hospital, the Muraco elementary school and several playing fields). Washington Street traverses the study area in a general north/south direction. Additional turn lanes are provided at major intersections. Travel lanes are separated by a double yellow centerline. Marked shoulders are also provided. The posted speed limit on Washington Street from the Woburn Town Line to Cross Street is initially 35 miles per hour (mph) and reduces to 30 mph north at Sunset Road (north of Forest Street). Sidewalks are generally provided along both sides of the road. Land use along Washington Street in the study area consists of residential homes, commercial development, the Calvary Cemetery, and the Center for Cancer Care.

Cross Street

Cross Street is a two-lane, Urban Minor Arterial under the jurisdiction of the Town of Winchester. Cross Street provides access to many residential homes as well as commercial and industrial businesses in Winchester. Cross Street traverses the study area in a general east/west direction. Additional turn lanes are provided at major intersections. Travel lanes are separated by a double yellow centerline. The posted speed limit on Cross Street is 30 mph. Sidewalks are generally provided along both sides of the road. Land use along Cross Street in the study area consists of residential homes and commercial development.

Existing Traffic Volumes

To establish base traffic volume conditions within the study area, traffic volume data was compiled from available traffic studies and the Massachusetts Department of Transportation (MassDOT). MassDOT has a traffic count on Washington Street from 2001 where the average annual daily traffic (AADT) was 15,900 vehicles per day (vpd). This volume of traffic yields peak hour volumes of approximately 1,400 vehicles per hour (vph). Most of this traffic is commuter traffic traversing Washington Street. This is a substantial volume of traffic for a two lane roadway.

Eversource collected traffic volume data last December on Cross Street. These counts were conducted from Thursday December 10, 2015 through Wednesday December 16, 2016. Based on these counts, the average daily traffic for Cross Street is approximately 9,450 vpd. Peak hour traffic volumes are in the range of 656 vehicles per hour (vph) during the weekday morning peak hour and 729 vph during the weekday evening hour.

A review of traffic volume data from the traffic evaluation[1] prepared for the Winchester Hospital building addition at the Cancer Care Center at 620 Washington Street indicates that Washington Street in the vicinity of the Cancer Care Center carries approximately 15,100 vpd. Peak hour traffic volumes are in the range of 1,400 vph during the weekday morning peak hour and 1,300 vph during the weekday evening hour.

Existing Field Measurements and Photos

As part of Bayside's review, measurements of the roadway widths along Washington Street and along Cross Street were also performed and a photographic inventory was performed. This data is included in the appendix. For Washington Street, the roadway with was found to vary from 28 feet to 30 feet in general, with the roadway approximately 32 feet in width (just north of Cross Street).

Cross Street was found to vary in width from approximately 28 feet in width to approximately 33 feet in width. A review of the Cross Street measurements indicate that the roadway with is not consistent throughout the study area.

The photos of Washington Street and Cross Street are included in the appendix along with a summary table with the roadway measurements.

REVIEW OF BLACK & VETACH PLANS

The proposed 345kV line is proposed to be constructed within the rights of way for several streets in the Town of Winchester. These streets include:

- Pickering Street
- Border Street
- Cross Street
- Washington Street

As shown above in the existing traffic volume section, available traffic volume data shows that Washington Street is a heavily trafficked corridor. The maintenance of traffic flow during the construction of the 345kV line is of extreme importance. Of the plans reviews, no information has been provided for review. A review of the layout of the 345 kV line shows that the line meanders down Washington Street from the Woburn Town Line to Cross Street. The construction vehicles expected to be used for the construction of the 345 kV line are expected to be approximately 11 feet in width. Allowing for a 4 foot wide safety zone on either side of the construction vehicle yields the remaining pavement with on average of approximately 11 or 12

[1] *Traffic Evaluation, Proposed Building Addition at 620 Washington Street*; VHB; Watertown, MA; August 3, 2010.

feet. This will require vehicles to be controlled by police officers when traffic is reduced to a single lane on Washington Street. As purported in the pre-filed testimony of the Town of Winchester Police Chief, Peter F MacDonnell, "any closure or partial closure of Washington Street will result in traffic gridlock that will place the area residents at great risk'. Bayside concurs with this assessment based upon a review of Washington Street travel and the traffic volumes identified in this letter.

There are also three locations where jack and bore operations are proposed. These are at the two crossings of the Aberjona River (one on Washington Street and one on Cross Street) and the third is under the MBTA commuter rail tracks. Again, these jack and bore operations most likely will require the entire closure of the roadway, or at a minimum allow one way, alternating traffic only. As indicated in the pre-filed testimony of the town of Winchester Fire Chief, John F Nash, Jr., "the Winchester fire Department relies heavily on the Washington Street corridor response to fire and rescue incidents and it is a primary route for transporting ill and injured patients by Fire Department ambulance to the Winchester Hospital Emergency Department". Bayside concurs with this assessment.

The construction of the 345kV line will have a significant impact on traffic volumes. Not only will there be a significant impact on traffic but travel times experienced by emergency response vehicles will be significantly impacted particularly if there are road closures. Washington Street and Cross Street are major travel routes in the northern section of the Town of Winchester. If the proposed jack and bore operation on Cross Street requires the closure of Cross Street, this will significantly increase travel times for a response vehicles, not to mention the existing developments in the area of the Aberjona River. There are several commercial operations on Cross Street in the vicinity of the Aberjona River that will be affected by the construction and potential road closure. If Cross Street were to be closed, the next parallel street would be Swanton Street to the south (would add approximately 2 miles of additional travel). To the north, the alternate route would be to Holton Street to Green Street to Montvale Avenue to Washington Street back to Cross Street (would add approximately 2.8 miles of additional travel). For emergency vehicle response times, this is a significant increase.

Should Washington Street have to be closed, to the west, the alternate route would include Cross to Holton Street to Green Street to Montvale Avenue back to Washington Street (would add approximately 2.8 miles of additional travel). To the west, the route would include Forest Street to Park Street to Montvale Avenue back to Washington Street (would add approximately 3 miles of additional travel). Again these significant increases in travel distances result in increased travel times as well as emergency response vehicle times and further points to a need for a detailed traffic management plan.

Closure of Washington Street at the jack and bore location would also result in ambulance traffic down Washington Street needing to be rerouted in order to access Winchester Hospital. Review of the roadway network indicates that there is no easy way to re-route it. One option would be to use Montvale Avenue to I-93, to Park St to Marble Street to Forest Street to Highland Avenue

(where the Hospital would be located). This would add a substantial amount of travel time, particularly at rush hour.

Where the jack and bore operations are proposed to occur, no information has been provided relative to clearances from the jacking pit to the edge of the road to determine if there is adequate safety for vehicles to safely pass instruction area. As previously indicated the roadway with for both Washington Street and Cross Street varies from 28 to 33 feet, depending upon location, and the proposed jacking pit is expected to take up a significant portion of this with in the vicinity of the Aberjona River or the MBTA railroad crossing. In particular, under the railroad pass, Cross Street narrows to 23.5 feet.

No information has been provided relative to maintaining access to homes and commercial developments along either Washington Street or Cross Street during construction. In particular, a major health facility, the Cancer Care Center will require access at all times.

Lastly, alternate route has been identified which avoids Cross Street and Washington Street in Winchester. This route would use Green Street in Woburn as a bypass. This route slightly longer than the preferred route, however, there are no river crossings with this route.

CONCLUSION

Washington and Cross Streets serve as local and regional transportation routes, providing east-west and north-south corridors through the Town of Winchester. Washington Street carries approximately 15,000 vehicles per day and Cross Street carries approximately 5,450 vehicles per day. These are substantial volumes for two-lane roadways and any full or partial closures as a result of conduit installation or jack and bore operations associated with the 345kV line construction will cause these vehicles to divert to other streets in the area causing further traffic congestion.

As detailed in our memo, closure of Cross Street at the railroad/Aberjona River crossing for jack and bore operations would add between 2 and 2.8-miles of additional travel for vehicles being detoured. Closure of Washington Street at the Aberjona River for the jack and bore work would add between 2.8 and 3-miles of additional travel, and would cause approximately 10 residential properties in Winchester and Winchester Hospital's Ambulatory Care/Cancer Care at 620 Washington Street to be completely cut off from the rest of Town, with the only access through Woburn. Closure of Washington Street may also require ambulances to use Interstate Route 93 (I-93) to access Winchester Hospital, which could add significant travel time during period of heavy traffic.

A traffic management plan has not been provided for review by Eversource. This is an essential key to maintaining traffic flow during construction for any type of roadway project. However, even with a traffic management plan, there will be significant disruption to travel within the

region, including impacts to public safety response times and disruption of existing ambulance routes to Winchester Hospital.

There are a number of sensitive generators in the area for which access must be maintained, including Winchester Hospital's Ambulatory Care/Cancer Care Center located at 620 Washington Street; the Muraco Elementary School located just south of the preferred route on Washington Street; and various private daycares, preschools, the Acera School, a private multi-sport athletic facility, Town-owned parks and playfields, and various educational, commercial, and industrial uses along the preferred route. No plan has been provided to show how access to these areas will be maintained.

Lastly, alternate routes for the 345kV line should be revisited. With three potential road closures on two key roads in northern Winchester, serious traffic impacts are expected.

If you have any questions or we can be of further assistance, please call.

Sincerely,

BAYSIDE ENGINEERING, INC.

Kenneth P. Cram, P.E.
Director, Traffic Engineering

APPENDIX

ROADWAY WIDTHS AND PHOTOS
TRAFFIC VOLUME COUNT DATA

BAYSIDE ENGINEERING

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ROADWAY WIDTHS AND PHOTOS

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Location	Width of Road	Photo #	Orientation	Street	Approximate Position
a	30.5'	523	Looking East	Cross St.	85' West of Wendell St.
		524	Looking West	Cross St.	85' West of Wendell St.
b	27.75'	525	Looking East	Cross St.	65' East of Wendell St.
		526	Looking West	Cross St.	65' East of Wendell St.
c	30.5'	527	Looking East	Cross St.	150' West of Cleveland St.
		528	Looking West	Cross St.	150' West of Cleveland St.
d	29.5'	529	Looking East	Cross St.	130' East of Cleveland St.
		530	Looking West	Cross St.	130' East of Cleveland St.
e	31.5'	531	Looking East	Cross St.	95' East of George Rd.
		532	Looking West	Cross St.	95' East of George Rd.
f	31'	533	Looking East	Cross St.	280' West of Loring Ave.
		535	Looking West	Cross St.	280' West of Loring Ave.
g	32'	536	Looking East	Cross St.	120' West of Loring Ave.
		537	Looking West	Cross St.	120' West of Loring Ave.
h	30.5'	539	Looking East	Cross St.	125' East of Loring Ave.
		540	Looking West	Cross St.	125' East of Loring Ave.
I	32.75'	541	Looking East	Cross St.	185' West of Verplast Ave.
		542	Looking West	Cross St.	185' West of Verplast Ave.
J	30'	543	Looking East	Cross St.	165' East of Verplast Ave.
		544	Looking West	Cross St.	165' East of Verplast Ave.
k	31'	545	Looking East	Cross St.	55' West of Pine Grove Park
		546	Looking West	Cross St.	55' West of Pine Grove Park
L	31'	547	Looking East	Cross St.	75' East of Adams Rd.
		548	Looking West	Cross St.	75' East of Adams Rd.
m	31'	549	Looking East	Cross St.	160' West of Lowell Ave.
		550	Looking West	Cross St.	160' West of Lowell Ave.
n	32.5'	551	Looking East	Cross St.	90' East of Holton St.
		552	Looking West	Cross St.	90' East of Holton St.
o	34'	553	Looking East	Cross St.	20' West of MBTA Bridge
		554	Looking West	Cross St.	20' West of MBTA Bridge
p (MBTA)	23.5'	555	Looking East	Cross St.	Middle of MBTA Bridge
		556	Looking East	Cross St.	Middle of MBTA Bridge
		557	Looking East	Cross St.	Middle of MBTA Bridge
		558	Looking West	Cross St.	Middle of MBTA Bridge
		559	Looking West	Cross St.	Middle of MBTA Bridge
		560	Looking West	Cross St.	Middle of MBTA Bridge
		561	Looking South	Cross St.	Middle of MBTA Bridge
		562	Looking North	Cross St.	Middle of MBTA Bridge
Q	30'	563	Looking East	Cross St.	115' East of MBTA Bridge
		564	Looking West	Cross St.	115' East of MBTA Bridge
River 1	34.75'	566	Looking North	Cross St.	115' West of Forest St.
		569	Looking South	Cross St.	115' West of Forest St.
		570	Looking East	Cross St.	115' West of Forest St.
		571	Looking East	Cross St.	115' West of Forest St.
		572	Looking East	Cross St.	115' West of Forest St.
		574	Looking West	Cross St.	115' West of Forest St.
		575	Looking West	Cross St.	115' West of Forest St.
		576	Looking West	Cross St.	115' West of Forest St.

Location	Width of Road	Photo #	Orientation	Street	Approximate Position
R	39.75'	577	Looking East	Cross St.	85' West of Forest St.
		578	Looking West	Cross St.	85' West of Forest St.
S	33.75'	579	Looking East	Cross St.	90' East of Forest St.
		580	Looking West	Cross St.	90' East of Forest St.
T	31.75'	581	Looking East	Cross St.	50' West of Cardinal St.
		582	Looking West	Cross St.	50' West of Cardinal St.
U	31'	583	Looking East	Cross St.	70' East of Cardinal St.
		584	Looking West	Cross St.	70' East of Cardinal St.
V	30.5'	585	Looking East	Cross St.	40' East of Marion St.
		587	Looking West	Cross St.	40' East of Marion St.
W	33.5'	588	Looking East	Cross St.	100' West of Washington St.
		589	Looking West	Cross St.	100' West of Washington St.
X	32.25'	590	Looking North	Washington St.	20' North of Cross St.
		591	Looking South	Washington St.	20' North of Cross St.
Y	30'	592	Looking South	Washington St.	55' North of Marion St.
		593	Looking North	Washington St.	55' North of Marion St.
Z	28'	595	Looking North	Washington St.	40' South of Orient St.
		596	Looking South	Washington St.	40' South of Orient St.
AA	28'	597	Looking North	Washington St.	50' South of Brookside Ave.
		598	Looking South	Washington St.	50' South of Brookside Ave.
BB	28'	599	Looking North	Washington St.	160' North of Brookside Ave.
		600	Looking South	Washington St.	160' North of Brookside Ave.
CC	28'	602	Looking North	Washington St.	70' South of Sunset Rd.
		605	Looking South	Washington St.	70' South of Sunset Rd.
DD	30'	607	Looking North	Washington St.	70' North of Sunset Rd.
		611	Looking South	Washington St.	70' North of Sunset Rd.
River 2	30'	612	Looking North	Washington St.	115' North of Sunset Rd.
		613	Looking North	Washington St.	115' North of Sunset Rd.
		614	Looking North	Washington St.	115' North of Sunset Rd.
		615	Looking West	Washington St.	115' North of Sunset Rd.
		616	Looking South	Washington St.	115' North of Sunset Rd.
		617	Looking South	Washington St.	115' North of Sunset Rd.
		620	Looking South	Washington St.	115' North of Sunset Rd.
		621	Looking East	Washington St.	115' North of Sunset Rd.
EE	28'	622	Looking North	Washington St.	190' North of Sunset Rd.
		624	Looking South	Washington St.	190' North of Sunset Rd.
FF	28'	625	Looking North	Washington St.	355' North of Sunset Rd.
		626	Looking South	Washington St.	355' North of Sunset Rd.
GG	28'	627	Looking North	Washington St.	690 ft South of D St.
		628	Looking South	Washington St.	690 ft South of D St.
HH	28'	629	Looking North	Washington St.	315' South of D St.
		630	Looking South	Washington St.	315' South of D St.
II	30'	631	Looking North	Washington St.	35' South of D St.
		632	Looking South	Washington St.	35' South of D St.
JJ	30'	633	Looking North	Washington St.	65' North of D St.
		634	Looking South	Washington St.	65' North of D St.

Photo 523: Location a - Cross St. looking east. 85' west of Wendell St.

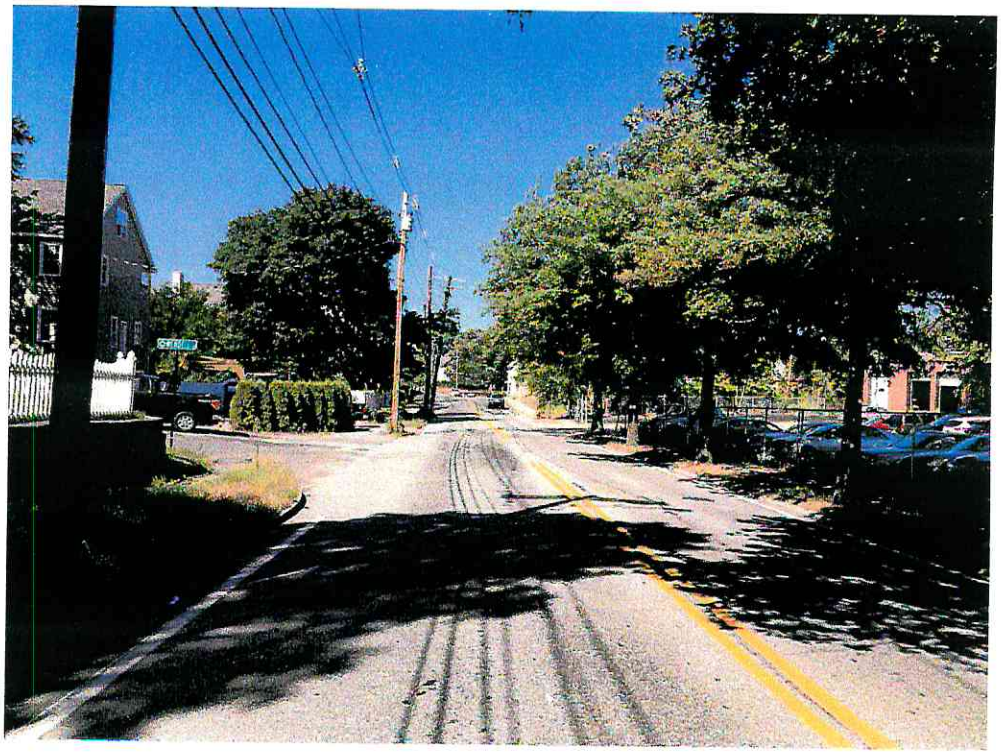

Photo 524: Location a - Cross St. looking west. 85' west of Wendell St.

Photo 525: Location b – Cross St. looking east. 65' east of Wendell St.

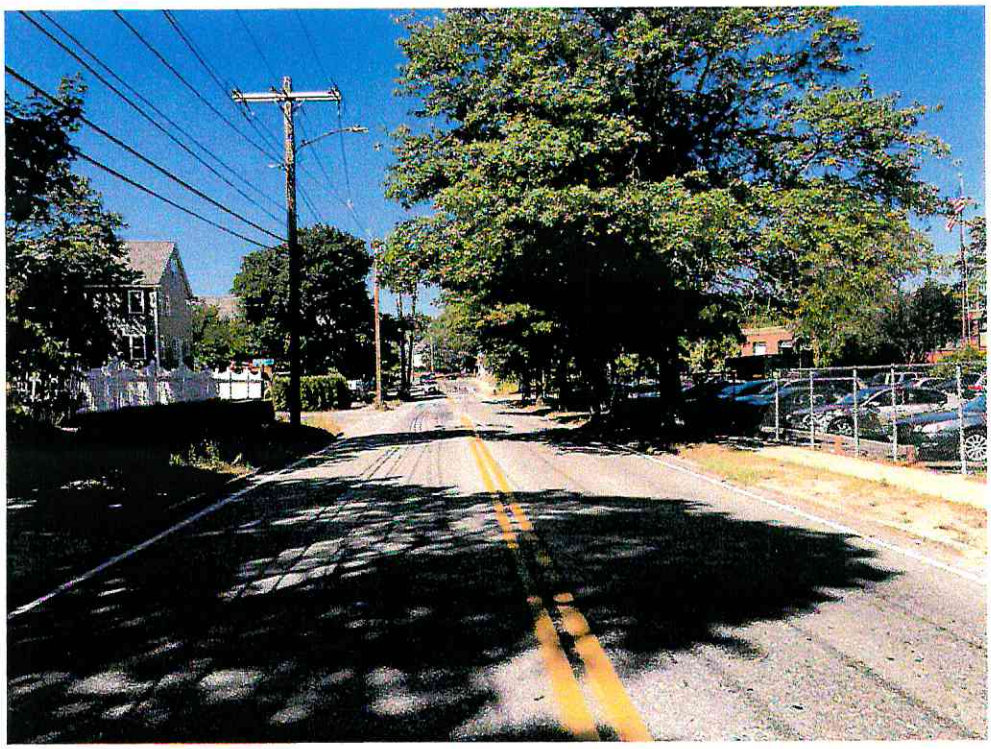

Photo 526: Location b – Cross St. looking west. 65' east of Wendell St.

Photo 527: Location c – Cross St. looking east. 150' west of Cleveland St.

Photo 528: Location c – Cross St. looking west. 150' west of Cleveland St.

Photo 529. Location d – Cross St. looking east. 130' east of Cleveland St.

Photo 530: Location d – Cross St. looking west. 130' east of Cleveland St.

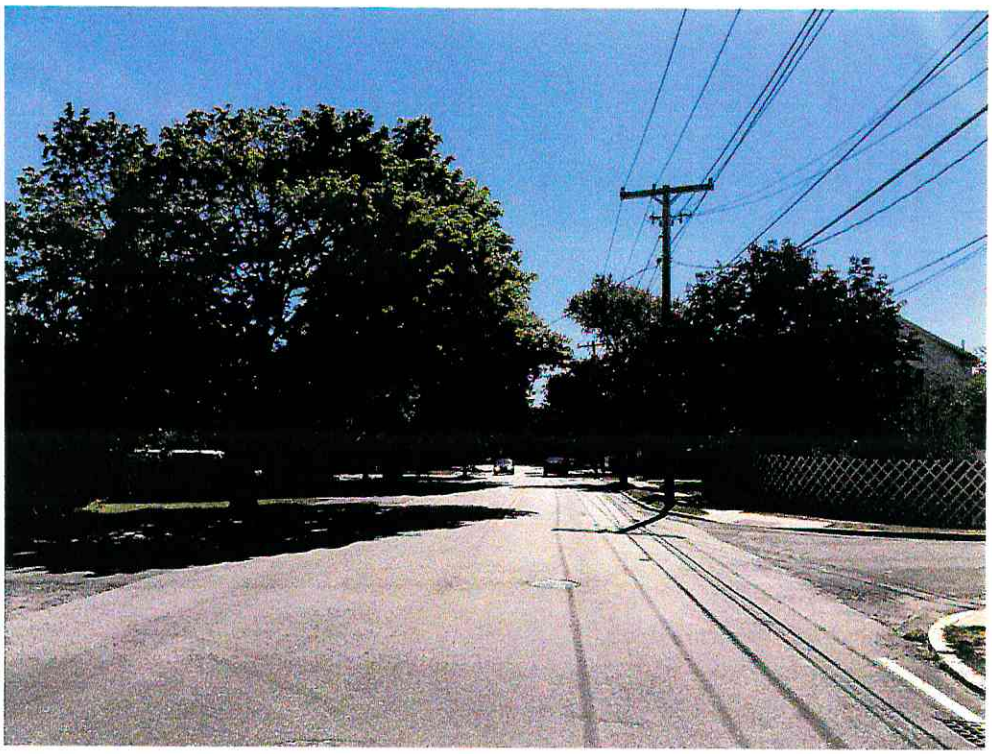

Photo 531: Location e – Cross St. looking east. 95' east of George St.

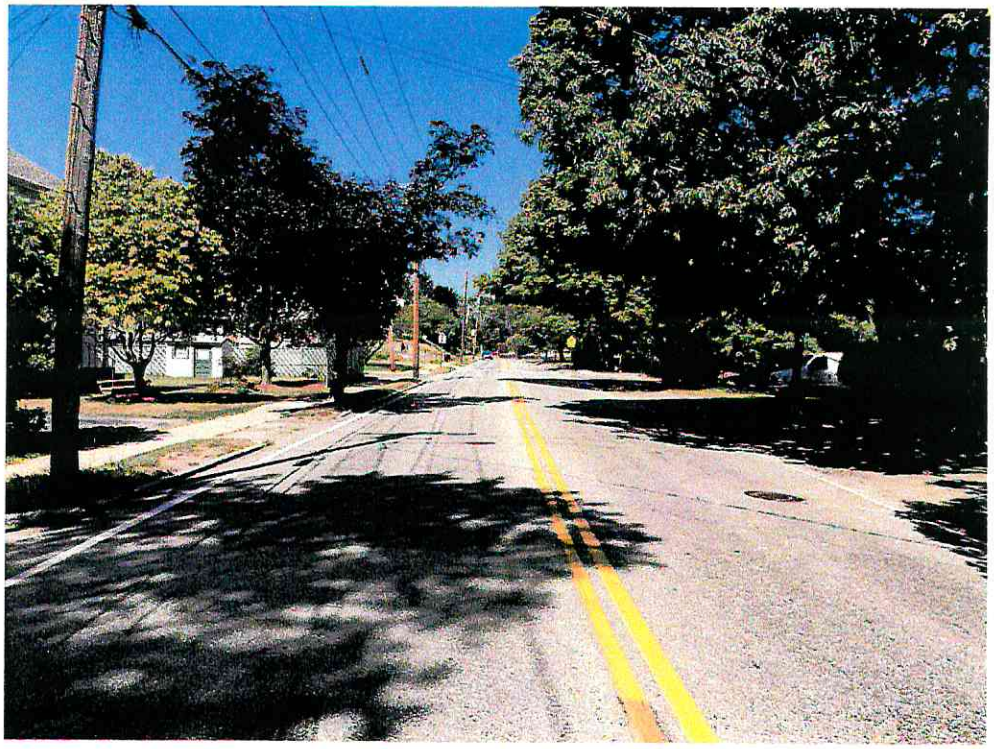

Photo 532: Location e – Cross St. looking west. 95' east of George St.

Photo 539: Location h – Cross St. looking east. 125' east of Loring Ave.

Photo 540: Location h – Cross St. looking west. 125' east of Loring Ave.

Photo 541: Location I – Cross St. looking east. 185' west of Verplast Ave.

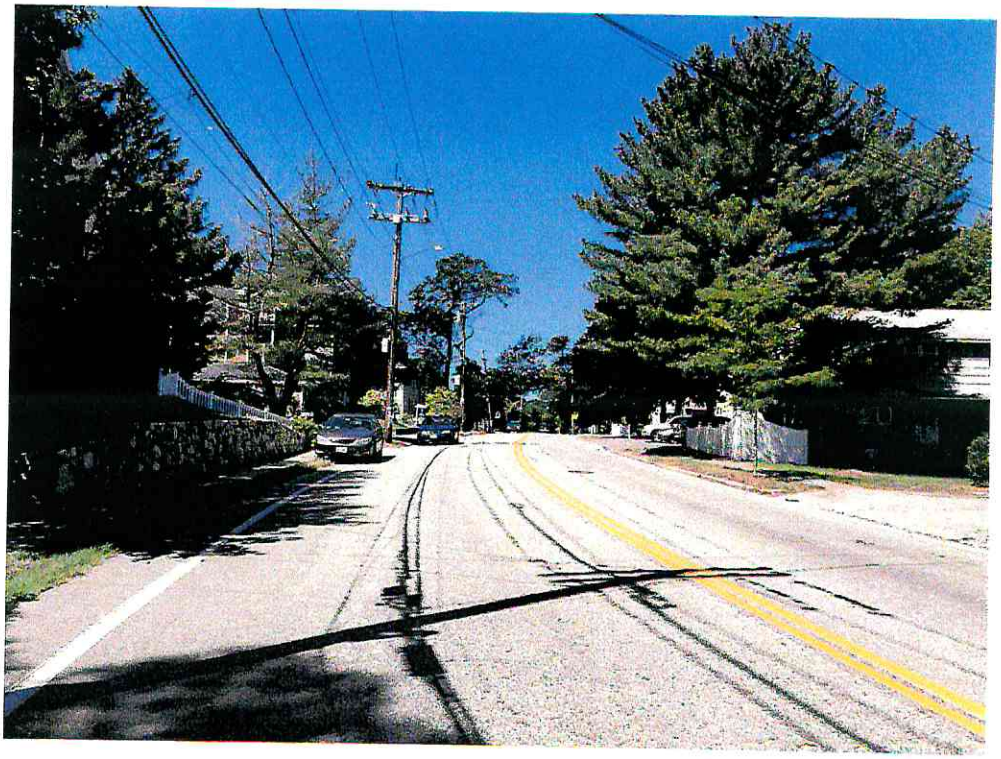

Photo 542: Location I – Cross St. looking west. 185' west of Verplast Ave.

Photo 547: Location L – Cross St. looking east. 75' east of Adams Rd.

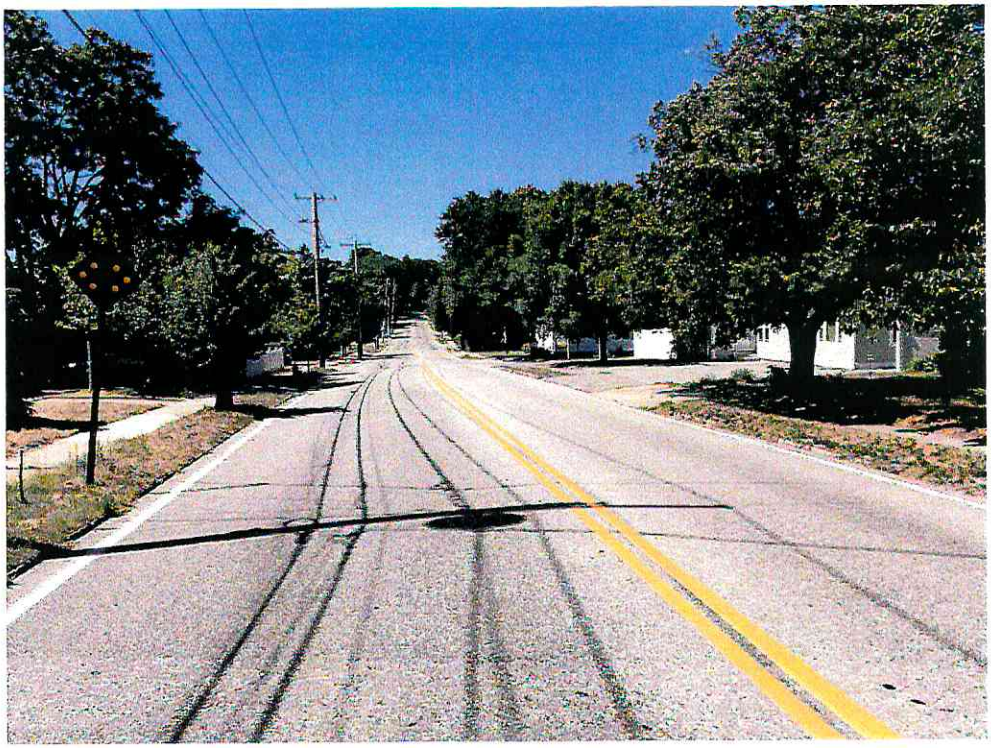

Photo 548: Location L – Cross St. looking west. 75' east of Adams Rd.

Photo 549: Location m – Cross St. looking east. 160' west of Lowell Ave.

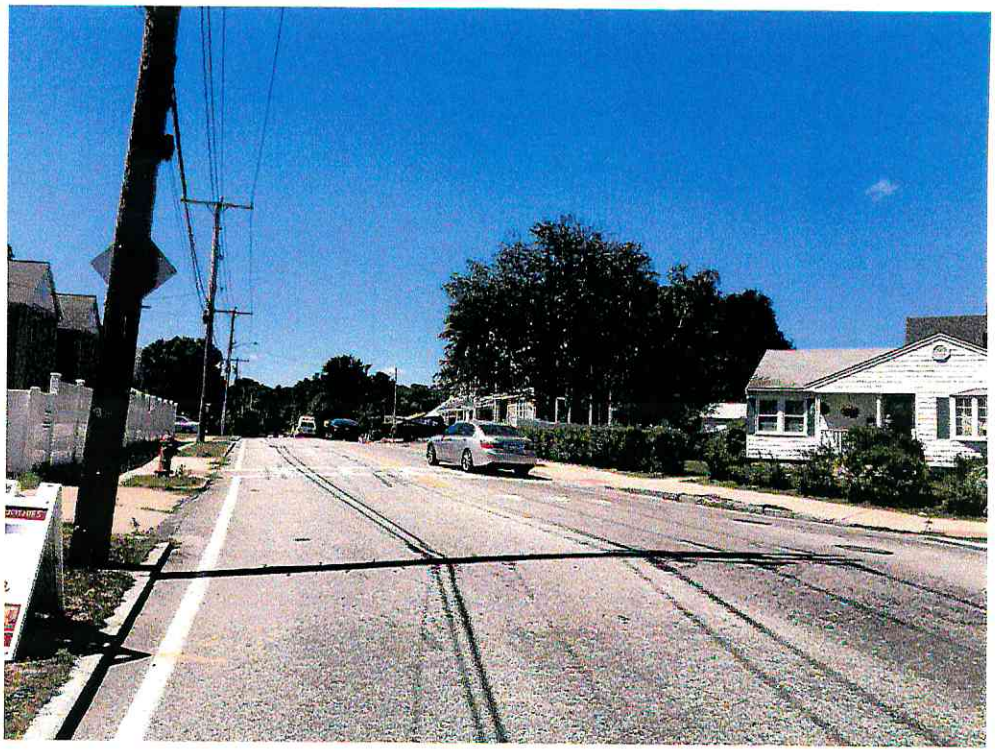

Photo 550: Location m – Cross St. looking west. 160' west of Lowell Ave.

Photo 551: Location n – Cross St. looking east. 90' east of Holton St.

Photo 552: Location n – Cross St. looking west. 90' east of Holton St.

Photo 553: Location o – Cross St. looking east. 20' west of MBTA Bridge.

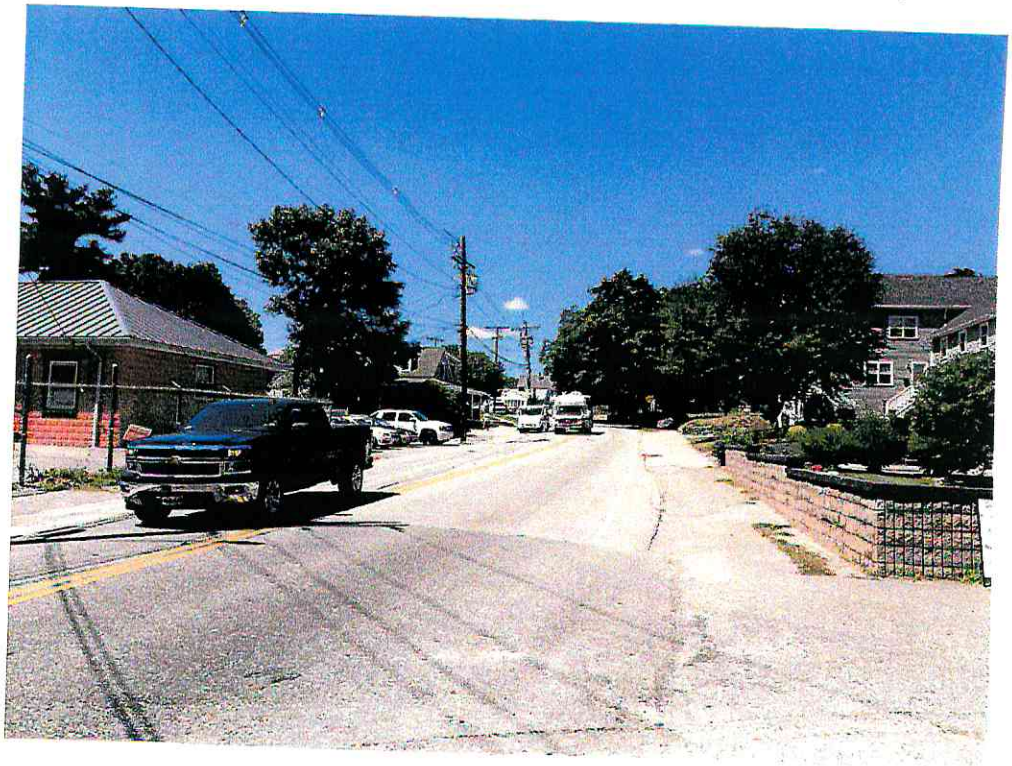

Photo 554: Location o – Cross St. looking west. 20' west of MBTA Bridge.

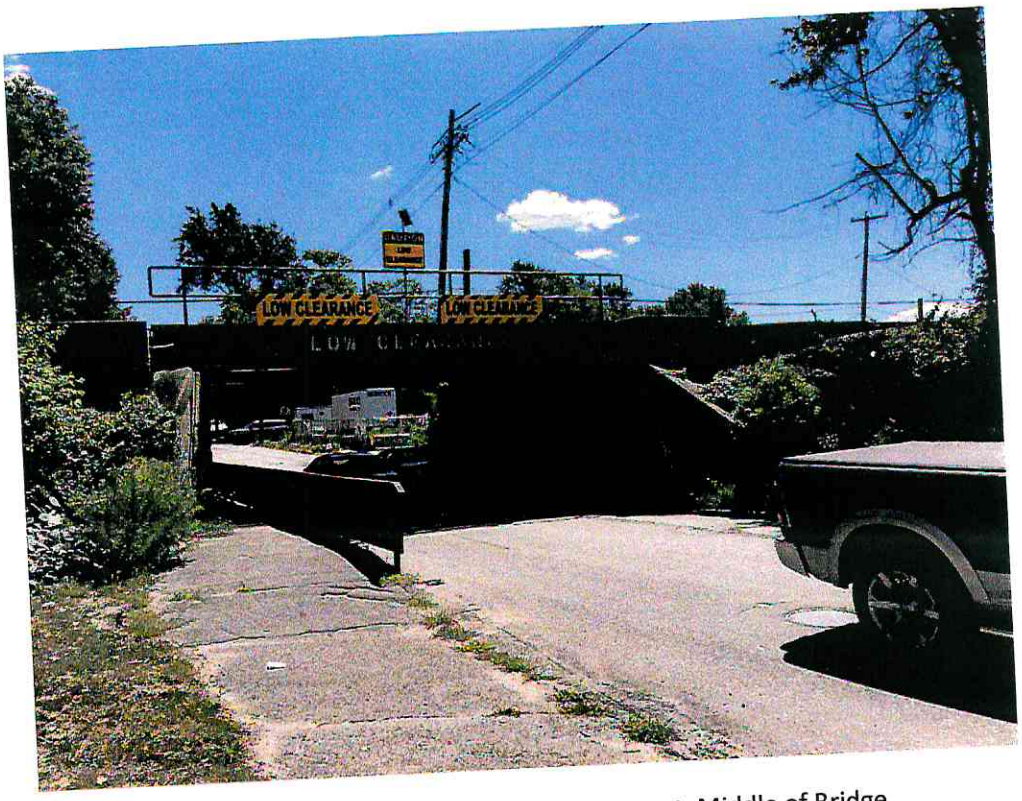

Photo 555: Location p – Cross St. looking east. Middle of Bridge.

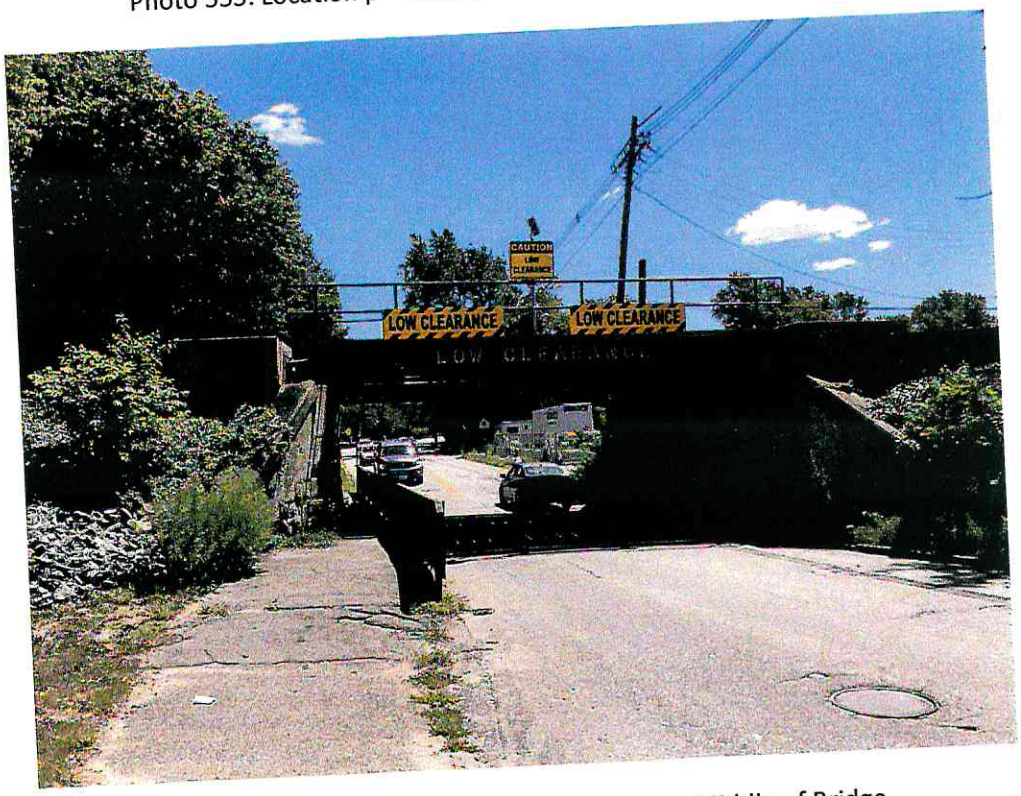

Photo 556: Location p – Cross St. looking east. Middle of Bridge.

Photo 557: Location p – Cross St. looking east. Middle of Bridge.

Photo 558: Location p – Cross St. looking west. Middle of Bridge.

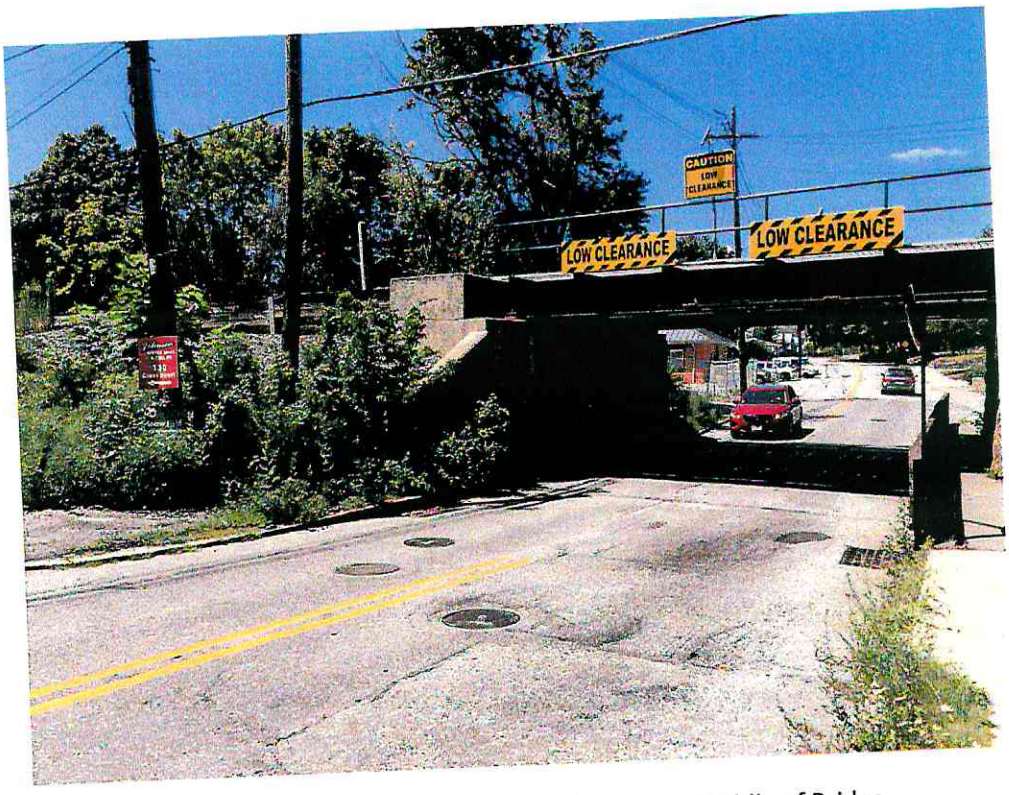

Photo 559: Location p – Cross St. looking west. Middle of Bridge.

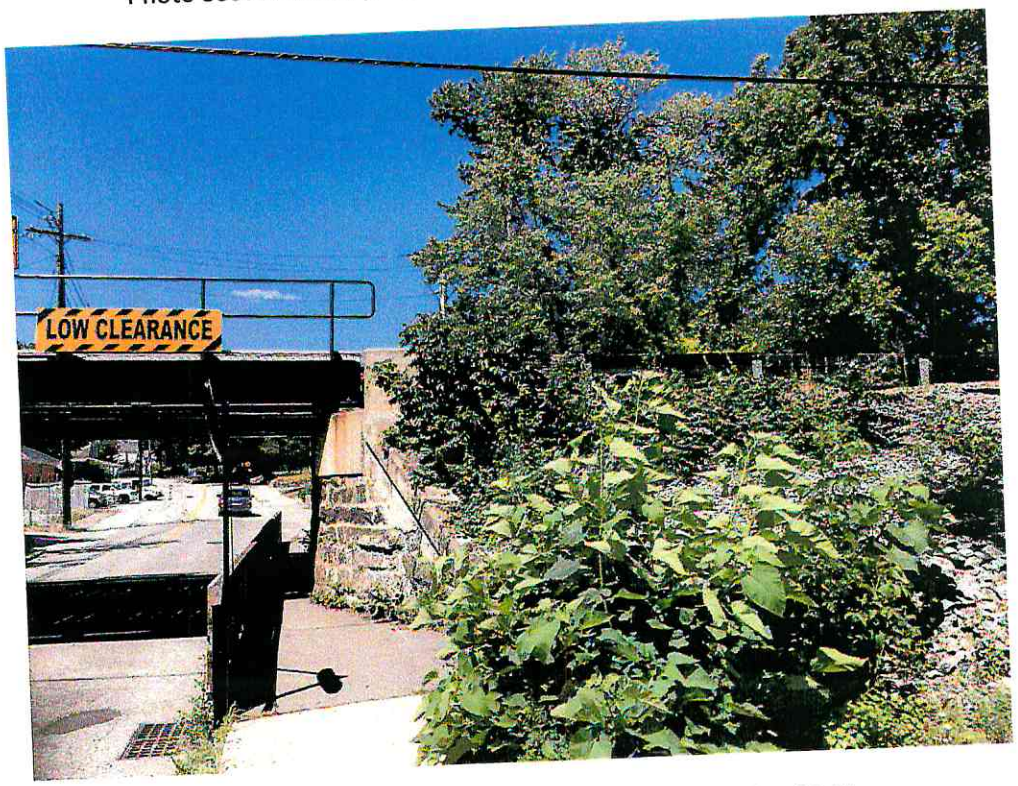

Photo 560: Location p – Cross St. looking west. Middle of Bridge.

Photo 561: Location p – Cross St. looking north. Middle of Bridge.

Photo 562: Location p – Cross St. looking north. Middle of Bridge.

Photo 563: Location Q – Cross St. looking east. 115' east of MBTA Bridge.

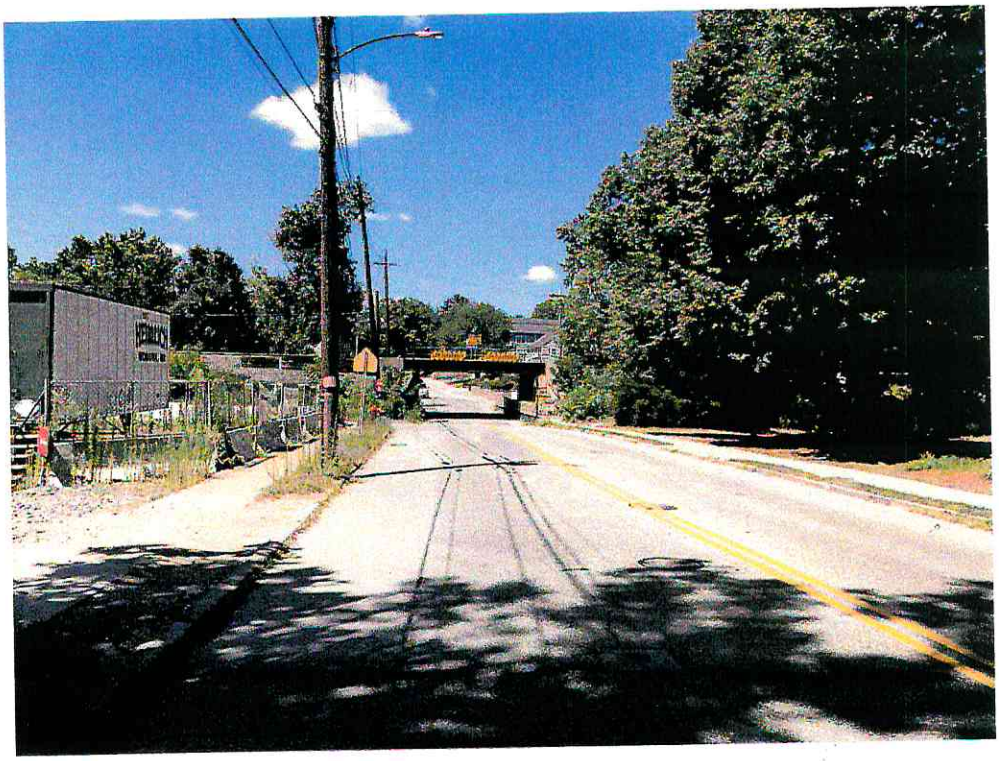

Photo 564: Location Q – Cross St. looking west. 115' east of MBTA Bridge.

Photo 566: Location "River 1" – Cross St. looking north. 115' west of Forest St.

Photo 569: Location "River 1" – Cross St. looking south. 115' west of Forest St.

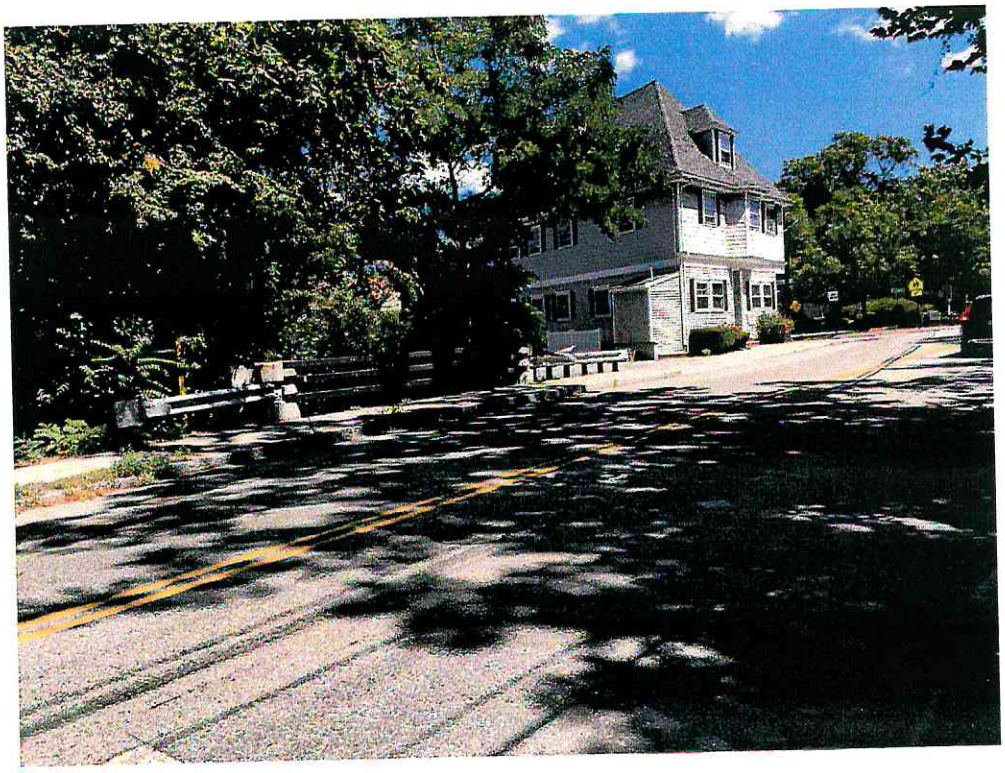

Photo 570: Location "River 1" – Cross St. looking east. 115' west of Forest St.

Photo 571: Location "River 1" – Cross St. looking east. 115' west of Forest St.