The Commonwealth of Massachusetts

MassDOT – Highway Division

Interoffice Memorandum

To: Jocelyn Dewire, Project Manager

From: Daniel Gentile, Community Compliance Section

Date: 9/4/07

Subject: Town of Belmont-Trapelo Road Key: #604688

Comment 1: The Preliminary Right of Way Plans are sufficient for Right of Way purposes. Please deliver or mail Right of Way Plans to liaison in the Town of Belmont.

Response: The Town has a copy of the 25% Preliminary Right of Way Plans and will be provided with a revised set at the 75% design stage.

The Commonwealth of Massachusetts

MassDOT – Highway Division

Interoffice Memorandum

To: Marie Rose, P.E., Acting Project Management Engineer

Through: David Anderson, P.E., Acting Chief Engineer

From: Luciano Rabito, P.E., Bicycle/Pedestrian Accommodation Engineer

Date: September 7, 2007

Subject: **BELMONT/WALTHAM/WATERTOWN –** Trapelo Rd. & Belmont St.
Roadway Reconstruction Project
25% Project Review
Project File # 602925 EWO/PARS #: P602925P11
Jocelyn Dewire, Interim Project Manager

I have reviewed the latest submission of subject project for compliance with The Project Development and Design Guide and The AASHTO Guide for the development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

The proposed project design calls for:

Comment 1: Trapelo Road
Sta. 21+00 to Sta. 23+50
Eastbound - 1- 11 foot travel lane, 1 - 11 foot turning lane, 1 - 4 foot shoulder, 1 - 8 foot parking lane, and 1 - 8.5 foot sidewalk.
Westbound - 2- 11 foot travel lanes, 1 - 5 foot shoulder, 1 - 12 foot turning lane, and 1 - 6 foot sidewalk.

This section is in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

Response: No response required.

Comment 2: Trapelo Road
Sta. 161-50
Eastbound - 2- 11 foot travel lanes, 1 - 5 foot shoulder, and 1 - 9.5 foot sidewalk.
Westbound - 2- 11 foot travel lanes. and 1 - 5 foot shoulder.

This section is in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

Response: No response required.

Comment 3: Trapelo Road

Sta. 30+50 to Sta. 31+30
Eastbound - 2- 11 foot travel lanes, 1 - 4 foot shoulder, and 1 - 5.5 foot sidewalk.
Westbound - 1- 11 foot travel lane, 1 - 4 foot shoulder, and 1 - 4.5 foot sidewalk.

This section is NOT in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards. The minimum width for a sidewalk is 5.5 feet.

Response: There is not adequate width in the area to provide the 5.5 foot sidewalk without eliminating the bicycle accommodation or taking additional land from the gas station from which we are already taking a narrow strip of land to provide the proposed four foot sidewalk. Taking more would put the owner out of business. We are not allowing any obstructions (signs, poles, hydrants) in the proposed four foot section of sidewalk (about 150 feet long) that would block a wheelchair from traversing the sidewalk.

Comment 4: Trapelo Road
Sta. 24+00 to Sta. 26+50
Eastbound - 2- 11 foot travel lanes, 1 - 4 foot shoulder, 1 - 8 foot parking lane, and 1 - 8.5 foot sidewalk.
Westbound -2- 11 foot travel lanes, 1 - 5 foot shoulder, and 1 - 5.5 foot sidewalk.

This section is in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

Response: No response required.

Comment 5: Trapelo Road
Sta. 45+00 to Sta. 51+00
Eastbound - 1- 12 foot travel lane, 1 - 5 foot shoulder, 1 - 8 foot parking lane, and 1 - 12.5 foot sidewalk.
Westbound - 1- 12 foot travel lane, 1 - 5 foot shoulder, 1 -8 foot parking lane, and 1 - 12.5 foot sidewalk.

This section is in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

Response: No response required.

Comment 6: Trapelo Road
Sta. 39+00 to Sta. 43+00
Eastbound -*1* - 16 foot travel lane, 1 - 5 foot shoulder, 1 -8 foot parking lane, and 1 - 8.5 foot sidewalk.
Westbound -1- 16 foot travel lane, 1 - 5 foot shoulder, 1 -8 foot parking lane, and 1 - 8.5 foot sidewalk.

This section is in conformance with The Project Development and Design Guide and the AASHTO Guide for the Development of Bicycle Facilities, and relevant bicycle and pedestrian accommodation standards.

Response: No response required.

The Commonwealth of Massachusetts

MassDOT – Highway Division
Asset Management Division

Memorandum

To: Marie Rose, P.E., Acting Director of Projects Management Division

From: Matthew Turo, Pavement Management Engineer
Asset Management Division – Pavement Management Section

Date: October 2, 2007

Subject: Belmont Waltham Watertown – Trapelo Road/Belmont Street
Project File No. 604688

Comment 1: Based on the pavement cores, the existing asphalt pavement is approximately 4 inches of asphalt over 3 inches of penetrated crushed stone. The pavement design submittal proposes milling to a depth of 3 inches. This milling depth would leave the remaining pavement with minimal cover over the penetrated crushed stone. This 1" cover over the penetrated crushed stone is too thin and is inadequate for traffic and construction vehicles. It is preferred that a minimum of two inches asphalt cover remain after milling to prevent damage to the penetrated crushed stone layer.

The proposed milling shall retain a 2" minimum asphalt cover over the penetrated stone base. The contractor should minimize the exposure of the milled surface to traffic, thereby reducing the possibility of damaging the penetrated stone layer.

The Pavement Resurfacing Overlay is approved as follows:

- Cold planning to a depth of 1.5".
- 2" HMA Surface Course Type B - (formerly modified top coarse)

The Pavement Full Depth Construction is approved as follows:

- 2" HMA Surface Course Type B - (formerly modified 'top course) over
- 2" HMA Intermediate Course Type B – (formerly dense binder) over
- 3.50" HMA Base Course Type A - (formerly black base) over
- 4" Dense Graded Crushed Stone over
- 8" Gravel Borrow Type b

Response: This comment was superceded by an e-mail from the author on June 23rd , 2009 (included hereinafter) and subsequent telephone conversations in October of 2009 and March of 2011. The final agreed to pavement design was:

The Pavement Resurfacing Overlay is as follows:

- Micro-milling to a depth of 2.25".
- 1.50" Superpave Surface Course 12.5 (SSC - 12.5), over
- 2.00" Superpave Intermediate Course 12.5 (SIC -12.5)

The Pavement Full Depth Construction is approved as follows:

- 1.50" Superpave Surface Course 12.5 (SSC - 12.5), over
- 2.00" Superpave Intermediate Course 12.5 (SIC -12.5) over
- 4.50" Superpave Base Course 37.5 (SBC -37.5)
- over
- 4" Dense Graded Crushed Stone over
- 8" Gravel Borrow Type b

Comment 2: Tack coat shall be applied at the rate of 0.05 gallons per square yard to paved surfaces and 0.07 gallons per square yard to milled surfaces.

Response: This has been added to the pavement notes.

Comment 3: The Designer shall provide for full depth pavement repairs to patch utility trenches, localized areas exposed by milling operations, and as directed by the Engineer.

Response: The Construction Details Plan includes a full depth "Trench Patch Detail" for the repair of culvert and conduit trenches excavated prior to the milling of the roadway. It also includes a "Pavement Repair Detail" for localized areas exposed by milling operations. There is also an item for controlled density fill for hard to compact area such as around utilities.

The Commonwealth of Massachusetts

MassDOT – Highway Division

Interoffice Memorandum

To: Neil E. Boudreau, State Traffic Engineer

From: Michael Galvin, P.E., Traffic Operations Engineer

Date: November 1, 2007

Subject: Belmont – Trapelo Road and Belmont Street; by BSC Group, J. Dewire
25% Design Submission Review (Key # 604688 : EWO # P604-688-P11-1)

The Traffic Operations Unit of the Highway Safety Division has completed its review of the functional design report (FDR) and the 25% design plans for the proposed Trapelo Road/Belmont Street corridor improvements project in Belmont. There are many comments or questions that need to be responded to, but we believe that most of those responses can be reflected in the next design stage submission. Therefore, this project may be developed to the next design level provided that the comments listed below are appropriately addressed.

This project is intended to update the traffic signal systems, rehabilitate the roadway surface, and improve pedestrian and bicycle amenities along this corridor from the Waltham city line eastward to the Cambridge city line. The Beaver Brook culvert under Trapelo Road at the Belmont-Waltham line will also be replaced. We note the following:

FUNCTIONAL DESIGN REPORT (FDR)

Comment 1: The geometric, roadway surface, traffic signal system and intersection operations, sidewalks, bicycle facilities, and roadway safety are all being improved along most of this corridor. Not all intersections and approaches will realize improvements in the levels of service (LOS), however, but the overall operations of the corridor should improve.

Response: Comment noted. No response required.

Comment 2: The crash rate worksheets in Appendix B state that most of the peak hour traffic volumes, which are bases on the manual turning movement (MTM) counts, were counted on July 1, 2005, which was a Friday. Since that day was the beginning of the long 4th of July holiday weekend, the data would normally be unacceptable. However, the actual MTM data sheets (see Appendix A) indicate that the date were collected on June 8 and 9, 2005, which were a Wednesday and Thursday of a non-holiday week. Consequently, those data may be used in the report.

Response: Comment noted. No response required

25% DESIGN PLANS

Comment 3: The consultant needs to correct some of the Design Designation data shown on the Title Sheet and Index (see sheet 1). The design hourly volumes (DHV), and

consequently the directional design hourly volumes (DDHV), used for a project are based on the forecast traffic volumes expected in the design year, not the traffic counts of the existing year as seems to have been done here.

Response: Comment noted. See revised data on Title Sheet.

Comment 4: The typical section for the full depth reconstruction of a side street indicates a 4.0 foot paved sidewalk area (see sheet 12). This dimension is below many design criteria, and the designer needs to determine to what extent the 4.0 foot width meets AAB and ADA guidelines.

Response: The Town's standard for side streets is a four foot walk area as long as there is a grass strip to accommodate street furniture such as signs, poles and hydrants. As there is a continuous clear four foot path with passing zones at the driveways the standard meets ADA/AAB guidelines.

Comment 5: The designer needs to review the "design" of a number of crosswalks, particularly those that connect to traffic islands (e.g. see sheets 14 and 17). S/he also needs to review the ADA/AAB guidelines with respect to the alignment/orientation of crosswalks. Generally it is desirable to minimize or eliminate turns in the alignment, so that visually disabled persons can easily follow the path from one side of the street to the other. See also the comments/discussion on sheet. 46

Response: The "design" of all the crosswalks have been reviewed and modified where found that improvement pertaining to ADA/AAD guidelines could be made.

Comment 6: The consultant needs to review the design of a number of the traffic islands. At the intersection of Trapelo Road and Mill Street, for example (Sta. 19+30 Lt/see sheet 14), it appears that a crosswalk divides the island into two parts, one of which is only 50+/-sq. ft. The designer should consider how much of a potential obstruction such a small object may make. The safety and the flow of traffic there may depend on whether the islands are scored concrete, have mountable curb, have vertical granite curb, etc., but that is not shown on the construction plans.

Response: All islands with pedestrian crossing have been reviewed and revised where necessary.

Comment 7: The designer needs to ensure that the shrubs or trees proposed for the traffic island at Sta.18+30 Lt(see sheet 14) do not interfere with the line of sight of those drivers using the turning ramp from Mill Street SB→Trapelo Road WB.

Response: A new tree will be planted at this location in place of the existing tree that is being removed. The new tree is further back from the curb than the existing tree. No shrubs are proposed at this location. As long as a tree has a bottom of canopy that is higher than the driver's line of sight a tree trunk does not necessarily interfere with a driver's sight distance any more than a utility pole does.

Comment 8: Although no work is proposed on the Trapelo Road bridge over the railroad tracks (see sheet 17), the designer needs to coordinate with appropriate railroad officials to determine whether any railroad inspectors or flagmen, etc, may be required when the work is over or adjacent to the railroad right-of-way.

Response: This will be done prior to the 100% submission.

Comment 9: The designer should make a general review of the location of all crosswalks to ensure that they are in optimum locations for their particular intersection. The two north/south crosswalks at the Trapelo Road/ Beech Street intersections, for example (see sheets 22, 47, & 60), are far from perpendicular, and that increases both the crossing distance and the pedestrian crossing time.

Response: All the intersections were reviewed as requested and changes made where appropriate. At the Beech Street intersection the crosswalks were not made perpendicular as this location is in the middle of a business area and the suggested change would result in the loss of at least four parking spaces highly valued by the business community and area residents. At the intersection of Grove Street the crosswalk was made perpendicular.

Comment 10: The proposed bus shelter on the Trapelo Road at Sta. 56+80 Rt (see sheet 22) appears to take up the full width of the sidewalk there. The designer needs to indicate how pedestrians and wheelchairs using the sidewalk will get through/past/around the shelter (the same comments applies for Belmont Street at Sta. 146+00 Rt on sheet 41).

Response: The design has been revised, and the bus shelter no longer obstructs the passage of pedestrians.

Comment 11: In the median that is being proposed along portions of Trapelo Road (e.g. as on sheet 23), raised traffic islands have been interspersed at various locations within the flush stamped concrete rubble strips. While these islands will help to define the median and provide locations for some of the proposed landscaping, they can also be viewed as intermittent obstacles that may adversely affect the flow and safety of traffic along the street. The designer needs to consider the feasibility of either omitting the raised islands, or extending them for the full length(s) of the medians.

Response: The design of the islands have been revised to make them as long as possible without blocking the access to a private drive from the other side of the roadway. Some of the islands have been eliminated.

Comment 12: Since there is only one thru approach land WB at the Trapelo Road/Waverly Oaks Road intersection, the designer should consider clearly indicating that there is only one WB receiving lane, as shown on sheet 45.

Response: Comment is noted. This intersection in Waltham is no longer part of the project.

Comment 13: It is not clear what bicyclists should do/what options they have when traveling WB on Trapelo Road approaching the Mill Street intersections (see sheet 45). The designer needs to clarify the pavement markings there and/or provide some traffic signs to direct and guide the bicyclists.

Response: The pavement markings have been modified to clarify options for bicyclists traveling in the westbound direction. The bicyclist will now use the right turn lane in this area and from there can go either straight or right when arriving at Mill Street. Please see plan sheet PM-1.

Comment 14: The angle parking in the lot adjacent to Church Street (see sheet 46) results in a clockwise flow through the lot. The designer should determine if that is the intended operation, since vehicles from Trapelo Road WB and Church Street SW-bound will need to drive past the lot to the second driveway to enter the lot. Those vehicles NE-bound on Church Street that want to enter the lot will need to turn left across traffic on Church Street very shortly after they have gone through the Church Street/Lexington Street intersection (i.e. there is little storage room between the southern parking lot driveway and the intersection if a NE-bound vehicle is waiting to turn into the lot).

Response: The plans have been changed and the circulation within the lot will remain as it is today.

Comment 15: The MUTCD indicates that there should be no parking for (at least) 30 feet before a crosswalk or 20 feet after a crosswalk at a signalized intersection. The designer needs to review that guideline and determine to what extent some of the currently proposed parking spaces need to be changed (e.g. see sheets 47 and 59).

Response: We have reviewed the plans and increased the distance where possible. However, signalized intersections are in commercial districts where the loss of a single parking space has a negative impact to the businesses in the area.

Comment 16: Of particular concern in the layout of crosswalks (see comment 5 above) is that at Sta. 71+00 on Trapelo Road at its intersection with Slade Street (see sheet 48). Two of the crosswalks intersect outside of the traffic island, resulting in no physical indication for persons with poor vision that the crosswalks end or turn.

Response: The design has been modified to address this concern. Please see plans for revised crosswalk layout at Slade Street.

Comment 17: The designer needs to review the need for, and the usefulness of, the "DWLL" (dotted white lane [extension] lines) at the Trapelo Road/Common Street intersection (see sheets 49 and 63). If they are needed, the extension lines for both the Common Street NB→ Trapelo Road WB turns and the Common Street SB→ Trapelo Road EB turns should be "DYExL" (dotted yellow extension lines) to the left of the turning vehicles (i.e. extensions of the center lines). However, a more pressing need for extension lines may be for the Common Street NB "through" traffic: because Cushing Avenue is located directly across from Common Street NB, many drives will consider Cushing Avenue as being "through" and will be confused as to whether Common Street NB is "through" of "left". As indicated in comment 25 below, it appears from the traffic signal phasing that the designer considers Common Street as "through", but this is not evident to the driver.

Response: The DWLL is to provide a "guided" separation between opposing left turn vehicles that will be turning simultaneously. The use of the "DYExL" line does not provide the same guidance through this skewed intersection. With respect to Common Street northbound this is an existing condition that does not seem to create confusion to existing drivers. We believe the wide width and commercial development along the north leg of Common Street compared to the narrow

width and residential nature of Cushing Avenue make it obvious to northbound drivers that Common Street is the main route.

Comment 18: There are a large number of intersections where there appear to be unnecessary or redundant traffic signals; the designer needs to review all intersections to determine if some of the proposed signal needs can be removed. This would not only decrease the coast of the proposed new signals, but it would help to reduce the visual clutter that may occur at some locations. For example, at the intersection of Trapelo Road and Mill Street (see sheet 64), signal head A for the Trapelo Road EB traffic appears to be unnecessary, and their identical signal heads (J,K, and L) for the Mill Street SB traffic seem redundant.

Response: Comment noted. The plans have been revised to reduce the number of signal heads per approach. It must be noted, however, that the use of supplemental signal heads in addition to the two required for the main movement is recommended for roadways that experience large volume of trucks and busses, as is the case of Trapelo Road. The supplemental signals are expected to provide improved visibility for drivers following trucks/buses as they travel through the intersection

Comment 19: The designer should consider the feasibility of relocating the pedestrian signal mast arm on Trapelo Road from Sta. 23+50 Lt to Sta. 23+62 Lt, as suggested on sheet 55. This would result in the need for only a 25 foot mast arm instead of the currently proposed 35 foot mast arm.

Response: Comments noted. Design has been revised as requested.

Comment 20: At the Trapelo Road/Pleasant Street intersection (sheet 56), it appears that there are three separate NB approaches controlled by signal head J and N. It also appears that those three approaches can go north (i.e. through) onto Pleasant Street, but vehicles on the SB Pleasant Street approach cannot go straight through into the three driveways (signal heads M, H, and G for the SB traffic are left turn only). The design needs to discuss/explain/improve this.

Response: The plans have been revised to allow for the Pleasant Street southbound through movement.

Comment 21: There are numerous comments and questions on sheet 57 at the "compound" intersection of Trapelo Road, Lexington Street, Moraine Street, and Shaw's Drive regarding:

- turns into and out of Moraine Street
- what left turns are allowed from Trapelo Road WB
- the design vehicles that can be accommodated in the various turns
- the lens indications on signal heads A, B, and N; and
- whether signal head T is necessary

The designer needs to review and discuss these items, and revise the plans where necessary. Any changes in the design of the signal heads or the lens configurations therein will need to be reflected in revised capacity and level of service (LOS) analyses in the FDR.

Response:

- Turns are allowed on to Moraine Street from both directions of Trapelo Road. The permitted right turn for Trapelo Road eastbound at Moraine Street (Phase 2 and 6) is also allows the right movement to Lexington Street. All movements out of Moraine Street are allowed. The Moraine Street approach has its own signal phase.
- The left turn from Trapelo Road to Lexington Street across from the driveway at Shaws Supermarket is not allowed. The same movement at Moraine Street is not restricted but has very little demand as vehicles desiring to travel to Lexington Street will turn left at Church Street. The left turn to Moraine Street from Trapelo Road westbound is allowed.
- A WB-40 can make all movements within the intersections while staying in its own lane except the right turn out of Moraine Street into Lexington Street and that move can be made by travelling down Trapelo Road and turning right into Church to access Lexington Street.
- Signal heads A and B are now proposed as green balls. Signal head N, now called O was a green ball and is still a green ball and we do not see an issue with it.
- Signal head T had been removed.

Comment 22: There are numerous comments and questions on sheet 58 at the offset 4-way intersection of Lexington Street, Church Street, and Thayer Road regarding:

- the width of the SB approach lane and the NB receiving lane on Lexington Street
- some of the operational complications caused by the traffic island in the NE quadrant of the intersection
- the possible reconfiguration of the intersection to eliminate the Church Street WB→ Lexington Street NB turning ramp
- the need for signal heads G and H, especially if crosswalk P5-P6 is eliminated
- the operational complications caused for Thayer Street EB vehicles because of its offset from Church Street; and
- whether signal head L on Thayer Road is necessary

The designer needs to review and discuss these items also, and adjust the plans as needed.

Response:

- The SB approach lane is approximately 18 feet wide and will enable through vehicles to pass by SB left turning vehicles.
- The traffic island currently exists and provides refuge for pedestrians crossing Lexington Street and Church Street. It also helps to channelize the vehicles, mostly buses, that leave the Waverley Station.
- The traffic island is being retained for the above reasons and therefore the intersection is not proposed to be reconfigured.
- The Thayer Road EB and Church Street WB approaches have been modified to operate as split phases to reduce operational complications due to the offset alignment.
- The signal head L has been removed from the plan.

Comment 23: The designer needs to discuss whether or not a pedestrian signal is needed for

the mid-block crosswalk across Trapelo Road at Sta. 63+45. near the Belmont fire station (see sheet 61). Also at the Belmont fire station, the designer needs to provide stop lines for preemption signals A/B and C/D, and also needs to indicate how the driveway at Sta. 64+75 Rt is controlled during preemption.

Response: The emergency signals at this location are not being modified as part of this reconstruction project. The plans have been revised to show the location of the existing stop lines. Midblock pedestrian signals are not warranted at this location and none are therefore proposed. The driveway at Sta. 64+75 is not signalized and during preemption operations, exiting drivers currently stop and wait for the emergency vehicles to clear.

Comment 24: Another example of redundant signal heads (see comment 18 above) is at the Trapelo Road/Slade Street/Harriet Avenue intersection (sheet 62) where it appears that the number of identical signal heads could be reduced from 13 to 8.

Response: Comments noted. Please see plans

Comment 25: At the Trapelo Road/Common Street/Cushing Street intersection (see sheet 63), the designer should consider making signal head H all arrows, (R,Y, and G) at a 46 degree angle to the upper left (i.e. onto Common Street NB). This will hopefully minimize the driver confusion as to whether Common Street is included with the "left" or the "through" signals.

Response: The Trapelo Road/Common Street/Cushing Street intersection has a complex geometry and the goal is to minimize driver confusion with the proposed design. Under the proposed phasing, the opposing northbound and southbound left turn movements have the lead phase with a horizontal arrow followed by opposing through traffic for both approaches. Comments noted. Please see plans.

Comment 26: The designer must change signal heads G and H at the Trapelo Road/Pine Street intersection (see sheet 65). Even though they are existing signals, they are in conflict with the MUTCD and create a potentially unsafe situation for some of the turning movement in the intersection.

Response: The signal heads have been modified. Please see plans.

Comment 27: Also at the Trapelo Road/Pine Street intersection (sheet 65), the designer should consider relocating signal head I (for the "NB" Belmont St. traffic) from the ground mounted traffic signal post to the mast arm, as shown on the plans. On the mast arm it would still be useful as an advance signal for the Belmont St. traffic, but would also be used by NB drivers at the STOP line.

Response: Traffic signal head H (formerly I) is located on a ground mounted traffic signal post due to the proposed location of the mast arm. This proposed nearside location will serve both as an advance signal as well as a STOP line indication.

Comment 28: On the traffic management plan (TMP – see sheet 70), the specific "Standard Details and Drawings for the Development of Traffic Management Plans" referred to in the Notes need to be shown on the TMP plans in all further submissions.

Response: MassDOT's Standard Details have been inserted into the contract drawings following the first group of Traffic Management Plans, but before the Sign Summary Sheet(s).

Comment 29: All existing traffic-related signs throughout the project need to be shown on the plans with their legends identified and their dispositions given (i.e. R&R, R&S, etc.) If they are no longer applicable at the completion of this project, or if they do not meet current MUTCD and Mass Highway guidelines, they should be removed. Also, all traffic-related signs needed for this project need to be show on the next design submission.

Response: All existing traffic signs and their disposition are shown on the Pavement Marking and Sign Plans

Comment 30: D3 (STREET NAME) signs are needed at all intersections for the side streets of the project, and many of the intersections (perhaps half) should have the main street(s) of the project (i.e. Trapelo Road or Belmont Street) included as well. These need to be shown on the next design submission.

Response: New street name signs are called for on all streets. Street name signs identifying the main street are also included on significant side street approaches, such as signalized intersections.

Comment 31: A preliminary cost estimate is a required part of the 25% design submittal but was not included in the material provided, and needs to be incorporated into the next submission.

Response: The 25% design submission did include a preliminary cost estimate. The 75% design submission includes a more refined cost estimate.

Comment 32: Other miscellaneous comments that should be review by the consultant have been marked in the report and on the plans. If there are any questions or comments regarding this review, please contact Richard Garner at (617) 973-7369.

Response: The comments on the plans have been reviewed, all were considered, most were incorporated or commented on directly on the 25% mark up plans.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Memorandum

To: Marie Rose, P.E., Acting Director of Project Management

From: Patricia Leavenworth, P.E., District 4 Highway Director

Date: December 20, 2007

Subject: BELMONT-WALTHAM-WATERTOWN-RECONSTRUCTION ON TRAPELO ROAD & BELMONT STREET, FROM THE CAMBRIDGE C.L. TO WAVERLY OAKS ROAD (ROUTE 60)
25% Submission Review Comments – District Projects Section
Project File No. 604688
Design Consultant – BSC Group

Attention: Akhtar Maliha, Project Manager

THE FOLLOWING RESPONSES WERE SUBMITTED TO MASSDOT DISTRICT 4 IN 2008. A MEETING WAS HELD TO DISCUSS THE ADDITIONAL INFORMATION SUBMITTED AND SUBSEQUENT COMMENTS PROVIDED BY MASSDOT DATED MARCH, 24 2008 ARE INCLUDED HEREIN WITH THESE RESPONSES

The District Projects Section has reviewed the 25% design submission of the subject project. Attached please find comments from the Projects Section in written form. The consultant evaluations from the Projects Section will not be completed for this submission.

Comment 0: The District has determined that the 25% submittal is incomplete because the project documents do not contain the critical cross sections necessary to verify the pavement milling/overlay design and the proposed sidewalk widening. As a result, the project is not suitable for a 25% review. Please include a written response to these comments with subsequent submissions.

Response: Additional plans were prepared and a meeting was held to address the District's concerns. Their review of the additional plans and responses to the following comments are included hereinafter.

General:

Comment 1: A submittal of critical cross sections is requested to demonstrate how the proposed changes to the pavement edges and in the sidewalk widths are going to be construction . The following pavement areas will require at least one critical section, of the most impacted cross section, when the following project design criteria are met:

- Where the roadway requires full depth reconstruction
- Where the existing crown is moved

- Where an intersections geometrics are redesigned

Response: The "Typical Sections" on plan sheets 5 through 12 of the 25% Submission were intended to give the reviewer the same information that the "Critical Cross Sections" do. The Typical Sections were prepared by first cutting "old ground" sections at the various typical and critical conditions that would be encountered and then preparing the proposed roadway and sidewalk templates on top of the old ground sections, just as one would do for critical sections, only not on cross section paper. However, we did not include a few of the critical sections, in particular, the bump-out, the widening of some of the side streets, and the apparently sunken sidewalk at Station 139 Rt. on Belmont Street. In addition, drawing the critical sections at a larger scale (1 inch = 2 feet) allows the designer to demonstrate how the proposed changes to the pavement edges and in the sidewalk width are going to be constructed while generally maintaining the existing back of sidewalk elevation. The following Critical Cross Sections (Plan sheets 1 of 20 through 20 of 20) were prepared to respond to this comment:

- Trapelo Road, Stations 18+00, 21+00, 25+40, 42+75, 43+75, 47+75, 54+50, 63+25, 78+50, 79+50, 87+65
- Belmont Street, Stations 107+50, 111+00, 116+50, 120+00, 139+00
- Mill Street, Station 1+50
- School Street (South), Station 1+00
  Arlington Street, Station 1+75

Comment 2: Following are recommended critical cross section stations based on the above criteria: (These are not meant to be inclusive.)

- Stations, 21+00, 20+00, 1+25 Mill Street, 25+50, 43+75, 42+75, 47+75, 63+25, 78+50, 87+77, 120+00 1+00 School Street, 139+00.

For these stations provide a mill and overlay pavement design that will meet these proposed design changes rather than just a variable overlay binder note. Also provide typical pavement cross sections illustrating the pavement design.

Response: The mill and overlay design shown on the 25% Submission was reviewed by the Pavement Management Section and revised (see attached comments dated 10/02/2007). The accompanying critical sections include the new milling and overlay design as well as the new full depth construction design. There was a line in the "Pavement Design Notes" of Sheet 5 of the 25% submission plans that defined a "leveling course". The use of a leveling course to create a minimum cross slope in milling and overlay areas where the cross slope is relatively flat (Trapelo Road, in the vicinity of station 21+00 to 26+00) was discussed with MassDOT's pavement design section. Their suggestion was to use a "Milling Shim" (See attached e-mail dated 2/14/2007). The use of the milling shim is shown on plan sheets 3 and 4 of 20 at stations 21+00 and 25+40.

Comment 3: If MassHighway's 2% pavement cross slope standard is not provided, a DER will be required by the designer to demonstrate the constructability of the proposed mill/overlay pavement design. It is recommended that a DER for the pavement design, if require, is also reviewed by the Boston Pavement Section as part of the 25% process.

Response: All areas of full depth pavement (Trapelo Road reconstruction, Stations 13+80 to 19+25, and most areas of pavement widening) have a proposed minimum cross slope of 2% except when going through a super-elevation transition.

Comment 4: As a result of the size of a culvert being replaced which is included in the scope of this project and the current flooding problems due to the under-capacity of this culvert, the District recommends that the design overview of the culvert replacement system be done by Boston's Hydraulic Section and that the review start at the 25% project level.

Response: Plans and relevant sections of the Functional Design Report were sent to MassDOT's Hydraulic Section in Boston for their design overview as recommended by the District.

Comment 5: Please provide a profile for Trapelo Road & Belmont Street the main roadway for this project. This is being required because the existing gutter line drainage system is altered with the introduction of bump-outs and the profile will be necessary for the redesign of the closed drainage system of the roadway. Further, provide profiles for all of the intersecting side streets where proposed bump-outs adversary affect the side street runoff by interfering with the collection of the roadway gutter drainage because the geometrics of the side street turning radii and modified.

Response: As part of the 75% design process drainage flow in the gutters will be evaluated and additional catch basins proposed where warranted. Most proposed bump-outs will require a new catch basin. Roadway profiles are not necessary in areas of milling and overlay and are not expected to be prepared. However, for the next submission, we will provide enough information to the reviewer to at least determine the high points and low points in the gutter so the placement of catch basins can be determined and reviewed.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Memorandum

To: Brian Fallon, P.E., Projects Engineer

Through: Michael Karas, P.E., Traffic Operations Engineer

From: John Gregg, P.E., Traffic Operations, (781) 641-8485

Date: January 3, 2008

Subject: Belmont – Trapelo Road and Belmont Street
PARS/EWO #P604688P11
25% Traffic Operations Review

Functional Design Report

Comment 1: The 2025 AM peak hour volumes at the Belmont St./School St. intersection differ from those used in the SYNCHRO analysis

Response: The 2025 AM peak hour traffic volumes have been corrected in the SYNCHRO analysis and are the same as shown in the volume figure.

Comment 2: In the future, Templeton Parkway is proposed as a one-way street southbound, away from the intersection. However, the 2025 volumes in Figure 4 do not reflect this condition.

Response: The proposed one-way operation on Templeton Parkway is reflected in the revised 2025 traffic volumes in Figure 4.

Comment 3: In Table 6, Summary of Proposed Improvements, there is no mention of reconstructing the signal at Trapelo Rd/Belmont St./Pine St.

Response: This was an omission.

Comment 4: In Tables 7 and 9, Level of Service Summary – Signalized Intersections, there are several approaches at various intersections where 95th percentile queues will exceed available storage lengths. Also, at Trapelo Rd/Pleasant St and Trapelo Rd/Lexington St., 50th percentile queues will exceed storage lengths. How will these conditions be addressed? See marked-up tables.

Response: The entire Trapelo Road corridor has a 75-foot right of way with the exception of one section, which has a 55-foot right of way. This section is between Pleasant Street and Moraine Street. Constraints in this section include a gas-station with

its pumps close to the ROW and a four story building on the back of sidewalk on the opposite side of the road. The Town is not able to take these properties. Traffic simulations show that there would be some back-ups under the 95th percentile queues but these would clear quickly with the coordination of the signals.

Pavement Marking Plans

Comment 1: In general, stop lines should not extend to curb. They should extend only to the SWELs.

Response: BSC agrees with the comment that in general the stop lines should not extend to the curb. In this particular case, however, the stop line is extended to the curb to delineate where bicyclist using the 4/5-foot shoulder/bicycle lane should stop on a red traffic signal indication.

Comment 2: Are bicycle logo markings planned for the bike lane?

Response: Bicycle logos are proposed for the shoulder segments that are five feet or more wide based on latest discussion with the bicycle accommodation engineer.

Comment 3: Provide SWEL through the T stop areas rather than the dashed while lines, which are more difficult to maintain.

Response: The use of DWLL at bus stops and also on approaches to intersections is in accordance with the MUTCD. This is meant to alert bicyclist and motorist of potential conflict with turning vehicles and buses pulling in and out of bus stops.

Comment 4: There are gaps in the SWELs that should be extended or connected to each other. See plans

Response: Comment is noted and the appropriate pavement markings have been modified accordingly in the plans

Comment 5: Trapelo Road at Waverly Oaks Road: Provide a yellow gore area on Trapelo Road west of the intersection to reinforce the WB "left only" condition.

Response: Comment noted. The intersection is no longer part of the project

Comment 6: Trapelo Road at Pleasant Street: For the EB left turn lane, extend the SWLL further back and move the second set of arrow and ONLY markings further forward. Eliminate the third set of markings.

Response: Heavy left turn volume renders the entire length of this segment a de facto left turn lane. The SWLL has been extended as suggested and two sets of arrow and ONLY legends are provided.

Comment 7: Define the two parking spaces on Harriett Avenue NB better

Response: The parking spaces on Harriet Avenue have been modified. Please see plans

Signal Plans

Comment 1: Location 1: Why is video proposed here when all other locations have loops? Signal head "K" should be aimed better for Waverley Oaks Road traffic. Allow ped crossing P3/P4 to also occur during phases 2/6.

Response: Location 1 is an intersection in the City of Waltham. The city required the use of video detection for all its traffic signal operations. This intersection is no longer part of this project. However, the Town of Belmont now wants video detectors and all detection at the other traffic signal locations has been changed from loop detectors to video.

Comment 2: Location 2: Allow ped crossing P5/P6 to also occur during phases 2/5.

Response: Location 2: The signal phasing has been modified to allow pedestrian phase P5/P6 to occur during Phase 2/5 upon push button actuation.

Comment 3: Location 4: Delete phase 9 and allow the ped crossing P3/P4 to occur with phases 2/6. Why signalize the residential driveways? Permanent easements will be required in each in order to maintain loops, pullboxes, etc

Response: Phase 9 has been eliminated and pedestrian crossing P3/P4 will occur during phases 2/6. The driveways within the intersection are being signalized to allow controlled access/egress for the affected residents. Non-intrusive video detection is proposed and therefore there will be no need for easements for installation or maintenance purposes.

Comment 4: Location 5: The right turn from Trapelo Road EB onto either Moraine Street or Lexington Street should be shown as a dashed line under phase 8 as this movement conflicts with the left turn from Trapelo Road WB. The slash green right arrow cannot be used on heads "A" and "B" because the movement is not protected. Head "P" should be a 3-lens had rather than 5-lens.

Response: Location 5: The Trapelo Road EB right turn onto Moraine Street or to Lexington Street is a permitted move and has been shown as dashed in the signal phasing diagram. Signal heads A and B are shown with green balls accordingly. Head P (now Head Q) is 3 sections and allows for the protected/overlap phase operation of the exclusive right turn lane on Shaw's Drive.

Comment 5: Location 6: Phases 2/6 should be split since the streets are offset

Response: Location 6: The Lexington Street/Church Street/Thayer Road signal phasing has been modified to make the offset approaches of Church Street (Phase 6) and Thayer Road (Phase 2) operate as split phases

Comment 6: Location 8: Have all the ped crossings occur under phase 9. Why are there three signal heads on each approach of Trapelo Road when there is only one lane in each direction? Provide four loops on each approach to Trapelo Road with bicycle loops located in front at the stop lines.

Response: Location 8: Pedestrian crossings P1/P2 and P5/P6 are designed to operate concurrently with Phase 2/6, because of low turning volumes from Trapelo Road onto Beech Street. P1/P2 and P5/P6 are also called under the exclusive Phase 9. However, P1/P2 and P5/P6 pedestrian push buttons would not call Phase 9 because that would mean that Trapelo Road traffic would have to stop for pedestrians crossing Beech Street resulting in unintended delays to Trapelo Road. The plans now call for video detectors.

Comment 7: Location 9: Why is this plan shown when the signal is not being reconstructed?

Response: This location is no longer included.

Comment 8: Location 10: Signal heads, "J" and "M" are not needed since they each face single-lane approaches.

Response: The number of signal heads has been revised at this location. Please see plans.

Comment 9: Locate 11: Remove the ped movement from phase 3/7 since there are no ped heads.

Response: The ped movement has been removed from phase 3/7. Please see plans.

Comment 10: Location 12: Show signal head displays even though they are being retained. It is assumed the controller and cabinet are being replaced despite the note about existing equipment being retained. How will this signal be coordinated with Location 11 (hardwired, time-based, etc.)?

Response: Traffic signals at Location 12 are no longer included in the project. It was included for coordination purposes but no advantage will be gained by coordinating this location with the Trapelo Road/Common Street signal due to the very different characteristics – traffic volumes, phasing and cycle lengths.

Comment 11: Location 13: Change signal head "G" to ball indications. Change signal head "H" to a four-lens bi-modal head (same as "I") since the NB right turn is protected/permitted. Add a signal head for Trapelo Road EB to the mast arm that contains heads "A" and "B". Emergency pre-emption has not been included.

Response: Traffic signals at this intersection are being reconstructed and will include emergency pre-emption operations. The traffic signal heads have been revised. Please see plans.

Comment 12: Location 14: Explain why emergency pre-emption is included here. None of the other mid-block ped signals have it

Response: The emergency pre-emption in no longer proposed for this location. Please see Plans

Comment 13: Location 15: Provide School Street SB movement only during phase 8 because of the offset approaches.

Response: Signal phasing has been modified at this location to provide split phases for School Street northbound and southbound movements.

Comment 14: Location 16: Provide emergency pre-emption on the Arlington Street NB approach. Change phase 7 to phase 4 and phases 4/8 to phase 8 to match better with standard NEMA phasing designations.

Response: Emergency pre-emption has been provided on the Arlington Street NB approach.

Traffic Management Plans

Comment 1: For full-depth reconstruction between stations 14+00 and 18+00, temporary concrete barrier and multiple stages that go beyond the basic TLR plans will be needed.

Response: The Limit of Work for the project has been moved to a point near Station 18, negating the need to respond.

Estimate

Comment 1: The unit prices for Items 816.05, 816.06 and 816.13 seem low. Provide detailed breakdowns of all 816 series items with the next submission.

Response: Comment noted. Please see revised estimates.

Comment 2: Add the following items to the contract: 833.5, Demountable Reflectorized Delineator-Guardrail; 868;, Gore Lines – Reflectorized White (Thermoplastic); 869.; Gore Lines – Reflectorized Yellow (Thermoplastic).

Response: New guardrail is no longer proposed on this project. Because some of our gore lines are 8" and some 12" we are using items 866.08, 867.08, and 867.12.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Memorandum

To: Marie Rose, P.E., Director of Projects

From: George Batchelor, Supervising Landscape Architect

Date: January 15, 2008

Subject: Belmont – Trapelo Road and Belmont Street
EWO #604688P11
Landscape Design – 25% Review
Attn: Maliha Akhtar, Project Manager
Project File # 604688

The Landscape Design Section has reviewed the 25% plans for the above project and has the following comments:

General:

Comment 1: Proposed tree quantity and locations may not be feasible. There are overhead wires, utility poles, lights, traffic wires and poles, trolley wires and poles, etc. along much of Trapelo Road. In some instances there is inadequate space, utility/wire conflicts and/or visibility conflicts. Planting is not recommended in the traffic islands due to visibility concerns, conflicts with signs and utilities and survivability of the trees. The two foot grass strip for planting is too narrow for trees. Trees should be reconsidered in some of these location or, if and where possible, back of sidewalk planting considered or narrowing of sidewalk (while maintaining accessibility requirements). Existing trees that will be removed should be noted on the plans. Avoid locating proposed trees too close to existing trees that will remain. A more thorough review of locations should be done.

Response: Tree locations have been reviewed and coordinated with the above concerns. Many trees have been moved, adjusted or removed as needed to address existing conditions, space, visibility and underground and overhead utilities. Planting in the islands has been discussed with MassDOT Landscape Design Section and modified accordingly. Existing trees to be removed have been shown on the plans.

Plans:

Comment 2: Include plant list in next submission.

Response: A plant list has been included in the 75% submission plans.

Comment 3: Show size of tree pits for sidewalk locations.

Response: Most of the trees are now located in grass strips. Tree pit extents have been added to the plans. Pits size in general is at least 3' x 8.'

Comment 4: Maintain adequate site distance at intersections and driveways when locating trees

Response: We have reviewed and made changes as needed.

Comment 5: Median for tree planting should be a minimum of 10 feet wide. In some locations, median appears to be only 8 feet wide. Tree planting is not recommended in these locations.

Response: Planting in the medians was discussed with MassDOT's Landscape Design Section since the 25% submission and the proposed design reflects those discussions. The Town presently has trees in the median of Concord Avenue which is 7' wide. The medians proposed for Trapelo are 8' wide plus 1' shoulders on each side. We did reduce the numbers of trees in the medians and some medians no longer have trees proposed because they were determined to be too short in length.

Comment 6: Include scale on all sheets.

Response: A bar scale has been included on all plan sheets.

Comment 7: Show or note tree protection for existing trees to remain if necessary.

Response: A symbol for tree protection has been added for each tree to be protected. A note identifying the symbol has been added to each sheet.

Special Provisions:

Comment 1: Include planting special provisions and tree protection special provisions (if necessary) with next submission. Both are available from MHD upon request.

Response: This has been done.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Memorandum

To: Maliha Akhtar – Project Manager

From: David Phaneuf – Highway Design Section

Date: March 20, 2008

Subject: Belmont – Trapelo Road and Belmont Street
EWO No. P604688P11
Project File # 604688
AAB/ADA Accessibility Review

Comment 1: The following review is based on the 25% submission plans for the subject project. These plans have been marked and contain comments which have been highlighted on the title sheet. These review plan **must** be returned with the next submission.

Response: The plans are still in our possession and will be returned.

PROJECT COMMENTS:

Comment 2: Based on recent complains on constructed wheel chair curb cuts along a section of Route 62 in North Reading, several corner ramps proposed for this Trapelo road and Belmont Street in Belmont need to be adjusted. This adjustment consists on moving the centerlines of the ramps to direct the wheelchair more across the street and less to the intersection. Appearance can be very important to the disable community acceptance of the design.

Response: We discussed the comments with AAB/ADA Section and revised some of the ramps based on those discussions and the marked up plan set.

Comment 3: In addition, curb cuts should be located to allow for a future curb cut and crosswalk on the corner which will cross the other street of the intersection, even when this future curb cut is not being built. (See Exhibit 6-30, Project Development & Design Guide 2006, enclosed).

Response: We have reviewed the project and believe that there are no locations where there is likely to be future sidewalks where none exist today.

Comment 4: A typical adjustment to the placement of wheelchair ramps at corners is shown on the enclosed "TYPICAL SKETCH" which could be used for the adjustment of the ramps.

Response: In many instances pushing the wheelchair ramp around the corner and down the side street until the ramp pointed to the other side of the street brought the stop line more than 30 feet from the edge of travelled way which, to our

understanding, is contrary to the MUTCD. In these instances we could not meet the desired results shown on the sketch.

Comment 5: A change of the type of wheelchair ramp may be required in various locations.

Response: All existing and proposed wheelchair ramps have been reviewed to ensure that they are the proper type.

Comment 6: The placement of the wheelchair ramps at the following intersections should be revised:

- Belmont Street/Carver Road (Sheet 51)
- Belmont Street/Westlund Road (Sheet 52)
- Belmont Street/Woodleigh Road (Sheet 52)

Response: This has been done.

Comment 7: AAB allows apex openings where site constraints prevent the safe location and installation of paired ramps, or curb radius exceeds 30 feet.

The proposed wheelchair ramp located at the Belmont Street/Oxford Avenue intersection (Sheet 52) appears to be an apex ramp.

All safety and geometric issues must be documented in writing for apex openings to be proposed. Copies of such documents must be provided.

Response: The wheelchair ramp at the intersection of Oxford Avenue has been revised.

Comment 8: If existing wheelchair ramps are to remain in the project area, the designer is responsible to verify they conform to current AAB regulations.

The designer should provide a basic field report for the project manager and for project records on each ramp, and curb cut to remain in place. Attached is a basic field report outline indicating the type of information that should be collected for curb cuts. It should be adapted to collect information on sidewalks and wheel chair ramps which are for level changes within a site.

Response: All wheelchair ramps within the project limits are being rebuilt to the latest standards.

Comment 9: The AAB has ruled against pedestrian crossing a yield controlled traffic movement to reach a pedestrian call button. The ruling requires signalized intersections with pedestrian cycles to protect all pedestrian cross walks with walk cycles.

The applies to the following Traffic Signal Plans:

- Location No. 2, Trapelo Road at Mill Street (Sheet 54)
- Location No. 10, Trapelo Road at Slade Street (Sheet 62)
- Location No. 11, Trapelo Road at Common Street (Sheet 63)
- Location No. 15, Belmont Street at School Street (Sheet 67)

Concurrence from Traffic Section, that a design where pedestrians cross a yield controlled movement in an otherwise pedestrian cycle phased intersection, must be obtained, with a copy forwarded to AAB/ADA Review Section.

Response: Our understanding is that this question is no longer applicable.

Comment 10: The designer should provide details including dimensions and widths and cross slopes of the proposed paths of travel through the delta islands at these intersections. All paths and turning areas must meet AAB requirements.

Response: This has been done

Comment 11: The pedestrian accessibility at Belmont Street/Oxford Avenue intersection (Sheet 52) must be fully addressed. The pedestrian path (crosswalk) to connect the proposed wheelchair ramp at Sta 141+00 R± with the opposite sidewalk is not defined. An additional wheelchair ramp may be required at the left sidewalk.

Response: This has been revised.

OVERALL COMMENTS:

Comment 12: The 75% submission should include schedules for both driveways and wheel chair ramp curb cuts which are cross-referenced with the plans. The schedules should include the referenced roadway baseline, station and offset to the center of the opening at the gutter line, gutter profile slope, opening width at the gutter, left transition length, right transition length, depth from the gutter to the back of the sidewalk, and depth of level landing or width of path of travel across driveways.

Response: The requested schedules have been included.

Comment 13: We are attaching a copy of the more complete detail table for driveways and wheelchair ramps from an in-house project. The table can be modified slightly but should form the basis of tabular information used to layout and construct driveways and wheel chair ramps.

Response: This has been done.

Comment 14: The wheelchair ramp schedule plan should include a notation, on the sketches, that detectable warning panels are required on all the proposed wheelchair ramps and are to be installed in accordance with Construction Standard M/E 107.6.5R (December 2004)

Response: All the schedules now include an note requiring the detectable warning panel and all refer to the latest MassDOT standard drawings.

Comment 15: We are enclosing a drawing showing typical sidewalk clearance details to be used as a designer's guide in preparing the subject project. It is the designer's responsibility to verify, in advance, that there is sufficient width, to locate or relocate all sidewalk obstructions. The designer is responsible to ensure obstructions (utility poles, hydrants, signs, signals, etc.) can be relocated in a manner which will provide the minimum 36" excluding curb AAB required path

of travel. Utility removal, or Right of Way takings or sidewalk easements may be required to ensure this required path of travel.

Response: We have reviewed the plans and find that the required 36" width is available throughout the project.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Correspondence

To: Marie Rose, P.E., Director of Project Management

From: Patricia Leavenworth, P.E., District 4 Highway Director

Date: March 24, 2008

Subject: BELMONT-WALTHAM-WATERTOWN-RECONSTRUCTION ON TRAPELO ROAD & BELMONT STREET, FROM THE CAMBRIDGE C.L. TO WAVERLY OAKS ROAD (ROUTE 60)
25% Resubmission Review Comments – District Projects Section
Project File No. 604688
Design Consultant – BSC Group

Attn: Akhtar Maliha, Project Manager

Typicals:

Comment 1: The proposed wall height, for typical Trapelo Road STA. 16+50 Left, from the pavement surface is 2.5 feet. Since the face of the wall abuts the shoulder which accommodates bicycle traffic, it is recommended the height of the wall be brought up to the height of 4.5 feet for safety.

Response: The length of the project has been shortened and the project no longer includes the subject wall.

Comment 2: Since the wall is not at the back of sidewalk and is adjacent to the roadway pavement, the face of the wall/barrier has to be a safety shape. If this can not be achieved then a design waiver must be sought.

Response: The length of the project has been shortened and the project no longer includes the subject wall.

The Commonwealth of Massachusetts

MassDOT - Highway Division

Interoffice Correspondence

TO: Marie Rose, Acting Director of Project Management

THRU: Alex Bardow, Director of Bridges and Structures

FROM: Richard Murphy, Hydraulic Engineer

DATE: April 9, 2008

RE: Belmont, Waltham, Watertown, Trapelo Road/Belmont Street Improvements, Functional Design Report, Project File No. 604688

I have reviewed the Functional Design Report prepared by the BSC Group for the Town of Belmont. I offer the following comments.

Comment 1: Appendix E, Hydrologic and Hydraulic Evaluation, P.1, Paragraph 3

In this paragraph BSC indicates that they calculated a 50-year peak discharge for Beaver Brook at the Trapelo Road culvert crossing. I request that BSC submit supporting engineering data for this computation- as well as all other hydrologic and hydraulic computations referenced in the remaining pages of Appendix E- to MassHighway for review.

Response: The length of the project has been shortened and the project no longer includes the replacement of the Beaver Brook culvert. No response is necessary.

Comment 2: Appendix E, Hydrologic and Hydraulic Evaluation, P.2, Paragraph 1

The Trapelo Road crossing over Beaver Brook is immediately upstream of the beginning of the brook's National Flood Insurance (NFIP) Regulatory Floodway in the Town of Waltham (See Middlesex County Flood Insurance Study, September 2007, Volume 2 of 4, Flood Profiles 44P and 45P). To clarify the impact of the proposed replacement culverts on the stage profile of the Beaver Brook Regulatory Floodway in Waltham, I request that BSC assemble and calibrate an Army Corps of Engineer's HEC-RAS Water Surface Profile model of the crossing site, and use it to simulate the hydraulic performance of the proposed and existing culverts under 10-, 50-, 100-, and 500-year flood conditions. The results of these simulations should summarized and tabulated in a revision to the Functional Design Report presently under review by MassHighway.

Response: The length of the project has been shortened and the project no longer includes the replacement of the Beaver Brook culvert. No response is necessary.

MassDOT - Highway Division

Environmental Section

25% Design Review Comments

TO: Marie Rose – Director of Project Management

ATTN: Maliha Akhtar – Project Manager

FROM: Michael Trepanier – MEP/NEPS Coordinator

DATE: 4/29/08

RE: Belmont-Waltham-Watertown – Reconstruction of Trapelo Road and Belmont Street from the Cambridge City Line to Waverley Oaks Road (Route 60)

PROJECT FILE #: 604688 EWO#: P604688P11 ADV. DATE: 10/1/2011

EARLY ENVIRONMENTAL COORDINATION

Comment: The Designer has provided sufficient evidence that early coordination has occurred. No further information is required.

Response: No response required.

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (MEPA)/ENVIRONMENTAL NOTIFICATION FORM (ENF):

Comment: This project will require the preparation and filing of an ENF in accordance with the MEPA Regulations (301 CMR 11.00). The Designer will need to provide an electronic copy of the Draft Environmental Notification Form.

Response: An electronic copy of the Draft Environmental Notification Form is included with this submission.

ARTICLE 97 LAND DISPOSITION EVALUATION:

Comment: The project as designed will not result in a disposition of Article 97 land.

Response: No response required.

SECTION 4(F) EVALUATION:

Comment: The project, as designed, will not result in a "use" of Section 4(f) land. A Section 4(f) Evaluation is not required. As the project advances in design, we will need to evaluate impacts to Beaver Brook Reservation and to Peqousette Playground.

Response: The project will not include any work in the Beaver Brook Reservation and just very minor work on the Peqousette Playground. A Section 4(f) Evaluation is not required.

NATIONAL ENVIRONMENTAL POLICY ACT/CATEGORICAL EXCLUSION:

Comment: The Designer will need to provide an electronic copy of the Draft Categorical Exclusion Checklist.

Response: An electronic copy of the Draft Categorical Exclusion Checklist is included with this submission.

FISHERY RESOURCES/FEDERAL AND STATE RARE AND ENDANGERED SPECIES:

Comment: According to the latest Massachusetts Natural Heritage and Endangered Species Program (MNHESP) Maps, the project area is not located within Priority Habitat of Rare Species and/or Estimated Habitats of Rare Wildlife and Certified Vernal Pools. No coordination with MNHESP is required at this time. In a letter from NHESP dated 7/20/07 states that there are no mapped Priority or Estimated Habitat located within the project limits.

Response: No response required. Note that the MNHESP maps have been updated since the 7/20/07 NHESP letter. No mapped Priority or Estimated Habitat is located within the project limits according to the most recent maps.

Comment: In a letter from MA Division of Fisheries and wildlife dated 7/20/07 states that best management practices for erosion and sedimentation control must be adhered to for all phases of construction to minimize potential impacts to fisheries resources.

Response: Best management practices for erosion and sedimentation control will be incorporated into the Stormwater Pollution Prevention Plan that will be prepared for the project.

Comment: In a letter from US Fish and Wildlife Services dated 7/30/07 states that there are no federally-listed or proposed, threatened or endangered species or critical habitat located within the project limits.

Response: No response required.

DEP'S STORMWATER MANAGEMENT POLICY/MASSHIGHWAY'S STORMWATER HANDBOOK:

Comment: The project is defined as a redevelopment project in accordance with DEP's Stormwater Management Policy. As defined by the policy, redevelopment projects include: "maintenance and improvement of existing roadways, including widening less than a single lane, adding shoulders…and repaving." In accordance with the policy, the project must comply with the stormwater management standards to the maximum extent practicable. Stormwater management systems should be designed to improve existing conditions.

New direct discharges to wetland resource areas are prohibited. Any existing direct discharges should be pulled back from wetland resource areas and fitted with stormwater best management practices. The Designer should see MassHighway's Stormwater Handbook (May 2004) for direction on the design of stormwater treatment systems, which is available on MassHighway's Website.

Response: Stormwater management for the project has been designed to improve existing conditions and comply with the stormwater management standards to the maximum extent practicable. Stormwater management improvements will include providing deep-sumps for some of the existing catch basins and the construction of a rain garden. No new direct discharges are proposed.

SECTION 401 WATER QUALITY CERTIFICATE (WQC):

Comment: The project is located within a mapped Outstanding Resource Water and it involves work in water, therefore, this project will require a major Water Quality Certificate.

Response: The length of the project has been shortened and it no longer includes work in any waterways or wetlands and therefore will not require a Water Quality Certificate.

SECTION 404 U.S. ARMY CORPS OF ENGINEERS (USACE) PROGRAMMATIC GENERAL PERMIT (PGP) OR INDIVIDUAL PERMIT:

Comment: According to the plans, the project involves under 1 acre of cumulative temporary and/or permanent impacts to federally regulated wetland resource areas and the project will likely qualify under the USACE PGP. MassHighway's Boston Environmental Section will process the PGP upon receipt of the Water Quality Certification Application and/or Notice of intent application package and Order of Conditions.

Response: The project no longer includes work in any federally regulated wetland resource areas.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) CONSTRUCTION GENERAL PERMIT:

Comment: The proposed will involve over 1 acre of earth disturbance and therefore, the contractor will be required to secure a NPDES Stormwater Construction General Permit from the Environmental Protection Agency (EPA). No new direct discharges of untreated storm water are allowed under the NPDES program. The Designer must include Item 756 (NPDES Special Provision) in the design package accounting for the preparation of all required applications, including the preparation of the EPA Notice of Intent for Storm Water Discharges Associated with Construction Activities, the Stormwater Pollution Prevention Plan (SWPP) and inspection of erosion controls in accordance with the prepared SWPPP and Construction General Permit.

Response: The preparation of the EPA Notice of Intent, Stormwater Pollution Prevention Plan (SWPPP), and inspections of erosion and sedimentation controls will be included in the design package.

Notice of Intent (NOI)

Comment: There are activities that will permanently and/or temporarily impact state regulated wetland resource areas. A NOI must be prepared and filed with the local Conservation Commission. The Designer should independently verify the need for a NOI and submit the appropriate draft application to MassHighway's Environmental Section for review prior to filing by the designer. Completing this process as early as possible is important in determining if additional property rights may be required as a result of wetland mitigation. Upon filing the NOI, it can take approximately 2 to 3 months to complete the process and obtain an Order of Conditions from the Conservation Commission.

Response: The project will include work within the riverfront area to Beaver Brook and the buffer zone to wetland resource areas. The filing of a Request for Determination of Applicability with the Belmont Conservation Commission will be filed under the reasoning that the project is located within previously disturbed areas located within the Trapelo Road corridor and will not adversely affect the surrounding wetland resource areas. Additionally, upgrades to the existing stormwater management system and the implementation of Best Management Practices will result in an overall improvement to the surrounding area.. A Draft Notice of Intent application is included with this submission for review by MassHighway's Environmental Section.

25% DESIGN SUBMISSION COMPLETENESS CHECKLIST

Comment: Show & label all publicly owned parks, recreational area, & wildlife refuges.

Response: This has been completed.

The Town of Belmont

Belmont Municipal Light Department

E-Mail

To: Peter Briere, P.E.

From: Mario Etedali, Electrical Engineer

Date: March 3, 2009

Subject: MassHighway's Traffic Signal Project in Belmont

Comment 1: Trapelo Road & Mill Street, Page 45:
Change the design for proposed cross-walk from big island at intersection of Mill Street and Trapelo Road. We are suggesting to relocate the cross-walk to the east side of the intersection for pedestrians to cross the Trapelo Road from small island at east side, or adding a new cross-walk to their proposed plan for that location.

Response: A crosswalk has been added to the east side of the intersection. Please see plans.

Comment 2: Trapelo Road at Slade Street / Harriet Street, Page 62:
Add Straight arrows to the left turn arrows to east & west bounds on Trapelo Road, which will improve the flow of the traffic along the road.

Response: Plans have been revised to include thru/right turn arrows. Please see plans.

Comment 3: Trapelo Road at Common Street / Cushing Street, Page 63:
Add straight arrows to left turn arrows to east & west bounds on Trapelo Road, which will improve the flow of the traffic along the road.

Response: Plans have been revised to include thru/right turn arrows. Please see plans.

Comment 4: Belmont Street at Grove Street / Arlington Street, Page 68:
Add Straight arrows to left turn arrows on Arlington Street and Grove Street, which will improve the flow of the traffic along the intersection.

Response: Plans have been revised to include thru/right turn arrows. Please see plans.

Massachusetts Bay Transportation Authority

Letter

To: Peter J. Briere, P.E.

From: Jack Martin, Supervisor of Transportation & Distribution

Date: June 3, 2009

Subject: Trapelo Road/Belmont Street Corridor Improvements

Comment 1: The 25% drawings and specifications package that the Power Division reviewed were incomplete. We will require a complete set of drawings and specifications in order to perform a thorough review.

Response: The present 75% design submission has the material the MBTA wishes to review.

Comment 2: Per MBTA Safety Department, personnel and/or equipment cannot work within 10'-0" of live trolley wire or cables without being de-energized. Please advise if the contractor will be working within these limits, if so the MBTA Power Department will have to de-energize cables on a day/nightly basis.

Response: The contractor will be working within 10'-0" of the trolley wires and cables and it is anticipated that the system will need to be de-energized for much of the construction period which is likely to be two years.

Comment 3: The contract drawings show that the sidewalks are going to be excavated and redone with cement/brick. Please advise if existing MBTA catenary poles will be undermined and/or compromised during construction.

Response: It is not anticipated that the excavation around the MBTA poles will undermine them. During some operations, such as the installation of a catch basin next to a MBTA pole, support of the MBTA pole may be necessary. If so, the MBTA will be advised and the contractor will be required to provide support to the MBTA's satisfaction.

Comment 4: The MBTA Power Department has existing conduits, wayside switches, riser cables, DC feeders, trolley wires and controls that could be damaged during construction. Please provide details showing how these items will be protected.

Response: A detail and a special provision and pay item have been added to the contract documents to address this issue.

Comment 5: The contractor must notify the MBTA Power Dispatcher at 617-222-5546 if any machinery or debris hits the catenary system, DC feeders, wayside switches, controls or catenary poles.

Response: A note to this affect has been added to the General Notes on sheet 12 of the plan set and in the specifications.

Comment 6: Please advise if the elevation in the roadways will be changed from their existing conditions. The MBTA Catenary System must maintain a minimum height above street level.

Response: The elevation of the roadway surface will only be raised by one half of an inch. The roadway surface will be repaired using a milling and overlay process and the overlay is only one half of an inch more than the milling under the trolley wires.

Comment 7: This submittal should be forwarded to the Safety and Transportation Departments for review and comments.

Response: The 75% design review plan set is scheduled to be submitted to the MBTA Safety and Transportation Departments.

Comment 8: Please notify the contractor that the catenary system and DC feeders may be ALIVE during construction. Contractor must contact MBTA Power Dispatcher and OCC (Trackless Trolley) for confirmation.

Response: A note to this affect has been added to the General Notes on sheet 12 of the plan set and in the specifications.

MassDOT - Highway

E-Mail

To: Peter J. Briere, P.E.

From: Kevin Fitzgerald, Pavement Design

Date: June 23, 2009

Subject: Trapelo Road/Belmont Street Corridor Improvements

Comment 1: Peter, I have made a site visit. The pavement design shown on the typical sections is appropriate. We want to mill off as much pavement as possible and overlay. Additional pavement cores and pavement investigation would be useful to confirm the pavement stratification for milling depth. Typical sections call to mill 3" and overlay with 3 ½" HMA. I would continue with this pavement design approach.

Response: The original pavement depths have been maintained.

Comment 2: We noted in the field how the MBTA bus line is overhead electric bus. The travel lanes for those buses and the overhead lines will control how the Contractor paves the project. The contract documents need to require the Contractor to make a site visit to familiarize himself with roadway project.

Response: A note to this affect has been added to sheet 12 of the plan set.

Letter

To: Peter J. Briere, P.E.

From: Jack Martin, Supervisor of Transportation & Distribution

Date: March 30, 2010

Subject: Trapelo Road/Belmont Street Corridor Improvements – Review of a draft Construction Detail showing the traffic signal mast arms, their distance from the MPTA trolley wires (power, support, feeder) and how the mast arm would be protected from the DC electrical current.

Comment 1: Provide information on the proposed Protective Wrapping. What is the UV rating? What effects will the weather, direct sunlight, etc., have on the wrapping over time? What is the insulation value? The insulation should be at least 2000 volt minimum. How is the protective wrapping attached? Who is responsible to maintain and repair the wrapping?

Response: The design of the mast arms has been revised and all the equipment is now at least 10'-0" from the power wires and 5'-0" from the support wires. The protective wrapping is no longer necessary under these conditions.

Comment 2: The protective wrapping must be able to withstand contract from a trolley pole. Provide information/verification that the wrapping is capable of withstanding contact from a trolley pole and maintain its insulation value.

Response: See the response to Comment 1.

Comment 3: Provide information on the support cable identified in this detail.

Response: The support cable identified in the detail is the MBTA's own steel cables that support the overhead trolley wires that provide DC power to the electric busses.

Comment 4: How many locations is this crossing detail proposed to be used? Provide information on the proposed locations identifying MBTA pole numbers.

Response: The revised crossing detail, now shown of sheet TS-11(Waverley Square Pedestrian Crossing) of the traffic signal plans, will be used at locations 4, and 6 through 13.

Comment 5: What is the relationship to the MBTA DC Feeders and wood crossarms in the area?

Response: The existing mast arms are wrapped with wood slats as a protective wrapping. The present design does not require any protective wrapping as the arms are more than ten feet away from the power lines.

Comment 6: The mast arm must be properly grounded. Provide information on the traffic pole/mast arm grounding.

Response: The MassDOT Standard specifications cover this issue in Sections 813.61 and 62.

Comment 7: What is the dynamic sway range for the mast arm (with wind and ice).

Response: We will specify that the sway can be no more than 12 inches under the conditions described.

Comment 8: Show both sets of MBTA catenary wires on the detail with dimensions and clearances.

Response: This will be added for the next submission.

Comment 9: It must be noted that catenary heights for fixed tension systems can vary significantly with temperature. Therefore, the clearances shown in this detail may not be accurate for the entire line. A detail may have to be developed for each location, allowing for deviations in the catenary heights, in order to accurately show clearances.

Response: This will be considered after the 75% review comments are received.