

**BRUCE FREEMAN RAIL TRAIL
PHASE 2A and PHASE 2C**

**ACTON, CARLISLE, WESTFORD and
Concord, MA**

**Transportation Enhancement Program
Final Application**

September 2008

**Prepared for the Transportation Enhancement Committee
Massachusetts Highway Department**

REF. MAX-2006073.11

September 5, 2008

Mr. David Mohler, Acting Deputy Secretary for Planning
Executive Office of Transportation
10 Park Plaza, Suite 4150
Boston, MA 02116

ATTN: Mr. James P. Cope, Manager of Planning Programs

RE: Bruce Freeman Rail Trail Phase 2A and 2C
Acton, Carlisle, Westford and Concord, MA
MassHighway Project: 604532

Dear Mr. Mohler:

Greenman-Pedersen, Inc. (GPI) is pleased to submit this FINAL Application for funding the final design of the Bruce Freeman Rail Trail Phase 2A through the Towns of Acton, Carlisle and Westford and Phase 2C through the Town of Concord under the Transportation Enhancement Program. Per the letter from the Transportation Enhancements Program Steering Committee on behalf of Secretary Bernard Cohen dated July 23, 2008 to the Towns of Acton and Concord, clarification of cost estimates, a funding breakdown in MassHighway format and clarification of Right of Way has been included in the application. Per the request of the committee at the Draft Application presentation, the supplemental information that was included in the Draft Application was not included in this application. It is still valid and can be reviewed and referenced in the Draft Application. The Application Form and the additional requested information is all that has been included.

The Preliminary (25%) Design Plans for Phase 2A were submitted to MassHighway in April of 2008 and have been reviewed. The Public Hearing is scheduled for October 29, 2008. The Preliminary (25%) Design Plans for Phase 2C have been prepared and will be submitted to MassHighway upon receipt of Project Review Committee (PRC) approval.

Prior to submitting this application, GPI sent the final design scope and fee for both Phases 2A and 2C to Mr. Lawrence Cash, MassHighway Project Manager, for his review and comment. Based on MassHighway's review of the 25% Design Plans for Phase 2A and Phase 1 which is currently under construction, MassHighway determined that the final design cost for Phase 2A appears reasonable. In developing the final design contract, coordination with MassHighway will be continued.

Mr. David Mohler
September 5, 2008
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Since PRC tabled approval of Phase 2C along with all other Rail Trail Projects, MassHighway has not reviewed the plans. Based on the project scope and limits described for Phase 2C and in comparison with Phase 1 and Phase 2A, the final design cost seems reasonable, however, as Phase 2C is submitted to and reviewed by MassHighway, the final design costs may be amended if it is determined necessary. As with Phase 2A in developing the final design contract, coordination with MassHighway will be necessary.

GPI also spoke with Ms. Linda Walsh prior to submitting the application regarding the project right of way. The preliminary Right of Way plans for Phase 2A have been approved by MassHighway's Community Compliance Section and the towns are prepared to take responsibility for finalizing the right of way during the final design process. The cost for preparing final Right of Way has been included in the Final Design estimate.

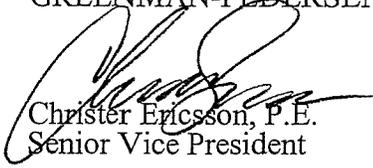
Preliminary Right of Way Plans for Phase 2C will be submitted with the 25% Design Plans. The right of way needs have been identified and the Town of Concord has initiated conversations with the impacted abutters.

Mr. Tim Doherty, Director of Rail Programs Executive Office of Transportation and Public Works, has relayed to Mr. Lawrence Cash that once the 25% Design Plans have been approved and final design funding is in place, EOT will draft and negotiate the lease agreement for use of the Railroad Right of Way with the Towns.

There has been and continues to be significant public support for this project as evidenced by the documentation included in this application. The Towns are anxious to begin final design immediately upon approval of the 25% Design Plans. We appreciate your comments and support of the application.

Very truly yours,

GREENMAN-PEDERSEN, INC.



Christer Ericsson, P.E.
Senior Vice President

- c. Beverly A. Woods, Northern Middlesex Council of Governments
- Barbara Lucas, Metropolitan Area Planning Council
- Madonna McKenzie, Carlisle Town Administrator
- Norman Khumalo, Town of Westford Interim Town Manager
- Steven Ledoux, Acton Town Manager
- Christopher Whelan, Concord Town Manager

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COMMONWEALTH OF MASSACHUSETTS

APPENDIX B

**Executive Office of Transportation
Massachusetts Highway Department**

FOR EOTC/MHD OFFICE USE ONLY
Project File # _____
Total Project Cost: \$ _____
Enhancement Funds
Requested: \$ _____

**COMMONWEALTH OF MASSACHUSETTS
TRANSPORTATION ENHANCEMENT PROGRAM GUIDELINES
EFFECTIVE NOVEMBER 2003**

APPLICATION FORM

PRE-APPLICATION

FINAL APPLICATION

(ONLY PROJECT PROPOSALS THAT HAVE SUCCESSFULLY COMPLETED THE PRE-APPLICATION PROCESS ARE ELIGIBLE FOR SUBMITTING A FINAL APPLICATION.)

DATE: 09/08

Before filling out this application, please see attached Application Form Instructions (Appendix A).

All questions must be answered.

1. Project Name: Bruce Freeman Rail Trail Phase 2A and Phase 2C

2. Project Applicant:

Applicant Name: Roland Bartl, Town of Acton Planning Director (See page 19)

Agency Name: Town of Acton Planning Department

Address: 472 Main Street, Acton, MA 01720

Telephone Number: (978) 264-9636 Fax Number: (978) 264-9630

E-mail address: rbartl@acton-ma.gov

Is there more than one project applicant? Yes No

3. Applicant's Contracting Officer:

Name: Steven LeDoux (See page 19 for 2C)

Title: Town Manager

Address: 472 Main Street, Acton, MA 01720

Telephone Number: (978) 264-9612 Fax Number: (978) 264-9630

E-mail address: manager@acton-ma.gov

4. Contact Person:

Name: Christer Ericsson

Title: Project Manager

Address: Greenman-Pedersen, Inc., 105 Central Street, Suite 4100, Stoneham, MA 02180

Telephone Number: 781-279-5500 Fax Number: 781-279-5501

E-mail address: cericsson@gpinet.com

5. Is the project to be managed by a sponsor other than the applicant? Yes No

If yes, please give:

Sponsor Name:

Contact Name:

Title:

Address:

Telephone Number: Fax Number:

E-mail address:

6. Regional Planning Agency(s):

Name: Northern Middlesex Council of Governments Name: Metropolitan Area Planning Council

Address: 115 Thorndyke St., 3B, Lowell, MA 01852 Address: 60 Temple Place, Boston, MA 02111

Contact person: Beverly Woods

Contact person: Barbara Lucas

Phone #: 978-454-8021

Phone #: 617-451-2770

7. MassHighway District Office(s):

District #: 3

District #: 4

Address: 403 Belmont St, Worcester MA 01604

Address: 519 Appleton St Arlington MA 02476

Contact person: Arthur Frost

Contact person: Patricia Leavenworth

Phone #: 508-929-3800

Phone #: 781-641-8300

8. Project Type: (Check Only One) Regional Statewide

9. Type of Work Category: (Include even those work category(s) that are being proposed as the non-federal share/applicant match.)

Program Property Acquisition Final Design Construction

A.) Are all work categories requesting Enhancement funding included in this one application?

Yes No

If you answered "No" to 9A, please explain?

Towns will fund property acquisition. \$4,700,000 of Congestion Mitigation Air Quality (CMAQ) funding has been allocated for construction to date. Final Design funds are being requested.

B.) Are any of these work categories requesting credit toward the non-federal share and applicant match?

Yes No

If you answered "Yes" to 9B, please explain?

C.) Is this project part of a larger MassHighway and/or municipal roadway project?

Yes No

If you answered "Yes" to 9C, please describe the nature of that project. (Include the type of funding, status of funding, and total project cost, including the Enhancement funding):

The Bruce Freeman Rail Trail (BFRT) is a proposed trail through the communities of Lowell, Chelmsford, Westford, Carlisle, Acton, Concord, Sudbury, and Framingham in Massachusetts -- following the 25-mile route of the old New Haven Railroad Framingham & Lowell line. It has been identified in the Statewide Massachusetts Bicycle Transportation Plan and the MAPC Regional Bicycle Plan. Phase 1 (6.8 miles in Lowell, Chelmsford, and Westford) is currently under construction. Approximately \$5 million in Congestion Mitigation Air Quality funds were allocated for Phase 1. Phase 2A, included in this application, is a 4.8 mile extension through the Towns of Acton, Carlisle and Westford. 25% Design Plans have been submitted and MassHighway has scheduled the Public Hearing for the project. Phase 2B is a 0.67 mile extension which is part of the Concord Rotary design and is not part of this application. Currently an EIR and 25% design plans are underway for Phase 2B. Phase 2C, also part of this application, incorporates the remaining portion in Concord which is approximately 3.0 miles and includes access to the Concord MBTA Commuter Rail Station. Phase 2D is a five mile extension through Sudbury. Phase 3 is a 4.6 mile extension through Sudbury and Framingham. \$4.7 million dollars of CMAQ Funding to date has been allocated to date for the construction of of the BFRT through the communities of Westford, Carlisle, Acton, Concord and Sudbury. The estimated construction cost for Phase 2A is approximately \$7.7 million and for 2C is approximately \$6.1 million. The Towns of Acton, Carlisle and Westford have allocated \$282,500 for the preliminary design and hope to receive \$765,500 in enhancement funding to complete the final design. The Town of Concord has allocated \$240,000 toward preliminary design and hopes to receive \$666,000 in enhancement funding to complete the final design. Phases 2D and 3 are in very preliminary stages.

D.) Is there funding, other than Enhancement funding, either being applied for or already approved for this project?

Yes No

If you answered “Yes” to 9D, please describe the other funding and what work categories it applies to. (Include the type of funding, status of funding, and total project cost, including the Enhancement funding):

Acton, Carlisle and Westford have provided \$282,500 to fund the preliminary design of Phase 2A. They are requesting \$765,500 in enhancement funds to complete the final design. The approximate construction cost for this portion of Phase 2A is \$7.7 million. (See page 19 for more on Phases 2A and 2C)

10. Has this project proposal received prior funding approval under the Transportation Enhancement Program? Yes No

If yes, please list project proposal name:

Fiscal Year the application was approved:

Amount of approved project proposal funding:

What Work Categories were approved:

What is the present status:

11. **Brief Project Proposal Description:** (A detailed project proposal description is requested in item 23. In the space provided, describe the Enhancement component of the project only.)

This project proposal is for construction of Phase 2A and 2C of the BFRT. Phase 2A is 4.8 miles of multi-use trail and an alternative transportation corridor that runs from the Phase 1 (under construction) terminus at Route 225 in Westford southerly to Acton Indoor Sports in Acton along the former Penn Central/Old Colony Railroad right of way. (See page 19 for more on Phases 2A and 2C)

B.) Direct and Substantial Relationship to Surface Transportation System:

In the space provided, check all relationships that apply to the project proposal and briefly describe.

 Function

Phase 2A and 2C will serve as off-road routes for bicycle /pedestrian traffic from Phase 1 of the trail through Westford, Carlisle, Acton and Concord (once the Rotary redesign is complete). Connections to the East Acton Village District, plazas along Great Road, Ice House Pond, Morrison Farm, Wetherbee Conservation Land, Veterans Memorial Field and North Acton Recreation Area (NARA) will also be provided in Acton. (See page 20 for more on Phases 2A and 2C)

 Proximity

When completed in its entirety, the BFRT will connect Lowell to Framingham. There are 3 commuter rail stations along this trail that are part of 3 different commuter rail lines (Lowell, Fitchburg, and Worcester). Trail parking will be provided at Acton Indoor Sports, Gould's Plaza, North Acton Recreational Area, 1019 Main Street in Acton, West Concord commuter lot and Commonwealth Avenue in Concord. (See page 20 for more on Phases 2A and 2C)

 Impact

This section of trail will serve to connect the communities of Lowell, Chelmsford, Westford, Carlisle, Acton and Concord (once the Route 2 Rotary redesign has been constructed). It will not only be a safe, off-road, non motorized transportation facility but would also provide recreation and economic development benefits. As other sections of the trail are developed, significant regional transportation, recreational, tourism and economic benefits will be realized.

C.) Non-Traditional Transportation Project Proposal:

Briefly explain how the “Enhancement” project proposal is a “Non-Traditional Transportation Project Proposal”:

The BFRT project is a non-traditional project since it provides a safe and off road transportation corridor that is designed specifically to accommodate bicyclists and pedestrians. In addition to providing an alternative mode of transportation from point to point linkages, it offers recreation benefits such as bicycling, jogging and cross country skiing and preserves the abandoned rail bed. It provides overlooks and viewing areas for observing the surrounding environment and the local flora and fauna thereby enhancing public awareness and education and offers access to recreation areas.

D.) (For Statewide Project Proposals Only) Briefly explain how the project proposal meets statewide criteria:

Phase 2A and 2C of the BFRT meet the statewide criteria since they span two regional planning agencies, Metropolitan Area Planning Council and Northern Middlesex Council of Governments, two MassHighway District Offices, District 3 and District 4, and four Towns.

13. Funding Breakdown for Transportation Enhancement funding:

Work Categories	Breakdown Of Funding			TOTAL for each row across
	Federal Share (80%)	State Share (10%/20%)	Applicant Share (10% min.)	
Programs				
Property Acquisition				TO BE DETERMINED
Final Design	\$1,288,350	\$143,150	\$522,500	\$1,954,000
Construction				
Cash				
TOTAL	\$1,288,350	\$143,150	\$522,500	Total Project Cost: \$1,954,000

*Applications submitted by a federal or state agency require a 20% applicant match.

Please indicated the percentage of funding shares, and explain the proposed applicant match, including its source and percentage of overall project costs: (For example, is the applicant match in the form of cash or in-kind services and explain.)

Percentage of Federal Funds requested: 66%
 Percentage of State Funds requested: 7%
 Percentage of applicant match: 27%

The applicant match is in the form of cash. The Towns of Acton, Carlisle and Westford paid \$282,500 for the prelinary design and the Town of Concord paid \$240,000 for the engineering assessment and preliminary design.

14. Project Proposal Location/Limits: (Please be as specific as possible.)

Phase 2A of the BFRT follows the former Penn Central/Old Colony Railroad Right-of-Way north from Acton Indoor Sports and runs parallel to Great Road (Route 2A/119) and crosses Wetherbee Street, Concord Road and Brook Street to Great Road south of Main Street (Route 27). There are three trestles crossing Nashoba Brook in this section of the BFRT. (See page 20 for more on Phases 2A and 2C)

15. Project Proposal Status: (All applicants must complete the following information.)

A.) Program work category, please answer the following:

Is the Planning Phase complete? Yes No

If “yes”, by whom? GPI, VHB, Acton, Carlisle, Westford, Concord, MassHighway

If “no”, please explain why?

B.) Property Acquisition work category, please answer the following: (All applicants must complete the following information.)

1) Is there any property acquisition necessary to complete this project? Yes No

If “yes”, please explain.

GPI and Acton have met individually with all impacted abutters to discuss the impacts and develop effective mitigated measures. For Phase 2A, both permanent and temporary easements are necessary at Rex Lumber in Acton for constructing the trail, clearing and grubbing, grading, loam and seed, removing and resetting boulders and timber rail fencing. (See page 20 for more on Phases 2A and 2C)

2) Was there any property acquisition already completed for this project? Yes No

If “yes”, please explain.

A permanent easement for access and parking on Phase 2A was granted to the Town at 1019 Main Street by Acton Garage Storage, Inc. and filed at the Registry of Deeds.

3) Has all necessary land acquisition been identified? Yes No

If “no”, please explain.

4) Does the applicant have permission to all the land? Yes No

If “yes”, in what way? (answer the following)

- | | | |
|----------------------|------------------------------|-----------------------------|
| Land in Fee: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Permanent Easements: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Temporary Easements: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Eminent Domain: | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please explain.

Preliminary ROW Plans for Phase 2A were submitted to MassHighway in April 2008. In May 2008, Daniel Gentile, Community Compliance Section approved the plans as sufficient for Right of Way purposes. They have had discussions with the abutters being impacted and they are agreeable. Acquisition will include both temporary and permanent easements. (See page 21 for more on Phases 2A and 2C)

5) Will this project application impact private property in any way? Ie. Does any part of this project application require construction on or through private property? Yes No

If “yes”, please explain?

Private property will be impacted for construction of the bike trail, the provision of access trails, grading, loam and seed and the removal and resetting of fencing.

6) Are there any encroachments? Yes No

If “yes”, please explain.

See page 21 for more on Phases 2A and 2C.

7) Has there been or will there be any land takings by eminent domain? Yes No

If “yes”, please explain whether they were or will be of a friendly or hostile nature?

8) Is the land acquisition for: Preservation or Construction (Check one).

C.) Final Design and/or Construction Work categories, please answer the following: (All applicants must complete the following information.):

1) Is the Planning/Feasibility Phase complete: Yes No

a.) If yes, by whom: Acton, Carlisle, Westford, Concord, MassHighway, MAPC,

b.) If no, explain:

2) Is the Preliminary Design (25%) Phase complete: Yes No

a.) If yes, by whom: Acton, Carlisle, Westford, MassHighway, GPI

b.) What is the status of the MassHighway review? :

MassHighway review of the 25% plans is complete for Phase 2A and the public hearing has been scheduled for October 2008.

c.) Is the designer a MassHighway-approved consultant?: Yes No

3) Is the Final Design (75%) Phase Complete: Yes No

a.) If yes, by whom: See page 22 for more on Phases 2A and 2C.

b.) What is the status of MassHighway review:

c.) Is the designer a MassHighway-approved consultant? Yes No

4) Is the Final Design (100%) Phase Complete: Yes No

a.) If yes, by whom: See page 22 for more on Phases 2A and 2C.

b.) What is the status of MassHighway review:

c.) Is the designer a MassHighway-approved consultant? Yes No

5) If the designer is not a MassHighway-approved consultant, please check one of the following:

local volunteer city or town engineer

consulting firm Other

If the designer is not a MassHighway-approved consultant, please explain why this consultant has been selected?

- 6) If design has begun, but is not complete, please give the design status and estimated completion date:

Design Status:

25% Design plans for Phase 2A were submitted in April 2008.

Comments have been transmitted to the Towns. Public Hearing is scheduled for October of 2008. (See page 22 for more on Phases 2A and 2C)

Estimated completion date: 07/2010

- 7) Estimated date to begin construction/implementation: Spring 2011

- 8) Estimated date to complete construction/implementation: Fall 2012

16. Party Responsible for Future Maintenance & Operation:

Department Name: Towns of Acton, Carlisle, Westford and Concord (See page 22 for more on Phases 2A and 2C)

Dept. Representative: Phase 2A - Steven Ledoux, Acton Town Manager

Address: 472 Main Street, Acton, MA 01720

Telephone Number: 978-264-9636 Fax No. 978-264-9630

E-mail address: manager@acton-ma.gov

17. Americans with Disabilities Act:

- A.) Has this project proposal received a waiver under the Americans with Disabilities Act?

No Yes

If yes, please include a copy of the waiver as an attachment.

- B.) Does this project require a waiver under the Americans with Disabilities Act?

No Yes

If yes, please explain.

C.) Is this project application requesting funding to meet ADA requirements?

No Yes

If yes, please explain.

18. Public Participation:

A.) Has a public hearing been held on the project proposal? Yes No

If "no", please explain why and whether you intend to hold a public hearing.

See Item 18 in Draft Application for Public Participation.

B.) Does your proposal have an affirmative town meeting vote, city council approval or municipal referendum? Yes No

If yes, by whom:

The Board of Selectmen in all four communities have written letters of approval and support for the project. Town Meeting in all communities has voted on several items related to the BFRT.

If "no", please explain why.

C.) Is there any known support to the project proposal? Yes No

If "yes", please explain who and why.

See support documentation (Item 21 - Draft Application).

D.) Is there any known opposition to the project proposal? Yes No

If "yes", please explain who and why.

There is no known opposition in Acton, Carlisle or Westford. Initially in Concord, there was opposition to the project from residents near the White Pond and Jennie Dugan wetlands located near the southern portion of the trail, with details of the design debated openly in the various public meetings, hearings and local newspapers. Four warrant articles regarding the design of the trail were presented to the April 2008 Annual Town Meeting and voted. (See Page 22 for more on Phases 2A and 2C)

E.) Have you solicited public opinion in any way? Yes No

If "yes", please explain how and to whom.

Several volunteer R.O.W. clean-up days. Publicity and campaign for local funding for design (CPA funds appropriated). Phase 2A - Project kickoff meeting was held on 2/13/07 with 13 in attendance. (agenda and sign in sheet in Draft Application) There was an Acton Board of Selectman meeting presentation and meetings with key individual project abutters on 6/4/07 (meeting minutes attached in Draft Application). (See page 23 for more on Phases 2A and 2C)

**COMMONWEALTH OF MASSACHUSETTS
TRANSPORTATION ENHANCEMENT PROGRAM GUIDELINES
FINAL APPLICATION FORM
SUPPLEMENTAL INFORMATION**

Question 2. -

Project Applicant:

Applicant Name: Marcia Rasmussen, Director Planning & Land Management

Agency Name: Town of Concord Department of Planning & Land Management

Address: 141 Keyes Road, Concord, MA 01742

Telephone Number: 978-318-3290

Fax Number: 978-318-3291

E-mail address: mras mussen@concordma.gov

Question 3. -

Applicant's Contracting Officer:

Name: Christopher Whelan

Title: Town Manager

Address: 22 Monument Square, P.O. Box 535, Concord, MA 01742

Telephone Number: 978-318-3000

Fax Number: 978-318-3002

E-mail address: cwhelan@concordma.gov

Question 9.D. -

The Towns of Acton, Carlisle and Westford are also prepared to fund any necessary right of way acquisition costs. The Friends of the BFRT (\$20,000) and a Bikes Belong grant (\$5,000) funded the initial \$25,000 - 2005 Engineering Assessment of the Concord portion of the BFRT. Subsequently, the Town of Concord allocated an additional \$50,000 at Town Meeting for the continued assessment. The Town of Concord provided an additional \$165,000 toward the preliminary (25%) design of Phase 2C for a total to date of \$240,000. Concord is requesting an additional \$666,000 in enhancement funds to complete the final design. The approximate construction cost for Phase 2C is \$6.1 million. The Town of Concord is prepared to fund any necessary right of way acquisition costs. To date \$4.7 million in CMAQ funding has been allotted for the construction of the BFRT through Westford, Carlisle, Acton, Concord and Sudbury.

Question 11. -

Phase 2C is 3.0 miles of multi-use trail and an alternative transportation corridor that runs from Commonwealth Avenue southerly to the MBTA Commuter Rail Station and continues to the Sudbury townline. When complete the Bruce Freeman Rail Trail will be approximately 25 miles in length and run through Framingham, Sudbury, Concord, Acton, Carlisle, Westford, Chelmsford and Lowell.

Question 12.B. –

Function: Connections to West Concord Village, the MBTA Commuter Rail Station, schools and natural resource areas will also be provided in Concord. As other segments of the trail are developed in Sudbury and Framingham, a more significant off road alternative transportation network will emerge.

Question 12.B. -

Proximity: The trail includes multiple spurs to provide connectivity and easy/safe access. These spurs include connections to Morrison Farm along Concord Road, Brookside Shops, and local neighborhoods.

Question 14. –

The trail then crosses Great Road and runs more or less parallel to Main Street (Route 27) to the Carlisle town line for a total trail length in Acton of approximately 4.5 miles. Between Great Road and the Carlisle town line, the BFRT crosses Main Street (Route 27) twice, Nashoba Brook twice and Butter Brook twice. From the Acton town line, the BFRT runs northerly to the Westford town line through approximately 850 feet (0.16 miles) in Carlisle. There are no brook or street crossings in Carlisle. From the Carlisle town line, the BFRT runs northerly to Route 225 through Westford for approximately 700 feet (0.13 miles). Although there are no brook crossings in Westford, a crossing at Route 225 will be required to connect with the northern segment of the BFRT (Phase 1) from Lowell to Westford.

Phase 2C, the Concord portion, follows the railroad right of way from Commonwealth Avenue southerly approximately 3 miles to the Sudbury town line. Phase 2C of the BFRT follows the former New York, New Haven and Hartford Railroad Right of Way and passes near Warner's Pond, crosses the Nashoba Brook twice, crosses the Assabet River, traverses the West Concord Village Center, crosses over the Jennie Dugan stream, through an extensive wetlands area and passes near White Pond. The corridor intersects six public roads including Route 2, Commonwealth Avenue, Main Street, Old Marlboro Road, Williams Road and Powder Mill Road as well as several private driveways and the active Fitchburg line of the MBTA commuter rail.

Question 15.B.1. –

Rex Lumber is agreeable. A permanent easement is needed from Nagog Knoll Realty Trust for the construction of a hot mix asphalt path to the parking area. The owner has agreed to accommodate trail parking in the rear of the plaza, where existing (excess/overflow) parking now exists. A permanent easement is needed from Acton Indoor Sports for construction of parking facilities. The owner has agreed to the accommodation of trail access parking on this site. A permanent easement is needed from Bravery Realty Trust for the construction of a five foot wide cement concrete sidewalk from the trail to Great Road. The Board of Selectmen reserved an easement in this area when approving the site plan for Powers Gallery. The Town has met with the Powers Gallery and they support the trail. Temporary easements are needed from Acton Water District for clearing and grubbing, John Kennedy Marital Trust in order to remove and reset an existing fence and loam and seed and Nancy Torode in order to remove and reset an existing fence. Capacity improvements have been proposed at the Route 27 and 225 intersection to accommodate the BFRT crossing. A pedestrian phase will be added to the signal to cross trail

users safely. These improvements will require temporary and permanent easements in addition to fee takings. These takings would require a warrant article at Town Meeting and the Town of Westford will pursue a Town Meeting vote once the 25% Design Plans have final approval and the Final Design Funds are in place. The Preliminary ROW Plans and MassHighway's Community Compliance Section Interoffice Memorandum sent in response to the Preliminary ROW Plans are included after this Application.

For Phase 2C, property acquisition in the form of easements or lease agreements with the State will be necessary for the construction of two small parking facilities in Concord; one near MCI-Concord and one at the West Concord Commuter parking lot. The Town has had conversations with the Department of Corrections and they are agreeable. The Town will also provide access over town land to construct a path from the Powdermill Road sidewalk down to the trail in Concord. A sight line easement at Williams Road in Concord is also necessary. The construction plan sheets for these areas are included after this Application.

Question 15.B.4. –

Once the 25% Design Plans are approved for Phase 2A, the necessary final plans and documents will be produced in order for the Town to properly record the easements.

Preliminary ROW Plans for Phase 2C will be submitted to MassHighway with the 25% Design Plans. The ROW needs have been identified, and the Town of Concord has initiated conversations with the affected parties and received support.

The Towns of Westford, Carlisle, Acton and Concord have initiated conversations with EOT regarding lease of the railroad right of way as well as parking facilities in Concord. EOT has indicated that once the 25% Design Plans have been approved and final design funds are in place, they will generate a lease agreement and forward it to the Towns of Acton, Carlisle, Westford and Concord.

Question 15.B.6 –

Along Phase 2A, there are some physical encroachments upon the railroad right-of-way currently within the project area. Acton Indoor Sports has a license agreement with EOT allowing them to maintain and ultimately remove two light poles and electric service located within the right-of-way. GPI and the Town met with the owner and construction of the proposed trail will not affect this agreement. EOT granted an access easement to the Durkin family as well, allowing them to use the railroad right-of-way as an access drive for their commercial trucking business. GPI and the Town of Acton met with the Durkin family and this will not be affected by the construction of the trail. They also have debris piled within the right-of-way which will be removed during construction. Bursaw Gas & Oil Company parks their gas and oil truck perpendicular to the right-of-way with some intrusion into the right-of-way. GPI and the Town of Acton met with the owner. As a result, stockade fencing has been proposed as part of the project to provide a barrier and prevent further encroachment and use of the right of way. Currently Dunk & Bubble is using the right-of-way as an access drive for their rear storage building and debris storage. The trail construction will prevent Dunk & Bubble from continued use of the right of way and debris storage. Rex Lumber is also currently using the railroad right-of-way and has constructed parking and two private drives across the tracks. In addition, Rex Lumber has placed gates

across the railroad right-of-way blocking continual access and use of the existing right-of-way. GPI and the Town of Acton met with the owner and the Town and Rex Lumber have arrived at a desirable outcome for both parties. Lastly, the Nashoba Sportsman Club's private access drive crosses the railroad right-of-way. This access drive is the only entrance to the Club. Signing and pavement markings have been proposed along both the trail and the drive in this location. There are no physical encroachments along Phase 2C.

Question 15.C.1.a. –
NMCOG, GPI and VHB

Question 15.C.2.

The 25% Design is complete for Phase 2A of the project and was submitted to MassHighway in April 2008. GPI has received comments on the 25% submission. The 25% Design has been prepared for Phase 2C of the project and will be submitted to MassHighway upon receipt of PRC approval.

Question 15.C.3. and 15.C.4. –

The Towns of Acton, Carlisle and Westford contracted with GPI for the 25% Design and Public Hearing for Phase 2A. The Town of Concord contracted with VHB for the 25% Design and Public Hearing for Phase 2C. Once complete, they will contract for the Final Design with a MassHighway-approved consultant. Scope and Fee for Right of Way will be incorporated into the Final Design Contract. The Public Hearing for Phase 2A is tentatively scheduled for October 29, 2008.

Question 15.C.6. -

Upon final approval of the 25% Design Submission for Phase 2A by MassHighway, the towns of Acton, Carlisle and Westford will develop a contract for Final Design. The Town of Concord will also develop a contract for Final Design once they have submitted and received approval of the 25% Design plans for Phase 2C and funding is in place. The estimated design completion date for Phase 2C of the project is 12/10.

Question 15.C.7. -

The estimated date to begin construction for Phase 2C is Fall 2011.

Question 15.C.7. -

The estimated date to complete construction for Phase 2C is Spring 2012.

Question 16. – Phase 2C

Department Representative: Christopher Whelan, Town Manager

Address: 22 Monument Square, P.O. Box 535, Concord, MA 01741

Telephone: 978-318-3000

Fax No.: 978-318-3002

Email address: cwhelan@concordma.gov

Question 18.D. –

The Advisory Committee's plan (and VHB's 25% design) was overwhelmingly approved, with two modifications - to add the replacement of the existing Powdermill Road culvert and to provide a paved asphalt surface for the entire length of the trail in Concord. The continuing design process is expected to address specific local issues and concerns which can best be addressed through the design details of the trail. See opposition documents (Item 19 - Draft Application).

Question 18.E. -

The Phase 2A 10% Design Public Meeting was held on June 12, 2007 with 44 in attendance (meeting minutes and sign in sheet attached in Draft Application). For Phase 2C – nine public outreach meetings were held (taped and televised on local-access cable) and additional public meetings were held by the local Advisory Committee. Information about Phase 2C of the BFRT is posted on the Town of Concord website.

PHASE 2A FINAL DESIGN SCOPE AND FEE

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
10 Park Plaza, Boston, MA**

**SCOPE OF WORK
AND
WORK HOUR ESTIMATE FORM
FOR DESIGN SERVICES**

**PHASE 2A BRUCE FREEMAN RAIL TRAIL
ACTON/CARLISLE/WESTFORD**

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

**SCOPE OF WORK AND WORK HOUR ESTIMATE FOR DESIGN SERVICES
PHASE 2A BRUCE FREEMAN RAIL TRAIL
ACTON/CARLISLE/WESTFORD**

This document consists of the following:

- **GENERAL**
- **SCOPE OF WORK**
- **WORK HOUR TASK DESCRIPTIONS**
- **WORK HOUR ESTIMATE**
- **WORK HOUR SUMMARY TABLE**

GENERAL

The attached documents list the basic scope of work and work hour estimate and fee for the final design elements of the Phase 2A Bruce Freeman Rail Trail Project in the Towns of Acton/Carlisle/Westford.

SCOPE OF WORK

The Scope of Work detailed below includes the final design of Phase 2A which will extend from the end of BFRT Phase I (Westford-Lowell Phase) and continue south through Westford, Carlisle and Acton for a total length of approximately 4.81 miles. The construction will include: a new 10-foot paved asphalt multi-use rail trail with 2-foot stabilized shoulders, pavement marking lines, construction of a pre-fabricated bridge structure over Route 2A/119, cross culverts, earthwork, landscaping and other items incidental to the construction of the bike path.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

SECTION 150

ENVIRONMENTAL

166 MEPA–Environmental Notification Form (ENF)

Prepare an ENF form and associated correspondence to various agencies as necessary in accordance with the Massachusetts Environmental Policy Act and MEPA Regulations 301 CMR 11.00. Prepare all associated filing attachments including a distribution list, public notice, etc., responses to comments, as necessary; and attend public meetings.

170 WPA Notice of Intent (NOI)

Prepare and submit an NOI to the local conservation commission in accordance with the Massachusetts Wetlands Protection Act and MEPA Regulations 310 CMR 10.00. Includes the preparation of all associated forms and backup documentation; permit plans, coordination during review, site walks and attending conservation commission hearings.

174 Water Quality Certification

Prepare an application for a Water Quality Certificate in accordance with the Massachusetts Surface Water Quality Standards and MEPA Regulations 310 CMR 9.00 and 314 CMR 4.00. Includes preparation of the appropriate state application form, WQC Standard Form for applicable Footprint Bridge projects, supporting documentation, plan preparation, and sediment analysis when applicable.

179 Coordination and Liaison

Includes scheduling and participating in environmental meetings with MassHighway, assisting in expediting the permitting process, and compiling and maintaining environmental files and records.

SECTION 400

75% HIGHWAY DESIGN SUBMITTAL

401 Response to 25% Comments

Prepare a formal written response to all comments received regarding the 25% review and address any revisions stemming from the Design Public Hearing that MassHighway deems necessary.

402 Field Reconnaissance

Review the proposed project interface with adjacent properties, streets, drives, drainage, utilities, wetlands, etc. Define additional survey needs.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

403 Meetings Liaison and Coordination

Attend all meetings necessary to advance the design of a project including meetings with MassHighway Boston and District Offices, community representatives, planning agencies, etc. Provide MassHighway with a transcript the minutes of the meetings.

404 Utility Coordination

Contact all utility companies affected by the proposed work. Discuss project impacts and note the locations of relocated utilities (poles, pipes, etc.) on the plans. Include estimate and special provisions for all utility work that is to be performed by the contractor.

405 Final Horizontal Design Geometrics

Tweak the horizontal geometry based on the 25% review comments and comments stemming from the Design Public Hearing. Plans must clearly show all aspects of the horizontal geometry including curve components such as Point of Curvature (PC), Radius (R), DELTA (Δ), Length of Curve (L), Tangent (T) and Point of Tangency (PT) along with a description of roadway widths, station equations and horizontal offsets between survey baseline and design centerline.

406 Final Vertical Design Geometrics

Tweak the vertical geometry based on 25% review comments and comments stemming from the Design Public Hearing. Plans must clearly show all aspects of the vertical geometry including Stopping Sight Distance (SSD), Passing Sight Distance (PSD), Grade 1 (G1), Grade 2 (G2), Length of Vertical Curve (L), K (factor), station and elevation of Point of Vertical Curvature (PVC), Point of Vertical Tangency (PVT) and Point of Vertical Intersection (PVI). Ensure that profiles are prepared in accordance with the Highway Design Manual.

407 Pavement Design

Respond to Pavement Design Engineer's comments and prepare detailed pavement design with completed data sheets per Highway Design Manual. For Footprint Bridge R&R projects refer to the 10-10-96 MassHighway Memorandum on Pavement Design.

408 Typical Cross Sections

Finalize typical cross sections ensuring that all materials and dimensions are clearly labeled in accordance with the proposed pavement structure approved by the Pavement Management Section.

409 Plot Cross Sections

Tweak cross sections to ensure that the slope limits and treatments of each cross section are crafted to suit the specific site locations. Individual cross sections should be evaluated regarding guardrail locations, gravel box detail, pay limits, and the need for subdrains and retaining walls.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES—TASK DESCRIPTION

410 Plot Proposed Layout and Easements

Tweak the plans based on the limits establish by the final cross sections to ensure that adequate right of way is available to perform the work. All existing layout lines, proposed alterations and any temporary or permanent easements must be clearly labeled.

411 Construction Plans

Prepare Construction Plans in accordance with the Highway Design Manual. Each item of work with the project limits must be clearly labeled. Drawings must be formatted exactly as described in the Highway Design Manual.

412 Grading & Tie Plans

Prepare grading and tie plans showing detailed information regarding proposed curve geometry and grades.

413 Drainage and Water Supply Details

Clearly show all existing and proposed drainage and water supply installations. Design must address all work as a result of proposed roadway improvements.

414 Traffic Signs

Identify locations for all warning, regulatory and route marker signs. Indicate on the construction plans the status of existing sign structures.

415 Guide Sign Design and Overhead Directional (OD) Elevations

Indicate proposed locations of all ground mounted and overhead guide signs. Develop panel legends and calculate size. Prepare a Sign Summary Sheet. Design support foundations and include calculations. Draft guide sign details and overhead sign elevations.

416 Traffic Signals and Plan Preparation

Include a complete design for signal installations, supports, and foundations. Finalize phasing details. Develop signal specifications.

417 Pavement Markings and Plan Preparation

Design and layout roadway pavement markings, stop lines, cross walks, gore markings, etc.

418 Traffic Management Plans (TMP)

Finalize construction staging. Prepare construction plans in accordance with the MUTCD such that sufficient information is provided to demonstrate a feasible means of constructing the project. The level of detail shall recognize that the actual traffic management plan implemented by the contractor may vary from that shown on the plans.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

420 Landscaping and Plan Preparation

Finalize planting locations and species based on review comments. Develop planting schedules and tabulate relevant data.

421 Erosion Control Plans

Detail the sequencing, material placement and measures to control the potential damage to adjacent properties, wetlands, bodies of water, etc.

422 Miscellaneous Contract Plans

Prepare miscellaneous full size drawings for presentation of the proposed project. Include Title Sheet, Index, Key Plan, Boring Plans, Boring Logs, etc.

423 Estimate

Prepare a detailed estimate based on the latest edition of the Standard Nomenclature. Check that every item of work shown on the plans has a pay item. The estimate shall be prepared in accordance with the Method of Measurement and Basis of Payment described in the Standard Specifications for Highways and Bridges including the latest supplements and the Standard Special Provisions. This task includes an estimate of all work hours associated with calculating quantities.

424 Draft Special Provisions

Review the latest edition of the Standard Specifications for Highways and Bridges and Supplemental Specifications and verify that every item in the estimate that is listed in the Standard Nomenclature with an asterisk (*) has a special provision. Ensure that special provisions are drafted only when absolutely necessary to describe a specific or unique activity to be performed by the contractor.

425 Constructability and Quality Control (QC) Review

Perform an independent review of the project by an experienced engineer who is not directly involved in the preparation of the contract documents. Review shall focus on the practicality of constructing the project based on access to site, equipment needs, material properties, etc. Provide an overall review of the plans, specifications and estimate for conformity to the Highway Design Manual, the Standard Specifications for Highways and Bridges, the latest Supplemental Specifications, the Bridge Manual, the Construction and Traffic Standard Details, and the latest Engineering and Policy Directives.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

SECTION 450

100% HIGHWAY DESIGN SUBMITTAL

451 Respond to 75% Comments

Prepare a formal written response to all comments received regarding the 75% review.

452 Finalize Plans

Prepare a complete set of plans addressing all comments from the 75% review. Ensure that the plans are clear and are prepared in accordance with Chapter 2 of the Highway Design Manual.

453 Finalize Special Provisions

Review the special provisions to ensure that the special provisions do not duplicate those with respect to Division I of the Standard Specifications. Review the Method of Measurement and Basis of Payment for every item in order to ensure that the special provisions are clear and not ambiguous.

454 Finalize Estimate

Prepare a calculation book in accordance with Chapter 13 of the Highway Design Manual. Ensure that all items of work have a pay item. Identify any non-participating work.

455 Quality Control (QC) Review

Have an experienced engineer who is not directly involved in the preparation of the contract documents perform an independent review of the project. Log on to the MassHighway web site for the latest edition of all reference documents, Engineering Directives and Policy Directives and verify that plans, specifications and estimate are prepared in accordance with these documents.

SECTION 500

RIGHT OF WAY

502 Layout Plans and Order of Taking

Prepare Layout Plans based on the approved Preliminary Right of Way Plans. Show lengths and bearings of all lines and calculate areas. The Layout Plans shall be prepared in accordance with Chapter 2 of the Highway Design Manual and shall include the proposed layout lines, property lines, corner markers, names of property owners, parcels to be taken, access and non-access points and the locations of all bounds. Include the preparation of a Decree Plan, if required.

503 Written Instrument

The Written Instrument for the Layout and Order of Taking shall be prepared in accordance with MassHighway Policy. The Written Instrument shall be carefully checked against the Layout Plan.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

504 Final Right of Way Plans

After FHWA has granted authority to the state to acquire right of way with federal participation and/or the Right of Way Bureau accepts the Preliminary Right of Way Plan, the Preliminary Right of Way Plan will become the Final Right of Way. The plan will be subject to any additions and revisions that may be required.

SECTION 600

GEOTECHNICAL REPORT

603 Subsurface Investigation Plan

Prepare a subsurface investigation plan (boring, probing, testing type, location, depth, etc.) in accordance with the Bridge Manual. Revise and resubmit after a Department review. Includes the preparation of the specifications and estimates if boring contract is to be paid for with direct expenses.

605 Geotechnical Report

Prepare and edit the Geotechnical Report, per Directive M15-1, Bridge Manual, Footprint Program and other guidelines. Correlate the contents of the report with the project construction plans.

606 Meetings, Reviews and Liaisons

Coordinate and meet with the Department for reviews, revisions, and advancement of project submittals.

607 Final Plans, Specifications and Estimates

Prepare and finalize geotechnical related details and items for the final plans, special provisions, and estimates.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

SECTION 700

PROJECT DEVELOPMENT – STRUCTURAL

701 Field Investigation

Review in the field the bridge site and adjacent conditions. Evaluate ground and river survey parameters for bridge design.

702 Determine Bridge Configuration

Collaborate with the highway designer to determine the vertical and horizontal alignments and typical cross-sections for both the roadway over and the roadway under. Determine a preliminary span length and vertical bridge clearance. Provide accommodations on the bridge for both existing and proposed utilities.

704 Comparative Design and Cost Analysis

Evaluate alternative bridge designs based on considerations of construction cost, traffic management, traffic safety, constructability, aesthetics, etc.

706 Type Study Report Preparation

Prepare a Type Study report detailing the various design alternatives for the bridge complete with appropriate graphics, descriptive text and cost breakdowns justifying the recommendations presented.

707 Meetings and Liaison

During the type study phase coordinate with others to advance the work and respond to MHD comments in the report document.

SECTION 710

BRIDGE SKETCH PLANS

711 Establish Boring Locations

Determine the locations for proposed bridge borings based on an approved scheme and coordinate the program with the geotechnical design effort.

712 Hydraulics Study and Report (Bridges over Water)

Review the hydrological analysis and hydraulics report relative to the size of the hydraulics opening. Make all calculations necessary to determine the size of the opening necessary to accommodate the design flows. Prepare a Hydraulics Report that presents pertinent data and recommendations.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

713 Sketch Plan Development

Prepare bridge sketch plans for each bridge in accordance with the MHD Bridge Manual. Submit review copies with foundation report to MHD. Ensure that the proposed design and construction staging plan addresses cost and scheduling impacts associated with accommodating both existing and proposed utilities.

714 Meetings, Coordination and Liaison

Participate in MHD reviews, preparation of responses to agency comments and plan revisions, as necessary. Provide coordination during the soils testing program and during the preparation of the soils and foundation reports by geotechnical staff or sub-consultant. Review bridge boring logs, foundation reports, and calculate geometric design.

715 Constructability Review

Review the design of the proposed structure to ensure that the structure does not present any unusual matters that would unduly increase the cost the project or present potential scheduling delays during construction resulting in claims for extra work. Particular attention must be given to the proposed construction staging and available right of way.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

SECTION 750

FINAL BRIDGE DESIGN

751 Structural Design - Superstructure

Prepare design calculations and perform an independent design check of all calculations for all superstructure design components in accordance with the MHD Bridge Manual.

752 Structural Design – Substructure

Prepare design calculations and perform an independent design check of all calculations for all substructure design components, including any cofferdams and permanent support systems for excavation in accordance with the MHD Bridge Manual.

753 Bridge Layout Geometrics

Prepare design calculations and perform an independent design check of all calculations for bridge geometrics including, framing, layout, critical clearance and elevation of footings, layout and ties, etc.

754 Contract Drawings

Prepare structural drawings in accordance with MHD Bridge Manual and check drawings for content and accuracy.

755 First Review Submission

Prepare and submit the first copy of the final plans for MHD review and subsequent resolution resulting from MHD comments and recommendations.

756 Quantity Cost Estimates

Prepare two sets of independent quantity calculations of bridge items and cost estimates for the bridge structures.

757 Special Provisions

Prepare bridge special provisions in accordance with the MHD Bridge Manual.

758 Second Review Submission

Prepare and submit copies of the bridge PS&E package for MHD review and subsequent resolution of MHD comments and recommendations.

760 Meetings and Liaison

Participate in meetings and coordinate in scheduling and advancing the bridge design.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES–TASK DESCRIPTION

761 Constructability and Quality Control (QC) Review

Perform an independent review of the project by an experienced engineer who is not directly involved in the preparation of the contract documents. Review shall focus on the practicality of constructing the structure based on access to site, equipment needs, material properties, etc. Provide an overall review of the plans, specifications and estimate for conformity to the Highway Design Manual, the Standard Specifications for Highways and Bridges, the latest Supplemental Specifications, the Bridge Manual, the Construction and Traffic Standard Details, and the latest Engineering and Policy Directives.

SECTION 800

PS&E SUBMISSION

801 Respond to 100% Comments

Prepare a formal written response to all comments received regarding the 100% review.

802 Finalize Plans, Specifications and Estimate

Ensure that all comments from 100% review are addressed and reflected in the contract documents.

803 Prepare Detail Sheets

Prepare Detail Sheets in accordance with Chapter 13 of the Highway Design Manual. All items of work not adequately reflected on the plans are to be described in the Detail Sheets.

804 Combine Highway and Bridge

Ensure that the highway plans accurately depict the approved bridge design and that the index correctly identifies the page numbering of the bridge plans. Combine Special Provisions and Estimate into one package that eliminates redundancy and ambiguity.

805 Quality Control (QC) Review

Have an experienced engineer who is not directly involved in the preparation of the contract documents perform an independent review of the project. Log on to the MassHighway website for the latest reference documents such as Engineering Directives and Policy Directives, and verify that Plans, Specifications and Estimate are prepared in accordance with these documents. Review all environmental permits and ensure that the contract documents provide a means of compensating the contractor for performing work described in the permits.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

WORK HOUR ESTIMATE FOR DESIGN SERVICES--TASK DESCRIPTION

SECTION 900

CONSTRUCTION ENGINEERING

903 Pre-Construction Conference

Attend the Pre-Construction Conference. Answer questions and prepare the minutes of the meeting.

904 Highway Shop Drawings and Signal Permit

Review lighting, traffic signals, and sign shop drawings including foundations and supports; and perform a site inspection of final operations. Prepare a signal permit based on as-built conditions.

905 Bridge and Wall Shop Drawings

Review and approve structural shop drawings.

906 Bridge Construction Procedures

Review and approve bridge demolition and erection procedures.

907 Furnishing Advice and Field Visits

Provide assistance to MassHighway in interpreting the contract documents. Includes field visits to the construction site during all phases of construction as necessary.

909 Bridge Rating and Photographs

Visit project site and evaluate structures for conformance to the contract documents. Take photographs of completed structure. Prepare Bridge Rating Report.

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

SECTION 100

PROJECT DEVELOPMENT ENGINEERING

PROJECT TYPE CODE: BR--PROJECT DESCRIPTION: BRIDGE REPLACEMENT

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
101	Project Concept Preparation						
102	Preliminary Corridor Analysis						
103	Reasonable Alternative Determination						
104	Alternative Selection & Report Preparation						
105	Value Engineering (VE)						

SUBTOTAL

SECTION 150

ENVIRONMENTAL

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
151	Early Coordination with Local Commissions						
152	NEPA/MEPA Determination						
153	Project Development Meetings and Hearings						
154	NEPA - Draft Environmental Impact Statement (EIS)						
155	NEPA - Final Environmental Impact Statement (EIS)						
156	NEPA - Environmental Assessment (EA)						
157	NEPA - Categorical Exclusion (CE)						
158	ACOE Programmatic General Permit (PGP)						
159	Individual ACOE (404) Permit						
160	U.S. Coast Guard Bridge Permit						
161	Programmatic Section 4(f) Evaluation						
162	Draft Individual Section 4(f) Evaluation						
163	Final Individual Section 4(f) Evaluation						
164	MEPA - Draft Environmental Impact Report (DEIR)						
165	MEPA - Final Environmental Impact Report (FEIR)						
166	MEPA - Environmental Notification Form (ENF)	4	24	40	16	16	100
167	Wetland Resource Area Delineation						
168	Wetlands Protection Act (WPA) ANRAD						
169	WPA - Request for Determination of Applicability						
170	WPA - Notice of Intent (NOI)	4	20	120	80	40	264
171	WPA - Variance						
172	Chapter 91 License Application						
173	Chapter 91 Permit Application						
174	Water Quality Certification (401)	4	8	8	16	16	52
175	Coastal Zone Management Consistency Certificate						
176	Hist./Arch. Impacts (Section 106 and Chapter 254)						
177	Hazardous Materials Research/Review						
178	Wildlife/Biological Assessment						
179	Coordination and Liaison	4	8	8			20
180	ACOE 404 Permit PGP II or PGP I (Not Individual)						

SUBTOTAL

16 60 176 112 72 436

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

**SECTION 200
FUNCTIONAL DESIGN REPORT (FDR)**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
201	Evaluate Existing Conditions						
202	Traffic Count Analysis						
203	Safety Analysis						
204	MUTCD Signal Warrants						
205	Intersection Analysis						
206	Proposed Geometrics						
207	Report Preparation						

SUBTOTAL

**SECTION 220
DESIGN EXCEPTION REPORT**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
221	Evaluate 13 Controlling Criteria (MHD HDM, Ch. 8)						
222	Perform Incremental Analysis						
223	Prepare Narrative/Report						

SUBTOTAL

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

**SECTION 300
25% HIGHWAY DESIGN SUBMISSION**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
301	Project Initiation and Data Compilation						
302	Utility Coordination						
303	Survey Coordination and Controls						
304	Base Plans, Profiles and Typical Sections						
305	Field Reconnaissance						
306	Plot Existing Layout Lines						
307	Meetings and Liaison						
308	Determine Roadway Cross Section						
309	Preliminary Horizontal Geometry						
310	Preliminary Vertical Geometry						
311	Cross Section Studies						
312	Prepare Cross Sections						
313	Plot Proposed Layout and Easements						
314	Pavement Design						
315	Typical Sections						
316	Construction Details						
317	Hydrological Studies and Hydraulics Report						
318	Preliminary Drainage and Utility Studies						
319	Lane Configuration						
320	Traffic Signals						
321	Preliminary Signs and Pavement Markings						
322	Preliminary Traffic Management Plan (TMP)						
323	Early Environmental Coordination						
324	Constructability Review						
325	Quality Control (QC) Review						
326	Preliminary Construction Estimate						

SUBTOTAL

**SECTION 350
DESIGN PUBLIC HEARING**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
351	Modifications and Revisions						
352	Meeting Preparation						
353	Design Public Hearing						

SUBTOTAL

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

**SECTION 400
75% HIGHWAY DESIGN SUBMISSION**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
401	Response to 25% Comments	4	24	24	24	16	92
402	Field Reconnaissance		40		120	120	280
403	Meetings, Liaison and Coordination	20	20	32			72
404	Utility Coordination	2	4	16	8		30
405	Final Horizontal Design Geometrics	2	8	32	16	4	62
406	Final Vertical Design Geometrics	2	8	32	24	4	70
407	Pavement Design		2	4	8		14
408	Typical Cross Sections			4	16	4	24
409	Plot Cross Section	2	8	32	240	120	402
410	Plot Proposed Layout and Easements		24	8	40		72
411	Construction Plans	2	8	24	60	40	134
412	Grading & Tie Plans		2	16	24		42
413	Drainage and Water Supply Details	2	8	40	24	4	78
414	Preliminary Traffic Signs			8	8		16
415	Guide Sign Design & Overhead Directional Elevations			4			4
416	Traffic Signals and Plan Preparation	2	16	32	32	20	102
417	Pavement Markings and Plan Preparation			12	16		28
418	Traffic Management Plans (TMP)		4	8	16		28
419	Highway Lighting Plans and Details						
420	Landscaping and Plan Preparation		8	24	16		48
421	Erosion Control Plans		4	16	16	4	40
422	Miscellaneous Contract Plans		2	4	16	8	30
423	Estimate		16	24	120	80	240
424	Draft Special Provisions		24	16			40
425	Constructability and Quality Control (QC) Review	4	24	16			44
SUBTOTAL		42	254	428	844	424	1992

**SECTION 450
100% HIGHWAY DESIGN SUBMISSION**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
451	Respond to 75% Comments	4	20	40	24		88
452	Finalize Plans	4	40	80	80	80	284
453	Finalize Special Provisions	4	16	8			28
454	Finalize Estimate	4	16	20	40	20	100
455	Quality Control (QC) Review	4	16	16			36

SUBTOTAL 20 108 164 144 100 536

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

**SECTION 500
RIGHT OF WAY**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
501	Preliminary Right of Way Plans						
502	Layout and Order of Taking Plans		24	8	60	8	100
503	Written Instrument		24	16	24	8	72
504	Final Right of Way Plans	2	16		8	8	34
SUBTOTAL		2	64	24	92	24	206

**SECTION 600
GEOTECHNICAL REPORT**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
601	Research Available Subsurface Data						
602	Field Reconnaissance						
603	Subsurface Investigation Plan				8	4	12
604	Office Studies, Analysis and Testing						
605	Geotechnical Report	2	2	8	8	4	24
606	Meetings, Reviews and Liaison	4	4				8
607	Final Plans, Specifications and Estimate	2	2	16	8	8	36
SUBTOTAL		8	8	24	24	16	80

**SECTION 700
PROJECT DEVELOPMENT (STRUCTURAL)**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
701	Field Investigation		8	8			16
702	Determine Bridge Configuration		4	24	16		44
703	Preliminary Structural Analysis						
704	Comparative Design and Cost Analysis	4	8	40	80	80	212
705	Preliminary Structures Report Preparation						
706	Type Study Report Preparation	4	16	16	80	120	236
707	Meetings and Liaison	4	4				8
SUBTOTAL		12	40	88	176	200	516

**SECTION 710
BRIDGE SKETCH PLANS**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
711	Establish Boring Locations		2	4	2		8
712	Hydraulics Study and Report (Bridges over Water)		24		24	24	72
713	Sketch Plan Development	4	42	80	168	168	462
714	Meetings, Coordination and Liaison	8	20	20	20		68
715	Constructability Review		24	24	24		72
SUBTOTAL		12	112	128	238	192	682

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

**SECTION 750
FINAL BRIDGE DESIGN**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
751	Structural Design - Superstructure	2	40	80	160	80	362
752	Structural Design - Substructure	2	40	80	160	80	362
753	Bridge Layout Geometrics	2	8	40	40	40	130
754	Contract Drawings	4	40	80	320	400	844
755	First Review Submission	4	40	40	24	24	132
756	Quantity Cost Estimates	2	8	16	40	40	106
757	Special Provisions	2	4	24		24	54
758	Second Review Submission	4	40	40	24	24	132
759	FHWA Review						
760	Meetings and Liaison	16	40	40			96
761	Constructability and Quality Control (QC) Review	8	24	40			72
SUBTOTAL		46	284	480	768	712	2290

**SECTION 800
PS&E SUBMISSION**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
801	Respond to 100% Comments	4	8	24	8		44
802	Finalize Plans, Specifications and Estimate	8	24	60	80	40	212
803	Prepare Detail Sheets		4	8	16	8	36
804	Combine Highway and Bridge	2	4	16	24	8	54
805	Constructability and Quality Control (QC) Review	4	24	16			44
806	Value Engineering (VE)						
SUBTOTAL		18	64	124	128	56	390

**SECTION 900
CONSTRUCTION ENGINEERING**

		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician	TOTAL
901	Subsurface Investigation Inspection						
902	Pre-Bid Conference						
903	Pre-Construction Conference		8	8			16
904	Highway Shop Drawings and Signal Permit	2	8	16	16		42
905	Bridge and Wall Shop Drawings	2	16	40	40	24	122
906	Bridge Construction Procedures	2	24	40	16	24	106
907	Furnishing Advice	4	40	120	40	40	244
908	Geotechnical Construction Evaluation						
909	Bridge Rating and Photographs	2	16	40	24	32	114
SUBTOTAL		12	112	264	136	120	644

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT
WORK-HOUR ESTIMATE**

City/Town	Acton/Carlisle/Westford	Contract No.:	
Location:		Assignment No.:	
Bridge No.:		ProjInfo No.:	604532

HOURLY RATE SUMMARY

	Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician
DIRECT HOURLY RATE (\$)	\$51.00	\$51.00	\$39.28	\$29.24	\$20.40
INDIRECT COST(%)	155	\$79.05	\$79.05	\$60.88	\$45.32
FEE (%)	12	\$15.61	\$15.61	\$12.02	\$8.95
NET HOURLY RATE (\$)	\$145.66	\$145.66	\$112.18	\$83.51	\$58.26

WORK HOUR AND FEE SUMMARY

TASK DESCRIPTION	PROJ. MGR.	SR. ENGR.	DESIGN ENGR.	JUNIOR ENGR.	TECH'N	TOTAL HOURS	TOTAL FEE
100 PROJECT DEVELOPMENT ENGINEERING							\$ -
150 ENVIRONMENTAL	16	60	176	112	72	436	\$ 44,362.13
200 FUNCTIONAL DESIGN REPORT							\$ -
220 DESIGN EXCEPTION REPORT							\$ -
300 25% HIGHWAY SUBMISSION							\$ -
350 DESIGN PUBLIC HEARING							\$ -
400 75% HIGHWAY SUBMITTAL	42	254	428	844	424	1992	\$ 186,314.02
450 100% HIGHWAY SUBMITTAL	20	108	164	144	100	536	\$ 54,893.69
500 RIGHT OF WAY	2	64	24	92	24	206	\$ 21,386.87
600 GEOTECHNICAL REPORT	8	8	24	24	16	80	\$ 7,959.33
700 PROJECT DEVELOPMENT/STRUCTURAL	12	40	88	176	200	516	\$ 43,796.42
710 BRIDGE SKETCH PLANS	12	112	128	238	192	682	\$ 63,482.48
750 FINAL BRIDGE DESIGN	46	284	480	768	712	2290	\$ 207,532.73
800 PS&E SUBMITTAL	18	64	124	128	56	390	\$ 39,806.47
900 CONSTRUCTION ENGINEERING	12	112	264	136	120	644	\$ 66,026.61
TOTAL WORK-HOURS	188	1106	1900	2662	1916	7772	
ACTUAL PERCENTAGES (TYPICAL PERCENTAGES)	2 1 to 2	14 10 to 15	24 15 to 25	34 30 to 35	25 30 to 40	100	
TOTAL							\$ 735,560.74
(a) Salary Costs							\$ 257,549.28
(b) Indirect Costs (%)	155						\$ 399,201.38
(c) Net Fee (%)	12						\$ 78,810.08
TOTAL LIMITING FEE							\$ 735,560.74
(d) Direct Expenses		Geotech Sub	\$ 20,000.00				\$ 30,000.00
MAXIMUM PAYMENT AMOUNT							\$ 765,560.74
(e) Special Engineering							
MAXIMUM OBLIGATION							\$ 765,560.74
MHD Personnel (%)						SAY	\$ 765,500.00
						SAY	\$ -

PHASE 2C FINAL DESIGN SCOPE AND FEE

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

SCOPING WORKBOOK Form 1.3 Work Hour Estimate

City/Town:		Contract No.:							
Location:		Assignment No.:							
Bridge No.:		Proj Info No.:							
SECTION 100									
PROJECT DEVELOPMENT ENGINEERING									
PROJECT TYPE CODE: -- PROJECT DESCRIPTION:									
		PIC	PAI	SE	Eng	AE	ET	TOTAL	
101	Project Concept Preparation								
102	Preliminary Project Area Analysis								
103	Reasonable Alternative(s) Identification								
104	Alternatives Analysis & Report Preparation								
SUBTOTAL:									
SECTION 150									
ENVIRONMENTAL									
		PIC	PM	SE	Eng	AE	ET	TOTAL	
151	Early Coordination		2	4	8	4		18	
152	Hist./Arch. Impacts (Section 106 and Chapter 254)								
153	MESA Determination								
154	Hazardous Materials Research/Review		2	8	24	20		54	
155	Project Development Meetings and Hearings		4	8	16	12	8	48	
156	NEPA/MEPA Determination								
157	NEPA - Categorical Exclusion (CE)								
158	NEPA - Environmental Assessment (EA)								
159	NEPA - Draft Environmental Impact Statement (EIS)								
160	NEPA - Final Environmental Impact Statement (EIS)								
161	NEPA - Supplemental Environmental Impact Statement (EIS)								
162	NEPA - Reevaluation								
163	MEPA - Environmental Notification Form (ENF)		4	16	60	40	32	152	
164	MEPA - Draft Environmental Impact Report (DEIR)								
165	MEPA - Final Environmental Impact Report (FEIR)								
166	MEPA - Notice of Project Change (NOPC)								
167	MEPA - Supplemental Environmental Impact Report (SEIR)								
168	MESA/NOI Streamlined Review								
169	MESA - Conservation and Management Permit								
170	USACE Section 404 Programmatic General Permit (PGP)								
171	USACE Individual Section 404 Permit								
172	U.S. Coast Guard Bridge Permit								
173	Programmatic Section 4(f) Evaluation								
174	Draft Individual Section 4(f) Evaluation								
175	Final Individual Section 4(f) Evaluation								
176	Wetland Resource Area Delineation								
177	Wetlands Protection Act (WPA) ANRAD								
178	WPA - Request for Determination of Applicability								
179	WPA - Notice of Intent (NOI)		2	16	52	32	24	126	
180	WPA - Variance								
181	Chapter 91 License/Permit Application		2	4	8	8	12	34	
182	Water Quality Certification (401)								
183	Coastal Zone Management Consistency Certificate								
184	Wildlife/Rare Species Assessment								
185	Essential Fish Habitat Assessment								
186	Coordination and Liaison		2	2	4	4	4	16	
SUBTOTAL:									
			13	55	172	130	80	448	
SECTION 200									
FUNCTIONAL DESIGN REPORT (FDR)									
		PIC	PM	SE	Eng	AE	ET	TOTAL	
201	Evaluate Existing Conditions								
202	Traffic Count Analysis								
203	Safety Analysis								
204	MUTCD Signal Warrants								
205	Intersection Analysis								
206	Proposed Geometrics								
207	Report Preparation								

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

SCOPING WORKBOOK Form 1.3 Work Hour Estimate

City/Town		Contract No.:						
Location:		Assignment No.:						
Bridge No.:		ProjInfo No.:						
SUBTOTAL								
SECTION 220								
DESIGN EXCEPTION REPORT								
		PIC	PM	SE	Eng	AE	ET	TOTAL
221	Evaluate 13 Controlling Criteria (PDDG Ch. 2)							
222	Perform Incremental Evaluation							
223	Prepare Narrative/Report							
SUBTOTAL								

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

SCOPING WORKBOOK Form 1.3 Work Hour Estimate

City/Town							Contract No.:	
Location:							Assignment No.:	
Bridge No.:							ProjInfo No.:	
SECTION 400								
75% HIGHWAY DESIGN SUBMISSION								
	PIC	PM	SE	Eng	AE	ET	TOTAL	
401 Response to 25% Comments	2	8	12	8			30	
402 Field Reconnaissance		8	18	24	48	48	146	
403 Meetings, Liaison and Coordination		4	8	12	24		48	
404 Utility Coordination			8	12	24	8	52	
405 Final Horizontal Design Geometrics		2	24	48	96	40	210	
406 Final Vertical Design Geometrics		2	24	48	96	40	210	
407 Pavement Design			2	4	8		14	
408 Typical Cross Sections		2	24	40	40	40	146	
409 Plot Cross Section					40	40	80	
410 Plot Proposed Layout and Easements								
411 Construction Plans			40	60	120	60	280	
412 Grading & Tie Plans			8	12	30	16	66	
413 Drainage and Water Supply Details		2	8	18	40	20	88	
414 Preliminary Traffic Signs		2	4	6	16	8	36	
415 Guide Sign Design & Overhead Directional Elevations								
416 Traffic Signals and Plan Preparation		2	12	18	40	24	96	
417 Pavement Markings and Plan Preparation			8	12	24	16	60	
418 Traffic Management			4	6	16	8	34	
419 Highway Lighting Plans and Details								
420 Landscaping and Plan Preparation			4	6	32	32	74	
421 Erosion Control Plans			8	12	24	8	52	
422 Miscellaneous Contract Plans			8	12	24	8	52	
423 Quantity & Cost Estimate		2	12	22	40		76	
424 Special Provisions		2	12	18	40		72	
425 Constructability and Quality Control (QC) Review		8	8	12			28	
426 Submission Check List		2	4	6			12	
SUBTOTAL		40	256	420	830	416	1962	
SECTION 450								
100% HIGHWAY DESIGN SUBMISSION								
	PIC	PM	SE	Eng	AE	ET	TOTAL	
451 Respond to 75% Comments		8	8	12			28	
452 Finalize Plans		2	20	36	48	40	146	
453 Finalize Special Provisions		2	20	36	48	26	132	
454 Finalize Estimate		2	20	36	34	24	116	
455 Quality Control (QC) Review		2	24	24			50	
456 Submission Check List		2	6	6			14	
SUBTOTAL		18	98	150	130	90	486	

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

SCOPING WORKBOOK Form 1.3 Work Hour Estimate

City/Town		Contract No.:					
Location:		Assignment No.:					
Bridge No.:		ProjInfo No.:					
SECTION 500							
RIGHT OF WAY							
	PIC	PM	SE	Eng	AE	ET	TOTAL
501 Preliminary Right of Way Plans		2	8	4	16	4	34
502 Layout and Order of Taking Plans			8	8	8	4	28
503 Written Instrument			6		4		10
504 Final Right of Way Plans			8		16	4	28
SUBTOTAL		2	30	12	44	12	100
SECTION 600							
GEOTECHNICAL REPORT							
	PIC	PM	SE	Eng	AE	ET	TOTAL
601 Research Available Subsurface Data		2	2	4			8
602 Field Reconnaissance		4	4	4	4		16
603 Subsurface Investigation Plan			2	4	8	12	26
604 Subsurface Investigation Inspection				8	8		16
605 Office Studies, Analysis and Testing							
606 Geotechnical Report		4	4	12	12	12	44
607 Meetings, Reviews and Liaison		6	4				10
608 Final Plans, Specifications and Estimate							
SUBTOTAL		16	16	32	32	24	120
SECTION 700							
PROJECT DEVELOPMENT (STRUCTURAL)							
	PIC	PM	SE	Eng	AE	ET	TOTAL
701 Field Investigation				8	16	16	40
702 Determine Bridge Configuration			4	8	16	16	44
703 Preliminary Structural Analysis			4	12	24	32	72
704 Comparative Design and Cost Analysis		2	6	12	24	32	76
705 Preliminary Structures Report Preparation		2	6	12	24	24	68
706 Bridge Type Selection Worksheet Preparation		2	6	8	16	16	48
707 Meetings and Liaison		2	2				4
SUBTOTAL		8	28	60	120	136	352
SECTION 710							
SKETCH PLANS							
	PIC	PM	SE	Eng	AE	ET	TOTAL
711 Establish Boring Locations			2	4	12	16	34
712 Hydraulics Study and Report (Bridges over Water)			16	24	48	42	130
713 Sketch Plan Development			24	30	72	48	174
714 Meetings, Coordination and Liaison		2	8	8			18
715 Constructability Review		2	8	4			14
716 Submission Check List		2	4				6
SUBTOTAL		6	62	70	132	106	376

**COMMONWEALTH OF MASSACHUSETTS
HIGHWAY DEPARTMENT**

SCOPING WORKBOOK Form 1.3 Work Hour Estimate

City/Town:		Contract No.:						
Location:		Assignment No.:						
Bridge No.:		ProjInfo No.:						
SECTION 750								
FINAL BRIDGE DESIGN								
		PIC	PM	SE	Eng	AE	ET	TOTAL
751	Structural Design - Superstructure		4	36	72	160	160	432
752	Structural Design - Substructure		4	36	74	160	160	434
753	Bridge Layout Geometrics		4	20	32	60	72	188
754	Contract Drawings		4	32	64	132	134	366
755	First Review Submission		2	8	20	8		38
756	Quantity Cost Estimates		4	32	64	120	80	300
757	Special Provisions		4	24	56	80	80	244
758	Second Review Submission		2	8	16	8		34
759	FHWA Reviews		2	4	8	8		22
760	Meetings and Liaison		8	32	24			64
761	Constructability and Quality Control (QC) Review		4	32	24			60
762	Submission Check List		2	8	8	4		22
SUBTOTAL			44	172	462	740	686	2104
SECTION 800								
PS&E SUBMISSION								
		PIC	PM	SE	Eng	AE	ET	TOTAL
801	Respond to 100% Comments		4	12	4			20
802	Finalize Plans, Specifications and Estimate			14	40	48	32	134
803	Prepare Detail Sheets			6	24	24		54
804	Combine Highway and Bridge			4	24	24	10	62
805	Quality Control (QC) Review		10	12	2			24
SUBTOTAL			14	48	94	96	42	294
SECTION 900								
CONSTRUCTION ENGINEERING								
		PIC	PM	SE	Eng	AE	ET	TOTAL
901	Pre-Bid Services			8	12	8		28
902	Pre-Construction Conference		2	8	12			22
903	Highway Shop Drawings and Signal Permit			12	24	12	16	64
904	Bridge and Wall Shop Drawings			8	24	12	16	60
905	Bridge Construction Procedures		2	8	16	16	16	58
906	Furnishing Advice and Field Visits		2	8	28	12		50
907	Geotechnical Construction Evaluation							
908	Bridge Rating and Photographs			8	24	12	16	60
SUBTOTAL			6	60	140	72	64	342

WORK-HOUR SUMMARY TABLE

HOURLY RATES

DIRECT HOURLY RATE (\$)		Proj. Mgr.	Sr. Engr.	Design Engr.	Jr. Engr.	Technician
		51.00	45.00	30.23	23.53	23.53
INDIRECT COST(%)	155					
FEE (%)	12					
NET HOURLY RATE (\$)		\$145.66	\$128.52	\$86.34	\$67.20	\$67.20

TOTAL WORK-HOURS AND NET FEE PER TASK

TASK DESCRIPTION	PROJ. MGR.	SR. ENGR.	DESIGN ENGR.	JUNIOR ENGR.	TECH'N	TOTAL HOURS	TOTAL COST
100 PROJECT DEVELOPMENT (BRIDGE PROJECT)						0	\$ -
150 ENVIRONMENTAL	18	58	172	120	80	448	\$ 38,366.25
200 FUNCTIONAL DESIGN REPORT						0	\$ -
220 DESIGN EXCEPTION REPORT						0	\$ -
300 25% HIGHWAY SUBMISSION						0	\$ -
350 DESIGN PUBLIC HEARING						0	\$ -
400 75% HIGHWAY SUBMITTAL	40	256	420	830	416	1962	\$ 158,722.14
450 100% HIGHWAY SUBMITTAL	18	98	150	130	90	486	\$ 42,951.67
500 RIGHT OF WAY	2	30	12	44	12	100	\$ 8,946.25
600 GEOTECHNICAL REPORT	16	16	32	32	24	120	\$ 10,912.89
700 PROJECT DEVELOPMENT - STRUCTURAL	16	56	112	200	224	608	\$ 47,690.86
710 BRIDGE SKETCH PLANS	16	120	144	240	200	720	\$ 39,754.15
750 FINAL BRIDGE DESIGN	64	304	496	784	740	2388	\$ 193,630.52
800 PS&E SUBMITTAL	24	64	132	116	64	400	\$ 35,213.79
900 CONSTRUCTION ENGINEERING	6	60	140	72	64	342	\$ 29,811.73
TOTAL WORK-HOURS	220	1062	1810	2568	1914	7574	\$ 626,000.24
						Subtotal Labor	\$ 626,000.24
						Subs - GeoTech	\$ 20,000.00
						Direct Costs (Printing, mileage, etc)	\$ 20,000.00
						Total	\$ 666,000.24

PHASE 2A RIGHT OF WAY

INTEROFFICE MEMORANDUM

To: Lawrence Cash, Project Manager

From: Daniel Gentile, Community Compliance Section

Date: 5/13/08

Subject: Town of Acton/Carlisle/Westford-Bruce Freeman Rail
Trail Phase 2A

Key: # 604532

- 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 Towns of Acton, Carlisle, Westford.

THE COMMONWEALTH OF MASSACHUSETTS HIGHWAY DEPARTMENT

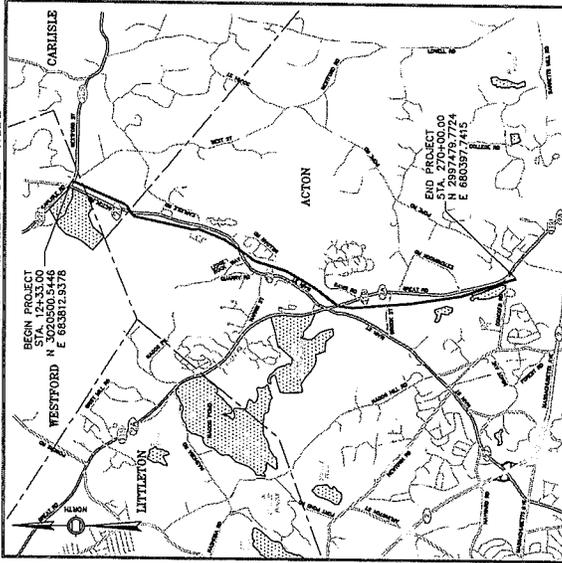
CONSTRUCTION OF BRUCE FREEMAN RAIL TRAIL PHASE 2A IN THE TOWNS OF WESTFORD, CARLISLE & ACTON MIDDLESEX COUNTY

SHEET INDEX

SHEET NO.	DESCRIPTION
1	TITLE & INDEX
2	PARCEL SUMMARY
3-9	PROPERTY PLANS

FEDERAL AID PROJECT NO. XXX-XXXX

PRELIMINARY RIGHT OF WAY



LOCATION MAP
HORIZONTAL SCALE
0 2000 4000 8000 12000
LENGTH OF PROJECT - 26,784 FT. ≈ (4.68 MILES)
SCALES - AS NOTED
APRIL 30, 2008

CONVENTIONAL SYMBOLS

.....	COUNTY, CITY, OR TOWN BOUNDARY
.....	COUNTY, CITY OR TOWN SIDE LINE
.....	FENCE LINE
.....	BASE LINE OR SURVEY LINE
.....	RIGHT OF WAY LINE
.....	CULVERT
.....	ELEVATIONS
.....	POLE

WESTFORD, CARLISLE & ACTON
BRUCE FREEMAN RAIL TRAIL PHASE 2A

STATE	FED. AID PROJ. NO.	YEAR	NO. OF SHEETS
MASS		2010	1
			9

PROJECT FILE NO. 68453Z
PRELIMINARY RIGHT OF WAY
TITLE & INDEX

THE 1988 MASSACHUSETTS HIGHWAY DEPARTMENT STANDARD SPECIFICATIONS AND BRIDGES (ENGLISH EDITION); THE SUPPLEMENTAL SPECIFICATIONS TO THE STANDARD SPECIFICATIONS (ENGLISH EDITION) DATED JUNE 6, 2006; THE 1977 MDPW CONSTRUCTION DRAWINGS (ENGLISH EDITION); THE METRIC/ENGLISH SUPPLEMENTAL DRAWINGS DATED APRIL 2003; THE 2003 "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" WITH LATEST REVISIONS; THE 1990 STANDARD DRAWINGS FOR SIGNS AND SUPPORTS; THE 1968 STANDARD DRAWINGS FOR TRAFFIC SIGNALS AND HIGHWAY LIGHTING; AND THE AMERICAN STANDARD FOR NURSERY STOCK (ANSI Z-601-2004); AND ALL AMENDMENTS WILL GOVERN.

TRAIL DESIGN CRITERIA

DESIGN SPEED: = 20 MPH
MINIMUM HORIZONTAL CURVE RADIUS = 100' (WARNING SIGNING FOR RADII < 100')
MINIMUM LENGTH OF CREST VERTICAL CURVE = BASED ON SSD/GRADE
MAXIMUM GRADE FOR LEVEL TERRAIN = 5.0% (WARNING SIGNING FOR GRADES > 5.0%)

GPI Greenman-Pedersen, Inc.
1000 Greenman-Pedersen Drive
Westford, MA 02145
Tel: (781) 278-2500 Fax: (781) 278-2501
http://www.gpinat.com

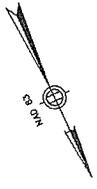
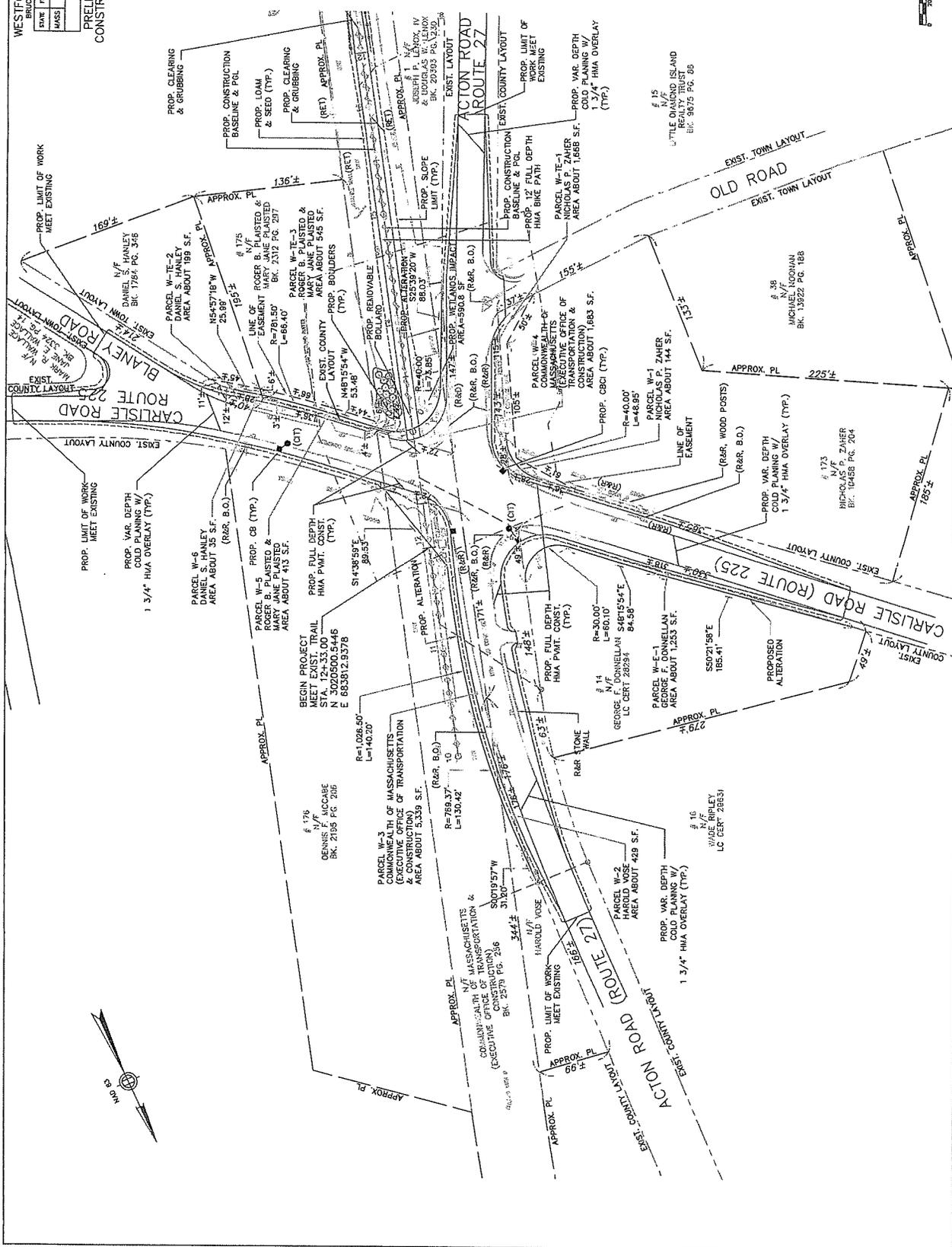
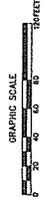
MASS HIGHWAY
MASSACHUSETTS
HIGHWAY DEPARTMENT
RECOMMENDED FOR APPROVAL
CHIEF ENGINEER _____ Date _____
APPROVED
AHD COMMISSIONER _____ Date _____

NO.	REASON	DATE
0	ORIGINAL SUBMISSION	4/30/08
	DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION APPROVED	
	DIVISION ADMINISTRATOR	Date

PARCEL NO.	PLAN SHEET NO.	TITLEHOLDER	RECORDED DEED BOOK NO.	PAGE NO.	TAKEN		EASEMENT		REMAINING		TOTAL TAKEN	PARCEL TOTAL	REMARKS
					STATE	TOWN	TYPE	AREA	LEFT	RIGHT			
		WESTFORD											
W-1	3	NICHOLAS P. ZAHER	10458	204	--	144 SF	--	--	--	--	144 SF	1.58 AC	FEE TAKING
W-TE-1	3	NICHOLAS P. ZAHER	10458	204	--	--	TEMP	1,668 SF	--	--	--	--	GRADING, LOAM & SEED, PROP. HMA. DRIVE
W-2	3	HAROLD VOSE	--	--	--	429 SF	--	--	--	11,027 SF	429 SF	11,456 SF	FEE TAKING
W-3	3	COMMONWEALTH OF MASSACHUSETTS (EXECUTIVE OFFICE OF TRANSPORTATION & CONSTRUCTION)	2579	256	--	5,339 SF	--	--	--	--	7,022 SF	--	FEE TAKING
W-4	3	COMMONWEALTH OF MASSACHUSETTS (EXECUTIVE OFFICE OF TRANSPORTATION & CONSTRUCTION)	2579	256	--	1,983 SF	--	--	--	--	--	--	FEE TAKING
W-5	3	ROGER B. PLAISTED & MARY JANE PLAISTED	2312	297	--	413 SF	--	--	--	23,587 SF	413 SF	24,000 SF	FEE TAKING
W-TE-3	3	ROGER B. PLAISTED & MARY JANE PLAISTED	2312	297	--	--	TEMP	545 SF	--	--	--	--	GRADING, LOAM & SEED, PROP. HMA. DRIVE
W-6	3	DANIEL S. HANLEY	1784	346	--	35 SF	--	--	--	16,518 SF	35 SF	16,553 SF	FEE TAKING
W-TE-2	3	DANIEL S. HANLEY	1784	346	--	--	TEMP	199 SF	--	--	--	--	GRADING, LOAM & SEED
W-E-1	3	GEORGE F. DONNELLAN	LC CERT 28294	--	--	--	PERM	1,253 SF	--	--	--	34,892 SF	PERMANENT HIGHWAY EASEMENT
		ACTON											
A-E-1	5	REX LUMBER CO.	15986	480	--	--	PERM	70,107 SF	--	--	--	--	PERMANENT EASEMENT
A-E-2	5,6	REX LUMBER CO.	15986	480	--	--	PERM	17,965 SF	--	--	--	--	PERMANENT EASEMENT
A-TE-2	5	REX LUMBER CO.	15986	480	--	--	TEMP	3,668 SF	--	--	--	--	PROP. CLEARING & GRUBBING
A-TE-3	5,6	REX LUMBER CO.	15986	480	--	--	TEMP	19,633 SF	--	--	--	--	GRADING, LOAM & SEED, R&R BOULDERS
A-TE-4	5	REX LUMBER CO.	15986	480	--	--	TEMP	1,072 SF	--	--	--	--	PROP. CLEARING & GRUBBING, PROP. LOAM & SEED
A-E-3	7	NAGOG KNOLL REALTY TRUST	--	--	--	--	PERM	11,315 SF	--	--	--	--	PERMANENT EASEMENT
A-E-4	9	ACTON INDOOR SPORTS	--	--	--	--	PERM	46,419 SF	--	--	--	--	PERMANENT EASEMENT
A-E-5	7	THE BRAVERY REALTY TRUST	48106	68	--	--	PERM	2,863 SF	--	--	--	--	PERMANENT EASEMENT
A-TE-1	4	ACTON WATER DISTRICT	997	172	--	--	TEMP	5,280 SF	--	--	--	--	PROP. CLEARING & GRUBBING
A-TE-5	5	JOHN KENNEDY MARITAL TRUST	15833	313	--	--	TEMP	2,586 SF	--	--	--	--	R&R EXISTING FENCE & PROP. LOAM & SEED
A-TE-6	8	NANCY TORODE	1284	113	--	--	TEMP	421 SF	--	--	--	--	R&R EXISTING WOOD FENCE

DATE	REV.	BY	NO.	TOTAL SHEETS
FEB. 02	1	2010	3	9
PROJECT FILE NO. 604532				

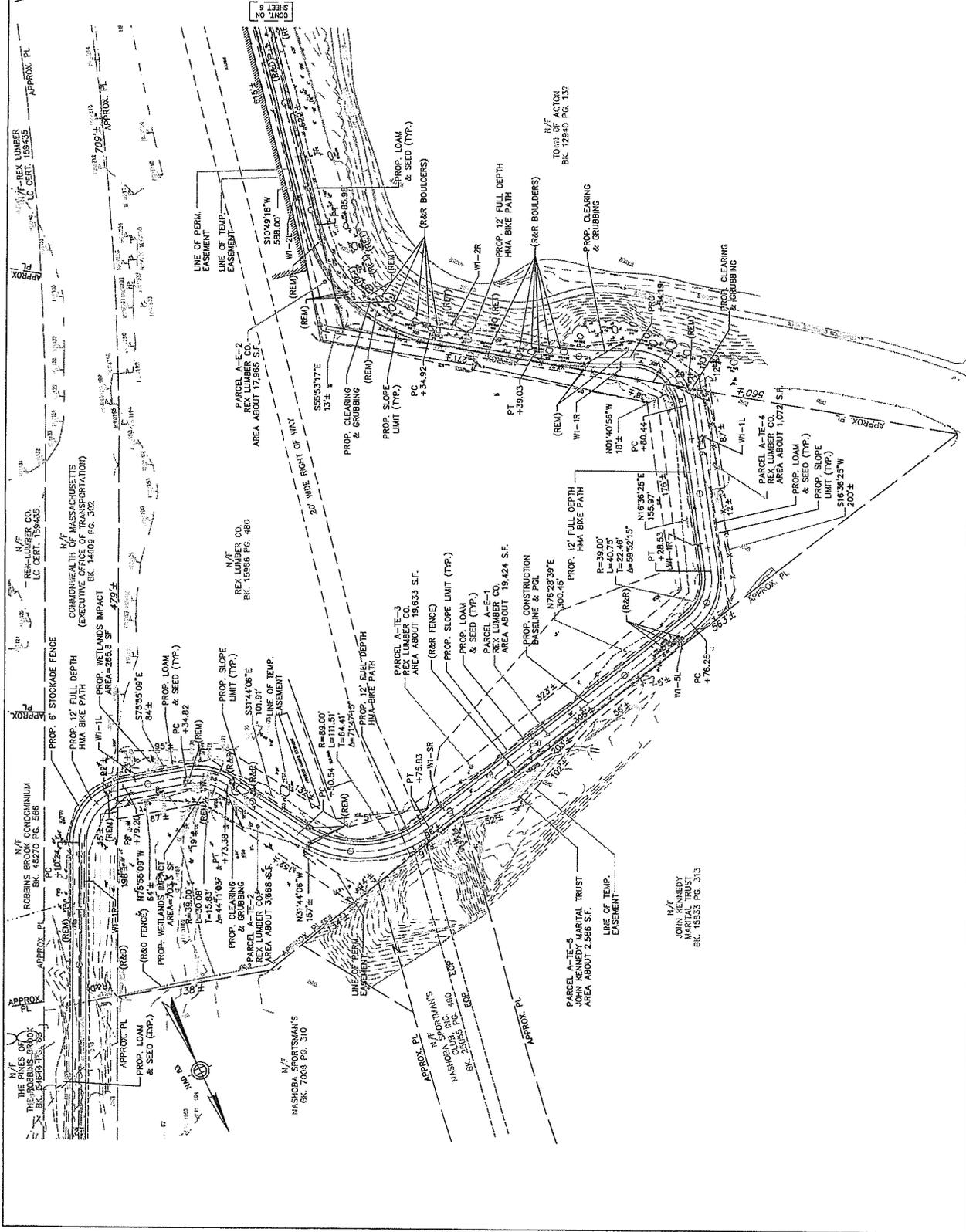
WESTFORD CARLISLE & ACTON
 BRIDGE RELOCATION
 PRELIMINARY RIGHT OF WAY
 CONSTRUCTION PLAN & PROFILE



WESTFORD, CARLISLE & ACTON
 WASTE TREATMENT PLANT
 PRELIMINARY RIGHT OF WAY
 PROPERTY PLAN

DATE	FOR APPROVAL	BY	NO.	SHEETS
MARCH	FEB. 2010	WESTFORD	5	9

PROJECT FILE NO. 04432



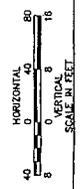
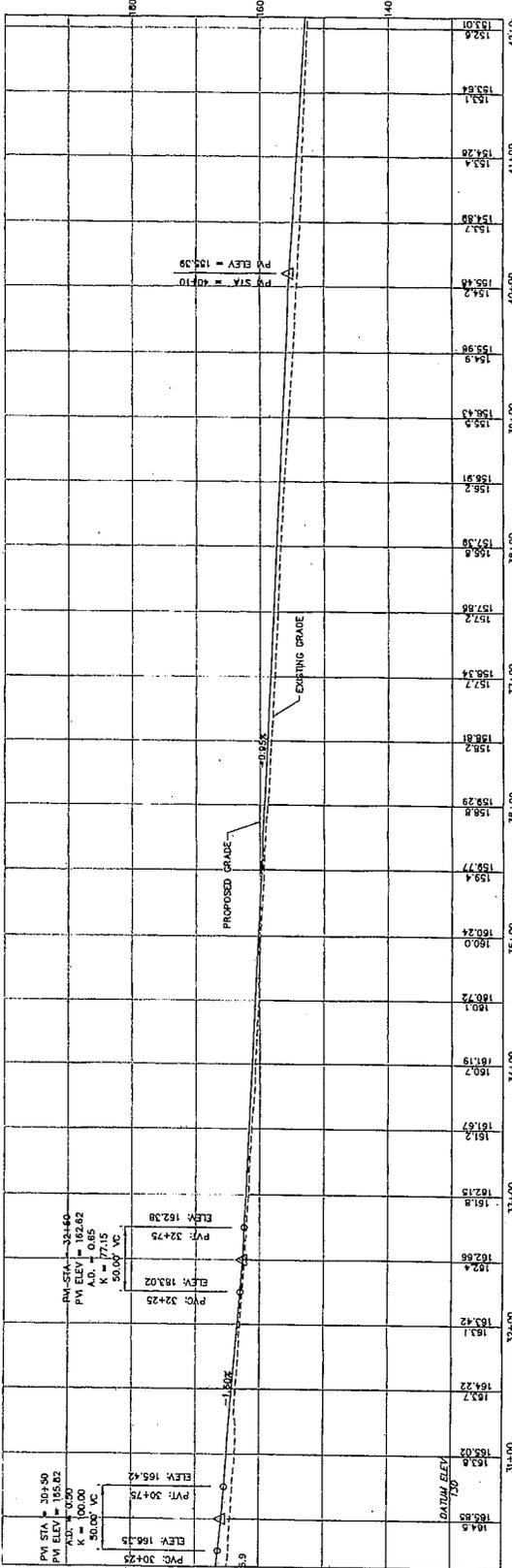
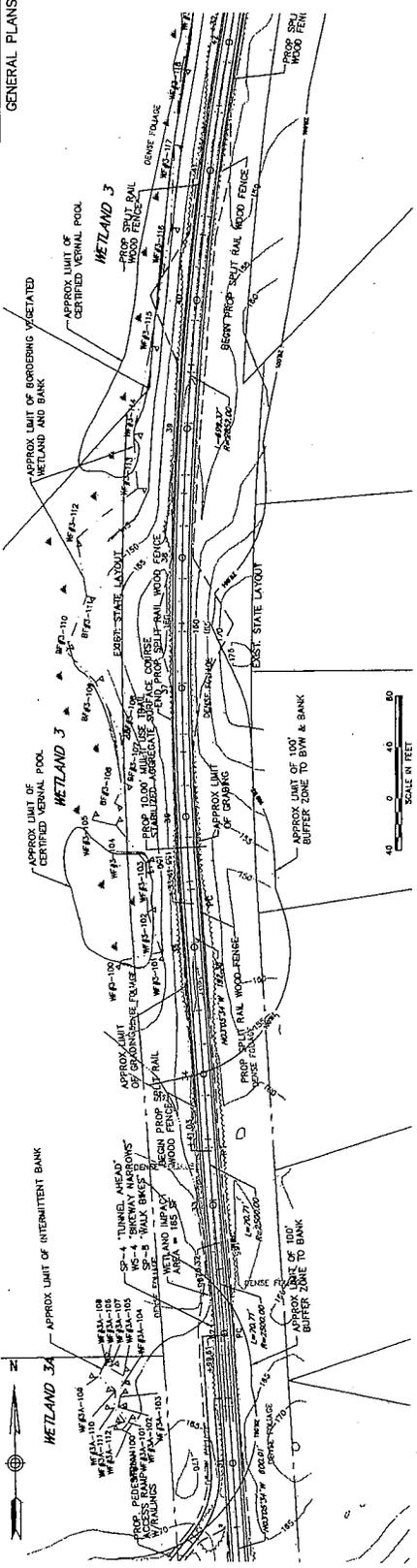
PHASE 2C RIGHT OF WAY

CONCORD BRUCE FREEMAN RAIL TRAIL

DATE	BY	APP. PROJ. NO.	SHEET NO.	TOTAL SHEETS
MAR. 11	MFA	13	28	

PROJECT FILE NO.

GENERAL PLANS



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CONT. ON SHEET 14

CONT. SHEET 12

