c. Background Noise Measurements

Comments were received indicating that the noise levels collected for the Fore River Bridge Project are too high and should be remeasured. The basis for this claim is a comparison of peak-hour Leq noise levels based on 24-hour measurements in 2010 for the project, with late night levels measured for the Fore River Station power plant from 1:00 to 3:00 AM in 2004 and 2006 as provided by one commenter. Late night noise levels are typically lower than the peak-hour period due to the lack of traffic during the nighttime period, and therefore the comparison between the 2010 noise levels and those from 2004 and 2006 is not an equivalent comparison.

Noise measurements for the Fore River Bridge Project were conducted over a continuous 24-hour period at five residences representative of their respective neighborhoods. The noise measurements were conducted during "typical" ambient conditions including weekday non-holiday period, dry low wind conditions with full cooperation from the residents where the monitoring equipment was set-up. The sound level meters were stored in a weather-tight case, which was connected with a remote cable to a microphone attached atop a tripod. A windscreen was used to eliminate any "self-noise" from wind across the microphone protective grill. All measurements were conducted according to the American National Standards Institute (ANSI) Standard S1.13-2005, "Measurement of Sound Pressure Levels in Air". This included calibrating the sound level meter before and after each measurement to capture any "drift" in the recorded levels. All noise levels were reported in A-weighted decibels (dBA), which best approximate the sensitivity of human hearing.

The baseline noise levels measured in the community are reflective of the current environmental conditions, which include a combination of sources such as roadway traffic, marine traffic and industrial activity (the Fore River Station power plant for example) in the area. At Site M5 at 50 Monatiquot Street, for example, average baseline noise levels (Leq) ranged from 49-52 dBA during the quietest period of the nighttime between 12:00-5:00 am. Similarly, the background noise levels (represented by the L90 metric, or the level exceeded 90 percent of the time) ranged from 49-51 dBA during this same period, less than 1-2 dBA lower than the Leq level. During the loudest period of the daytime when there is a higher influence from roadway traffic and other industrial activities in the area, the average Leq is 54-55 dBA while the average L90 is 52 dBA. Therefore, because the Leq and the L90 are relatively equivalent to one another during different periods of the daytime and nighttime, this is a strong indication that this receptor is sited in a remote location that is only marginally affected by roadway traffic. The residence at Site M5 is approximately 1,650 feet (or over one-quarter mile) from the Fore River Bridge.

The noise levels referred to by the commenter include ambient noise levels collected in the same receptor area 5 to 7 years ago as part of post-construction monitoring to determine if the Fore River Station power plant was in compliance with its nighttime noise limits. The older noise levels referred to by the commenter were measured on Monatiquot Street during the nighttime period from 1:00 to 3:00 AM (2004 to 2006) and ranged from 44 to 49 dBA. However, these older levels are only slightly lower (3-5 dBA) than what was measured over a 24-hour period in 2010, and would be considered acoustically equivalent given the different time periods. An industry-accepted standard is that a 3 dBA difference is barely recognizable by the human ear.

For the noise monitoring conducted for the Fore River Project in 2010, no unique or atypical events were recorded during the measurement period such as emergency vehicle, landscaper activity (e.g. lawn mowing) or aircraft over flights that would have skewed the measured noise levels. The monitoring equipment was set-up to collect noise levels 10 times per second and average these fluctuating levels over six 10-minute intervals for each hour of the day. This approach better identifies peak events that may be eliminated because they are not part of the typical background. The average baseline noise level for different periods of the daytime (7:00 am to 6:00 pm), evening (6:00 pm to 10:00 pm) and nighttime (10:00 pm to 7:00 am) were identified from the measurement data.

Therefore, contrary to the comment received that the older noise levels from 5-7 years ago are more relevant, we can reasonably conclude that the ambient noise levels measured in the community for this project are representative and have increased slightly due to traffic growth, increased industrial activity or other external factors.

d. Noise Criteria: FHWA vs. MassDOT

A comment was received indicating that the criteria used to assess the operational and construction impacts are inadequate and are cause for public health concerns. Contrary to the commenter's claims, all of the noise criteria developed by national experts for the FHWA for operational impacts were developed based on public health concerns. These criteria represent many years of research and practical experience that correlate exposure of transportation noise to potential health effects. As a transportation project funded by the FHWA and built by MassDOT, the federal and state noise guidelines were utilized to assess impacts as required.

The Federal Highway Administration (FHWA) developed new traffic noise guidelines in July 2010 [*Highway Traffic Noise: Analysis and Abatement Guidance*, FHWA-HEP-10-025]. Each of the 50 State Departments of Transportation (DOT) is required to update their noise policies to comply with the new federal policy within one year. The new FHWA noise guidelines do not specify construction noise limits for the States to adopt.

The new MassDOT *Type I and Type II Noise Abatement Policies and Procedures* for highway traffic noise based on the new FHWA noise policy becomes effective on July 13, 2011 and are the legal authority with which all traffic noise studies conducted in the Commonwealth of Massachusetts must comply. The noise criteria used to evaluate long-term traffic impacts are called the Noise Abatement Criteria (NAC), which are the same as the federal NAC. Similar to the FHWA noise guidelines, the new MassDOT policy does not address construction noise limits. The traffic noise study (*Noise Technical Report*, September 2010) for the Fore River Bridge Replacement project was prepared in accordance with the July 2010 FHWA noise guidelines and is consistent with the new MassDOT noise policy, which is based on the July 2010 FHWA guidelines.

e. Traffic Noise Assessment

A traffic noise assessment (*Noise Technical Report*, September 2010) was prepared for the EA to document the potential impacts from the bridge project at nearby residences. The noise assessment in the EA was prepared in accordance with the Massachusetts Department of Transportation's (MassDOT) noise abatement policy [*Type I Noise Barrier Guidelines*, April 1, 1996, in effect at the time] and the Federal Highway Administration's (FHWA) *Highway Traffic Noise: Analysis and Abatement Guidance* [FHWA-HEP-10-025, July 2010]. The Fore River Bridge Replacement traffic noise analysis was conducted in accordance with the new FHWA policy as well as guidance provided by MassDOT. As a result of this analysis, no noise impacts were predicted to result from traffic on the new bridge itself.

No impacts are predicted at any of the non-residential or commercial receptors in the project study area due to future traffic along Route 3A. However, noise impacts were measured at residences adjacent to Route 3A due to existing traffic (future impacts are also predicted under the Build Alternative). Although these impacts are due to the traffic along Route 3A rather than the bridge itself, mitigation measures were evaluated in accordance with the FHWA and MassDOT's noise policies. However, due to the need for driveway access at these residences, none of the mitigation measures would be feasible as openings in noise barriers would eliminate any acoustical benefit they would provide. As a result, noise barriers would not be a viable option to eliminate existing traffic noise impacts along Route 3A.

The new MassDOT *Type I and Type II Noise Abatement Policies and Procedures* further refines the activity categories for which NAC are defined. Whereas residential land uses and parklands were included in Activity Category B under the prior MassDOT policy, residential land uses are now in Activity Category B and parklands are now in Activity Category C under the 2011 MassDOT policy, although both still have the same NAC of 67 decibels

(dBA). Therefore an additional traffic noise assessment was conducted for this Clarification of Issues document to evaluate the potential for impact at the public access areas located directly under the Fore River Bridge that are used for passive recreation. The traffic noise assessment utilized the same prediction methodology that was utilized for the other receptor locations described in the Environmental Assessment, including the FHWA Traffic Noise Model (TNM Version 2.5). The future noise levels were also evaluated using the new MassDOT *Type I and Type II Noise Abatement Policies and Procedures* (effective July 13, 2011).

The traffic noise levels are predicted to range from 59 dBA under the bridge to 64 dBA at the outer edge of the public access area approximately 75 feet from the permanent replacement bridge. The lower noise levels under the bridge reflect the shielding provided by the solid roadway deck on the new bridge. (The temporary bridge has a steel plate deck that generates considerable noise when vehicles pass over the plate joints.) These levels are all well below the MassDOT noise abatement criterion (NAC) of 67 dBA for Activity Category C receptors. Therefore, no exceedances of the MassDOT NAC are predicted at the public areas under the future bridge due to traffic operations. There are no other existing Activity Category C receptors, such as cemeteries, libraries, hospitals and medical facilities, and places of worship, or undeveloped lands permitted for these uses, in proximity to the bridge.

As with Activity Category C, there are no existing Activity Category D uses, which include those Activity Category C uses that have interior space (for example libraries, but not outdoor parks), in proximity to the bridge. The NAC for Activity Category D is 52 dBA for interior noise levels. Activity Category E includes hotels, motels, offices, restaurants/bars and other developed lands, properties or activities not included in Categories A-D or F, as well as undeveloped lands that are permitted for these purposes. The NAC for Activity Level E is 72 dBA. No impacts are predicted at any of the Activity Level E (commercial) receptors in the project study area due to future traffic along Route 3A based on the noise analysis conducted for the EA. There are Activity Category F uses, which include industrial, manufacturing, and utilities, in proximity to the bridge; however, there is no NAC associated with Activity Category F. There are also undeveloped lands that are not currently permitted for any activity (Activity Category G) in proximity to the bridge, such as portions of the Fore River Shipyard and the Fore River Station parcels. There is no NAC for Activity Category G. As these parcels are currently zoned for industrial use, any potential development on them would fall into Activity Category F.

f. Construction Period Noise Mitigation

In addition to traffic noise impacts, which are considered long-term or permanent impacts, a construction noise analysis was also conducted for the EA using the FHWA *Roadway Construction Noise Model* (RCNM) to estimate the potential for short-term or temporary noise impacts. Unlike traffic noise, which can be predicted fairly accurately based on future traffic projections, construction noise is less easily defined because the actual equipment to be used to construct the new bridge will be determined by the contractor. Therefore, the potential for noise impacts from construction activities and equipment types was estimated based on worst-case modeling assumptions and was presented in the Noise Technical Report (Appendix D of the EA). Two scenarios were tested. Based on the results of the construction noise modeling, construction noise levels for the first scenario – construction of the bridge approach structures and flanking spans and removal of concrete – is not predicted to exceed construction noise limits. However, the construction noise levels for the second scenario – install sheeting for construction of the dolphins – were predicted to approach or exceed the proposed impact limits if construction occurred during the evening or nighttime periods. The predicted exceedances were based on an assumption that an impact pile driver would be used to install the sheeting for the dolphin cofferdam structures.

Although all construction activities would be temporary, MassDOT recognizes that noise control mitigation measures will be required. One method of noise control is the use of alternate construction techniques. MassDOT is recommending the use of drilled shafts instead of driven piles for the bridge pier foundations, which avoids the use of impact drivers for that construction activity. In addition, MassDOT is recommending that the existing retaining walls for the approach structures be retrofitted to minimize the need for concrete demolition and the noise associated with that activity.

MassDOT will also require the selected Design-Build contractor to comply with the Construction Noise Control specification. A copy of the draft specification is provided as Attachment A. The specification contains a number of provisions to mitigate noise, including the following:

- The contractor will be required to employ an acoustical engineer and develop a Noise Control Plan that defines what specific measures the contractor will take to comply with the mitigation required under the construction noise control specification.

- The contractor will be required to utilize construction equipment fitted with exhaust systems and mufflers that have the lowest associated noise whenever those features are available. In addition, the contractor will be required to utilize additional best mitigation methods when reasonable, which, depending on the approach the contractor selects to build the new bridge, may include but not be limited to scheduling of the loudest equipment for the least sensitive period of the day and use of equipment enclosures. Further, the contractor will be required to eliminate nuisance noise where reasonable and feasible, as determined by MassDOT.

- The contractor will be required to comply with the construction noise limits for the daytime, evening and nighttime hours, except where noise limit exceedances occur when utilizing mitigation in accordance with the Draft Construction Noise Control specification, as described below.

<u>Construction Period Noise Limits</u>

The new MassDOT noise policy encourages a “common-sense approach” to identify construction mitigation measures, but neither Federal guidelines nor MassDOT policy mandates absolute construction noise limits. Local noise ordinances were reviewed for the EA, and it was found that the City of Quincy allows construction during the daytime from 7:00 AM and 6:00 PM, but does not provide any absolute limits on construction noise. The Town of Weymouth adopted the Massachusetts Department of Environmental Projection (DEP) criteria (310 CMR 7.10) which sets noise limits for general community noise based on a threshold equal to 10 decibels above the existing background level as measured. The Weymouth noise regulations do not provide any specific guidance on construction activities.

The DEP noise criteria apply to “construction and demolition equipment, which characteristically emit sounds but which may be fitted and accommodated with equipment such as enclosures to suppress sound or may be operated in a manner so as to suppress sound…” 310 CMR 7.10: U Noise. In accordance with the DEP noise regulation, the impact thresholds for the project were established based on the existing background noise level. The construction noise impact criteria presented in Table 5.5-5 of the EA and restated in Table 6-1 herein are based on an allowable increase of approximately 10 decibels above the existing background level for each of the different areas in close proximity to the project as determined at the monitoring locations.

Subsequent to the publication of the EA, FHWA requested that MassDOT review the Central Artery/Third Harbor Tunnel Project (CA/T) noise limits that were used to control noise during construction of that large, complex project for use on the Fore River Bridge project. Table 6-1 provides a comparison of the noise limits proposed in the EA for the Fore River Project with those used for the CA/T construction, and indicates that the noise limits proposed for both projects were in a similar range. However, the EA noise criteria did not distinguish between “impact” and “non-impact” equipment, while the CA/T project did. Examples of “impact equipment” include jack hammers, hoe rams, impact pile drivers, etc. Based upon the comparative review of the EA and CA/T noise limits, MassDOT revised the Fore River construction noise limits as presented in Table 6-2 and included in the Draft Construction Noise Control specification (see Attachment A). The final selected construction noise criteria for the overall project were consolidated into one

set of thresholds with which the selected contractor will be required to comply. A single noise limit is now proposed for each category of use and time period of the day, as a single noise limit will be easier to enforce. In addition, thresholds for impact and non-impact equipment have been included. More specifically, the Leq thresholds for non-impact equipment follows the CA/T methodology, the Lmax thresholds for non-impact equipment are taken from Table 5.5-5 of the EA, and the Lmax thresholds for impact equipment are taken from the CA/T project.

Table 6-1: Comparison of the Construction Noise Limits for the CA/T and the Fore River Bridge Project EA (Table 5.5-5) (in dBA)

Period of the Day	Hours	Land-use	Central Artery/Tunnel Project (CA/T)						Fore River Noise EA (Table 5.5-5)		
			Non-Impact Equipment			Impact Equipment					
			Leq	L10	Lmax	Leq	L10	Lmax	Leq	L10	Lmax
Daytime	7:00 am to 6:00 pm	Noise-sensitive	72	75	85	--	--	90	65 - 75	--	75 - 85
		Commercial	77	80	--	--	--	--	--	--	--
		Industrial	82	85	--	--	--	--	--	--	--
Evening	6:00 pm to 10:00 pm	Noise-sensitive	Leq_{BL} + 5 (56 – 68)	$L10_{BL}$ + 5 (58 – 70)	80	Leq_{BL} + 5	$L10_{BL}$ + 5	80	60 - 70	--	70 - 80
Nighttime	10:00 pm to 7:00 am	Noise-sensitive (BL^f < 70 dBA)	Leq_{BL} + 5 (53 – 65)	$L10_{BL}$ + 5 (54 – 67)	80	Leq_{BL} + 5	$L10_{BL}$ + 5	80	55 - 65	--	65 - 75

Notes:

a) BL is the average baseline or background measured in Leq.
b) The L10 noise level can be assumed to be equal to the Leq noise level + 3 dBA for modeling purposes. [Federal Highway Administration's *Highway Traffic Noise: Analysis and Abatement Guidance*, July 2010].
c) All noise limits are measured at any point along the receiver lot line but not closer than 50 feet from any construction equipment.

Table 6-2: Construction Noise Limits for the Fore River Bridge Project (in dBA)

Period of the Day	Hours	Land-use	Non-Impact Equipment		Impact Equipment	
			Leq	Lmax	Leq	Lmax
Daytime	7:00 am to 6:00 pm	Noise-sensitive	70	85	n/a	90
		Commercial	77	--	n/a	--
		Industrial	82	--	n/a	--
Evening	6:00 pm to 10:00 pm	Noise-sensitive	62	80	n/a	80
Nighttime	10:00 pm to 7:00 am	Noise-sensitive (BL < 70 dBA)	60	75	n/a	80

Notes:

a) Noise from impact equipment is exempt from the Leq requirement, however is still subject to a lot-line Lmax limit.
b) All measurements shall be taken at the affected lot-line. In situations where the work site is within 50 feet of a lot-line, the measurement shall be taken from a point along the lot-line such that a distance of 50 feet is maintained between the sound level meter and the construction activity being monitored.
c) Lot-line noise limits shall apply to all points along the receptor's lot-line.
d) Leq noise readings are averaged over 20 minute intervals. Lmax noise readings occur instantaneously.
e) BL is the average baseline or background measured in Leq.
f) Nighttime use of impact equipment is prohibited unless allowed as an exception by MassDOT.

g. Construction Enforcement and Compliance

Comments received from the community indicate a concern regarding enforcement mechanisms to ensure compliance with the project's construction noise control criteria. Compliance with the noise criteria will be the selected contractor's responsibility. Although the contractor's primary responsibility is to build the new bridge, it is also their responsibility to conduct their construction operations within the guidelines and parameters established by MassDOT for this project. As previously described, the project specifications (*Construction Noise Control)* will define the procedures for complying with the project noise limits, and for applying noise control measures to minimize potential impacts.

While it will be the contractor's responsibility to comply with the construction noise control specification, it will be MassDOT's responsibility to ensure that the contractor does indeed conduct their operations in accordance with the specifications, as MassDOT does for all aspects of a contractor's performance and responsibility to adhere to the terms of the contract. Part of this enforcement will be the requirement for the contractor to submit a Noise Control Plan (NCP) for MassDOT review and approval demonstrating that the equipment to be used on site utilizes mitigation as required under the specification. The NCP will be reviewed by MassDOT for compliance with the specifications and will add a contractual obligation on the part of the contractor.

To facilitate the handling of potential noise complaints, the Community Liaisons designated by each of the local communities will serve as the project liaisons during construction. The Community Liaisons will forward any complaints to the contracting team. The objective of the complaint procedure is to ensure that any public and/or agency noise complaint received will be addressed and resolved consistently and expeditiously. In accordance with the project noise control specification section "Complaint Procedure", the Contractor will respond to any noise complaint received from the community or agency by investigating the source of the complaint. If it is determined after inspection by the Contractor that the source of the complaint originates from a project construction activity, then the Contractor will immediately notify the Acoustical Engineer and the Resident Engineer (RE) so that remedial action can be taken. If the construction activity generating the noise exceeds project noise control limits and can be mitigated, and the situation warrants it, the RE has the authority to shut down the construction activity causing the noise until the noise complaint is resolved.

7. Air Quality (Dust Control)

The project design will minimize the generation of dust since the existing concrete retaining walls for the bridge approaches will be retained and retrofitted for the replacement bridge. This reduces the need for concrete demolition and the potential for dust generation associated with that activity. In addition, several "good housekeeping" practices will be implemented during construction as necessary to minimize short-term air quality impacts. These practices are detailed in the project Construction Dust Control specification issued to the Design-Build contractor and include but are not limited to the following measures:

- Use watering trucks to minimize dust;
- Cover dust-producing materials (e.g. dirt) when hauling;
- Stabilize the surface of dirt piles if not removed immediately;
- Site-specific traffic management plans;
- Cover truck contents when transferring materials; and,
- Use of dust suppressants on traveled paths that are not paved.

The Dust Control Specification also requires the contractor to develop and submit a Dust Control Plan (DCP) for the project. The DCP will spell out the mitigation measures that will be implemented to minimize excessive airborne dust emissions from the work zone 24-hours per day, 7 days per week, including nonworking hours, weekends, and holidays. Any modifications to the approved DCP during construction will require MassDOT review and approval prior to implementation. A copy of the draft Construction Dust Control specification is provided as Attachment B.

8. Traffic Volumes

Several comments received on the EA were related to the validity of the traffic volume data collected on the Fore River Bridge in 2009.

The Fore River Bridge connects Weymouth and Quincy locally as well as being the primary vehicular connection between Boston and many South Shore communities. As such, Route 3A is a major urban arterial in the Greater Boston area, with critical commercial, residential, and historic land uses. The temporary 4-lane bridge currently in service also provides a sidewalk on the eastbound side to accommodate pedestrians.

One commenter suggested that the traffic volumes presented in the EA for the Fore River Bridge were too low and did not accurately represent typical weekday operations. In response to these concerns, the design team performed additional traffic counts in March 2011 in cooperation with city and town officials. The Fore River Bridge and other specific locations were counted on March 23 and March 24, 2011.

a. Daily Traffic Counts

The study team used Automatic Traffic Recorders (ATR) to collect continuous traffic counts on Route 3A at two locations; one in Quincy and one in Weymouth. The ATR in Quincy was located on Washington Street (Route 3A) adjacent to the fire station at approximately 615 Washington Street. The ATR in Weymouth was located immediately west of Monatiquot Street near the eastern approach of the Fore River Bridge. Traffic volume information for the Fore River Bridge is generated using data from the ATR located in Weymouth.

The counts were taken over a 48-hour period on Wednesday March 23 and Thursday March 24, 2011. The data from Wednesday and Thursday were averaged to determine the Average Daily Traffic (ADT), Directional Distribution (D), and peak-hour volumes. Table 8-1 summarizes the traffic volume parameters of Route 3A at the two ATR locations.

Table 8-1: 48 Hour Traffic Count Data

Approach	ADT	D	A.M. Peak	P.M. Peak
Route 3A (on Fore River Bridge)	31,158	51.4% WB	2,500	2,687
Route 3A (615 Washington Street, Quincy)	29,579	50.4% WB	2,253	2,572

The integrity of the Fore River Bridge ATR data was verified through a manual directional count taken on Thursday March 24 during the a.m. (6:00 – 9:00 a.m.) and p.m. (3:00 – 6:00 p.m.) peak periods. The manual count closely matches the traffic volumes collected by the Fore River Bridge ATR.

The bridge tenders reported two bridge openings occurred during the March 2011 traffic counts; from 1:00 to 1:18 p.m. on March 23 and from 9:00 to 9:16 a.m. on March 24. The 15 minute traffic count data from 1:00 to 1:15 p.m. on March 23 and from 9:00 to 9:15 a.m. were not included in the traffic analysis.

A comparison between the hourly traffic data collected in 2009 and 2011 for the Fore River Bridge is found in Table 8-2.

Table 8-3 provides a detailed comparison between the weekday peak period traffic volumes taken on the Fore River Bridge in March 2011 and the traffic volume data from April 2009.

Table 8-2: Hourly Traffic Count Summary

Time	Route 3A (on Fore River Bridge) – 2009*			Route 3A (on Fore River Bridge) – 2011		
	Eastbound Volume	Westbound Volume	Total Volume	Eastbound Volume	Westbound Volume	Total Volume
12:00 – 1:00 a.m.	148	57	205	138	60	198
1:00 – 2:00 a.m.	84	45	129	67	40	107
2:00 – 3:00 a.m.	43	29	72	30	29	59
3:00 – 4:00 a.m.	32	42	74	30	50	80
4:00 – 5:00 a.m.	41	125	166	44	141	185
5:00 – 6:00 a.m.	334	614	948	116	640	756
6:00 – 7:00 a.m.	349	1,456	1,805	323	1,526	1,849
7:00 – 8:00 a.m.	580	1,712	2,292	574	1,926	2,500
8:00 – 9:00 a.m.	700	1,563	2,263	685	1,608	2,293
9:00 – 10:00 a.m.	535	1,022	1,557	547	1,118	1,665
10:00 – 11:00 a.m.	659	853	1,512	607	786	1,393
11:00 a.m. – 12:00	707	764	1,471	671	796	1,467
12:00 – 1:00 p.m.	772	797	1,569	723	754	1,477
1:00 – 2:00 p.m.	847	769	1,616	786	760	1,546
2:00 – 3:00 p.m.	985	852	1,837	970	766	1,736
3:00 – 4:00 p.m.	1,199	866	2,065	1,325	877	2,202
4:00 – 5:00 p.m.	1,316	865	2,181	1,574	871	2,445
5:00 – 6:00 p.m.	1,495	955	2,450	1,775	912	2,687
6:00 – 7:00 p.m.	1,434	756	2,190	1,396	717	2,113
7:00 – 8:00 p.m.	1,001	593	1,594	868	510	1,378
8:00 – 9:00 p.m.	738	430	1,168	691	382	1,073
9:00 – 10:00 p.m.	573	357	930	554	351	905
10:00 – 11:00 p.m.	442	280	722	389	249	638
11:00 p.m. – 12:00	276	166	442	263	153	416

* as reported in the EA

Table 8-3: Traffic Data Comparison – Fore River Bridge

Time	2009 Volume		2011 Volume		Change in Volume		% Change In Volume	
Daily (ADT)	**31,249**		**31,158**		**-91**		**-0.3%**	
	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound	Eastbound	Westbound
6:00 a.m. to 7:00 a.m.	349	1,455	323	1,526	-26	+71	-7.4%	+4.9%
7:00 a.m. to 8:00 a.m.	580	1,712	574	1,926	-6	+214	-1.0%	+12.5%
8:00 a.m. to 9:00 a.m.	700	1,563	685	1,608	-15	+45	-2.1%	+2.9%
3:00 p.m. to 4:00 p.m.	1,199	866	1,325	877	+126	+11	+10.5%	+1.3%
4:00 p.m. to 5:00 p.m.	1,316	865	1,574	871	+258	+6	+19.6%	+0.7%
5:00 p.m. to 6:00 p.m.	1,495	955	1,775	912	+280	-43	+18.7%	-4.5%

As the table indicates, the traffic data collected on the Fore River Bridge in March 2011 showed a decrease in daily traffic volumes but an increase in peak period traffic volumes when compared to the traffic data collected in April 2009. After multiple field observations and discussion with city and town officials, there was consensus that the traffic data collected on the Fore River Bridge in March 2011 more accurately represents current typical weekday operations.

b. Weekday Peak-hour Traffic Volumes

Manual turning movement (MTM) counts were taken at two intersections in Weymouth on Thursday March 24, 2011:

- Bridge Street (Route 3A)/Evans Street/Kings Cove Way (Location A); and
- Green Street/North Street/Church Street (Location B).

The study intersections were counted during the weekday a.m. (6:00 – 9:00 a.m.) and p.m. (3:00 – 6:00 p.m.) peak traffic periods. The results of the count confirm that the previously selected morning peak hour of 7:00 – 8:00 a.m. and evening peak hour of 5:00 – 6:00 p.m. are appropriate. Figure 8-1 shows the peak-hour volume at the Green Street/North Street/Church Street intersection and Figure 8-2 shows the peak-hour volume at the Bridge Street (Route 3A)/Evans Street/Kings Cove Way intersection.

The Bridge Street (Route 3A)/Evans Street/Kings Cove Way intersection is approximately 1,000 feet east of the Fore River Bridge and is the first signalized intersection east of the Fore River Bridge. When the MTM counts at this intersection were compared to the Fore River Bridge ATR counts, the peak-hour traffic volumes on Route 3A were found to be approximately equal, as expected.

Figure 8-1: Peak-hour Turning Movements – Green Street/North Street/Church Street

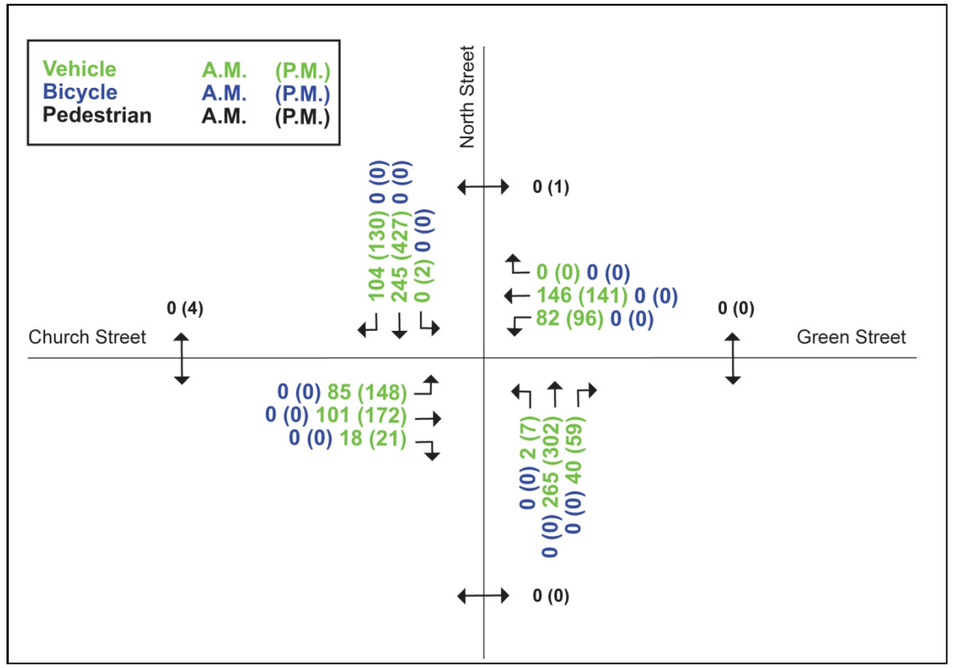
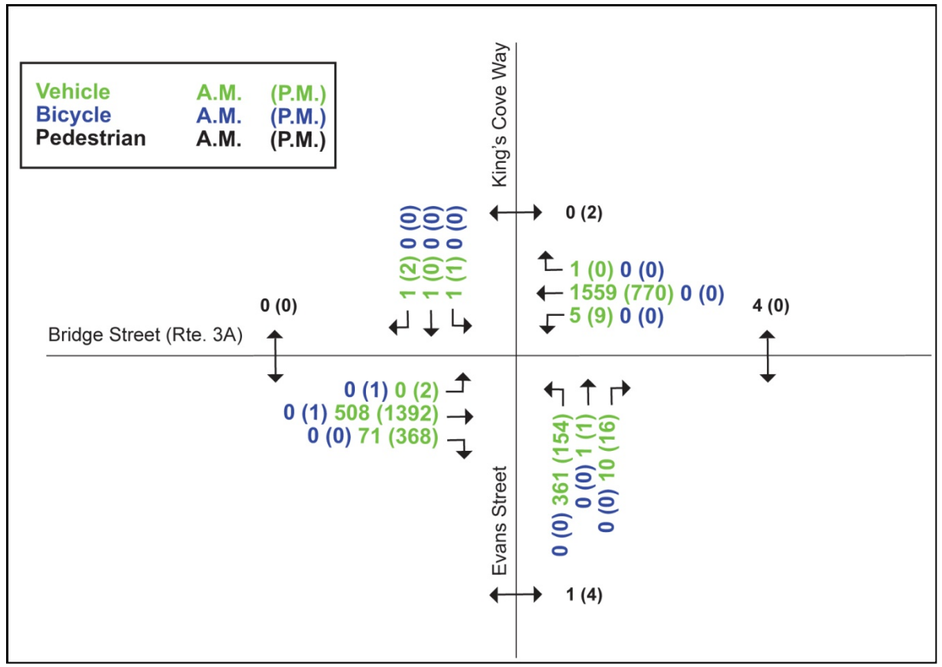


Figure 8-2: Peak-hour Turning Movements – Bridge Street (Route 3A)/Evans Street/Kings Cover Way



c. Capacity Analysis – Fore River Bridge

In the EA, the Fore River Bridge was analyzed to determine the impacts of a capacity reduction during a phase of construction expected to be four months in duration. The original analysis included assumptions about the construction period lane widths and configurations, as these plans had not been developed when this original analysis was performed. It was assumed that 11-foot lanes would be provided in each direction and that a concrete barrier would separate the two directions of travel.

The construction staging has been refined and the Temporary Traffic Control Plans have been further developed since the original analysis was completed. As currently proposed, a 12-foot lane will be provided in each direction with delineator posts used to separate the two directions of travel. The capacity analysis for the Fore River Bridge during construction period lane closures has been updated. The new capacity analysis for the Fore River Bridge was performed using the March 2011 traffic volumes and the construction period roadway conditions proposed in the Temporary Traffic Control Plans.

Additionally, MassDOT has observed 1500 vph in a one lane bridge section on the Neponset River bridge during construction.

Weekday traffic data were analyzed at Fore River Bridge for one lane in each direction, using the thresholds developed for level of service analysis (see Table 8-4) consistent with Highway Capacity Manual (HCM) methodology.

Table 8-4: Traffic Volume Thresholds for LOS

Level of Service	Volume Threshold (passenger-car equivalent vehicles per hour)
	1 Lane Each Direction
A	0–360
B	360–585
C	585–864
D	864–1,160
E	1,160–1,496
F	>1,496

HCM methodology for the calculation of level of service thresholds includes traffic volume adjustments. The raw traffic volumes are converted to passenger-car equivalent vehicles by increasing the raw traffic volumes to account for the peak hour factor and heavy vehicle percentage of the traffic stream.

HCM methodology for the calculation of level of service thresholds includes adjustments based on roadway features such as lane width and median type. When compared to the level of service thresholds presented in the EA, the new analysis indicates an increase in the capacity of the Fore River Bridge operating with one lane in each direction. The change in lane width from 11 feet to 12 feet and the change in median type from concrete traffic barrier to delineator posts result in an increase in calculated bridge capacity.

The hourly Levels of Service during the lane reductions is shown Table 8-5. It should be noted that the traffic volumes contained in this table are not the observed volumes, but are the maximum predicted hourly volumes that have been factored according to HCM methodology. The factored traffic volumes shown in Table 8-5 will not match the raw traffic count data shown in Table 8-1, Table 8-2, and Table 8-3.

The analysis of the anticipated construction scenario that provides a single travel lane in each direction for approximately four months indicates the following:

- Westbound traffic operations during the morning peak period will go from an existing LOS D/E (2 lanes) to LOS E/F with a single lane. The roadway will operate at an acceptable LOS (LOS D or better) during the remainder of the day with a single lane available.

- Eastbound traffic operations during the evening peak period will go from an existing LOS C/D (2 lanes) to LOS E/F with a single lane. The roadway will operate at an acceptable LOS (LOS D or better) during the remainder of the day with a single lane available.

Table 8-5: Route 3A, Fore River Bridge, Level of Service for One Lane in Each Direction – Typical Weekday

Time	Eastbound			Westbound		
	Volume	% of peak	% of daily	Volume	% of peak	% of daily
12:00-1:00 a.m.	152	7.8%	0.9%	66	3.1%	0.4%
1:00-2:00 a.m.	74	3.8%	0.4%	44	2.1%	0.2%
2:00-3:00 a.m.	33	1.7%	0.2%	31	1.5%	0.2%
3:00-4:00 a.m.	33	1.7%	0.2%	55	2.6%	0.3%
4:00-5:00 a.m.	48	2.5%	0.3%	155	7.3%	0.9%
5:00-6:00 a.m.	127	6.5%	0.8%	704	33.2%	4.0%
6:00-7:00 a.m.	355	18.2%	2.1%	1,678	79.2%	9.5%
7:00-8:00 a.m.	631	32.3%	3.8%	**2,118**	**100.0%**	**12.0%**
8:00-9:00 a.m.	754	38.6%	4.5%	1,769	83.5%	10.0%
9:00-10:00 a.m.	601	30.8%	3.6%	1,230	58.1%	7.0%
10:00-11:00 a.m.	667	34.2%	4.0%	865	40.8%	4.9%
11:00 a.m.-12:00 p.m.	738	37.8%	4.4%	876	41.3%	5.0%
12:00-1:00 p.m.	795	40.7%	4.8%	829	39.1%	4.7%
1:00-2:00 p.m.	865	44.3%	5.2%	836	39.5%	4.7%
2:00-3:00 p.m.	1,066	54.6%	6.4%	843	39.8%	4.8%
3:00-4:00 p.m.	1,458	74.6%	8.8%	965	45.5%	5.5%
4:00-5:00 p.m.	1,731	88.7%	10.4%	958	45.2%	5.4%
5:00-6:00 p.m.	**1,953**	**100.0%**	**11.7%**	1,003	47.3%	5.7%
6:00-7:00 p.m.	1,536	78.6%	9.2%	789	37.2%	4.5%
7:00-8:00 p.m.	954	48.9%	5.7%	560	26.5%	3.2%
8:00-9:00 p.m.	760	38.9%	4.6%	420	19.8%	2.4%
9:00-10:00 p.m.	609	31.2%	3.7%	386	18.2%	2.2%
10:00-11:00 p.m.	427	21.9%	2.6%	273	12.9%	1.6%
11:00 p.m.-12:00 a.m.	289	14.8%	1.7%	168	7.9%	1.0%

*the traffic volumes in this table have been factored according to HCM level of service calculation methodology and do not match the raw traffic volumes shown in Table 8-1, Table 8-2, and Table 8-3.

From this information, it appears that the construction scenario providing one lane in each direction would cause substantial traffic delays from 6:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7:00 p.m. This could potentially be mitigated by the regional diversion of a portion of westbound traffic volumes during the morning peak period and a portion of eastbound traffic volumes during the evening peak period during this construction stage's approximate four-month duration.

In the EA it was reported that for the Fore River Bridge to continue to operate at LOS E or better during the four-month construction phase with one lane in each direction, approximately 560 westbound vehicles would need to divert during the morning peak hour and approximately 320 eastbound vehicles would need to divert during the evening peak hour. The updated level of service analysis indicates that between 200 and 600 westbound vehicles per hour would need to divert during the morning peak period and between 100 and 450 eastbound vehicles per hour would need to divert during the evening peak period.

The design team conducted further analysis to determine if the signal at the intersection of Bridge Street (Route 3A) and Evans Street would meter the amount of vehicles approaching the bridge during the approximate four-month construction phase requiring reduced capacity on the Fore River Bridge. The intersection is located approximately 1,000 feet east of the Fore River Bridge and the signalized operations may impact the operations on Fore River Bridge.

Capacity analysis was performed at the intersection of Bridge Street (Route 3A) and Evans Street to determine the approximate capacity of each lane group. The cycle length at this intersection is 60 seconds, with the eastbound and westbound effective green being 40 seconds, and the northbound effective green being 12 seconds. To present a conservative analysis, it was assumed that intersections along Route 3A would operate without the assistance of police details. The use of police details during the morning and evening peak periods at intersections along Route 3A near the Fore River Bridge would likely improve operations by pulling Route 3A traffic through the intersections.

The Bridge Street westbound and Evans Street northbound left-turn movements of the intersection process vehicles toward the Fore River Bridge. Each cycle during the morning peak hour, these two approaches process approximately eight more vehicles than the Fore River Bridge is able to process in one lane. During the morning peak hour, the intersection processes approximately 480 more vehicles toward the Fore River Bridge than the bridge is able to process in one lane. These vehicles form a queue as they wait to be processed by the bridge.

As part of the Fore River Bridge level of service analysis and the Bridge Street (Route 3A)/Evans Street signal metering analysis, it is assumed that no traffic diverts. In reality, MassDOT has planned to incorporate a public outreach campaign to inform motorists of a reduced capacity during these four months. This will be supplemented by regional changeable message sign (CMS) so that drivers are able to use alternate routes such as the freeway system (e.g. Route 3) to divert. MassDOT has recent experience with the public outreach required to encourage temporary regional diversions on projects including the Craigie Bridge, Neponset River Bridge, and Fast 14 projects. Likewise, MassDOT has committed to improvements at the signalized intersections located in Weymouth Landing to help optimize capacity for this local diversion route.

d. Likely Alternate Route

The anticipated construction scenario includes a phase lasting approximately four months during which the Fore River Bridge will be reduced to one lane in each direction. This lane reduction is necessary in order to decrease the overall project duration and to avoid longitudinal construction joints in the new bridge deck, which increase the life cycle costs of bridge decks. To measure the impacts of this capacity reduction, MassDOT's consultant evaluated the regional roadway network and made field observations to determine the most likely route of travel for motorists who choose to divert around the Fore River Bridge during these periods of reduced bridge capacity.

The alternate route detailed in the EA represents the expected route of vehicles that may divert. This alternate route is not suggested to be designated as an official detour route as Route 3A is not anticipated to be fully closed to traffic. As such, it is also not anticipated that this alternate route will be signed as a detour route. However, this represents the project team's estimate of the most likely route traveled by an approximate number of motorists who may choose to divert.

The motorists most likely to divert onto the alternate route will be those who are both familiar with the project area roadways and provided with sufficient advanced warning of the reduced bridge capacity. Motorists who travel substantially beyond the beginning of the alternate route are unlikely to turn around and backtrack. For example, vehicles traveling on Route 3A eastbound that reach South Street in Quincy or vehicles traveling on Route 3A westbound that reach Evans Street are not likely to use the alternate route.

Roadways Included in Alternate Route

Several commenters made the argument that the alternate route should not include Church Street and could not accommodate additional traffic volume, particularly through Weymouth Landing.

The project team determined that the most likely alternate route for drivers familiar with the area who choose to divert includes Church Street. Church Street serves as the most direct route for vehicles traveling south on North Street and continuing on Commercial Street westbound or vice versa. Commercial Street and Church Street both feature one travel lane in each direction, shoulders on both sides of the roadway, and are both classified by the MassDOT Office of Transportation Planning as urban minor arterials.

After this route was determined to be the most likely diversion route, the consultant evaluated the intersections along the route. The intersections most likely to be adversely impacted by vehicles diverting from Route 3A were selected for detailed capacity analysis. The intersection of Commercial Street and Church Street in Weymouth was not included in the original study area as it wasn't anticipated that it would be among the intersections that would most likely be substantially impacted. The flashing warning beacon at this location serves to increase intersection visibility and augment the stop sign on the Church Street approach. During construction, this location may be monitored to determine if construction period mitigation is appropriate. If construction staging warrants that a specific detour route be established, the regional transportation network will be revaluated to determine a specific, viable detour route, which may not be identical to the likely alternate route.

The design team does not endorse the alternate route as a signed detour route or propose that the alternate route can effectively accommodate additional traffic volume during weekday peak periods without signal modifications and regional diversions. Instead, the alternate route represents the project team's estimate of the most likely route traveled by a majority of motorists who may choose to divert.

Mitigation Along the Alternate Route

Several commenters requested clarification on the proposed mitigation for intersections along the alternate route. MassDOT has committed to a multi-faceted approach to decrease the effects of diverted traffic on intersections along the alternate route during the four-month construction phase.

The design team has proposed signal modifications at specific locations along the alternate route that include signal retiming, signal coordination, and changes to signal phasing. These relatively low cost improvements partially mitigate the effects of motorists who choose to divert around the Fore River Bridge. The use of police details at key intersections along the alternate route during the morning and evening peak periods would likely improve operations. These police details would facilitate the movement of vehicles diverting from Route 3A westbound during the morning peak period and vehicles diverting from Route 3A eastbound during the evening peak period.

In addition to the traffic signal improvements, the design team will continue to work with Braintree, Quincy, and Weymouth to develop traffic solutions to better process potential diverted traffic through Weymouth Landing. Methods to divert traffic more regionally will be required so the potential impacts to the likely alternate route representing the natural diversion through Weymouth Landing can be minimized.

Travel Time Along the Alternate Route

The end points of the likely alternate route are the Bridge Street (Route 3A)/North Street intersection in Weymouth and the Washington Street (Route 3A)/Southern Artery intersection in Quincy. The existing travel time between these intersections for motorists using Route 3A and the Fore River Bridge without the implementation of any mitigation measures is estimated at between approximately 5 and 15 minutes during both the morning and evening peak hours. The travel time along the likely alternate route under existing conditions is approximately 24 to 34 minutes during the morning peak hour in the westbound direction and approximately 19 to 29 minutes during the evening peak hour in the eastbound direction.

Operations at alternate route intersections during the four-month construction phase when the bridge is restricted to one lane were analyzed. For the Fore River Bridge to continue to operate at LOS E during the four-month construction phase with one lane in each direction, it is estimated that between 200 and 600 westbound vehicles per hour would need to divert during the morning peak period and between 100 and 450 eastbound vehicles per hour would need to divert during the evening peak period. To provide a conservative analysis, it was assumed that the volume of diverted vehicles required for the Fore River Bridge to maintain LOS E would divert along the alternate route without assistance from police details.

The analysis indicates that motorists traveling on Route 3A westbound during the morning peak hour who choose to divert along the alternate route will experience an increase in travel times of between approximately 25 and 45 minutes. Motorists traveling on Route 3A eastbound during the evening peak hour who choose to divert along the alternate route will experience an increase in travel times of between approximately 20 and 40 minutes. The use of police details at key intersections along the alternate route during the morning and evening peak periods would likely improve operations and decrease travel times along the alternate route. The police details would facilitate traffic using the alternate route to divert around the Fore River Bridge

If, on the other hand, motorists choose not to divert along the alternate route and remain on Route 3A, travel times for vehicles on Route 3A will likely increase by 25- to 35-minutes during the morning and evening peak hours. During off peak periods, travel time increases due to lane restrictions will be less along Route 3A and the likely alternate route.

The analysis and calculation of travel time along the alternate route includes both the increase in travel time due to the increase in travel distance and the increase in travel time due to the increase in delay experienced by motorists at study area intersections along the alternate route. The analysis does not include possible delay experienced by motorists at minor intersections along the alternate route that are not included in the study area.

9. Dredging and In-Water Construction

Comments on the EA from the Environmental Protection Agency requested additional information regarding dewatering and disposal of dredged material. The US Coast Guard requested additional information on consultation performed by MassDOT on behalf of FHWA regarding wildlife and fisheries resources, particularly with the US National Marine Fisheries Service and the Massachusetts Division of Marine Fisheries regarding time of year restrictions for in-water work and acceptable mitigation measures. In addition, a permit application for a Massachusetts Department of Environmental Protection Water Quality Certificate for project-related dredging was submitted in January 2011, which revised the dredging volumes associated with the project.

a. Dredging

The in-water dredging activities (removal of sediment) for the Project are subject to review under Section 401 of the Clean Water Act, administered through the Water Quality Certification Regulations 314 CMR 9.00 by the Massachusetts Department of Environmental Protection (DEP). Accordingly, the Sediment Sampling program was done in compliance with the DEP Interim Policy #COMM-94-007 for Sampling, Analysis, Handling and Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills. This Policy recommends that one sediment sample (vibracore) be taken per 1,000 cubic yards of material to be dredged. The number of sediment samples collected was consistent with this policy.

MassDOT conducted a sediment pre-characterization program to determine sediment quality and identify potential disposal scenarios. This sediment sampling was conducted in November 2009, before the preferred bridge type was identified and before any of the bridge concepts were refined. At that time, a conservative estimate of the required dredging volume for a bascule bridge alternative[4] was determined to be 33,000 CY, and therefore approximately 30 vibracores were installed to obtain the requisite number of samples for the estimated dredging. Since that time, the collection of geotechnical data, the development of drilled shaft foundation designs, and the selection of the vertical lift as the preferred alternative have allowed MassDOT to reduce the anticipated dredging volume to 17,000 CY. This volume will continue to be refined through the design development process.

This sediment pre-characterization program concluded that the majority of the dredged material could be used as daily cover, or as shaping material at a Massachusetts soil waste landfill. (See the Sediment Pre-Characterization Sampling Report included as Appendix K in the December 2010 Environmental Assessment (EA) for the sediment pre-characterization program compliance protocols, results and conclusions.) The contractor will be required to test all dredged material immediately before disposal due to landfill requirements for acceptance of such material.

A 401 Water Quality Certificate (WQC) application was filed with the Massachusetts Department of Protection (DEP) in January 2011 as a Major Dredging project (BRP WW07) for approximately 17,000 CY of dredged material. Appendix H of the 401 WQC application is a Draft Dredged Material Management Plan (Draft DMMP) prepared for the Project in accordance with 314 CMR 9.00, 410 Water Quality Certification for Discharge of Dredged or Fill Material, Dredging and Dredged Material Disposal in Waters of the US in the Commonwealth. It addresses the baseline characterization of Fore River sediments to be dredged for the Project, potential dredging methods, the proposed mitigation of localized dredging impacts and risks, and evaluation of options for the handling and disposal of the dredged material. This management plan was submitted in "draft" form so that the Design-Build contractor could have the opportunity to further refine and amend any dredged material management strategies and/or protocols as necessary based on their selection of final means and methods of performing the bridge construction and any related dredging. Development of the Draft DMMP is premised on a performance standard approach requiring adherence to applicable laws and regulations, rather than detailing exact contractor means and methods, as such specificity may result in disadvantageous pricing or could remove a Design-Build contractor's ability to perform the work in an even more environmentally preferable method. For example, the Draft DMMP indicates that the Design-Build contractor will be required to monitor turbidity at the boundary of a 500-foot "mixing zone" to ensure that elevated turbidity levels do not exceed resource agency recommendations for a 5 Nephelometric Turbidity Unit (NTU)[5] increase above background (or reference) condition. This mixing zone definition and turbidity limit are based on agency requests for previous coastal dredging projects in Massachusetts, such as the Boston Harbor Dredging monitoring program. The Draft DMMP provided a conceptual overview of the potential approaches to dredging and dewatering at the site, including the following:

Dredging Methods, Equipment and Schedule/ Timing

Sediments will be dredged using the typical mechanical method (clamshell bucket) from a work barge, with placement on an adjacent work barge that will then be relocated and secured for dewatering. Appropriate quantities of dredge material will be placed into either a water tight-steel sided barge or Cable Arm water tight tanks placed on the work barge to avoid barge overtopping.

To minimize adverse impacts to surface water quality, sensitive biota and Essential Fish Habitat (EFH), dredging and other major silt-producing activities will be conducted seasonally to avoid the February 15 to September 15 spawning and migratory periods for winter flounder and other sensitive fish species. Dredging will only occur during fall and winter months, from September 15 to February 15. Silt-curtains will be used between February 15 to June 30 for in-water construction activities that do not involve dredging, in accordance with National Marine Fisheries Service recommendations.

Dredged Material Dewatering

Incidental water that would normally discharge freely from the dredge material will be fully contained within the barge until dewatering is complete. Once the barge is filled with dredged material, it will be moved for dewatering. In the work barge, free water will rise to the top above the dredge spoil and settled sediments. Once the suspended solids have settled, the free water will be discharged directly to the receiving water (Fore River). A potential barge dewatering area could be to the northeast of the bridge location near the dock currently being dismantled by Fore River Station, but this would depend on the Design-Build Contractor's means and methods and would require coordination with the USCG. To document that free water discharges from the settling equipment do not violate water quality standards, turbidity of the receiving water will be monitored at the boundary of a 500-foot "mixing zone" and compared to concurrent turbidity at a similar background reference location. Turbidity monitoring and a water quality "action contingency plan" will be prepared by the Design-Build contractor as described in Section 5.2 of the DMMP.

Following the dewatering process, the dredge spoil material will be removed from the barge using an excavator that will place the material in covered dump trucks for hauling to an existing upland disposal or reuse facility (such as a landfill or asphalt batching plant), depending on the chemical quality of the dredged material as determined in the pre-characterization study and/or based on the results of any additional sediment sampling and analysis that may be required by the receiving facility. Typically, receiving facilities prefer soil/sediment sampling to be within 1-1.5 years of actual disposal so that no changed condition that may occur during the intervening time period is missed. The actual requirements will depend on the agreement reached between the receiving facility and the Design-Build contractor. Dredged material will be transported as required under the 401 Water Quality regulations of 314 CMR 9.07(5), including truck undercarriage washing procedures and Paint Filter Testing to verify the absence of free liquids in the dredged materials. All dredged sediments transported to a landfill will be accompanied by a DEP Material Shipping Record (MSR) completed by a qualified environmental professional (such as a Licensed Site Professional, a Professional Engineer, or a Professional Geologist).

It is possible that during the 401 WQC application review, DEP may have comments or questions on the Draft DMMP, which could result in revisions, although none have been received yet. Alternatively, the DEP may simply incorporate a condition when issuing the final 401 Certificate that the DMMP be finalized by the Design-Build contractor and submitted prior to the start of work.

b. Agency Consultation

In June 2009, STV Inc. (design engineers on behalf of MassDOT) sent consultation letters to the following agencies: Massachusetts Division of Marine Fisheries (MassDMF), Natural Heritage of Endangered Species Program (NHESP), and the National Marine Fisheries Service (NMFS). Additionally, the US Fish and Wildlife Service (USFWS) consultation online review was conducted. This consultation is part of the record on this project. Agency correspondence in response to the consultation letters is included as Appendix A of the EA. The FHWA, through their capacity as the lead federal agency, is aware of the consultation that has occurred to date. Additionally, FHWA reviewed the Essential Fish Habitat (EFH) assessment and provided it to NMFS for review (see emails in Attachment C). NMFS requested additional information and plans to aid their review. MassDOT provided the requested information to NMFS and will continue to coordinate with NMFS on behalf of FHWA as the project moves forward. FHWA will continue to remain informed of the consultation taking place, and will take an active role should any of the federal agencies request formal consultation.

There is not an individual response from USFWS included in the EA because they no longer respond to letter correspondence, instead referring correspondents to their on-line database. No issues related to migratory birds were

[4] The bascule bridge represented the most conservative case from a dredging perspective as it would require larger piers than the vertical lift bridge.

[5] The unit used to describe turbidity. Nephelometric refers to the way the instrument, a nephelometer, measures how much light is scattered by suspended particles in the water. The greater the scattering, the higher the turbidity. Therefore, low NTU values indicate high water clarity, while high NTU values indicate low water clarity.

raised through that process. Because the project area land uses are mostly urban, industrial, and highly developed residential, it does not provide much habitat for migratory birds, except for coastal shorebirds and waterfowl. The project has a very small footprint within the context of available migratory bird species habitat along Boston's south shore community shorelines. Therefore, potential impacts to migratory birds will be negligible as no substantial alteration to the habitat is proposed. Construction timeframe impacts are temporary or will be minimized by avoidance behaviors exhibited by migratory birds when confronted with noise or vessel activity, for example.

In response to recommendations by the MassDMF to minimize adverse impacts to surface water quality, sensitive biota and EFH, MassDOT will require the Design-Build contractor to avoid the February 15 to September 15 spawning and migratory periods for winter flounder and other sensitive fish species for dredging and other major silt-producing activities. Dredging will only occur during fall and winter months, from September 15 to February 15. The NMFS concurred with the February 15 to September 15 Time-of-Year (TOF) restriction for dredging and other major silt-producing activities and recommended the use of silt-curtains between February 15 to June 30 for in-water construction activities that do not involve dredging. MassDOT will incorporate these mitigation measures in the project specifications.

MassDOT will continue to consult with NMFS on behalf of FHWA as the project goes to final design, regarding the status of the Atlantic sturgeon, and the potential need for consideration of any conservation actions that will limit the potential for adverse effects on the Atlantic sturgeon in accordance with the NMFS comment letter on the EA. It is documented that spawning Atlantic sturgeon adults migrate upriver in spring anytime between April and June in some large rivers of the northeastern U.S. (beginning April-May in the mid-Atlantic, and May-June in Canadian waters). In some areas, a small spawning migration may also occur in the fall. Spawning occurs in flowing water between the salt front and fall line of large rivers. The Monatiquot River and other tributaries to the Fore River estuary are not large rivers, and spawning migration or activity is unlikely. However, overwintering occurs in the lower estuarine reaches of large rivers such as the Connecticut River to the south or Kennebec River to the north of Massachusetts. This pattern of habitat use has been documented in the Merrimack River. Therefore, any potential concern in the project area would be associated with overwintering of juveniles or adults, although the project area does not represent the same type of habitat as large river systems and documentation of the occurrence of any sturgeon in the Fore River estuary is incomplete.

Currently, MassDOT has established a Time of Year (TOY) restriction with the Massachusetts Division of Marine Fisheries (DMF) which includes no major silt producing activities (dredging, etc.) between February 15th and September 15th. This TOY restriction covers a large part of the seasonal timeframe of concern for this species, and therefore represents a suitable action to limit the potential for adverse effects on the Atlantic sturgeon. (Source: NOAA Fisheries, Office of Protected Resources at http://www.nmfs.noaa.gov/pr/species/fish/atlanticsturgeon.htm)

10. Procedural Requirements/Permits

a. Permits

The following provides the status of applications for permits currently under review for the replacement bridge:

Massachusetts Department of Environmental Protection Section 401 Water Quality Certification;

A 401 Water Quality Certificate (WQC) application was filed with the Massachusetts Department of Protection (DEP) in January 2011 as a Major Dredging project (BRP WW07) with over 100 cubic yards (CY) of dredged material. The 401 WQC application is currently under review for approximately 17,000 CY of dredged material (the dredging calculations have been slightly revised since the EA submittal) associated with bridge construction and the temporary channel for the MBTA commuter boat. Responses have been provided to the comments that were submitted during the public comment period. The Water Quality Certificate is anticipated to be issued by DEP by December 2011.

U.S. Coast Guard Bridge Permit

The Bridge Permit application was filed with the US Coast Guard in 2010. The US Coast Guard solicited comment on the application during a 45- day comment period that ended on April 25, 2011. MassDOT will respond to comments on the application in the summer of 2011. It is anticipated the US Coast Guard will issue a Bridge Permit in January 2012. The USCG permit will include dredging incidental to bridge construction. Issuance of the Bridge Permit is contingent on the Massachusetts Coastal Zone Management Consistency Determination, the 401 WQC, and the issuance of a Finding of No Significant Impact (FONSI) by the FHWA.

Massachusetts Coastal Zone Management (CZM) Consistency Statement

MassDOT submitted a request for coastal zone management (CZM) consistency review on January 28, 2011. The CZM consistency determination is expected by December 2011.

U.S. Army Corps of Engineers Section 404 Category II Permit (GP) for Navigable Waters;

MassDOT submitted an amended request for Category II permit application to the US Army Corps of Engineers on May 18, 2011 for dredging to provide a temporary navigation channel to allow for MBTA commuter boat operations during construction.

MassDOT will also obtain a Massachusetts Water Resource Authority (MWRA) 8(m) Permit for work within the MWRA tunnel easement and will coordinate with the City of Quincy and the Town of Weymouth relative to local permits. A Federal Aviation Administration (FAA) Notice of Construction will also be submitted.

The contractor will be responsible for complying with the U.S. Environmental Protection Agency *National Pollutant Discharge Elimination System (NPDES)* Permit for construction-related stormwater discharge, and for obtaining street opening permits from the City of Quincy and the Town of Weymouth.

b. Section 106 Memorandum of Agreement

As stated in the December 2010 EA, the Massachusetts State Historic Preservation Officer (SHPO) entered into a Memorandum of Agreement (MOA) with the U. S. Coast Guard and the Federal Highway Administration regarding demolition of the 1936 Fore River Bridge and the future construction of a permanent bridge to replace the 1936 bridge. That MOA, which was fully executed on March 31, 2004, included a number of stipulations. The following summarizes the stipulations and provides an update on their status:

- *Historic recordation of the Fore River Bridge, including a written narrative history of the bridge and archival quality photographic documentation, which will be submitted to the State Archives, the Quincy Historical Commission (QHC), and the Weymouth Historical Commission (WHC).*

  The photographic documentation of the bridge has been completed and submitted to the State Historic Preservation Officer, the QHC and the WHC.

- *Preparation of a short informational brochure (with photos) about the Fore River Bridge. One hundred copies of the brochure will be submitted to each of the QHC and the WHC and fifty copies given to the SHPO.*

  The brochure is currently under development.

- *Salvage of the bronze plaques on the bridge's end posts and consultation with the QHC and the WHC as to the appropriate disposition of those plaques.*

  Unfortunately, those plaques were lost or stolen during demolition of the Fore River Bridge. MassDOT, in consultation with the QHC and the WHC, will design and fabricate new plaques for placement on the new bridge.

- *Review of the design of the permanent replacement bridge by the SHPO, the QHC, and the WHC as project plans are developed.*

  MassDOT has initiated consultation with both the QHC and the WHC in compliance with the MOA. MassDOT met with the QHC on April 12, 2010, and the WHC on May 11, 2010. At those meetings, MassDOT agreed to provide copies of the project plans to the QHC and the WHC for review and comment as those plans are developed. When completed, the bridge sketch plans, which represent an approximate 25 percent level of design will be distributed for comments. In addition, the MassDOT has agreed to consult with the historical commissions further on the design of the new plaques for the bridge, and to allow the commissions to comment on the content of the brochure. MassDOT also has proposed to install interpretive historical signs at either end of the bridge and to allow the QHC and WHC to comment on the content of those signs.

11. Continued Coordination /Public Involvement

MassDOT will continue to work closely with the City of Quincy, the Towns of Weymouth and Braintree, and all other stakeholders. Bi-monthly coordination meetings have been held with local officials with regard to the bridge design and aesthetics. Public informational meetings and information distribution will continue to be an important part of the project development process. The selected Design-Build contractor will be encouraged to hold public information meetings prior to the start of major phases of construction to keep the public informed and to solicit feedback on construction activities.

Attachment A – Draft Construction Noise Control Specification

CONSTRUCTION NOISE CONTROL

DESCRIPTION

1.01 GENERAL

A. The intent of this Section is to minimize construction noise within construction areas, lay-down areas, and communities adjacent to the construction site. To this end, the Contractor and all subcontractors, suppliers, and vendors, are required to comply with all applicable noise regulations, specification requirements, and the noise level limits specified herein.

B. This Section specifies requirements for response to community complaints. All requirements of this Section, if needed during performance of the Work, shall be overseen by an approved Acoustical Engineer employed by the Contractor.

C. The Contractor shall use equipment with efficient noise-suppression devices and employ other noise abatement measures such as enclosures and barriers necessary for the protection of the public. In addition, the Contractor shall schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the Work and to occupants of buildings in the vicinity of the Work.

D. In no case shall the restrictions identified in this Section limit the Contractor's responsibility for compliance with all Federal, state, and local safety ordinances and regulations.

1.02 TERMS USED

A. Noise is any audible sound which has the potential to annoy or disturb humans, or to cause an adverse psychological or physiological effect on humans.

B. Daytime refers to the period from 7 AM to 6 PM local time daily, except Sundays and Federal holidays.

C. Evening refers to the period from 6 PM to 10 PM local time daily, except Sundays and Federal holidays.

D. Nighttime refers to the period from 10 PM to 7 AM local time daily, as well as all day Sunday and Federal holidays.

E. Noise-Sensitive Locations shall mean locations where particular sensitivities to noise exist, such as residential areas, institutions, hospitals, and parks.

F. Nuisance Noise refers to sound levels that annoy or disturb a reasonable person of normal sensitivities, but do not exceed the noise limits specified herein.

G. Lot-line refers to the line separating a parcel of land from another parcel or from the street.

H. Background Noise shall be defined as the measured ambient noise level associated with all existing environmental, transportation, and community noise sources in the absence of any audible construction activity.

I. dBA shall be defined as the sound level (in decibels referenced to 20 micro-pascals) as measured using the A-weighting network on a sound level meter, in accordance with ANSI S1.4 Standards.

J. Lmax shall be defined as the maximum measured sound level at any instant in time.

K. Leq shall be defined as the equivalent sound level, or the continuous sound level that represents the same sound energy as the varying sound levels, over a specified monitoring period.

L. L10 shall be defined as the sound level exceeded 10 percent of the time for a specified monitoring period.

M. Slow specifies a time constant or 1 second for the root-mean-square (RMS) detector used by a sound level meter, in accordance with ANSI S1.4 Standards.

N. Impact noise is noise produced from impact or devices with discernible separation in sound pressure maxima. Examples for impact equipment include but are not limited to blasting, clam shovel or chisel drops, pavement breakers, jackhammers, hoe rams, mounted impact hammers, and impact pile drivers (but not vibratory pile drivers). Table 2 specifies types of equipment which are considered to emit impact or continuous noise.

1.03 SUBMITTALS

A. Submit (as needed) the name, address, and qualifications of the Acoustical Engineer, as specified in Article 1.05 of this Section for review and acceptance.

B. Develop and submit for approval, a Noise Control Plan (NCP) that outlines in detail, the measures to be implemented by the Contractor to comply with this Section. Any modifications to the approved NCP must be submitted for review and approval prior to implementation.

C. Submit (as needed) shop and working drawings, computations, material data, and other descriptions for abatement measures used as Temporary Noise Barriers, Acoustical Barrier Enclosures, or Noise Control Curtains as specified in Articles 2.03, 2.04, 2.05 of this Section. Drawings and computations shall be stamped by a Registered Professional Engineer of the Commonwealth of Massachusetts.

1.04 CONSTRUCTION LIMITATIONS

A. Noise Levels

1. Daytime, evening, and nighttime construction noise levels at noise-sensitive locations and other noise monitoring locations shall not exceed the limits specified in Table 1, unless the noise exceedances occur when mitigation consistent with this specification is utilized, as determined by the Engineer. The lot-line criteria shall apply to all points on a given lot-line of an affected receptor.

2. In addition, equipment operating under full load shall not exceed the Lmax noise limits specified in Table 2, unless noise exceedances occur when mitigation consistent with this specification is utilized, as determined by the Engineer. The 50-feet noise emission limits specified in Table 2 shall apply to the entire operation in which the equipment is engaged. Table 2 also provides distinction as to which equipment is considered to emit impact or continuous noise.
3. Work shall be performed in a manner to prevent nuisance conditions such as noise which exhibits a specific audible frequency or tone (e.g., backup alarms, unmaintained equipment, brake squeal) or impact noise (e.g., jackhammers, hoe rams). The Engineer will make any final interpretation concerning whether or not nuisance noise conditions exist. The Engineer has the authority to stop the Work until nuisance noise conditions are resolved, without additional time or compensation for the Contractor.

B. Equipment Operations

1. *If night work is allowed by the Engineer*, vibratory pile driving shall be prohibited during the nighttime period (i.e. 10 PM to 7 AM as defined in Article 1.02).
2. *If night work is allowed by the Engineer*, the use of all impact devices, including hoe rams, jackhammers, chiseling devices, and pavement breakers, shall be prohibited during the nighttime hours (i.e. 10 PM to 7 AM). Any necessary use of impact devices between 10 PM and 7 AM shall be reviewed by the Engineer in advance and allowed as an exception only upon sufficient justification.
3. Contractors shall use approved haul routes to minimize noise at residential and other sensitive noise receptor sites.
4. *If night work is allowed by the Engineer*, all equipment with backup alarms operated during the hours of 10 PM to 7 AM by the Contractor, vendors, suppliers, and subcontractors on the construction site shall be equipped with either audible self-adjusting ambient-sensitive backup alarms or manually-adjustable alarms. The ambient-sensitive alarms shall automatically adjust to a maximum of 5 dBA over the surrounding background noise levels. The manually-adjustable alarms shall be set at the lowest setting required to be audible above the surrounding noise. Installation and use of the alarms shall be consistent with the performance requirements of the current revisions of Society of Automotive Engineering (SAE) J994, J1446, and OSHA regulations.
   a. *Or, if work is allowed by the Engineer between the hours of 10 PM to 7 AM, the Contractor shall use in lieu of audible backup alarms an appropriate alternative safety method in accordance with OSHA regulations (29 CFR Part 1926, Subpart "O", 1926.601.b.4 and 1926.602.a.9.) and accepted Health and Safety Plan that is to be submitted by the Contractor. This applies to all vehicles and equipment operated by the Contractor, vendors, suppliers, and subcontractors on the construction site.*
5. Per State regulations, engine idling for trucks is limited to 5 minutes maximum.

1.05 ACOUSTICAL ENGINEER

A. The Acoustical Engineer identified in this Article shall oversee all requirements of this Section.

B. The Acoustical Engineer shall have the following minimal qualifications:

1. Bachelor of Science or higher degree from a qualified program in engineering, physics, or architecture offered by an accredited university or college, and five years experience in noise control engineering and construction noise analysis; or current enrollment as a full Member or Board-certified Member in the Institute of Noise Control Engineering (INCE).
2. Demonstrated substantial and responsible experience in preparing and implementing construction noise controls and monitoring plans on construction projects conducted in an urban setting, calculating construction noise levels, and designing and overseeing the implementation of construction noise abatement measures.

C. If at any point, in the judgment of the Engineer, the quality of the Acoustical Engineer's submittals proves to be repeatedly unacceptable, then the Engineer can require the submittal and selection of an alternative Acoustical Engineer meeting the requirements in this Article.

MATERIALS

2.01 GENERAL

A. All equipment and materials specified in this part will remain the property of the Contractor or Contractor's subcontractors, vendors, and suppliers, as applicable.

2.02 NOISE REDUCTION MATERIALS AND EQUIPMENT

A. Noise reduction materials may be new or used. Used materials shall be of a quality and condition to perform their designed function.

B. Noise reduction equipment and materials may include, but not be limited to:

1. Shields, shrouds, or intake and exhaust mufflers.
2. Noise-deadening material to line hoppers, conveyor transfer points, storage bins, or chutes.
3. Noise barriers using materials consistent with the Temporary Noise Barrier materials specified in Article 2.03 of this Section.
4. Noise curtains using materials consistent with the Noise Control Curtains materials specified in Article 2.05 of this Section.

C. If work between the hours of 10 PM and 7 AM is allowed by the Engineer, all equipment with backup alarms operated during the hours of 10 PM to 7 AM by the Contractor, vendors, suppliers, and subcontractors on the construction site shall be equipped with either audible self-adjusting ambient-sensitive backup alarms or manually-adjustable alarms. The ambient-sensitive alarms shall automatically adjust to a maximum of 5 dBA over the surrounding background noise levels. The manually-adjustable alarms shall be set at the lowest setting required to be audible above the surrounding noise. Installation and use of the alarms shall be consistent with the performance requirements of the current revisions of Society of Automotive Engineering (SAE) J994, J1446, and OSHA regulations.

D. All equipment used on the construction site, including jackhammers and pavement breakers, shall have exhaust systems and mufflers that have been recommended by the manufacturer as having the lowest associated noise.

E. The local power grid shall be used wherever feasible to limit generator noise. Where a generator is necessary, it shall have the maximum noise muffling capability recommended by the manufacturer to meet the noise emission limits specified in Table 2.

2.03 TEMPORARY NOISE BARRIERS

A. Materials

1. Temporary barriers shall be constructed of 3/4-inch Medium Density Overlay (MDO) plywood sheeting, or other material of equivalent utility and appearance having a surface weight of two pounds per square foot (2 lbs/sq.ft.) or greater. The temporary noise barriers shall have a Sound Transmission Class of STC-30, or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90.
2. The temporary barriers shall be lined on one side with glass fiber, mineral wool, or other similar noise curtain type noise-absorbing material at least 2-inches thick and have a Noise Reduction Coefficient rating of NRC-0.85, or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.
3. The materials used for temporary barriers shall be sufficient to last through the duration of construction for this Contract, and shall be maintained in good repair.

B. Construction Details

1. Barrier panels shall be attached to support frames constructed in sections to provide a moveable barrier utilizing the standard "Temporary Precast Concrete Median Barrier" for the Project, or other supports designed to withstand 80 mph wind loads plus a 30 percent gust factor.
2. When barrier units are joined together, the mating surfaces of the barrier sides shall be flush with each other. Gaps between barrier units, and between the bottom edge of the barrier panels and the ground, shall be closed with material that will completely fill the gaps, and be dense enough to attenuate noise.
3. The barrier height shall be designed to break the line-of-sight and provide at least a 5 dBA insertion loss between the noise producing equipment and the upper-most story of the receptor(s) requiring noise mitigation. If for practicality or feasibility reasons, which are subject to the review and approval of the Engineer, a barrier cannot be built to provide noise relief to all stories, then it must be built to the tallest achievable height.

C. Prefabricated acoustic barriers are available from various vendors. An equivalent barrier design can be submitted as specified in Paragraph 1.03.C. in lieu of the plywood barrier described above.

2.04 ACOUSTICAL BARRIER ENCLOSURES

A. Materials

1. The acoustical barrier enclosure shall consist of durable, flexible composite material featuring a noise barrier layer bonded to sound-absorptive material on one side.
2. The noise barrier layer shall consist of rugged, impervious material with a surface weight of at least one pound per square foot (1 lbs/sq.ft.). The sound absorptive material shall include a protective face and be securely attached to one side of the flexible barrier over the entire face.
3. The acoustical material used shall be weather and abuse resistant, and exhibit superior hanging and tear strength during construction. The material shall have a minimum breaking strength of 120 lb/in. per FTMS 191 A-M5102 and minimum tear strength of 30 lb/in. per ASTM D117. Based on the same test procedures, the absorptive material facing shall have a minimum breaking strength of 100 lb/in. and a minimum tear strength of 7 lb/in.
4. The acoustical material shall be corrosion resistant to most acids, mild alkalies, road salts, oils, and grease.
5. The acoustical material shall be fire retardant and be approved by the local fire department with jurisdiction over the proposed location for installation (City of Quincy or Town of Weymouth Fire Department) prior to procurement. It shall also be mildew resistant, vermin proof, and non-hygroscopic.
6. The acoustical material shall have a Sound Transmission Class of STC-25 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient rating of NRC-0.70 or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.
7. The Contractor shall submit the name of the manufacturer, properties of the material to be furnished, and two one-foot square samples to the Engineer for review prior to submittal of design and detailed engineering as specified in Paragraph 1.03.C.

B. Construction Details

1. The acoustical barrier enclosure shall be designed to effectively cover a noise producing source to reduce noise affecting nearby noise-sensitive receptors.
2. The acoustical material shall be installed in vertical and horizontal segments with the vertical segments extending the full enclosure height. All seams and joints shall have a minimum overlap of 2 inches and be sealed using double grommets. Construction details shall be performed according to the manufacturer's recommendations.
3. The Contractor shall be responsible for the design, detailing, and adequacy of the framework and supports, ties, attachment methods, and other appurtenances required for the proper construction of the acoustical barrier enclosure.
4. The design and details for the acoustical noise barrier enclosure framework and supports shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall submit the design and detailed engineering drawings to the Engineer as specified in Paragraph 1.03.C.

2.05 NOISE CONTROL CURTAINS

A. Materials

1. The noise control curtain shall consist of durable, flexible composite material featuring a noise barrier layer bonded to sound-absorptive material on one side. The noise barrier layer shall consist of a rugged, impervious material with a surface weight of at least one pound per square foot (1 lbs/sq.ft). The sound absorptive material shall include a protective face and be securely attached to one side of the flexible barrier over the entire face.
2. The noise curtain material used shall be weather and abuse resistant, and exhibit superior hanging and tear strength during construction. The curtain's noise barrier layer material shall have a minimum breaking strength of 120 lb/in. per FTMS 191 A-M5102 and minimum tear strength of 30 lb/in. per ASTM D117. Based on the same test procedures, the noise curtain absorptive material facing shall have a minimum breaking strength of 100 lb/in. and a minimum tear strength of 7 lb/in.
3. The noise curtain material shall be corrosion resistant to most acids, mild alkalies, road salts, oils, and grease. It also shall be mildew resistant, vermin proof, and non-hygroscopic.
4. The noise curtain material shall be fire retardant and be approved by the local fire department with jurisdiction over the proposed location for installation (City of Quincy or Town of Weymouth Fire Department) prior to procurement.
5. Noise control curtain shall have a Sound Transmission Class of STC-30 or greater, based on certified sound transmission loss data taken according to ASTM Test Method E90. It shall also have a Noise Reduction Coefficient rating of NRC-0.85 or greater, based on certified sound absorption coefficient data taken according to ASTM Test Method C423.
6. The Contractor shall submit the name of the manufacturer, properties of the material to be furnished, and two one-foot square samples to the Engineer for review prior to submittal of the design and detailed engineering drawings as specified in Paragraph 1.03.C.

B. Construction Details

1. The noise control curtains shall be designed to effectively reduce noise affecting nearby noise-sensitive receptors. The curtains shall be secured above, at the ground, and at intermediate points by framework and supports designed to withstand 80 mph wind loads plus a 30 percent gust factor.
2. The curtains shall be installed in vertical and horizontal segments with the vertical segments extending the full curtain height to the ground. All seams and joints shall have a minimum overlap of 2 inches and be sealed using Velcro or double grommets spaced 12 inches on center. Curtains shall be fastened to framework and guardrails with wire cable 12 inches on center. Construction details shall be performed according to the manufacturer's recommendations.
3. The curtain height shall be designed to break the line-of-sight and provide at least a 5 dBA insertion loss between the noise producing equipment and the upper-most story of the receptor(s) requiring noise mitigation. If for practicality or feasibility reasons, which are subject to the review and approval of the Engineer, a curtain system cannot be built to provide noise relief to all stories, then it must be built to the tallest achievable height.
4. The Contractor shall be responsible for the design, detailing, and adequacy of the framework and supports, ties, attachment methods, and other appurtenances required for the proper installation of the noise control curtains.
5. The design and details for the noise control curtains framework and supports shall be prepared and stamped by a Professional Engineer licensed in the Commonwealth of Massachusetts. The Contractor shall submit the design and detailed engineering drawings to the Engineer as specified in Paragraph 1.03.C.

CONSTRUCTION METHODS

3.01 NOISE REDUCTION METHODS

A. The Contractor shall use all reasonable efforts to implement the noise reduction methods listed below to minimize construction noise emission levels. Noise reduction methods shall include, but not be limited to:

1. Use of: 1) concrete crushers or pavement saws for concrete deck removal, demolitions, or similar construction activity; 2) pre-augering equipment to reduce the duration of impact or vibratory pile driving; 3) local power grid to reduce the use of generators.
2. Attaching: 1) intake and exhaust mufflers, shields, or shrouds; 2) noise-deadening material to inside of hoppers, conveyor transfer points, or chutes.
3. Maintaining: 1) equipment mufflers and lubrication; 2) precast decking or plates; 3) on-site roadways to minimize surface irregularities to prevent unnecessary noise.
4. Limiting: 1) the number and duration of equipment idling on the site; 2) the use of annunciators or public address systems; 3) the use of air- or gasoline-driven hand tools.
5. Configuring, to the extent feasible: 1) the construction site in a manner that keeps loud equipment and activities as far as possible from noise-sensitive locations; 2) barrels or signage to detour traffic away from plated trenches.
6. Scheduling of construction events and limiting usage times to minimize noise, especially during nighttime hours and near sensitive abutters.
7. Constructing noise barriers and/or noise curtain systems.
8. Minimizing noise from the use of backup alarms using measures that meet OSHA regulations. This includes use of self-adjusting ambient-sensitive backup alarms, manually-adjustable alarms on low setting, use of observers, and scheduling of activities so that alarm noise is minimized.

9. Where practical and feasible, configuring construction sites to minimize backup alarm noise. For example, construction site access should be designed such that delivery and dump trucks move through the site in a forward manner without the need to back up.
10. Preventing nuisance noise conditions such as from squealing equipment, backup alarms, radios and public address systems, etc.
11. Using variable message and sign boards that are solar powered or connected to the local power grid.

3.02 COMPLAINT PROCEDURE

A. To facilitate the handling of potential noise complaints, the Community Liaisons designated by each of the local communities will serve as the project liaisons during construction. The Community Liaisons will forward any complaints to the contracting team and the Engineer.

B. The objective of the complaint procedure is to ensure that public and agency complaints are addressed and resolved consistently and expeditiously.

C. If the Contractor receives a complaint regarding construction noise, the Contractor shall immediately notify the Acoustical Engineer and contact the Engineer.

D. In the event that noise levels measured by the Contractor's Acoustical Engineer exceed allowable limits as specified in Article 1.04 of this Section, or work being performed under this contract is resulting in nuisance conditions as determined by the Engineer, the Contractor shall immediately use noise reduction materials and methods as described in Article 3.01 to reduce noise levels or to alleviate the nuisance conditions.

3.03 TEMPORARY NOISE BARRIERS

A. General

1. The Contractor shall erect temporary noise barriers to mitigate construction noise at locations per the NCP and/or as directed by the Engineer.
2. The temporary noise barriers shall be readily moveable so that they may be re-positioned, as necessary, to provide noise abatement for non-stationary, as well as stationary, processes.

B. Installation, Maintenance, and Removal

1. The barriers shall be installed such that the noise-absorptive surfaces face the construction noise source.
2. The Contractor shall maintain the temporary noise barriers and repair all damage that occurs, including, but not limited to, keeping barriers clean and free from graffiti and maintaining structural integrity. Gaps, holes, and weaknesses in the barriers, and openings between or under the units, shall be repaired promptly or replaced by the Contractor with new material.
3. The Contractor shall remove and dispose of the temporary noise barriers at the end of the Contract or sooner at the direction of the Engineer.

3.04 ACOUSTICAL BARRIER ENCLOSURES

A. General

1. The Contractor shall erect acoustical barrier enclosures to mitigate construction noise at locations per the NCP, as required in construction drawings, and/or as directed by the Engineer.
2. The acoustical barrier enclosures shall be readily moveable so that they may be repositioned, as necessary, to provide noise abatement for non-stationary equipment (e.g., jackhammers, chain saws, compressors).

B. Installation, Maintenance, and Removal

1. The acoustical enclosure shall be installed such that the noise-absorptive surfaces face the construction noise source.
2. The Contractor shall maintain the acoustical barrier enclosures and repair all damage that occurs, including, but not limited to, keeping barriers clean and free from graffiti and maintaining structural integrity. Gaps, holes, and weaknesses in the acoustical enclosure, and openings between or under the panels, shall be repaired promptly or replaced by the Contractor with new material. Construction work shall not proceed until repairs are made.
3. The Contractor shall remove and dispose of the acoustical enclosure at the end of the Contract, or sooner at the direction of the Engineer.

3.05 NOISE CONTROL CURTAINS

A. General

1. The Contractor shall erect noise control curtains to mitigate construction noise at locations specified in construction drawings, per the NCP, and/or as directed by the Engineer.
2. Noise control curtains shall particularly be used for short-term operations (e.g., less than 3 months), or where vehicular or pedestrian access is required during the day, or as directed by the Engineer.

B. Installation, Maintenance, and Removal

1. The noise control curtains shall be installed without any gaps such that the sound-absorptive side faces the construction activity to be shielded. The curtains shall be supported by the existing elevated roadway, bridge spans, or other methods identified by the Contractor.
2. The Contractor shall maintain the noise control curtains and repair all damage that occurs including, but not limited to, keeping noise control curtains clean and free from graffiti and maintaining structural integrity. Gaps, holes, and weaknesses in the noise control curtains, and openings between or under the panels, shall be repaired promptly or replaced by the Contractor with new material. Construction work that will produce noise exceeding the established thresholds without the noise control curtains in place shall not proceed until such repairs are made.
3. The Contractor shall remove and dispose of the noise control curtains at the end of the Contract, or sooner at the direction of the Engineer.

END OF TEXT FOR THIS SECTION

TABLE 1. CONSTRUCTION NOISE LOT- LINE LIMITS IN dBA

Period of the Day	Hours	Land-use	Non-Impact Equipment		Impact Equipment	
			Leq	Lmax	Leq[a]	Lmax
Daytime	7:00 am to 6:00 pm	Noise-sensitive	70	85	n/a	90
		Commercial	77	--	n/a	--
		Industrial	82	--	n/a	--
Evening	6:00 pm to 10:00 pm	Noise-sensitive	62	80	n/a	80
Nighttime	10:00 pm to 7:00 am	Noise-sensitive (BL[e] < 70 dBA)	60	75	n/a	80

NOTES:

(a) Noise from impact equipment is exempt from the Leq requirement, however is still subject to a lot-line Lmax limit.

(b) All measurements shall be taken at the affected lot-line. In situations where the work site is within 50 feet of a lot-line, the measurement shall be taken from a point along the lot-line such that a distance of 50 feet is maintained between the sound level meter and the construction activity being monitored.

(c) Lot-line noise limits shall apply to all points along the receptor's lot-line.

(d) Leq noise readings are averaged over 20 minute intervals. Lmax noise readings occur instantaneously.

(e) BL is the average baseline or background measured in Leq.

TABLE 2. CONSTRUCTION EQUIPMENT 50-FEET NOISE EMISSION LIMITS (a), (b)

Equipment Category	Lmax Noise Limit at 50 ft, dBA, slow	Is Equipment an Impact Device? (c)	Acoustic Usage Factor (d)
All other equipment > 5 HP	85	No	50 %
Auger Drill Rig	84	No	20 %
Backhoe	78	No	40 %
Bar Bender	80	No	20 %
Blasting	94	Yes	1 %
Boring Jack Power Unit	80	No	50 %
Chain Saw	84	No	20 %
Clam Shovel	87	Yes	20 %
Compactor (ground)	80	No	20 %
Compressor (air)	78	No	40 %
Concrete Batch Plant	83	No	15 %
Concrete Mixer Truck	79	No	40 %
Concrete Pump Truck	81	No	20 %
Concrete Saw	90	No	20 %
Crane (mobile or stationary)	81	No	20 %
Dozer	82	No	40 %
Drill Rig Truck	79	No	20 %
Drum Mixer	80	No	50 %
Dump Truck	76	No	40 %
Excavator	81	No	40 %
Flat Bed Truck	74	No	40 %
Front End Loader	79	No	40 %
Generator (25 KVA or less)	73	No	50 %
Generator (more than 25 KVA)	81	No	50 %
Gradall	83	No	40 %
Grader	85	No	40 %
Grapple (on backhoe)	85	No	40 %
Horizontal Boring Hydraulic Jack	80	No	25 %
Hydra Break Ram	90	Yes	20 %
Impact Pile Driver (diesel or drop)	95	Yes	20 %
Insitu Soil Sampling Rig	84	No	20 %
Jackhammer	85	Yes	20 %
Man Lift	75	No	20 %
Mounted Impact Hammer (hoe ram)	90	Yes	20 %
Paver	77	No	50 %
Pavement Scarifier	85	No	20 %
Pickup Truck	75	No	40 %
Pneumatic Tools	85	No	50 %
Pumps	77	No	50 %
Refrigerator Unit	73	No	100 %
Rivet Buster / Chipping Gun	79	Yes	20 %
Rock Drill	81	No	20 %
Roller	80	No	20 %
Sand Blasting	90	No	20 %
Scraper	84	No	40 %
Shears (on backhoe)	90	No	40 %
Slurry Plant	78	No	100 %
Slurry Trenching Machine	80	No	50 %
Soil Mix Drill Rig	80	No	50 %
Tractor	84	No	40 %
Vacuum Excavator (vac-truck)	85	No	40 %
Vacuum Street Sweeper	80	No	10 %
Ventilation Fan	79	No	100 %
Vibrating Hopper	85	No	50 %
Vibratory Concrete Mixer	80	No	20 %
Vibratory Pile Driver	95	No	20 %
Warning Horn	83	No	5 %
Welder / Torch	73	No	40 %

NOTES:

(a) Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.

(b) Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.

(c) "Impact" equipment is assumed to produce separate discernable sound pressure maxima.
(d) "Acoustic Usage Factor" represents the percent of time that equipment is assumed to be running at full power while working on site.

(Insert Fore River Project Site Map Here)

FIGURE 1. FORE RIVER PROJECT SITE MAP & RESIDENTIAL NOISE RECEPTOR LOCATIONS

Attachment B – Draft Construction Dust Control Specification

CONSTRUCTION DUST CONTROL

Description

1. General

   a. The contractor is responsible for controlling construction related dust emissions at all times during work of this Contract, 24 hours per day, 7 days per week, including nonworking hours, weekends, and holidays.

2. Regulatory Requirements

   a. The Contractor shall perform all Work specified under this Section in compliance with the provisions of the Massachusetts Department of Environmental Protection Code of Massachusetts Regulations (CMR) 310 CMR 7.09 “Dust, Odor, Construction and Demolition.”
   b. Work of this Contract shall be conducted in a manner that will not result in excessive particulate matter emissions, nuisance dust conditions, or PM10 (particulate matter with an aerodynamic diameter less than or equal to 10 microns) concentrations exceeding the Massachusetts and National Ambient Air Quality Standard of 150 micrograms per cubic meter (µg/m3) on a 24-hour average basis measured at offsite receptor locations.

3. Submittals

   a. Specific to the work to be performed for this contract, develop and submit for approval a Dust Control Plan (DCP) that outlines in detail the measures to be implemented to comply with this Section. For work activities to be performed, the plan should include details as to how dust emissions will be controlled and/or minimized for demolition activities, earthwork activities including excavation activities, stockpile material, and on public roadways. Any modifications to the approved DCP must be submitted to MassDOT for review and approval prior to implementation.
   b. Submit product literature and material Safety Data Sheets for dust suppression wetting agents and stabilizers.

Materials

1. Dust Suppression Agents
   a. Dust suppression wetting agents shall be water soluble, non-toxic, non-reactive, non-volatile, and non-foaming.
   b. Soil stabilizer shall be a sprayable organic or inorganic tackifier.

2. Barriers, Screens and Covers

   a. Wind screens shall be a durable fabric mesh of 50 percent porosity, attached to construction fence.
   b. Wind barriers shall be solid wood fences, solid durable fabric attached to construction fence, or other solid barriers intended to block the passage of wind.
   c. The construction fence itself (chain link or solid) is not part of this Section.
   d. Covers for stockpiles shall be plastic tarps.

3. Seeding

   a. Seeding for dust control shall conform to Section 765. The Contractor shall determine, through testing if necessary, the materials and methods necessary for the Contractor to satisfactorily produce a stand of grass that will effectively control dust.

Construction Methods

7. Construction Site Dust Control - General
   a. Wet suppression shall be used to provide temporary control of dust. Several applications per day may be necessary to control dust depending upon meteorological conditions and work activity. The Contractor shall apply wet suppression on a routine basis as necessary or as directed by the Engineer to control dust.
   b. Calcium chloride shall be used to control dust instead of wet suppression when freezing conditions exist. Calcium chloride shall be uniformly applied at one and one-half (1.5) pounds per square yard, unless otherwise directed by the Engineer. Ensure vegetation, or soil to be used for vegetation, is not treated.
   c. The use of petroleum products for dust suppression is prohibited in this Contract.
   d. Provide wind screens and wind barriers in locations where they would be effective in minimizing wind erosion and spread of dust within areas disturbed by the Contractor. Locations shall be submitted as part of the Contractor’s DCP. The Contractor shall keep wind screens and barriers in good repair for the life of the Contract.
   e. Seeding used to prevent wind erosion shall be in accordance with Section 765. During seeding, furnish to the Engineer all container labels or empty containers from all materials used. Do not seed without the direction of the Engineer.
   f. Compressed air will be permitted only for cleaning of non-particle debris, such as that from reinforcing bars. Cleaning debris from any surface or structure using compressed air is not permitted.
   g. Only wet cutting of concrete block, concrete, and/or asphalt surfaces is allowed.

2. Public Roadway Dust Control

   a. Vehicles leaving the construction site shall have no mud and dirt on the vehicles body or wheels.
   b. Haul truck cargo areas shall be securely covered during material transport on public roadways.
   c. Material with high water content shall not be allowed to leak from truck cargo areas during transport over public roadways.
   d. Vehicle mud and dirt carryout, material spills and soil wash-out onto public roadways and walkways and other paved areas shall be immediately cleaned up.
   e. The Contractor is responsible for daily clean-up of public roadways and walkways affected by Work of this Contract. The Contractor shall use vacuuming, wet mopping, wet power sweeping, regenerative power air sweeping, or wet power broom sweeping on paved roadways. Dry power sweeping is prohibited.

3. Control of Earthwork Dust

   a. During batch drop operations (i.e., earthwork with front-end loader, clamshell bucket, or backhoe) the free drop height of excavated or aggregate material shall be reduced as practical to minimize the generation of dust.
   b. To prevent spills during transport, freeboard space shall be maintained between the material load and the top of the truck cargo bed rail.

4. Control of Stockpile Dust

   a. Wet suppression without wetting agent during active stockpile load-in, load-out and maintenance activities. Salty or brackish water shall not be used.
   b. Plastic tarps on stockpiles, secured with sandbags or an equivalent method to prevent the covers from being dislodged by the wind. The Contractor shall repair or replace covers whenever damaged or dislodged, without additional compensation.
   c. Soil stabilizers applied to the surface of inactive stockpiles.
   d. Seeding of inactive stockpiles.
   e. The method to be used shall be submitted for review and approval as part of the dust control plan specified under Submittals.

5. Demolition Dust Control Measures

   a. Wet suppression without wetting agent during demolition work shall be used.
   b. Dropping or throwing of demolition debris is prohibited.
   c. Demolition debris shall be removed promptly from the site.
   d. During transport of demolition debris, the truck cargo area shall be securely covered.

Attachment C – Referenced Correspondence

From: Damaris.Santiago@dot.gov
Sent: Friday, July 23, 2010 8:49 AM
To: christopher.boelke@noaa.gov
Cc: Julie.Crocker@Noaa.Gov; Erin.Remillard@state.ma.us; Susan.Mcarthur@state.ma.us; gary.kassog@uscg.mil; john.w.mcdonald@uscg.mil
Subject: Quincy/Weymouth: Fore River Bridge project - EFH Assessment
Attachments: EFH Assessment 7-14-2010.pdf; trasnm letter.pdf

Chris,
You should receive a hard copy of the attached report through regular mail.
Don't hesitate to contact me should you have any questions.
D/

Damaris Santiago
Environmental Engineer

55 Broadway 10th Floor
Cambridge, MA 02142
ph: 617-494-2419
Fax: 617-494-3355
Damaris.Santiago@dot.gov

Please consider the environment before printing this email

From: Damaris.Santiago@dot.gov
Sent: Thursday, July 29, 2010 5:58 PM
To: Christopher.Boelke@Noaa.gov
Cc: Lou.Chiarella@noaa.gov; Gary.Kassof@uscg.mil
Subject: RE: Quincy/Weymouth: Fore River Bridge project - EFH Assessment

Hi Chris,

Sorry I wasn't able to respond earlier. I've been out on meetings all day.

There is a project website where you can find more details about the project and also information that has been presented to the public and the power point presentations of the public meeting that contains good information on the project area, potential impacts, bridge type, and renderings. You can access through the following link:

http://www.massdotprojectsforeriverbridge.info/

Basically, the FHWA is providing funds for the construction of the Fore River Br, which will replace a temporary bridge that has been in place for over a decade. The old bridge was demolish, so this project is proposing to provide a permanent bridge over the Fore River.

As the lead agency for this project, we are processing this project through an EA, in cooperation with the Coast Guard, given that the bridge spans a navigable water. The bridge requires a Coast Guard permit, so a lot of coordination has happened to incorporate design features that will provide clearances acceptable to the CG. It is my understanding that the CG (Gary could correct me if I'm wrong) will release the Public Notice for the permit coinciding with the EA public comment period. The EA would probably be out for public review this fall.

I'll ask MassDOT to provide plans for your review.

Please let me know if you have any other comments or questions regarding this project.

Thanks,
Damaris/

Damaris Santiago
Environmental Engineer

55 Broadway 10th Floor
Cambridge, MA 02142
ph: 617-494-2419
Fax: 617-494-3355
Damaris.Santiago@dot.gov

Π Please consider the environment before printing this email

-----Original Message-----
From: Christopher.Boelke [mailto:Christopher.Boelke@Noaa.gov]
Sent: Thursday, July 29, 2010 12:11 PM
To: Christopher.Boelke
Cc: Santiago, Damaris (FHWA); Lou Chiarella; Gary.Kassof@useg.mil
Subject: Re: Quincy/Weymouth: Fore River Bridge project - EFH Assessment

Damaris - Just want to check in on this issue. I will be out next week and wanted to make sure that NMFS can respond to you in a timely fashion. In addition to the questions below, please forward proposed project plans for our review

Thank you,
Chris

Christopher.Boelke wrote:
> Hi Damaris - I do not believe that I have received any recent
> information on this project. Could you please provide some background
> on this. Is there a USCG bridge permit pending that needs an EFH
> assessment?
>
> Thanks,
> Chris
>
> Damaris.Santiago@dot.gov wrote:
>>
>> Chris,
>>
>> You should receive a hard copy of the attached report through regular
>> mail.
>>
>> Don't hesitate to contact me should you have any questions.
>>
>> D/
>>
>> *Damaris Santiago*
>>
>> Environmental Engineer
>>
>> 55 Broadway 10^th Floor
>>
>> Cambridge, MA 02142
>>
>> ph: 617-494-2419
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>> Fax: 617-494-3355
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>> Damaris.Santiago@dot.gov <mailto:Damaris.Santiago@dot.gov>
>>
>> Every Day Counts logo. With text: ' Innovation, Invention, Ingenuity,
>> Imagination.'
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PART II: RESPONSE TO COMMENTS