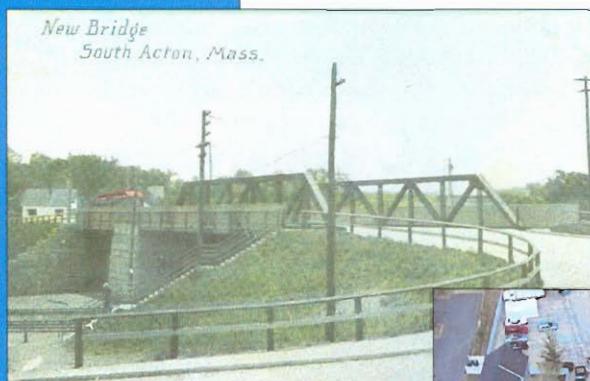


# Acton Bikeway Bridge Connection Alternatives Study Assabet River Rail Trail

## Town of Acton, MA



September, 2007

To: Roland Bartl, AICP  
Town of Acton  
Date: September 7, 2007

From: Marybeth Murphy, RLA  
BSC Group  
Proj. No: 61043.01

Re: Town of Acton - Analysis of Options to  
Connect the ARRT Bikeway to MBTA Lot

Summary of Board of Selectman Presentation  
August 13, 2007 and Study Summary

BSC Group conducted the final presentation for the Analysis of Options for a new bike path bridge and ramp system to extend the Assabet River Rail Trail over the MBTA rail lines in South Acton to the MBTA Commuter Rail Station area to the Board of Selectmen (BOS) during a meeting on August 13th, 2007. This presentation included a brief summary of the study process, provided answers to questions that were raised at the previous BOS meeting held on June 25<sup>th</sup> and suggested final recommendations for the 10% design for approval by the BOS. The 10% design recommendations will become the basis for the ARRT final design in this area. This memorandum also provides a summary of the public input process.

#### **10% Design Recommendations**

The design recommendations made by BSC Group are based upon and a result of all the work done to date and comments received from the public, Board of Selectmen and the Acton Historic District Commission. BSC provided a preferred option for the design of the ramp and bridge system for the rail trail, however, this recommendation is based on the information available at the time of this study and is subject to modification based on final topographic survey, location of property lines and costs. In addition, as the 25% design of the Acton portion of the Assabet River Rail Trail proceeds, other design decisions may impact the ramp and bridge treatment over the rail lines. With that being said, BSC recommended the following treatments be pursued (See Exhibit "A" for visual images and plans):

*Bridge* – should be a pre-cast bridge separated from the existing road bridge by five feet. The bridge should be light in structure with no or very low sidewalls. The safety fencing on both sides of this bridge should have a frame and support elements that provide a silhouette that emotes the old bridge that once was located at this site.

*North Ramp* – from the bridge down to the Railroad Street parking lot should be a switchback ramp system built into the embankment with a minimal number of switchbacks. As topography and property boundaries permit, this ramp should have a minimal amount of switchbacks and extend along the MBTA side of Mr. Chen's wall to minimize any impacts to existing parking spaces. Bicyclists should walk their bikes through this ramp over to the commuter rail parking lot to avoid pedestrian/bicyclist conflict. Impacts to existing Railroad Street parking should be minimized and the trail should connect all the way over to the commuter lot.

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*South Ramp* – should cross lower on Maple Street, away from the intersection. The proposed layout shows the edge of crosswalk at 130' from the intersection, which is similar to the Bruce Freeman Trail design.

It was noted that the Fitchburg study, presently underway, is looking at a double track through this area that may affect this project and should be taken into consideration as the project enters 25% design. Additionally, the ramp on the south side might benefit from a push button crosswalk light and signage similar to that proposed for the Bruce Freeman Trail intersection designs.

The BOS unanimously approved the BSC Group recommendations for the 10% design and noted that the 25% design should show a path from the Railroad Avenue parking lot through to the Commuter Rail lot and that bicyclists will need to walk their bikes through the path.

Overall, public input was noted to be in favor of the trail, however, existing and anticipated parking issues related to the MBTA Commuter Rail lot were of great concern to abutters, local residents and parking lot users.

#### **Responses to Questions raised during the June 25<sup>th</sup> BOS Meeting**

See detailed responses which are included in the attached memorandum dated August 8, 2007, a summary of the questions and responses is as follows:

- Meeting with Historic District Commission to obtain input on proposed options (see detailed information below).
- Explore possibilities of a land swap with Chen property - the possibilities of a land swap with Frank Chen (Blue Building Owner) were explored by BSC Group and Roland Bartl to see if the Town could gain more width in the Railroad Street parking lot area. It was determined that a land swap was not feasible.
- Contact MHD for a response to the definitional question as to where the access on the north side could terminate - Mass Highway confirmed that they consider the MBTA Commuter Rail platform the destination point for users of the rail trail and therefore a safe and defined bike trail connection must be provided to that point.
- Explore another option to the elevated ramp that provides retention of more existing parking - BSC explored this option which is shown in "North Ramp - Option E" and depicted what it might look like in a photo edit.
- Develop probable cost estimates for the various ramp options. Cost estimates were developed for three variations of the north ramps options. Costs range from \$150,000 to \$250,000 for the ramp system built into the embankment (based on Option "B" layout) up to \$250,000 to \$450,000 for the longer, extended sweeping ramp options (Options "C" & "E").

**Meeting with Acton Historic District Commission (HDC)**

BSC Group obtained feedback from the Commission concerning the layout and visual appearance of the bridge during a meeting on July 16, 2007.

Recommendations from the Committee during the meeting included:

- A freestanding bridge is preferred over one that would attach to the existing bridge.
- Bridge deck and superstructure/suicide fence silhouette should be reminiscent of the old bridge.
- Sidewalls should be as low as possible.
- Eliminate, if possible, the fencing between the bridges and provide a grate or netting (this would need to be looked at during detailed design).
- South ramp crossing lower on Maple Street was acceptable as long as efforts were made to preserve historic railroad remnants in that area.
- North ramp should be tucked into the embankment to minimize its visual impact. They suggested that a switch back might be eliminated if the trail started descending at the bridge, instead of following the grade of the sidewalk/road until it reached the area near the Chen Building. This became the “North Ramp-Option F” layout.
- Work in the Town-owned triangular property (north ramp area) is located within the South Acton Local Historic District and therefore would require a Certificate of Appropriateness from the HDC.

**Public Input Process**

In addition to the meetings with the BOS (June 25<sup>th</sup> and August 18<sup>th</sup>) and the Historic District Commission (July 16<sup>th</sup>), two public meetings were held to gather input from abutters, residents, bike trail proponents and other public agencies such as Mass Highway.

Public Meeting #1 – January 30, 2007, held at the Library

This meeting was comprised of a group of invited stakeholders from various agencies, organizations and the neighborhood. (See sign in sheet in Exhibit “E”, attached).

A memorandum summarizing the meeting is included in Exhibit “B”, portions of which area as follows:

- BSC presented the following layout options for consideration:
  - Bicycle lanes within the existing Main Street roadway;
  - Widening the existing bridge to increase the west sidewalk width to accommodate the bike trail either as a widened sidewalk or a separate path; and
  - Construct a separate structure over the railroad tracks, located adjacent to the west side of the existing roadway bridge.

- Bridge aesthetics were discussed as well as the length and configuration of the ramps that would be necessary to connect the bike trail to the bridge and then to the MBTA platform.
- Public feedback included:
  - Bridge - the group preferred bridge options that included either a freestanding bridge adjacent to the existing roadway bridge or an widening of the existing roadway bridge to accommodate a separate bike path. For bridge aesthetics, the group preferred a look consistent with the existing roadway bridge.
  - North Ramp - on the north side of the bridge, consider an option that has only one switchback leading to a freestanding ramp down to track level on the track side of the small parking lot near the bridge. Try to work the ramps into the landscape instead of having freestanding ramps.
  - South Ramp - in the area south of Maple Street, stretch the ramp from the proposed end of the ARRT trail along the Maple Street embankment to the old stone arch bridge then reverse direction to decrease the number of switchbacks and work the ramp into the landscape.
  - Alternative Option - the group also asked BSC to explore another ramp and bridge option. That option would bring the rail trail across Maple Street, then turn east, run parallel to the rail lines and go under the roadway bridge, rising to the east of the roadway bridge to a point where the trail could then bridge over the tracks, then ramp back down parallel to the tracks, again under the roadway bridge and down to platform level. This was called the “U-turn” option.
  - Parking and Security - the group noted that currently there are parking problems in the MBTA lot off of Central Street and did not want the rail trail to exacerbate that problem. There were also concerns about graffiti and the need for good visibility to the bridge and ramps for security purposes.

#### Public Meeting #2 – May 7<sup>th</sup> Town Hall

As part of the Selectmen’s meeting agenda, the public was invited to attend to review and comment on the design options presented by BSC Group. These options included refinements and additions to the options presented at the January 30<sup>th</sup> meeting as well as the meeting with Mass Highway on March 1st. A summary of comments and concerns is as follows:

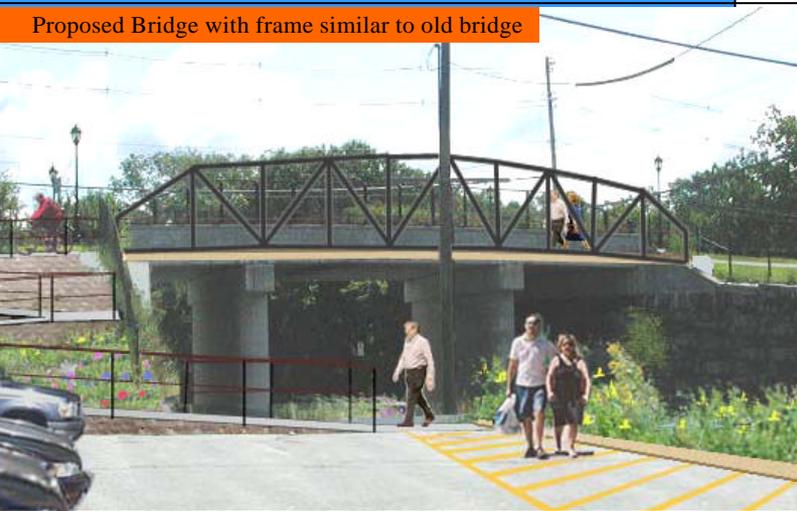
- There was a lot of discussion about why there could not be an at-grade crossing on Martin Street to avoid the need for the bridge. BSC explained the cost and safety issues involved and that it was not a recommended alternative for these reasons. (See memorandum dated May 3<sup>rd</sup> in Exhibit “B” for more details).
- Even if the tunnel under Maple Street had not been filled in when the intersection was reconstructed, it probably would not be feasible to bring the trail under the existing road due to cost and security issues.
- The trestle bridge/historic look was preferred.
- A suggestion was made for a freestanding ramp over the existing parking lot (later referred to as the “flyover” option).
- There were many residents and abutters who noted concern over parking issues, as the existing parking is not adequate for the present MBTA commuters.

- There was discussion on whether the crosswalk at Maple should be at the intersection or lower down from the intersection.
- Some liked the “U” turn option, although it was noted that that option might not be acceptable to the MBTA and/or Mass Highway.
- Perhaps widen Maple Street to accommodate off street parking.
- South of Maple Street - there are railroad remnants that should be preserved.

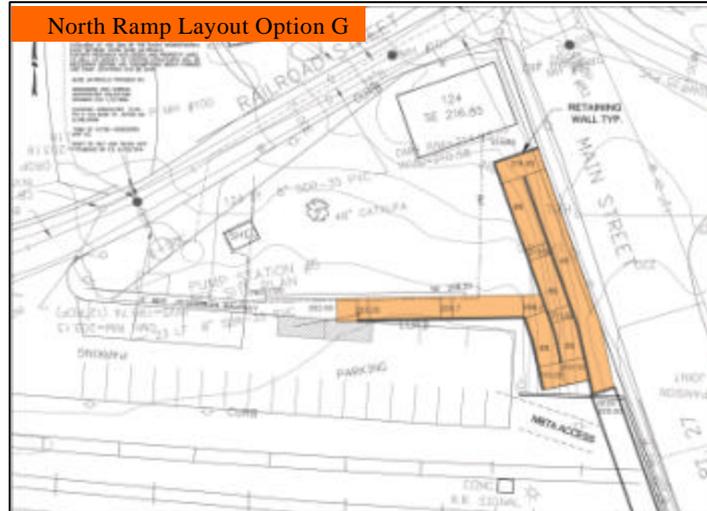
In the attached “Exhibits” are plans and images of the recommended options, supplementary memorandums that contain more detailed information on the process and various study options considered, probable cost estimates and sign in sheets for the Initial Public Meeting as well as the Mass Highway meeting.

# Acton Bikeway Bridge Connection

Proposed Bridge with frame similar to old bridge



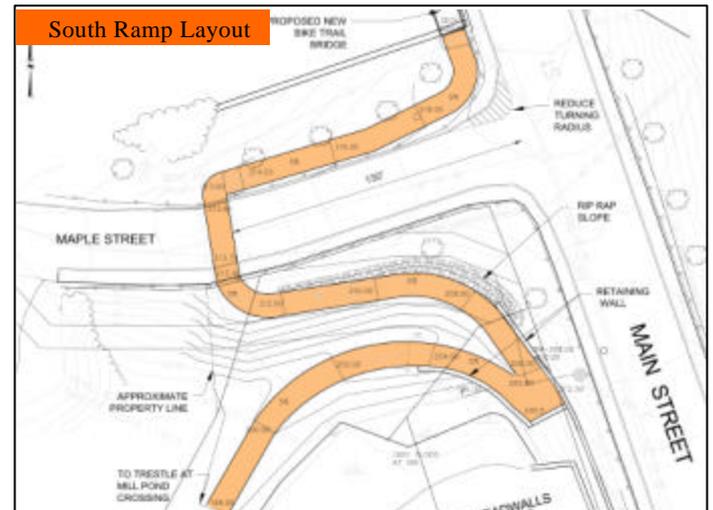
North Ramp Layout Option G



South Ramp Visual



South Ramp Layout



To: Roland Bartl, AICP  
Town of Acton Date: May 3, 2007

From: Jef Fasser, RLA, AICP  
BSC Group Proj. No: 61041.01

Re: Town of Acton - Analysis of Options to  
Connect the ARRT Bikeway to MBTA Lot

Summary of Stakeholder Meeting to Discuss  
Alternatives

cc:

**INITIAL PROJECT MEETING SUMMARY**

BSC Group was hired by the Town of Acton to explore options for connecting the Assabet River Rail Trail (ARRT) from its proposed terminus in South Acton at Maple Street over the MBTA rail lines by the Main Street bridge to the MBTA parking lot north of the rail lines off of Central Street. The main focus of this study was to explore bridge options for crossing over the tracks while also examining bike trail options connecting the ARRT up to the bridge and then down from the bridge to the MBTA platform area.

Following initial data collection and analysis of options, BSC presented their preliminary findings on January 30, 2007 to a group of invited stakeholders from various agencies, organizations and the neighborhood. (attendees listed at end of this memo) The intent of this initial meeting was to share information collected by BSC to date, discuss bridge design and bridge access options, ask the stakeholders for feedback and collect any additional information that the stakeholders may have or have knowledge of.

Information presented included photographs of the project area, photographs of the proposed terminus of the ARRT at Maple Street, images of the current Main Street roadway bridge as well as historic images of the previous Main Street roadway bridge and images of bike path bridges that have been used at other rail trail projects.

BSC then presented three options for bike trail crossings along or adjacent to the Main Street (Route 27) over the MBTA Commuter Rail tracks. The following options were considered:

- Including bicycle lanes within the existing Main Street roadway;
- Widening the existing bridge to increase the west sidewalk width to accommodate the bike trail either as a widened sidewalk or a separate path; and
- Construct a separate structure over the railroad tracks, located adjacent to the west side of the existing roadway bridge.

A more detail description of these options is included in a companion memo focusing on bridge design alternatives.

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In addition, bridge aesthetics were discussed as well as the length and configuration of the ramps that would be necessary to connect the bike trail to the bridge and then to the MBTA platform. On the north side of the tracks, up to 150 feet of ramp would be needed to connect the bridge down to the level of the rail lines. On the south side, up to 300 feet of ramp is needed to connect the bridge down to the lower elevation of the proposed ARRT trail terminus. In each case, the desire is to keep the ramps on publicly owned land and to not exceed a slope of 8.33% for handicap accessibility.

After some discussion, the group made a number of comments and suggestions:

- Try to work the ramps into the landscape instead of having free-standing ramps.
- In the area south of Maple Street, stretch the ramp from the proposed end of the ARRT trail along the Maple Street embankment to the old stone arch bridge then reverse direction to decrease the number of switchbacks and work the ramp into the landscape.
- On the north side of the bridge, consider an option that has only one switchback leading to a free-standing ramp down to track level on the track side of the small parking lot near the bridge.
- The group preferred bridge options that included either a free standing bridge adjacent to the existing roadway bridge or an widening of the existing roadway bridge to accommodate a separate bike path.
- For bridge aesthetics, the group preferred a look consistent with the existing roadway bridge.
- The group also asked BSC to explore another ramp and bridge option. That option would bring the rail trail across Maple Street, then turn east, run parallel to the rail lines and go under the roadway bridge, rising to the east of the roadway bridge to a point where the trail could then bridge over the tracks, then ramp back down parallel to the tracks, again under the roadway bridge and down to platform level. This was called the “U-turn” option.
- The group noted that currently there are parking problems in the MBTA lot off of Central Street and did not want the rail trail to exasperbate that problem.
- There were also concerns about graffiti and the need for good visibility to the bridge and ramps for security purposes.

BSC agreed to explore these suggestion and talk to MassHighway as well as the MBTA regarding options that impact their land and facilities.

BSC did place a call to the MBTA to discuss the “U-turn” option of going under the existing bridge, parallel to the MBTA tracks but within the MBTA right-of-way (ROW). The MBTA stated they need that space for track maintenance purposes and would not support such an option.

BSC also arranged a meeting with MassHighway to discuss the options. This meeting was held on March 1, 2007 at MassHighway’s District 3 office. (meeting attendees are listed at the end of this memo). At that meeting, MassHighway stated they would not support an option that included the widening of their existing roadway bridge, but a free standing bridge adjacent to their bridge would be considered. However, they did ask the Town to explore an on-road option that would connect the end of the ARRT trail along

Maple Street to Martin Street to Central Street and then into the MBTA parking lot. Though such an option was outside the purview of this bridge option study, BSC did look at this route and has summarized issues in an attached memo.

The next step is to present this information and recommendations at a public meeting as part of a Selectmen's meeting to solicit additional public input. After that meeting, recommendations will be finalized and a final report will be prepared summarizing the work performed and recommending a preferred option. This recommendation will then be presented at a final public meeting.



Martin Street pavement width is also 20 feet with a variable width Right-Of-Way averaging about 35 feet. Currently, plans are being prepared by the Town showing how a sidewalk could be added to the eastern side of Martin Street. One sidewalk option, showing a green strip between the road and proposed four-foot wide sidewalk will require easements. Adding bike lanes would most certainly add to the need for easements or takings. Trees also pose a problem along Martin Street. The current MBTA gated crossing on Martin Street is designed for the 20-foot wide roadway. A new trail crossing would require additional gates at this location as well as considerable involvement and permits from MBTA. Utility poles are located on the west side of Martin Street.

Central Street presently has a sidewalk on the north side, which could possibly be incorporated into the trail. Utility poles are located along the south side of Central Street. There is one residence only +/-5 feet from the edge of roadway on the south side of Central Street located next to the commuter rail parking lot. Designing a trail through this location would require either taking of the property, or relocation of the roadway or, what would most likely be most cost effective, locating the trail on the north side of Central Street. This option, however, creates more street crossings for the trail and Central Street is one of Acton's main roadways.

In summary, this on-road option has many issues including: limited right-of-way available, the removal of many mature trees, the increase length over the bridge option (5000 feet in length versus 1400 feet for the bridge option), the possibility of additional roadway crossings, the redesign of the MBTA gated crossing on Martin Street, relocation of utility poles and the general impact to the affected neighborhoods. Furthermore, there is a high probability that property takings will be needed to accommodate the bike trail, and depending on the proximity of houses related to the needed land takings, structures may also be impacted, such as the residence located on Central Street +/- 5 feet from the edge of the roadway. Such acquisitions could approach \$500,000 or more. Therefore, this alternative has considerable disadvantages due to cost, right-of-way impacts and probable opposition from the neighborhood.

It should be noted that immediately north of the Martin Street rail crossing, it may be possible to modify the above described alternative, and turn eastward to locate the trail along the commuter rail lines where there appears to be a level area adjacent to the tracks that may be wide enough for a trail. It is believed that this level area is an MBTA maintenance roadway, and may be an area that the MBTA desires to add a second track adjacent to the existing track sometime in the future. While this has the advantage over the above-described route since it is shorter, it would require negotiations with the MBTA in order to attempt to combine uses of their needs with an active trail. Furthermore, Mass Highway requires a minimum separation between active rail lines and bike paths running parallel to the rail lines. The separation needs to be a minimum of 25 feet if a fence is being used to separate the two uses, and 15 feet if a solid physical barrier, such as a wall is used, to separate the rail line from the trail. Without detailed survey information it is difficult to determine how much width is between the rail line and the property line in this area. However, some rough measurements indicate there may be sufficient space for a 15-foot offset between the rail line and bike path, thus requiring a solid barrier. It is not clear if there is enough room for a 25-foot offset and fence. Furthermore, in order to achieve the required separation between an active rail line and

the trail, it may be necessary to widen the level area, which may also impact adjacent property.

In addition, this potential alignment parallel to the rail line would also pass beside wetlands to the north of the rail line. Depending on permitting requirements, and the Acton Conservation Commission requires a 75 foot wetlands setback for construction, a boardwalk may be necessary to accommodate the path in this area. It appears that this modification to the Maple, Martin and Central Street At-Grade Alternative has as many drawbacks as it does advantages.

To: Roland Bartl, AICP  
Town of Acton Date: May 3, 2007

From: Jef Fasser, RLA, AICP  
BSC Group Proj. No: 61041.01

Re: Town of Acton - Analysis of Options to  
Connect the ARRT Bikeway to MBTA Lot

Bridge Options to Cross the MBTA  
Commuter Rail Line

cc:

**BRIDGE OPTIONS**

The main focus of this study was to explore options for providing a crossing over the MBTA Commuter Rail tracks along or adjacent to the Main Street (Route 27) crossing over these same tracks. The following options were considered:

- Including bicycle lanes within the existing Main Street roadway;
- Widening the existing bridge to increasing the west sidewalk width to accommodate the bike trail; and
- Construct a separate structure over the railroad tracks, located adjacent to the west side of the existing roadway bridge.

Currently the Main Street Bridge has a roadway width of 36 feet curb to curb. This is divided into single through lanes in each direction and a southbound left turn lane for vehicles turning onto High Street. To include dedicated bicycle lanes adjacent to the curbs, within the existing bridge roadway, would require eliminating or reducing the length of the existing southbound left turn lane. However, due to current and projected traffic volumes, reconfiguration of the traffic lanes on the bridge to accommodate bicycle lanes would increase vehicular traffic congestion in this area. Additionally, on-street bike lanes would have to be to the right of the vehicle travel lanes with movement in both lanes in the same direction. This would mean that the ARRT would have a directional split across the bridge with two street crossings for northbound bike traffic to the station parking lot. Therefore it was determined that it is not practical to provide bicycle lanes within the existing bridge roadway and no cost estimates were developed.

Widening the existing west bridge sidewalk from 5 feet to 12 feet, to provide room for bicycles and pedestrians, could be accomplished by extending the existing abutment beam seats and piers to support additional prestressed deck beams. Construction of this option would require removing the existing bridge parapet, installing drilled shafts into the railroad bed below to support the extensions of each pier, and removal of the concrete cap portion of the wingwalls, which would allow for extending the concrete bridge seats. Additional prestressed beams could be placed on the substructure extensions and the widened concrete sidewalk constructed with a new concrete and masonry parapet, matching the original that was removed. This option would require extensive

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coordination and cooperation with the MBTA during installation of the drilled shafts, construction of the pier extensions and placement of the deck beams. The existing gas and water mains that are supported under the existing west sidewalk would also need protection and/or temporary support during construction of the bridge widening. The option of widening the existing west bridge sidewalk is the most expensive and would require the longest construction time of the options considered. It is estimated that construction of this bridge widening option would require nine to twelve months to build and would cost approximately \$331,000. Furthermore, upon review by MHD, they are not recommending this option.

*The recommended option* for providing a crossing over the MBTA Commuter Rail tracks at the Main Street bridge is to construct a separate structure over the tracks, located adjacent to the west side of the existing roadway bridge. A prefabricated truss superstructure, with a 14 foot deck width and a length of approximately 100 feet, will be able to span from abutment to abutment without the need of intermediate pier supports. Final assembly of the bridge components can be performed in the open area adjacent to the tracks and the entire superstructure then lifted over the tracks and set into place. The structure would be parallel to the existing Main Street Bridge with a space of between 3 to 4 feet provided between the structures allowing for uninhibited inspection access to each bridge. Construction of this option will require removal of the existing concrete cap portions of the west wing walls allowing for construction of concrete bridge seats for the new structure. Use of the prefabricated superstructure will minimize the coordination required for working within or over the MBTA track right-of-way. It is estimated that construction of this adjacent bridge option would require three to four months to erect and would cost approximately \$175,000 to \$200,000. This is the cost of the bridge including installation; the costs of ramps connecting the bikeway to the bridge from the south and the bridge to the MBTA lot to the north would be an additional cost.

If desired, the pre-fabricated bridge can be designed and built with a slight residual camber that can follow the arch of the existing Main Street bridge. Such a change to customize a pre-fabricated bridge for a specific site will result in a slight cost increase. Attached are images of pre-fabricated bridges with an arch treatment.

To: Roland Bartl, AICP  
Town of Acton  
Date: June 20, 2007

From: Jef Fasser, RLA, AICP  
BSC Group  
Proj. No: 61041.01

Re: Town of Acton - Analysis of Ramp Options to  
Connect the ARRT Bikeway to a Proposed  
Bridge and the MBTA Lot

cc:

On Monday, June 25, 2007, the BSC Group will be presenting to the public additional information regarding options for connecting the ARRT bike trail from Maple Street over the MBTA rail lines by means of a new pre-fabricated bridge and then down to the MBTA station. The information to be presented on Monday will include before-and-after photo images of the proposed bridge as well as ramp options to get to and from the proposed bridge as described below.

Following is a description of the ramp options, which are attached to this memo.

#### TRAIL RAMP OPTIONS

##### South Ramp

This option shows a proposed trail alignment from the end of the current rail bed up to Maple Street, crossing Maple Street then onto the proposed pre-fabricated bridge over the MBTA rail lines. As was suggested at the previous public meeting, this alignment attempts to tuck the trail into the embankment in this area to minimize its visual impact and need for retaining walls. We feel this alignment meets these criteria as best as possible considering the physical, environmental and property ownership constraints in this area.

- This alignment stays within the bounds of property owned either by the town or state, therefore avoiding any private property acquisitions.
- The ramped trail is at a slope of 5%, therefore no intermediate landings are needed.
- There is only one "switch-back", but we feel this if unavoidable on this site.
- Once the trail ramps-up from the end of the rail trail to Maple Street, the street crossing is located 130 feet west of Main Street, not at the Main Street intersection. At the last meeting, there was a lot of discussion about the location of this Maple Street crossing, as some felt it should be located at the Main/Maple intersection. Much more study will be needed to evaluate sight lines and sight distances at any crossing location. However, there has been concern that if the crossing is at the Maple/Main intersection, there is not adequate sight distance to the intersection from vehicles traveling across the bridge to the south entering Maple Street. In addition, the Massachusetts Highway Department has recommended a similar crossing treatment associated with the Bruce Freeman trail. If the trail were to cross at the Main/Maple intersection, then another

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switchback would be needed and additional walls may be required to bring the trail along the southern edge of Maple Street up to Main Street before making the crossing.

#### North Ramp

The north ramp will connect the pre-fabricated bridge down the embankment to the informal parking area at the bottom of Railroad Street, which then connects to a walkway to the MBTA station. At the last public meeting, there were comments about the visual impact of a ramp system down this slope, the need to minimize switch-backs along a ramp system, the need to minimize the loss of any parking spaces in this area, the possibility of having a raised ramp over the parking area and the possibility of connecting this access across private property to Railroad Street.

We did explore the possibility of connecting across the private property to Railroad Street. The change in grade would most likely require a ramped system with intermediate landings, possibly a switchback and would greatly impact the recent improvements to this property. It was determined that this was not a preferred solution.

Other ramp options were explored to stay on state and town owned land as described below.

#### North Ramp – Option A

This option shows a ramp from the end of the proposed pre-fabricated bike bridge adjacent to the Maple Street sidewalk down to the blue building. A landing there would allow access to the current sidewalk to the right and also provide a connection to a ramp system to the left with switchbacks in the embankment down to the informal parking lot. To meet existing grades at the parking lot and still allow for the current safety and maintenance access to the MBTA rail lines, the ramp would need to decrease at a slope of 8% (for handicap accessibility) with intermediate landings. Such a ramp system would require retaining walls to place it into the embankment and railings for handicap accessibility.

- The option still allows MBTA access to the rail lines.
- Once the ramp system exits onto the parking lot, a striped lane would demark a bike lane to the existing path leading to the MBTA station.
- Perpendicular parking located along the southern edge of the parking lot would need to be moved to the north edge of the parking lot.
- 7 Parallel parking spaces would be lost.

#### North Ramp – Option B

As with Option A, this option shows a ramp from the end of the proposed pre-fabricated bike bridge adjacent to the Maple Street sidewalk down to the blue building. From this point, there would be a ramp system with switchbacks in the embankment down to the parking lot. However, a portion of the parking lot would be rebuilt to tilt it up to meet the ramp. This allows the ramp to end on the northern edge of the parking lot, but a low retaining wall would be required along the southern edge of the parking lot to support the elevation of the parking lot.

- This option would require the construction of an access ramp down from the elevated parking lot to allow MBTA access.

- Once the ramp systems exits onto the parking lot, a striped lane would demark a bike lane along the northern edge of the parking lot to the existing path leading to the MBTA station.
- Parking spaces could remain as is, but the 7 parallel spaces would be lost.

#### North Ramp – Option C

As with A and B, a ramp would be installed from the bridge, along Main Street to blue building. Then a gently curved ramp would lead from the landing down to the parking lot. This ramp would be built partly into the embankment, then free standing, then land on a ramp in the southern edge of the parking lot. This ramp treatment eliminates switchbacks and is at 5% to avoid the need for intermediate landings.

- This option would impact MBTA access to the rail line and the Town would need to work with them to explore other options.
- Once the ramp systems exits onto the parking lot, a striped lane would demark a bike lane along the southern edge of the parking lot to the existing path leading to the MBTA station.
- Parking spaces would be greatly impacted. Only a few spaces would remain, with parallel spaces along the northern edge of the parking lot and the possibility of only a few perpendicular spaces below the free-standing part of the ramp.

At this time, we recommend that these options be considered as the bike trail is designed and more detailed information about topography, land ownership and access issues are explored.

BRIDGE EXAMPLES:

To: Roland Bartl, AICP  
Town of Acton Date: August 8, 2007

From: Jef Fasser, RLA, AICP  
BSC Group Proj. No: 61041.01

Re: Town of Acton - Analysis of Options to  
Connect the ARRT Bikeway to MBTA Lot

Summary of Answers to Board of Selectman  
Questions of June 25, 2007

At the June 25, 2007 meeting of the Acton Board of Selectmen (BOS), the BSC Group provided a presentation of design options for a new bike path bridge and ramp system to extend the Acton River Rail Trail over the MBTA rail lines in South Acton to the MBTA Commuter Rail Station area. In response to this presentation, the BOS asked certain questions and requested the following information:

1. Meet with the Acton Historic District Commission for a discussion on bridge and ramp design issues, details and materials.
2. Explore possible options for a land swap with Frank Chen (Blue Building) to see if the Town can get more width in the Railroad Street parking lot area.
3. Check with MassHighway on the definitional question of whether or not the Railroad Street parking lot is considered part of the rail station, and could therefore be sufficient as a destination point to the rail trail. If MassHighway does consider it a destination point then investigate the possibility of adding bike racks and lockers at the east end of the Railroad Street parking lot.
4. Explore another ramp option that extends the elevated ramp option to the far western edge of the Railroad Street parking lot so as to allow the retention of all or most of the existing 90-degree parking spaces in this lot.
5. Develop cost estimates for the various ramp options as another source of information to help evaluate the possible solutions.

Following is the information that has been collected in response to these comments, requests and questions.

1. *Meet with the Acton Historic District Commission (HDC) for a discussion on bridge and ramp design issues, details and materials. Draft minutes provided by the Commission are attached.*

On July 16, 2007, Roland Bartl and Jef Fasser (BSC Group) met with the HDC to provide an overview of the bridge and ramp options and seek the Commission's comments and input on layout and design options. In attendance at the meeting were Anne Forbes, Brian Bendig, Anne Moore, Michaela Moran, Tom Peterman. Following is a summary of the HDC comments. In addition, they raised certain questions that BSC has since attempted to answer as noted.

- The proposed ramp system from Maple Street extending south down the embankment along Maple Street to the future ARRT trailhead seemed acceptable to the HDC. There were no

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comments or suggestions for changes. Roland Bartl acknowledged the historic railroad remnants in that area and assured the commission that efforts will be made to preserve them.

- The HDC preferred the bridge design option that did not include any sidewalls, thus providing a “lighter” look to the bridge and bridge deck with a superstructure/suicide fence silhouette that is reminiscent of the old bridge that once was. This option also allows unobstructed views from the bridge area down to the walking/biking surface.
- Since the bike trail bridge will be a new structure separated from the existing roadway bridge by five feet, the HDC asked if the inside suicide fences (the fences between the street bridge and the bikeway bridge that were only five feet from each other) could be removed and instead have a grate or netting installed horizontally between the two bridges for safety purposes.

Since the meeting, BSC asked both its internal bridge designers as well as MassHighway about the possibility of eliminating these fences and both sources indicated that this is not something that would be easy to do. A more detailed study of this issue would be needed during the design phase of the bike trail bridge. It is clear that a custom design option would need to be developed that would satisfy both the safety needs and requirements of the MHD and the MBTA as well as the aesthetic needs and concerns of the HDC. The barrier between the two bridges would need to take into account the differential movements of the two structures, the ability to remove any connected covering for inspectional purposes and deter people from passing from one structure to the other.

- Following a discussion of the various ramp options to the north of the bridge to connect the rail trail down to the Railroad Street parking lot, the HDC preferred the switchback ramp system option built into the embankment and did not like the elevated sweeping ramp option. They thought the elevated sweeping ramp option was too visually intrusive. However, the HDC requested, and BSC agreed to look into, reducing the number of switchbacks in the preferred ramp option by increasing the slope of the ramp to 8% starting at the north end of the bridge, instead of following the road grade of 4% down to the blue building. The connection between the bikeway and adjacent sidewalk would then occur immediately at the north end of the bridge instead of at the blue building.

BSC did explore this option. This option would eliminate one switchback at the end of the ramp system (as shown in attached North Ramp Option F) only if combined with rebuilding the Railroad Street parking lot to “tilt” it up at a 3% slope to meet the ramp system as shown on some of the previous ramp options.

- During the discussion with the HDC, it was discovered and agreed by all in attendance that the Town-owned triangular property, which is the proposed location of the north side ramp system, is within the South Acton Local Historic District. Therefore, the HDC would have jurisdiction over any above ground structure, i.e. the ramp system, in this area. Accordingly, any work in this area will require a Certificate of Appropriateness from the HDC.

- The HDC recommended the use of high quality material in the bridge construction since people will be walking and riding close to the bridge elements and be able to appreciate high quality construction materials.

2. *Explore possible options for a land swap with Frank Chen (Blue Building) to see if the Town could obtain more width in the Railroad Street parking lot.*

BSC was given various sources of information regarding property lines in this area. Some plans show a property line adjacent to Mr. Chen's new wall, others show it further away. If it is indeed close to his wall, then land that is now a grassed strip can actually be used for the ramp system or expanded parking. Attached North Ramp Option G shows how the ramp system could be incorporated into this area, eliminating one switchback, however, it would possibly impact one or two of the existing parallel parking spaces, which are presently available for use from April 2<sup>nd</sup> to October 31st. There is also an existing utility line pole that would need to be relocated. However, additional deed and property line research will be needed to confirm the actual property line location here before any assumptions can be made about parking and ramp locations.

In addition, Roland Bartl explored the feasibility of any land swap with Mr. Chen for additional land on the Railroad Street parking lot side. Based on a detailed review of Mr. Chen's recently approved and now built parking lot, Mr. Bartl feels that Mr. Chen needs every bit of space he currently owns in order to maintain zoning compliance and functionality, and that there is no part of Mr. Chen's lot that could be carved out and would be useful for the rail trail in a potential swap for Town-owned land where Mr. Chen presently maintains a shed. This conclusion is based upon the availability of land shown on Mr. Chen's site plan, from property lines surveyed on behalf of Mr. Chen. This information should be verified in the 25% design phase.

3. *Check with MassHighway on the definitional question of whether or not the Railroad Street parking lot is considered part of the rail station, and could therefore be sufficient as a destination point to the rail trail. If MassHighway does consider it a destination point, then investigate the possibility of adding bike racks and lockers at the east end of the Railroad Street parking lot.*

BSC contacted MassHighway on this issue. They consider the MBTA Commuter Rail platform the destination point for users of the rail trail and therefore a safe and defined bike trail connection must be provided to that point.

4. *Explore another ramp option that extends the elevated ramp option to the far western edge of the Railroad Street parking lot so as to allow the retention of all or most of the existing 90-degree parking spaces in this lot.*

BSC explored this option as shown North Ramp Option E and depicted in the attached photo edit.

5. *Develop cost estimates for the various ramp options as another source of information to help evaluate the possible solutions.*

Cost estimates were developed for four variations of the north ramps options. Costs range from \$150,000 to \$250,000 for the ramp system built into the embankment up to \$250,000 to \$400,000 for the longer, extended sweeping ramp options.

Summary

As a result of all the work done to date and comments received from the public, Board of Selectmen and the Acton Historic District Commission, BSC believes there is a preferred option for the design of the ramp and bridge system for the rail trail. However, this recommendation is based on the information available at this time and is subject to modification based on final topographic survey, location of property lines and costs. In addition, as the 25% design of the Acton portion of the Assabet River Rail Trail proceeds, other design decisions may impact the ramp and bridge treatment over the rail lines. With that being said, BSC recommends the following treatments:

- The ramp from the end of the historic rail bed up to Maple Street should be as previously shown on the South Ramp Option dated
- The rail trail bridge over the railroad tracks should be a pre-cast bridge separated from the existing road bridge by five feet. The bridge should be light in structure with no or very low sidewalls. The safety fencing on both sides of this bridge should have a frame and support elements that provide a silhouette that emotes the old bridge that once was located at this site.
- The north ramp from the bridge down to the Railroad Street parking lot should be a switchback ramp system built into the embankment. As topography and property boundaries permit, this ramp should have a minimal amount of switchbacks and extend along the MBTA side of Mr. Chen's wall to minimize any impacts to existing parking spaces.

After the next presentation to the Board of Selectmen, BSC will package all memorandums, plan, cost estimates and images into one final deliverable to the Town of Acton.

**MAIN STREET OVER MBTA COMMUTER RAIL  
PRELIMINARY CONSTRUCTION ESTIMATE FOR WIDENING EXISTING BRIDGE  
 TO ACCOMMODATE THE ASSABET RIVER RAIL TRAIL**

ITEM 115.1 DEMOLITION OF BRIDGE NO. A-02-004

Demolition consist of removing the existing bridge parapet, a portion of the existing sidewalk, rounded ends of the existing piers, and top of existing west side wingwalls.

Removal of parapet stone fascia :

Inside Face =	2.167	ft. high x	92.38	ft. =	200.19	sq. ft.
Outside Face =	3.167	ft. high x	92.38	ft. =	<u>292.57</u>	sq. ft.
					492.75	sq. ft.

Removal of wingwall facing stones :

North Abut. Wingwall =	14.50	ft. long x	4.25	ft. hgt. =	61.63	sq. ft.
South Abut. Wingwall =	14.00	ft. long x	3.65	ft. hgt. =	<u>51.10</u>	sq. ft.
					112.73	

Total Area Stone Removal = 605.48 sq. ft.

Removal of parapet concrete core & cap :

Concrete Core =	0.917	ft. thick x	2.167	ft. high =	1.99	sq. ft.
Concrete Cap =	0.500	ft. thick x	1.833	ft. wide =	<u>0.92</u>	sq. ft.
					2.90	sq. ft.

Vol. Parapet Conc. = 2.90 sq. ft. x 92.38 ft. = 268.18 cu. ft.

Removal of sidewalk concrete :

Sidewalk Concrete =	1.000	ft. thick x	5.67	ft. wide =	5.67	sq. ft.
Vol. Sidewalk Conc. =	5.67	sq. ft. x	92.38	ft. =	523.79	cu. ft.

Removal of rounded ends of pier shafts :

End of Pier Shaft Radius =	2.083	ft.	End of Pier Shaft Area =	6.82	sq. ft.	
Vol. End of Pier Conc. =	6.82	sq. ft. x	19.56	ft. =	133.31	cu. ft.
	133.31	cu. ft. x	2.0	Piers =	266.62	cu. ft.

North Abut. Wingwall =	14.50	ft. long x	4.25	ft. hgt. =	61.63	sq. ft.
	61.63	sq. ft. x	1.5	ft. =	92.44	cu. ft.
South Abut. Wingwall =	14.00	ft. long x	3.65	ft. hgt. =	51.10	sq. ft.
	51.10	sq. ft. x	1.5	ft. =	76.65	cu. ft.

Total Vol. Conc. Removal = 1227.68 cu. ft. / 27 = 45.47 cu. yds.

Total Cost Stone Removal =	605.48	sq. ft. x	\$50.00	/sq. ft. =	\$30,274.00
Total Cost Conc. Removal =	45.47	cu. yds. x	\$400.00	/cu. yd. =	\$18,187.90
					\$48,461.89

Use = \$48,500.00

**MAIN STREET OVER MBTA COMMUTER RAIL  
PRELIMINARY CONSTRUCTION ESTIMATE FOR WIDENING EXISTING BRIDGE  
 TO ACCOMMODATE THE ASSABET RIVER RAIL TRAIL**

ITEM 990.10 MOBILIZATION - DEMOBILIZATION OF SPEC. EQUIPMENT FOR DRILLED SHAFTS

For Mobilization - Demobilization Use = \$7,500.00 Lump Sum

ITEM 945.503 DRILLED SHAFT 4.0 FOOT DIAMETER

Say one new shaft required at each pier :

Drilled Shaft Length at North Pier =	25	Feet
Drilled Shaft Length at North Pier =	20	Feet
	<u>45</u>	Feet

Total Cost Drilled Shafts = 45 Feet x \$575.00 Per Ft. = \$25,875.00

ITEM 904 4000 PSI, 3/4 IN., 610 CEMENT CONCRETE

**For Extensions to Piers :**

Length of Extensions = 7.00 Ft. Beams + 2.00 Ft. Rad. = 9.00 Feet

Width of Extensions = 4.17 Feet

Aver. Height of Piers = 21.5 Feet

Vol. of Pier Extension Concrete = 1612.50001 Cu. Ft. = 59.72 Cu. Yds.

**For Extensions to Abut. Seats :**

Length of Extensions = 7.00 Ft. Beams + 1.50 Ft. Ck. Wall = 8.50 Feet

Area of Bridge Seat = 13.00 Sq. Ft.

Vol. of Pier Extension Concrete = 110.50 Cu. Ft. = 4.09 Cu. Yds.

**Construct New Wingwalls :**

North Abut. Wingwall = 14.50 Ft. Long x 4.25 Ft. Aver Hgt. x 1.50 Ft. Thk. = 92.44

South Abut. Wingwall = 14.00 Ft. Long x 3.65 Ft. Aver Hgt. x 1.50 Ft. Thk. = 76.65

Vol. of Wingwall Concrete = 169.09 Cu. Ft. = 6.26 Cu. Yds.

Total Volume of Concrete = 70.08 Cu. Yds.

Total Cost 4000 PSI Conc. = 70.08 cu. yds. x \$650.00 /cu. yd. = \$45,550.25

Use = \$45,600.00

**MAIN STREET OVER MBTA COMMUTER RAIL  
PRELIMINARY CONSTRUCTION ESTIMATE FOR WIDENING EXISTING BRIDGE  
 TO ACCOMMODATE THE ASSABET RIVER RAIL TRAIL**

ITEM 904.3 5000 PSI, 3/4 IN., 685 HP CEMENT CONCRETE

Sidewalk Concrete =	1.000	ft. thick x	12.67	ft. wide =	12.67	sq. ft.
Vol. Sidewalk Conc. =	12.67	sq. ft. x	92.38	ft. =	1170.45	cu. ft.
 Total Volume of Concrete =	 43.35	 Cu. Yds.				
 Total Cost 5000 PSI Conc. =	 43.35	 cu. yds. x	 \$1,600.00	 /cu. yd. =	 \$69,360.27	
				Use =	\$69,400.00	

ITEM 910.1 STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED

For estimated total weight of reinforcement use 100 lbs./ cu. yd. of concrete.

Total Volume of Concrete =	43.35	cu. yds. +	70.08	cu.yds.=	113.43	cu. yds.
Total Reinforcing Weight =	113.43	cu. yds. x	100	lbs. =	11343	lbs.
 Total Cost Reinforcing =	 11343	 lbs. x	 \$2.00	 /cu. yd. =	 \$22,685.50	
				Use =	\$22,700.00	

ITEM 930.304 & 930.308 PRESTRESSED CONCRETE DECK BEAMS

Add a 3 foot wide and a 4 foot wide deck beam along the west side of the bridge to widen sidewalk for bicycle use.

Total Length of Beams =	92.38	ft. x	2.00	Beams =	184.76	feet
 Total Cost Prestress Beams =	 184.76	 ft. x	 \$275.00	 /ft. =	 \$50,809.00	
				Use =	\$50,800.00	

**Cost to Widen Existing Bridge Sidewalk :**

Demolition	\$48,500.00
Temporary Protection/Support of Exist. Utilities	\$10,000.00
Railroad Flagging Allowance	\$20,000.00
Mobilization - Demob Drilled Shaft Equip.	\$7,500.00
Drilled Shafts	\$25,875.00
4000 PSI Conc.	\$45,600.00
5000 PSI Conc.	\$69,400.00
Reinforcing	\$22,700.00
Prestress Beams	\$50,800.00
+10% for Misc. Items & Contingencies	\$30,037.50
	<b>\$330,412.50</b>
Use =	\$331,000.00











NOTES:  
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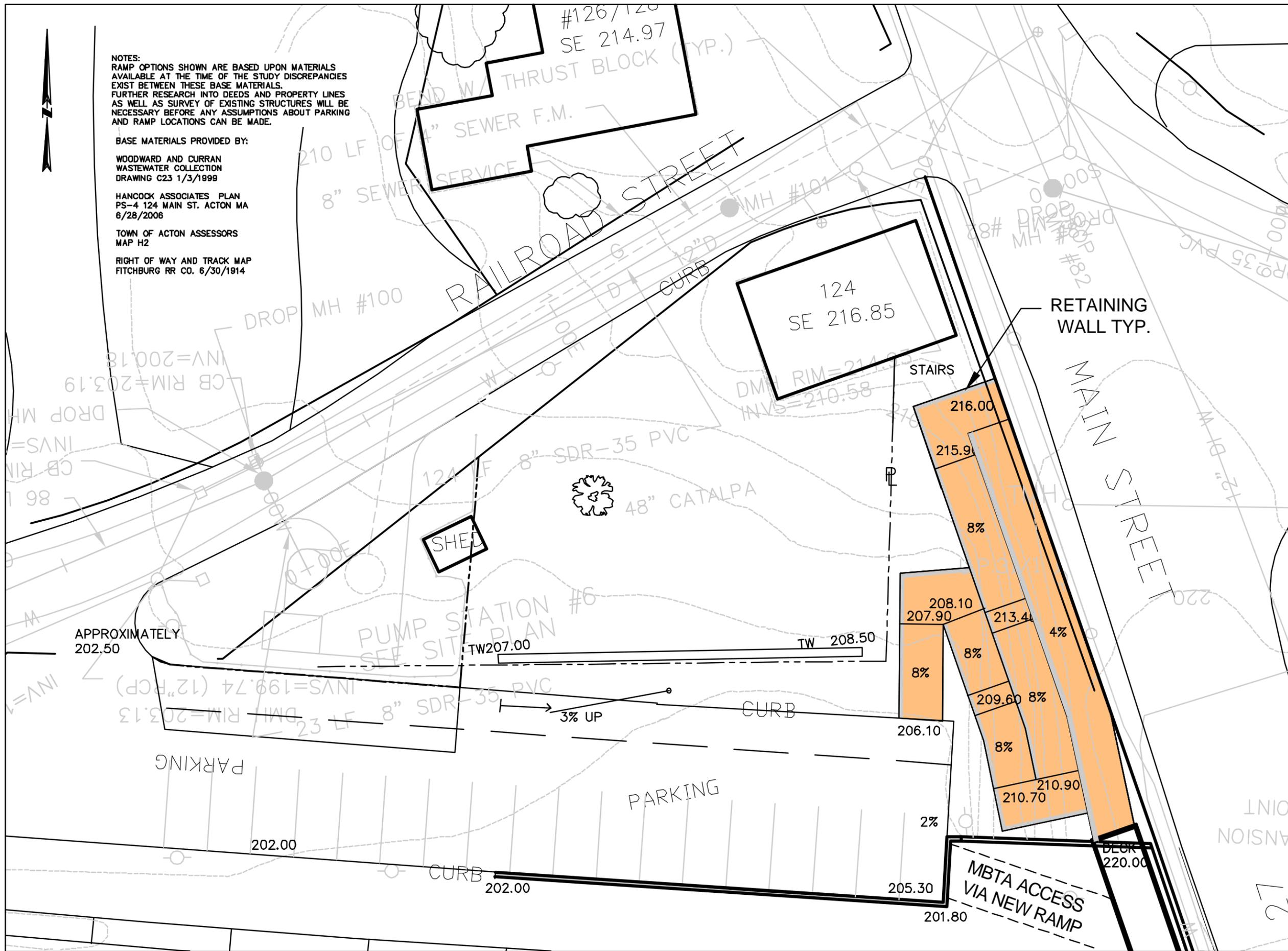
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HANCOCK ASSOCIATES PLAN  
 PS-4 124 MAIN ST. ACTON MA  
 6/28/2006

TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914



### NORTH RAMP OPTION B

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

BASE MAP

MARCH 2007

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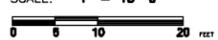


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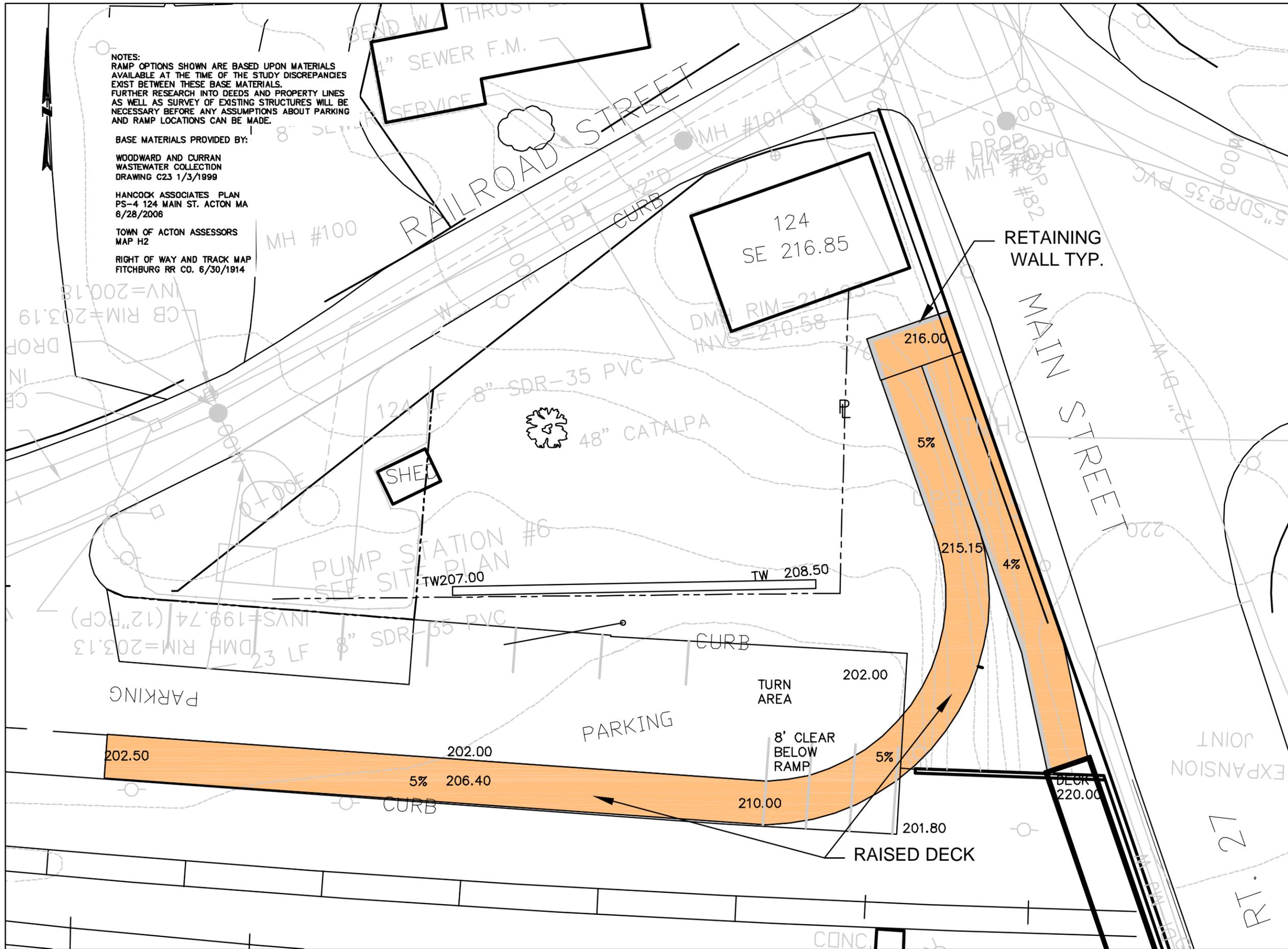
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 6/28/2006

TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914



**NORTH RAMP  
 OPTION C**

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

BASE MAP

MARCH 2007

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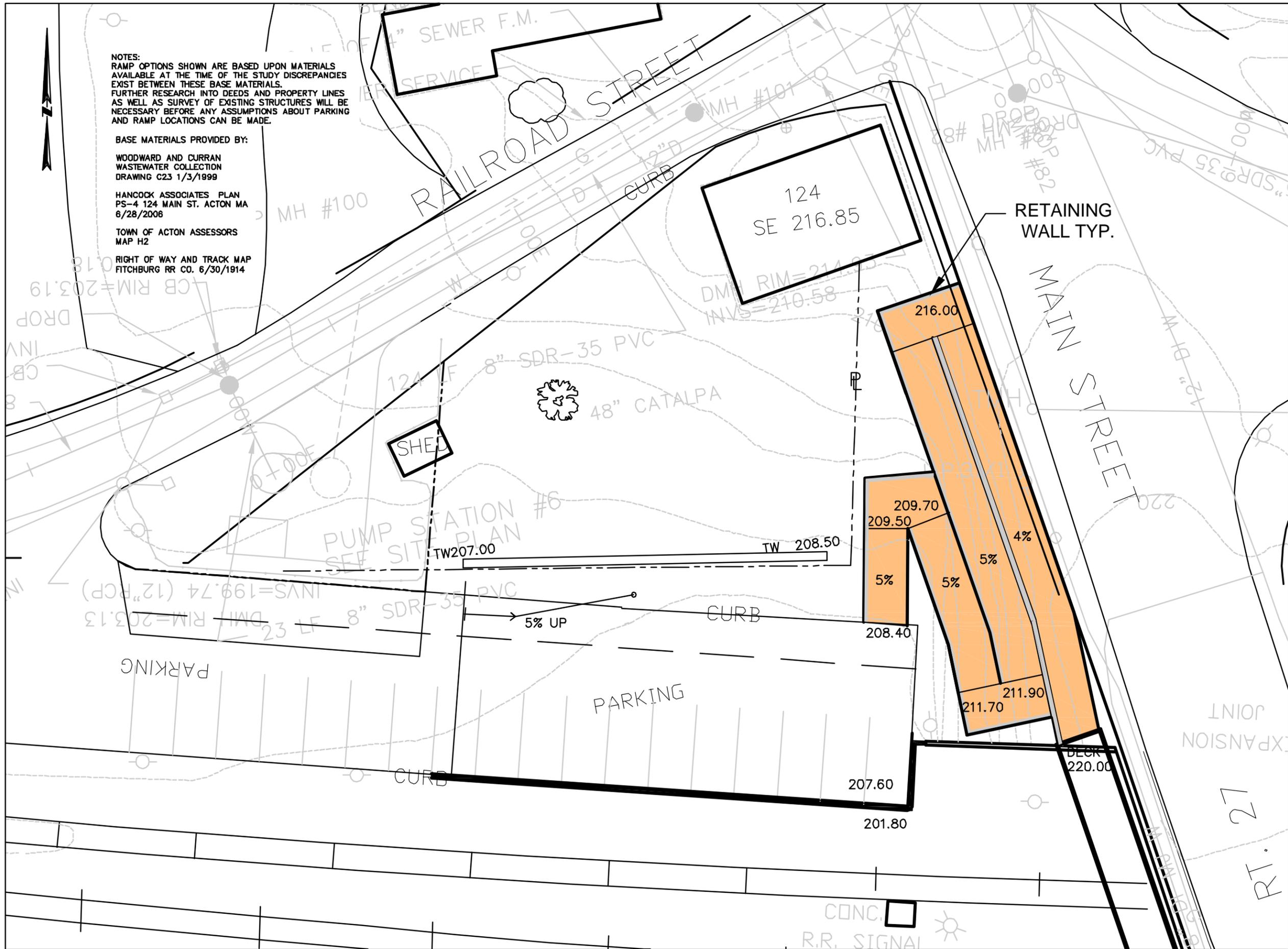
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TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914



**NORTH RAMP  
 OPTION D**

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

BASE MAP

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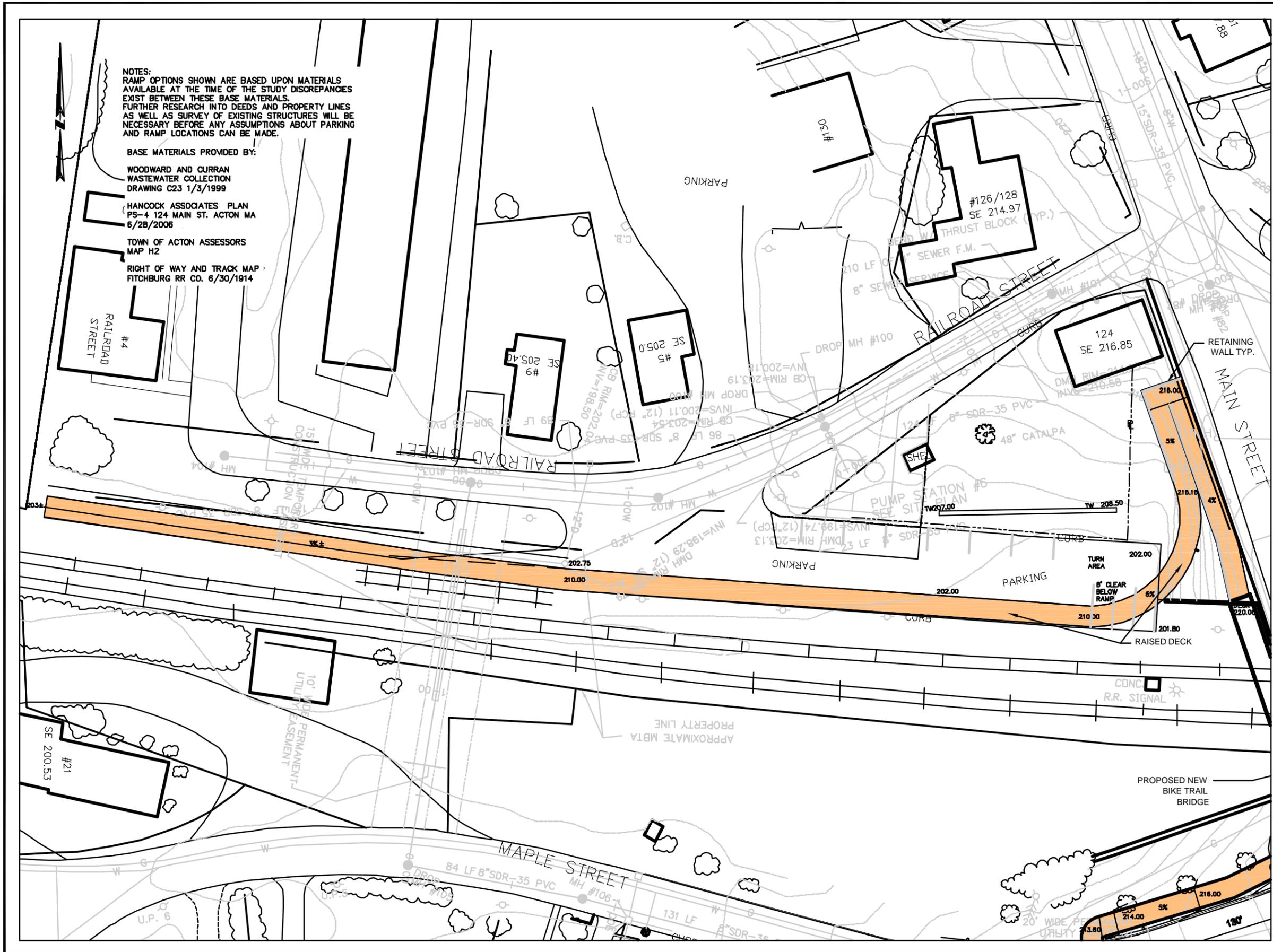
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TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CD. 6/30/1914



# NORTH RAMP OPTION E

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

BASE MAP

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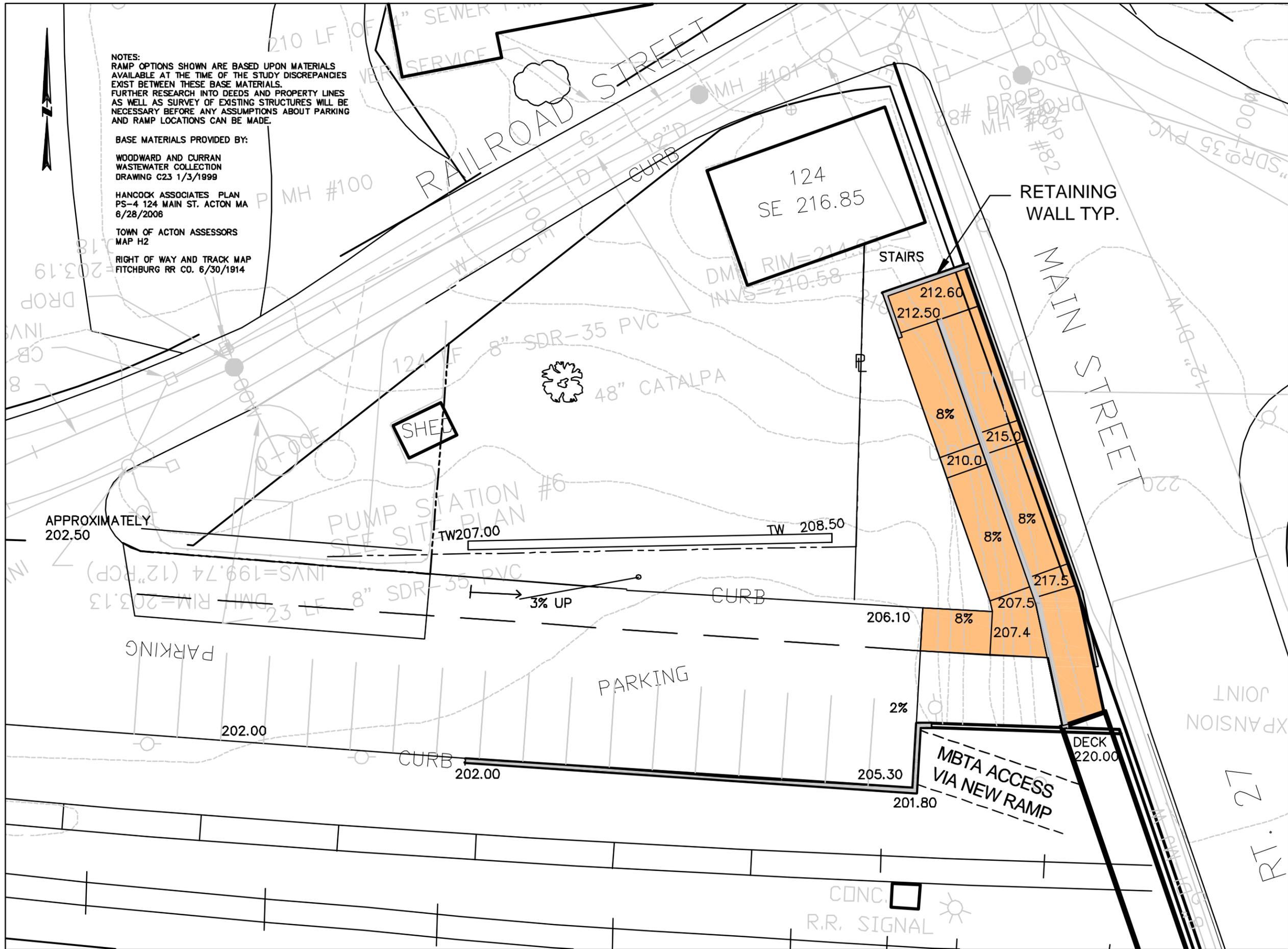
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TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914



**NORTH RAMP  
 OPTION F**

ROUTE 27 MAIN STREET  
 IN  
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 MASSACHUSETTS

BASE MAP

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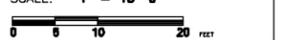
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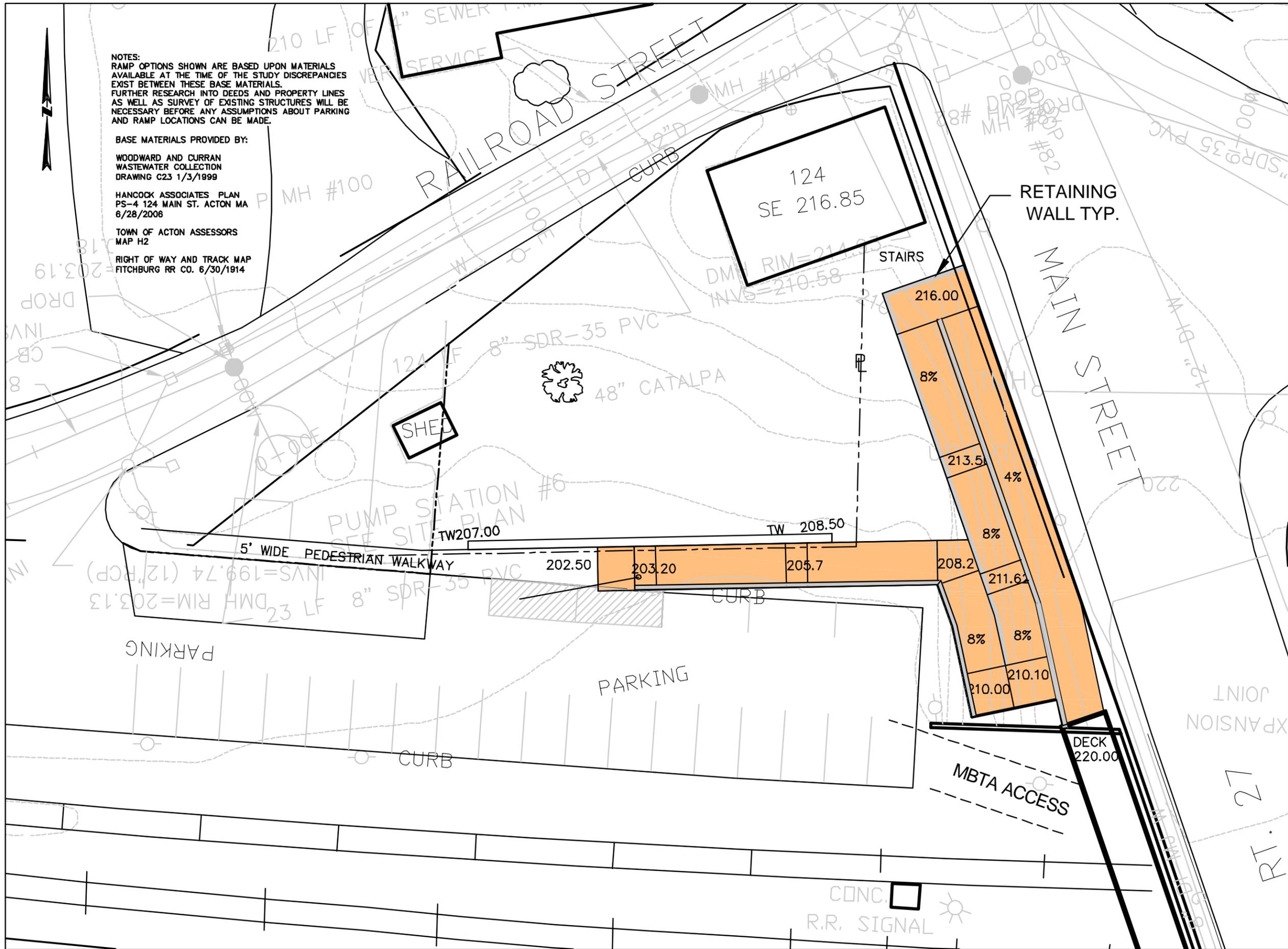
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TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914



**NORTH RAMP  
 OPTION G**

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

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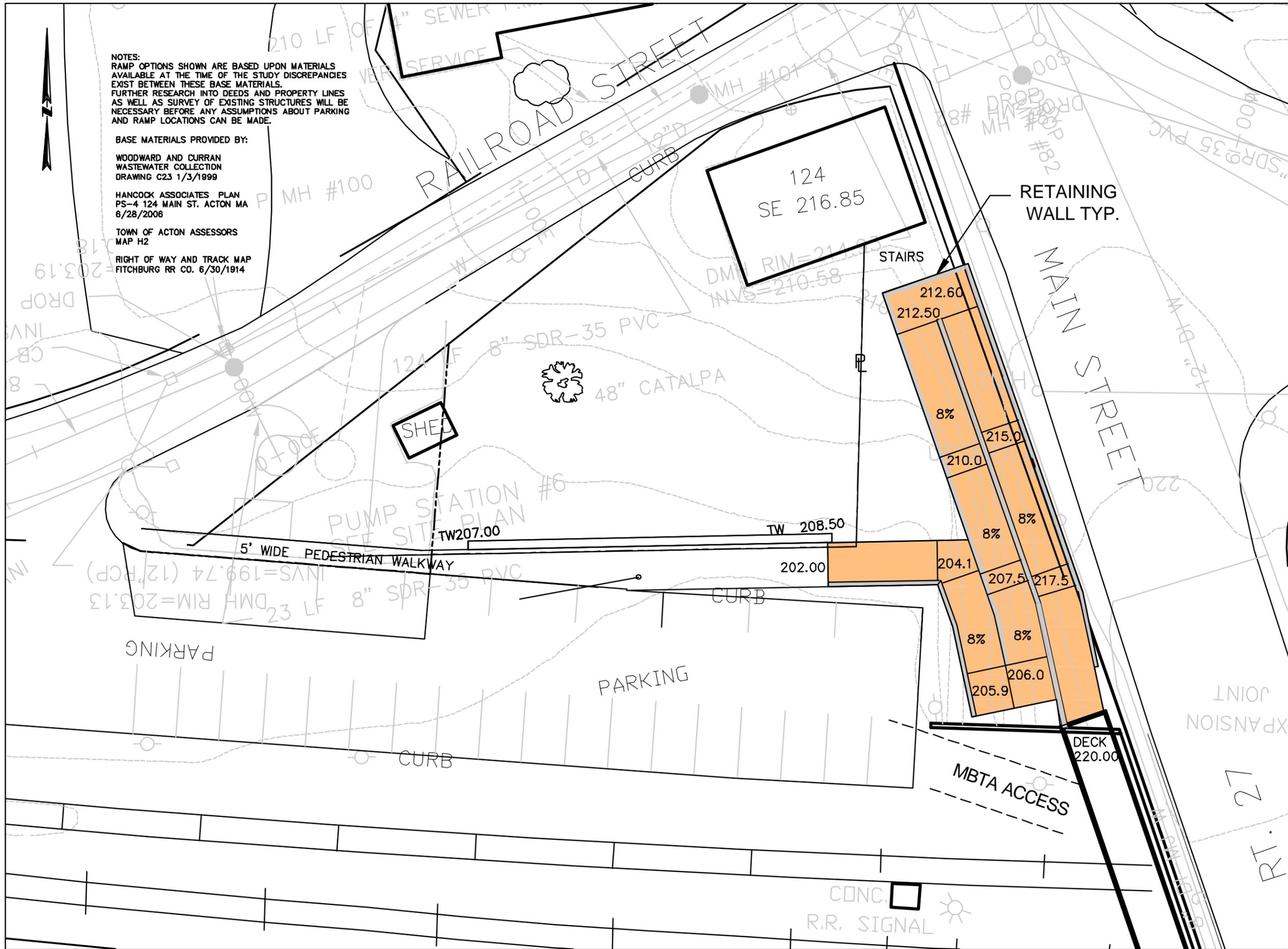
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TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
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**NORTH RAMP  
 OPTION H**

ROUTE 27 MAIN STREET  
 IN  
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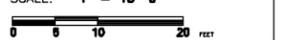
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NOTES:  
 RAMP OPTIONS SHOWN ARE BASED UPON MATERIALS AVAILABLE AT THE TIME OF THE STUDY. DISCREPANCIES EXIST BETWEEN THESE BASE MATERIALS. FURTHER RESEARCH INTO DEEDS AND PROPERTY LINES AS WELL AS SURVEY OF EXISTING STRUCTURES WILL BE NECESSARY BEFORE ANY ASSUMPTIONS ABOUT PARKING AND RAMP LOCATIONS CAN BE MADE.

BASE MATERIALS PROVIDED BY:

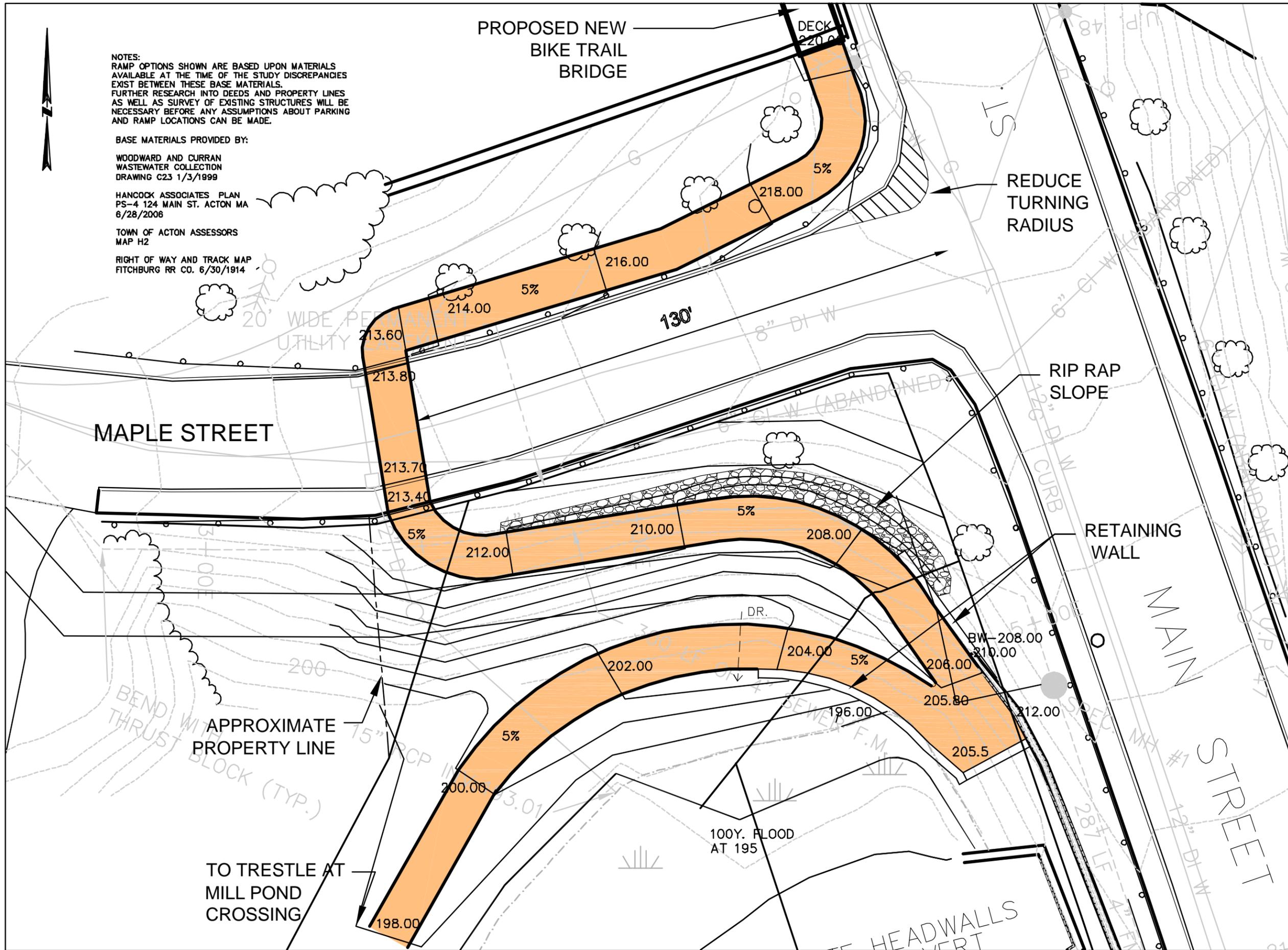
WOODWARD AND CURRAN  
 WASTEWATER COLLECTION  
 DRAWING C23 1/3/1999

HANCOCK ASSOCIATES PLAN  
 PS-4 124 MAIN ST. ACTON MA  
 6/28/2006

TOWN OF ACTON ASSESSORS  
 MAP H2

RIGHT OF WAY AND TRACK MAP  
 FITCHBURG RR CO. 6/30/1914

PROPOSED NEW BIKE TRAIL BRIDGE



REDUCE TURNING RADIUS

RIP RAP SLOPE

RETAINING WALL

MAPLE STREET

APPROXIMATE PROPERTY LINE

TO TRESTLE AT MILL POND CROSSING

100Y. FLOOD AT 195

SOUTH RAMP

ROUTE 27 MAIN STREET  
 IN  
 ACTON, MA  
 MASSACHUSETTS

BASE MAP

MARCH 2007

REVISIONS:

NO.	DATE	DESC.

PREPARED FOR:



33 Waldo Street  
 Worcester, Massachusetts  
 01608

617 896 4300

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SCALE: 1" = 10'-0"



FILE: 6104301-SH

DWG. NO:

JOB. NO:

SHEET 1

**ACTON BIKEWAY BRIDGE CONNECTION**

**PRELIMINARY COST ESTIMATE OPTION B**

Project:  
Location:  
Contract #:

Computed By: GMS  
Checked By: JEF  
Date: 06/19/07  
Revised: 08/13/07  
Date of Printing: 09/10/07

**I. CONTRACT ITEMS**

**A: PATHWAY ITEMS**

Item #	Item Description	Units	Quantity	Unit Price	Cost
151.01	GRAVEL BORROW - TYPE C	c.y.	570	\$20.00	\$11,400.00
402.	DENSE GRADED CRUSHED STONE FOR SUB-BASE	c.y.	290	\$30.00	\$8,700.00
460.	HOT MIX ASPHALT	ton	150	\$85.00	\$12,750.00
660.	METAL PIPE RAIL	l.f	130	\$95.00	\$12,350.00
XXX	RETAINING WALL	s.f.	620	\$60.00	\$37,200.00

**SUBTOTAL: \$82,400.00**

**B: MINOR ITEMS (20% OF A)**

**MINOR ITEMS COST: \$16,480.00**

**SUBTOTAL: \$98,880.00**

**C: LUMP SUM ITEMS (% OF A+B)**

Item	Item Description	Units	Quantity	Unit Price	Cost
100.1	CLEARING AND GRUBBING	l.s.	1	2.0%	\$1,977.60
748.	MOBILIZATION	l.s.	1	7.5%	\$7,416.00

**LUMP SUM ITEMS COST: \$9,393.60**

**SUBTOTAL: \$108,273.60**

**II. INCIDENTALS AND CONTINGENCIES**

INCIDENTALS (15%) \$16,241.04  
CONTINGENCIES (10%) \$10,827.36

**INCIDENTALS AND CONTINGENCIES COST: \$27,068.40**

**SUBTOTAL: \$109,468.40**

**III. UTILITIES**

**UTILITY COST:**

**IV. CONSTRUCTION COST**

**TOTAL \$109,468.40**

**\*\*\*TOTAL PROJECT COST: \$109,468.40**  
**SAY: \$150,000.00**

**ACTON BIKEWAY BRIDGE CONNECTION**

**PRELIMINARY COST ESTIMATE OPTION C**

Project:  
Location:  
Contract #:

Computed By: GMS  
Checked By: JEF  
Date: 06/19/07  
Revised: 08/13/07  
Date of Printing: 09/10/07

**I. CONTRACT ITEMS**

**A: PATHWAY ITEMS**

Item #	Item Description	Units	Quantity	Unit Price	Cost
151.01	GRAVEL BORROW - TYPE C	c.y.	460	\$20.00	\$9,200.00
402.	DENSE GRADED CRUSHED STONE FOR SUB-BASE	c.y.	100	\$30.00	\$3,000.00
460.	HOT MIX ASPHALT	ton	60	\$85.00	\$5,100.00
660.	METAL PIPE RAIL	l.f	130	\$95.00	\$12,350.00
XXX	RETAINING WALL	s.f.	620	\$60.00	\$37,200.00
XXY	10' WIDE DECK-H10 rated.	l.f	205	\$470.00	\$96,350.00

**SUBTOTAL: \$163,200.00**

**B: MINOR ITEMS (20% OF A)**

**MINOR ITEMS COST: \$32,640.00**

**SUBTOTAL: \$195,840.00**

**C: LUMP SUM ITEMS (% OF A+B)**

Item	Item Description	Units	Quantity	Unit Price	Cost
100.1	CLEARING AND GRUBBING	l.s.	1	2.0%	\$3,916.80
748.	MOBILIZATION	l.s.	1	7.5%	\$14,688.00

**LUMP SUM ITEMS COST: \$18,604.80**

**SUBTOTAL: \$214,444.80**

**II. INCIDENTALS AND CONTINGENCIES**

INCIDENTALS (15%) \$32,166.72  
CONTINGENCIES (10%) \$21,444.48

**INCIDENTALS AND CONTINGENCIES COST: \$53,611.20**

**SUBTOTAL: \$216,811.20**

**III. UTILITIES**

**UTILITY COST:**

**IV. CONSTRUCTION COST**

**TOTAL \$216,811.20**

**\*\*\*TOTAL PROJECT COST: \$216,811.20**

**SAY: \$250,000.00**

**ACTON BIKEWAY BRIDGE CONNECTION**

**PRELIMINARY COST ESTIMATE OPTION E**

Project:  
Location:  
Contract #:

Computed By: GMS  
Checked By: JEF  
Date: 06/19/07  
Revised: 08/13/07  
Date of Printing: 09/10/07

**I. CONTRACT ITEMS**

**A: PATHWAY ITEMS**

Item #	Item Description	Units	Quantity	Unit Price	Cost
151.01	GRAVEL BORROW - TYPE C	c.y.	460	\$20.00	\$9,200.00
402.	DENSE GRADED CRUSHED STONE FOR SUB-BASE	c.y.	100	\$30.00	\$3,000.00
460.	HOT MIX ASPHALT	ton	52	\$85.00	\$4,420.00
660.	METAL PIPE RAIL	l.f	130	\$95.00	\$12,350.00
XXX	RETAINING WALL	s.f.	620	\$60.00	\$37,200.00
XXY	10' WIDE DECK H-10 rated	l.f	555	\$470.00	\$260,850.00

Note: 300 for non H10 rating.

**SUBTOTAL: \$327,020.00**

**B: MINOR ITEMS (20% OF A)**

**MINOR ITEMS COST: \$65,404.00**

**SUBTOTAL: \$392,424.00**

**C: LUMP SUM ITEMS (% OF A+B)**

Item	Item Description	Units	Quantity	Unit Price	Cost
100.1	CLEARING AND GRUBBING	l.s.	1	2.0%	\$7,848.48
748.	MOBILIZATION	l.s.	1	7.5%	\$29,431.80

**LUMP SUM ITEMS COST: \$37,280.28**

**SUBTOTAL: \$429,704.28**

**II. INCIDENTALS AND CONTINGENCIES**

INCIDENTALS (15%) \$64,455.64  
CONTINGENCIES (10%) \$42,970.43

**INCIDENTALS AND CONTINGENCIES COST: \$107,426.07**

**SUBTOTAL: \$434,446.07**

**III. UTILITIES**

**UTILITY COST:**

**IV. CONSTRUCTION COST**

**TOTAL \$434,446.07**

**\*\*\*TOTAL PROJECT COST: \$434,446.07**

**SAY: \$450,000.00**

ACTON BIKEWAY BRIDGE CONNECTION  
MEETING

SIGN IN SHEET

30 January 2007

<u>NAME</u>	<u>AGENCY/ORGANIZATION</u>	<u>PHONE AND EMAIL</u>
Tom Kelleher	ARAT INC	617-512-7104 THOMAS.E.KELLEHER@VERIZON.NET
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✓ Jeff Fassal	BSC Terrasphere	508-792-4500
Margaret Murphy	BSC Terrasphere	508-792-4534
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Nonreen Eweer	TAC	978-635-9817
Kimberly Young	Homeowner	978-264-2038 kayyoung@msbad.com

**ACTON BIKEWAY BRIDGE CONNECTION**  
**MEETING**

**SIGN IN SHEET**

30 January 2007

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Jim Yarin	TAC	978/263-6353 jimyarina@verizon.net
Anna Fobos	MBRC	afobos@acn.com
Ron Schlegel	Rec Comm	rjsch15@comcast.net
Nancy Buehner	Acton Weekly	

**ACTON BIKEWAY BRIDGE CONNECTION**  
**MEETING**

**SIGN IN SHEET**

1 March 2007

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