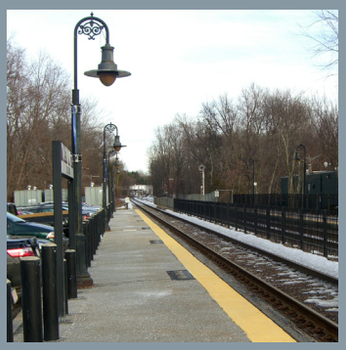


90% DESIGN REPORT

Fitchburg Commuter Rail Line Improvements Project

SOUTH ACTON STATION REDESIGN

SUBMITTED TO:
Massachusetts Bay Transportation Authority

SUBMITTED BY:
HNTB Corporation
in association with

Jacobs Engineering Group Inc.

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September, 2011

HNTB

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I. – OVERVIEW OF REPORT

This report provides the current status of the South Acton Station renewal project as progressed to a 90% level of design. The report also describes the changes between the 60% and 90% design levels that have resulted from meetings with the Town of Acton and MBTA stakeholders.

A. Project Execution and Schedule: The Project is to be completed by a combination of Contractor work and Railroad Force Account (FA) work. The Contractor's work will be paid for on the basis of a competitive bid process. The FA work performed by the operating Railroad MBCR will be paid for on a time and materials basis. The FA work will apply to the track and signal work within the limits of the station area. A Project Initiation (PI) Agreement will be negotiated between the MBTA and their operating railroad, the Massachusetts Bay Commuter Railroad (MBCR). The primary reason for doing the track and signal work through a force account is that the track and signal work is very closely integrated with ongoing railroad operations. The track and signal work will be performed adjacent to an operating railroad with upwards of 40 train pass bys per day. The volume of track and signal work is significant and the work is complex; using the current railroad operator to perform this work is critical from an operational, safety, and schedule standpoint. The station design and the development of the contract package is currently scheduled to be completed by the end of December 2011. The contract notice to proceed is anticipated for the spring of 2012. All station construction work is scheduled to be completed by early January 2014.

Chapter 3 of this Report contains the cost estimate for work to be done by the Contractor and includes a sum that is anticipated for the associated FA work. As presented in Chapter 3, the 90% design cost estimate for the contractor's work is $10,240,000 while the anticipated cost for FA is $455,000. This latest cost estimate for the Contractors work includes a 12% "market conditions" reduction of cost as was requested by the MBTA in the summer of 2010 to account for the very competitive market conditions prevalent at that time. The MBTA was receiving contractor bids coming in well below the Engineer's estimates, on average about 12% less. Since this may be a temporary condition, a close watch should be kept on market conditions and bid prices going forward from 90% to 100%. Continued changes in market conditions may warrant further estimate adjustment change request by the MBTA at the 100% design completion level.

This cost estimate also includes a 5% design contingency factor which is appropriate for the 90% level of design, an escalation factor of 4% per year based on the number of months in the future that the work will be performed, and a 10% construction contingency for changes that may occur during construction.

C. Contents of the Chapters: The chapters following in this technical Report are summarized as follows:

Chapter 1: South Acton Station Renewal

This chapter contains a description of the elements of the station improvements.

Chapter 2: Changes From the 60% Submittal

This chapter contains a listing of the major changes since the previous 60% design submittal.

Chapter 3: Cost Estimate

This chapter presents the cost estimate with explanation of the changes since the previous 60% design submittal.

CHAPTER 1

South Acton Station Design

OPTIMIZE | Prioritize • Package • Perform

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I. - INTRODUCTION

The MBTA's Fitchburg Commuter Rail Line is a 50 mile long railroad line that extends from North Station in downtown Boston to the northwest to the city of Fitchburg in the North Central Region of the state. There are eighteen station stops along the route. On a typical weekday there are thirteen inbound commuter rail trips that originate from Fitchburg Station and four inbound trips that originate from South Acton Station which is at the halfway point of the line. The average weekday inbound passengers over the entire line are approximately 5,800 based on observations on February 28, 2008. The size of the trains providing service on the line varies from three cars to five cars. The Fitchburg Line has undergone no major infrastructure upgrades for many years and many elements of the systems and overall infrastructure have outlived their useful life. The Fitchburg Commuter Rail Line systems and infrastructure are now being upgraded to provide a faster trip time and to improve the reliability of service. The Fitchburg Line improvements are being carried out by the Massachusetts Bay Transportation Authority which has been awarded funding from several sources that include the Federal Transit Administration Small Starts Program, the Commonwealth of Massachusetts, and the U.S. Department of Transportation Stimulus Program (ARRA). Improvements under the project include double tracking from South Acton to Ayer, track geometry modifications, track system upgrades, signal system upgrades, grade crossing warning system improvements, the rehabilitation of several bridges, culvert replacements, and station improvements at South Acton Station and Littleton Station.

A. Station Location and Area Features: South Acton Station is located in the Town of Acton in the area known as South Acton Village which is along the railroad right of way between the Main Street Bridge and the Martin Street Grade Crossing. The main element of the existing station is a 400 foot long low level platform along the north side of the railroad right of way. Planned double tracking through the South Acton Station area has created the need for extensive station improvements because the new track will occupy the space of the existing station platform.

B. The Evolution of the Station Design: The improvements proposed to South Acton Station have been part of the Fitchburg Line Improvements Project since its inception and were included as part of the original Small Starts Program design that was initiated in the spring of 2008. The initial design concept for South Acton Station included a single center island high level platform located between two divided tracks with a pedestrian ramp leading from the main parking lot and drop off area to an overhead pedestrian walkway and then to a ramp leading down to the center island platform. The center island platform was favored by the MBTA because it offered the greatest operational flexibility. This operational flexibility was highly desirable for the operation of South Acton Station which is the origin of four inbound trips per day. Town of Acton officials and citizens objected to this original design concept for three reasons. Their concerns were that (1) the new concept did not allow access from both sides of the station as had traditionally been available, (2) the ramp system designed in accordance with the requirements of the accessibility standards seemed too long for easy access, and (3) the size of the ramp system was perceived as being out of scale with its South Acton Village surroundings.

In the spring of 2009 the Town proposed an alternate station layout which was comprised of two side platforms rather than a single center island platform. The two side platform configuration allowed for access to the station from both sides and also included an elevator and stairway set

on each of the platforms. The elevators and stairways lead to an overhead pedestrian bridge over the tracks to connect the two platforms. With this configuration, long ramps would no longer be required.

After much discussion between the Town Officials and the Authority, the Town's proposal for a two side platform configuration that included the use of elevators was accepted by the Authority for two reasons. The first reason was that additional double tracking was added to the project with Federal Stimulus Program funding which resulted in required improvements to Littleton Station. Littleton Station, being the next station stop outbound from South Acton Station, proved to be an acceptable location for a center island platform and access ramp system which will allow for the origination of inbound trips from the center island platform at Littleton Station in the future with limited changes in the system schedule. The second reason was that the Town of Acton agreed to accept responsibility for the maintenance of the elevators. The Authority was concerned about the installation of elevators since they have had nothing but bad experiences with elevator maintenance programs at other commuter rail stations. Based on these two developments, the alternative station configuration proposed by the Town was accepted by the Authority and the two platform station layout was progressed to a conceptual design level, then a 30% design level which was presented to some of the members of the Town's Commuter Rail Committee during May 2010. The members present had no objection to the design concept and the Board of Selectmen issued a letter on June 2, 2010, saying that "The Town of Acton supports the proposed design and overall Fitchburg Commuter Rail Improvement project".

The project was then progressed to a 60% level of design and was submitted to MBTA during September 2010. At that time the Acton Historic District Commission (AHDC) took exception to some of the headhouse design details where they felt that the design should achieve compatibility with the Acton Historic District which is adjacent to the station site. The Massachusetts Historical Commission encouraged close cooperation on a local level to achieve this compatibility. A series of four meetings were held from February 2011 through April 2011 with the AHDC and the Train Station Advisory Committee. As a result of these meetings, design changes have been made that are reflected in the current drawings, specifications, and this report. The main focus of these design changes were at the two head houses - the structures at each platform which contain the elevators and the stairways.

C. The Elements of the Station: The program for South Acton Station includes two 800 foot long side platforms and a pedestrian bridge spanning between head houses on either side of the track way. Each head house contains lobby space, an elevator, and a stairway. The platforms are accessed via sloped walkways, ramps, and steps up from ground level. A large town-owned parking lot with a drop off area on the north side of the right of way will continue in use in the same manner it always has. A small Authority owned parking lot on the north side of the right of way off Railroad Street will undergo minor modifications and then continue in use. A new drop off area and an entrance walkway on the south side of the station at Maple Street will be included in the design.

D. The Contents of This Chapter: This report describes the major elements of the planned station improvements. An accompanying set of drawings shows the existing conditions at the station site and plans of the station improvements. This report, the drawings, the specifications, and the construction cost estimate will be reviewed by the Massachusetts Bay Transportation Authority and other affected parties and will be modified as necessary based on their input. The

design will then be developed to a 100% design level leading to a final design, bid period, and construction phase.

II - EXISTING CONDITIONS AT SOUTH ACTON STATION

A. Overview: Located in the Town of Acton in the area known as South Acton Village, this station is the most heavily patronized of the eighteen station stops along the Fitchburg Line. The station receives thirteen inbound trains that originate at Fitchburg Station and four trains that originate at South Acton Station itself. The average weekday inbound boardings at South Acton Station alone are about 885 based on the observations on February 28, 2008.

B. The Trackway: The right of way in the area of the new station is about 60 feet wide. This is sufficiently wide to accommodate two tracks and, in fact, did so earlier in the history of the line. The single track in the station platform area is located along the south side of the right of way. There is an at grade rail crossing at Martin Street which is about 1,000 feet to the west of the station area.

C. The Grade Crossing Warning System Equipment: The existing grade crossing warning system at Martin Street consists of an instrument house which controls the activation of the crossing gates, flashing lights, and bells. These devices will all be replaced as part of the double tracking part of the overall Fitchburg Line improvements work being performed by the operating railroad. This work should have little effect on the work at the new station. Coordination will take place during construction.

D. The Platform: The main features of the existing station are the platform and the drop off area. The platform is a low level bituminous concrete paved platform on the north side of the bi-directional track. The platform is about 400 feet long and ten feet wide. There are two bituminous concrete walkways connecting the drop off area to the platform. There is a bituminous concrete paved walkway that extends from the Railroad Street parking lot along the north side of the right of way to the platform area. Other features in the platform area are passenger shelters, bicycle racks, bicycle lockers, overhead lighting on wood poles, and both informational and advertising signs.

E. Adjoining Land Uses: The railroad right of way and adjoining properties as taken from Town Assessor's Map H2A are shown in the 90% design drawings set as the South Acton Station Right of Way and Property Plan. The property immediately to the south of the railroad right of way fronts on Maple Street. At the west end of the station area is a row of single family residences. The residences front on Maple Street and back up to the railroad right of way. Further to the east is the property owned by Gordon Richards, a concrete construction contractor. This property fronts on Maple Street and backs up to the right of way. Activities on this property are equipment storage, materials storage, parking, and office space. Further to the east is property of Montouri Realty Company which is cleared and undeveloped. This property fronts on Maple Street in the area where Maple Street slopes down from the Main Street Bridge. The property immediately to the north of the railroad right of way is accessed from Central Street and from Railroad Street. At the west end of the station area are two large Town of Acton owned parcels that are accessed from Central Street. The parcel furthest to the west is a large parcel consisting mainly of wetlands. Further to the east is the main station parking lot

which is owned and operated by the Town. This parking lot includes about two hundred parking spaces divided between permit parking and metered parking. There is a drop off lane and sidewalk that allows for direct access to the station platform. Areas to the east of the main parking area are mainly privately owned and are accessed from Railroad Street. At the base of Railroad Street near the railroad right of way are three townhouse style apartment buildings and two multi-family residential condominium complexes. The other land uses fronting on Main Street are small scale commercial operations. There is a trackside parking area east of the existing platform and within the MBTA's property line that has about twenty five parking spaces. This area is accessed from Railroad Street.

F. Automobile and Truck Traffic: Central Street to the north of the station area and Main Street to the east of the station area are both busy through roadways. The intersection of Central Street and Main Street has difficult geometry. Intersection improvements at these locations are not included in the project. Railroad Street is a short, steep, dead end street that intersects Main Street. The intersection is signalized which allows access out onto heavily travelled Main Street. Maple Street to the south of the station area is a lightly used, one way residential street.

G. Bicycle and Pedestrian Traffic: The station is a major destination for pedestrians and bicycle riders. There are concrete sidewalks along Railroad Street and there is a bituminous concrete walkway along the north side of the right of way from Railroad Street to the station platform. There is a bituminous concrete walkway along the perimeter of the main parking area that leads to the station platform from Central Street. These passageways are all well used for pedestrian and bicycle access. Bicycle racks and bicycle lockers are located adjacent to the platform. The Town is planning an off road bicycle path that will terminate at Maple Street in the area of the station.

H. Natural Resources: The Flood Insurance Rate Maps of the area show that there are no flood plains in the station area. The large wetlands area immediately to the west of the main parking lot is part of a floodplain but is below the level of the railroad right of way and the station site. The culvert that crosses under the railroad right of way about 300 feet west of the station site is part of the floodway that connects this wetland to the Fort Pond Brook floodway to the south of Maple Street. The design of the station has no impact on floodplains. The station area does not include any Priority Habitats of Rare Species, Estimated Habitats for Rare Wildlife, or Certified Vernal Pools. Fort Pond Brook and its tributaries run through the South Acton Village area but there are no perennial streams or riverfront resources in the station area. Regulated wetland resources in the station area have been delineated and characterized during recent growing seasons. Flags have been placed to demark the wetland boundaries and these flags have been located by ground survey. There is a large wetlands area to the west of the main parking lot but outside of the railroad right of way. There are two small wetlands pockets immediately beyond the limits of the railroad right of way. One is on the north side of the railroad right of way on the east side of the main parking area; one is on the south side of the railroad right of way on the Gordon Richards property. Areas within 100 feet of these wetlands resources are considered to be in a buffer zone for these resources. Elements of the station fall within the buffer zone so the protection of the adjacent wetland resources will be a consideration in the design and construction of the station. A Notice of Intent has been filed with the Acton Conservation Commission and the hearing has been scheduled for September 7, 2011.

I. Subsurface Conditions: A program of subsurface investigation consisting of five borings along and adjacent to the right of way was carried out during November 2008. Subsurface conditions in the project area consist of a layer of fill over medium dense sand deposits over relatively shallow bedrock. Bedrock was encountered at depths ranging from 13 feet to 31 feet below ground surface. Groundwater is within five feet of the top of ballast.

J. Utilities Crossing the Railroad Right of Way: There are several underground utilities that cross the tracks within the limits of the station area. A rather deep, sleeved 8 inch sewer line originating from a manhole at the base of Railroad Street runs perpendicular under the tracks to a manhole on the Montouri property, about 30 feet in from the edge of Maple Street. There is currently a 10 foot wide easement that straddles this sewer line that will be preserved and maintained in place throughout construction and beyond. The manhole is located outside of any permanent station work. The top riser section of this sewer manhole on the Maple Street side of the tracks is slightly raised above grade and will need to be protected during construction. There is also a 15 inch diameter corrugated metal storm drainage pipe that crosses under the tracks about half way between the Railroad Street parking lot and the main parking lot. On the north side of the tracks this 15 inch pipe ties into a drain manhole that will be relocated slightly north to make way for the proposed outbound platform. The pipe will be extended approximately 12 feet to the relocated manhole. This same manhole also accepts two other drainage pipes that parallel the tracks. Both these pipes will be repositioned to tie back into the relocated manhole. The 15 inch pipe crossing the track transitions into a concrete pipe on the south side and traverses the Gordon Richards property and eventually drops into a ditch along Maple Street. No work is planned for this 15 inch pipe on the south side. There is one power line crossing over the tracks within the station area near the Main Street Bridge. This overhead power line is high and connects to poles far outside the limits of construction.

K. Utilities in Railroad Street: There are numerous underground utilities located within the right of way on Railroad Street adjacent to the proposed station construction area. These utility lines include gas, water, sewer, and storm drainage. There is a Railroad Street water line that will be tapped into to connect water service to the platforms. This work will cause temporary disturbances in the immediate area of work.

III – THE STATION LAYOUT

A. Overview: The constraints to the proposed station layout are to limit property taking or easements beyond the right of way and to limit interference with adjacent land uses. These constraints can be met to a great extent because the majority of the station elements can be accommodated within the existing right of way.

B. The Trackway and the Platforms: The proposed double track layout through the station area involves centering the two tracks within the right of way to allow space within the right of way for a platform on either side of the tracks. Starting from the east side of the Main Street Bridge going west, the tracks curve under the bridge then straighten out in the area of the existing platform. The new high level platforms are located directly opposite each other somewhat to the east of the existing platform. Ideally the platforms would be located completely within a tangent section of the track alignment and away from a curve. In this case, it was found advisable to move the platform somewhat to the east along the tracks and partially out of the

tangent section to avoid having the platform in close proximity to the backyards of single family residences fronting on Maple Street that border the right of way on the south side. As a result, the far eastern ends of both platforms are within the curves. The clearance between the track centerline and the platform edge must be adjusted slightly in these areas to accommodate the train cars as they negotiate the curve. On the north side of the right of way, the connector walkway from Railroad Street to the main station parking area will be eliminated due to space constraints. The new outbound platform will occupy the area of the right of way now occupied by the walkway. Pedestrian traffic that formerly used the connector walkway will need to use the access ramps and the outbound platform as a passageway.

C. The Pedestrian Bridge, the Elevators, the Stairways, and the Lobby Area: The lobby area, elevators, and stairways, must be set back beyond the back edge of the platform so that the full platform width is available along the entire length of the platform. As a result, the lobby area, elevators, and stairway extend beyond the back edge of the platforms and slightly beyond the limits of the right of way. On the north side at the existing Town of Acton parking lot and drop off area, and on the south side at the Gordon Richards property the lobby areas, elevators, and stairways extend into the respective properties requiring a property acquisition by the MBTA. The main goal for the location of the lobby area, elevator, and stairway, on the north side of the station, is to establish a convenient access location with regard to the parking lot and the drop off area. The location of one end of the pedestrian bridge on the north side necessarily sets the location of the other end of the pedestrian bridge on the south side. The resultant location on the south side works without any wetlands impacts or any interference with existing structures on the Gordon Richards property.

D. Access Points: There are three access points to the station platforms. The main access point is at the main parking lot and drop off area on the north side of the right of way and the west end of the platform. This is envisioned as the main area of activity and the main visual focus of the station. The drop off area on the north side of the right of way within the main parking lot will continue to function as it always has but at a location slightly more to the west. The vertical curb line will be replaced with an accessible slope with a tactile warning strip and a row of bollards. Station users dropped off here can proceed directly to the main station entrance. A second entrance point is located on the north side of the right of way at the east end of the platform. This entrance point will provide access for those who use the Railroad Street parking lot and pedestrians approaching the station from the east. The third entrance point is located on the south side of the right of way at the east end. This access point will provide for pedestrians approaching the station from the south along Maple Street. The drop off area on the south side of the station off Maple Street will be a new feature. Station users dropped off along Maple Street can proceed directly to the east end of the inbound platform.

E. Parking Lots: The configuration of the main parking lot on the north side of the right of way will experience limited permanent changes. The location of accessible parking spaces will be changed to improve their proximity to the new main station entrance. The trackside parking lot off Railroad Street will be affected by the east end of the new inbound platform and the parking spaces will have to be reconfigured. All the satellite parking areas that serve the station will remain unchanged.

F. Property Acquisitions and Easements: The vast majority of the station facilities will be located within the existing railroad right of way. The elevator, stairway, and lobby area on the south side will be located beyond the south edge of the platform and will extend beyond the right of way on the south side on the adjacent property of Gordon Richards. A permanent acquisition will be required here for these permanent structures. There will also be a temporary construction easement extending in from Maple Street in this area to support the construction process (access and laydown). The elevator, stairway, and lobby area on the north side will be located beyond the north edge of the platform and will extend beyond the right of way on the north side onto the adjacent property of the Town of Acton parking area. A permanent acquisition will be required here to provide for these permanent structures. There will also be a temporary construction easement encompassing part of the parking lot to support the construction process (access, laydown, and parking area modifications). The walkway to the inbound platform from Maple Street and the drop off area on Maple Street will be located on the property of Montouri Realty Company and a part of the Commonwealth of Massachusetts parcel located adjacent to the Main Street Bridge. The entire Montouri Realty Company parcel will be acquired since it would be unreasonable to take a portion of it and leave an unusable remnant parcel. The Montouri Realty Company parcel and the part of the Commonwealth of Massachusetts parcel will be used during the construction period to provide access off Maple Street and a support area for construction activity. It will also provide temporary construction and permanent maintenance access to the proposed signal equipment in the vicinity of the Main Street Bridge that will be constructed under a separate MBCR PI agreement as part of the overall Fitchburg Line Improvement project.

IV – SOUTH ACTON STATION SYSTEMS AND ELEMENTS

A. Overview: The station systems and elements are described under the following major headings: The Trackway, The Platforms, The Pedestrian Bridge, Elevators, Stairways, Ramps and Sloped Walkways, Lighting, and Other Station Elements.

B. The Trackway: The trackway will consist of an outbound track and an inbound track. Each track consists of rails and ties set within a layer of ballast and supported by a compacted sub-grade. The area of the new tracks will be prepared with underdrains, the subgrade layer, and an initial layer of ballast. The rail, ties, and final layer of ballast will be furnished and installed by the Operating Railroad through force account work.

C. The Platforms

1. Dimensional Requirements: The floor level of the station platforms will be four feet above the top of rail so that station users can walk directly from the platform level to the floor level of a railroad passenger car. The platforms will be 800 feet long to accommodate nine 85 foot long passenger cars with some allowance for undershoot or overshoot when the train comes to a stop at the station. The platforms will each be 12 feet wide. This width includes a two foot wide tactile warning strip along the track side of the platforms. The set back of the platform edge from the centerline of the track is 5 feet 7 inches on tangent track.

2. Foundations: The foundation type chosen for the support locations along the platforms is a set of drilled mini-piles with a cast in place concrete pile cap. The drilled mini-pile approach was chosen because it can be used in the area of an active track without the need for excavation

and excavation support. The platform is being constructed directly adjacent to a track that will be in continuous service. Being able to proceed with foundation construction without the cost of excavation support and concern for undermining the track is a significant benefit. This is an approach that has been used successfully for other station platform projects. Because of the density of the soil in the area, seismic issues can be accounted for in the design of the platform foundations.

3. Surfaces: The platforms will be constructed of 32 foot long precast concrete double tee sections. This is an approach that has been used successfully for other high level station platform projects. The trackside edges of the platform will have a two-foot wide tactile warning strip and a timber edge strip; the back edges of the platform will have a continuous protective guard fence. The area of each of the platforms exclusive of the tactile warning strip will be about 8,000 square feet. Allowing seven square feet for each station user gives a theoretical capacity for each platform of about 1,100 station users.

4. Canopies: The platform will have canopies at the access points. The canopies will be made of pre-finished sheet metal with painted galvanized steel supports. The design is reminiscent of historic railroad facilities, is practical and economical, and can be part of an overall station design approach in which the pedestrian bridge, ramps, and canopies all have complementary roof designs. The roofs and canopies – although only a relatively small part of the overall station structure – will have a major effect on establishing the unique appearance and character of the station. Three troublesome issues to be dealt with in canopy design are runoff, snow slides, and bird roosting. Runoff will be handled by oversize gutters along the eave line of the canopy. The gutter will direct runoff to downspouts and splash blocks beneath the platforms. Snow slides will be prevented by snow guards and snow tabs on the roof surface, and the oversize gutters. Bird roosting will be reduced because the support of the canopy system will be tight to the underside of the canopy roof surface and will provide limited horizontal surfaces for roosting.

D. The Pedestrian Bridge

1. Dimensional Requirements: The pedestrian bridge crosses over both tracks; it must be at a level that allows sufficient clearance for both commuter and freight trains to pass below. The Massachusetts General Laws require a vertical clearance of 22 feet 6 inches above the top of rail; however, MBTA Railroad Operations has agreed that this clearance will not be necessary at this location. The vertical clearance to be used will be in accordance with MBTA Standard Drawing No. 1016, which requires a minimum vertical clearance of 20 feet 8 inches for new overhead structures on the Fitchburg Rail Line between Boston and the Willows Interlocking in Ayer. A waiver from the Department of Public Utilities is being sought by the Authority. In the horizontal direction, all supports for the pedestrian bridge will be set back from the track to provide a horizontal clearance of 17 feet 7 inches from the centerline of the nearest track which is greater than the 8 foot 6 inch minimum required.

2. The Structure: The pedestrian bridge will span over the two tracks and the two platforms. The clear span will be about 50 feet. The bridge will consist of a single through truss structure spanning between support columns on either side. The truss structure will require only a limited depth of structure for the bottom chord. The limited depth of structure is advantageous in that the floor elevation is only slightly above the bottom of the structure which minimizes the length

of stair runs. The top chord and the side chords of the truss will be used to provide support for the roof system and the side paneling system.

3. Other Features: The pedestrian bridge will have a concrete floor surface, a roof, and side panels. Its width is great enough to provide a generous clearance between the interior side handrails and a space for benches. The roof system will be a pre-finished sheet metal system complementary to that provided for the canopies. There will be ventilation openings at the top and at the bottom of the side panels and at the roof ends to help dissipate heat during the summer. The side panels, consisting of fixed steel frame windows with stainless steel fabric screening on the interior side, will function both for station user comfort and to protect the concrete floor from the weather. If only limited amounts of snow and ice accumulate on the floor of the bridge, applications of salt can also be limited. Salt applications are often necessary for station user safety but such applications are harmful to the structure.

E. Elevators, Stairways, Ramps, and Sloped Walkways

1. **The Elevators:** The elevator at the outbound platform will extend from the lobby floor level at the main entrance up to the floor level of the pedestrian bridge. The elevator at the inbound platform will extend from the platform level to the pedestrian bridge level. The elevator shaft will extend up beyond the highest floor level to accommodate the height of the elevator cab. The elevator cabs will be of sufficient size to accommodate a stretcher. The elevators will be of the machine-room-less type, having almost all of its components within the shaftway containing the cab with very limited requirements for space outside of the shaft itself. The design of the elevators is based on the latest version of the MBTA's Elevator Design Standards Manual. Elevator cabs and shafts will be glazed.
2. **The Stairways:** The stairways will have precast concrete treads. There will be periodic landings and continuous side railings.
3. **The Head Houses:** The head houses will provide weather protection for the elevators, the stairways, and the lobby areas. These will be steel framed structures. The roof system will be a pre-formed sheet metal system complementary to that provided for the canopies and the pedestrian bridge. The floors will be concrete slabs on grade; the side panels will be a combination of preformed wall panels, glazed windows, and metal grilles. Openings are located alongside lobby areas, stairs, and corridors and provide a level of visibility that will limit any sense of isolation and resultant insecurity. Screened openings are provided for ventilation in areas where roof overhang or canopies will provide reasonable protection against wind-blown rain or snow. Glazing is located along side walkway areas and stairways where weather protection is needed.
4. **Ramps and Sloped Walkways:** The ramps and sloped walkways are at-grade concrete surfaces constructed on a gravel base. Ramps are typically at a maximum grade of 7.5% (1:13) and require periodic landings and a roof cover; sloped walkways are typically at a maximum grade of 4.5% (1:22) and do not require periodic landings or a roof.

F. Drop Off Areas: The drop off areas involve a sidewalk and a drop off lane. The sidewalk will be accessible and will be bordered with a tactile surface and a row of bollards.

G. Lighting

1. **Electric Service:** The electric service for the station will require a connection to the local electric utility system, a transformer specified and located in cooperation with the local electric utility, and an underground conduit and cable connection to electrical panels at the station lobby area. The electric use will be primarily for lighting along the platform, under the canopies, within the head houses, along pedestrian pathways, for power outlets to support maintenance activities, for the elevator, for the communications systems, and for future fare collection equipment as required.
2. **Light Fixture Characteristics:** Light fixtures must be able to function under extreme weather conditions, be vandal resistant, and require limited maintenance. The products specified meet the MBTA's needs for ease of maintenance and replacement. Generally accepted product manufacturers are Kim, Gardco, Lithonia, Insight, or approved equals.
3. **Platform Lighting:** There will be a series of pole mounted light fixtures along the back edge of the platforms. Lighting levels for the open platform will be from 2 to 5 average maintained foot candles. For under the canopy, lighting levels will be 5 to 10 average maintained foot candles.
4. **Pedestrian Bridge, Stairway, and Lobby Lighting:** There will be wall and ceiling mounted lighting fixtures located periodically along the bridge and stairways and in the lobby areas. Lighting levels will be 5 to 10 average maintained foot candles.
5. **Walkway, Parking Lot, and Other Site Lighting:** The lighting along sidewalks will be 5 average maintained foot candles. The lighting in parking lots will be from 1 to 2 average maintained foot candles. Pole mounted Archetype fixtures will be used.

H Other Station Elements

1. **Stormwater Management:** The stormwater management approach for the station is to provide frequent opportunities for infiltration of runoff into the right of way. The platforms will drain away from the trackway and runoff will fall directly to the surfaces below. The canopies, pedestrian bridge roof, and stairway and elevator shaft roofs will drain through gutters, downspouts, and splash blocks down to the ballast lined trackway or to the surfaces beneath and beside the platform.
2. **Water Service:** The water service for the station consists of a yard hydrant on each platform. This is a freeze proof water supply that will be used for platform wash down and other maintenance activities.
3. **Communications Systems:** The station communications systems will be integrated into the MBTA's systemwide Commuter Rail communications system infrastructure. The design will provide for communications system elements that are presently MBTA standard for commuter rail stations such as variable message signs with conversion of text to speech at the sign. Equipment and communications provisions for Closed Circuit Television and Automated Fare Collection systems are not included at this time. Communications control equipment will be located inside a secure communications space. The communications space will be sized to accommodate an equipment rack and provide working space similar to that presently used at other commuter rail stations. A data communications connection to the existing MBTA Commuter Rail communications system will be provided by the

operating railroad. Provision will be made for a connection to the Town's existing fiber optic line that terminates at the station drop off area.

4. **Fare Collection System:** The future plans for a Commuter Rail Fare Collection System are uncertain. In anticipation of a "Proof of Payment" system which may require media validating equipment to be mounted on the platform canopy structures approximately 50 to 75 feet apart, the design will include additional conduit from the Communications room to the platform to accommodate wiring for such a future fare collection system.
5. **Benches, Windscreens, and Signage:** The platform will have a series of assemblies consisting of benches, windscreens, and signs located periodically along its length. There will be other freestanding benches throughout the site.
6. **Storage Containers:** Storage containers are needed for the storage of salt and snow blowers. One storage container will be located on each side of the right of way. The storage containers will be located so that bags of salt can be unloaded from a truck and readily moved to the storage shed and snow blowers can readily be moved to the platforms.
7. **Landscaping:** The majority of the station site will not be vegetated and will consist of ballasted trackways and graded areas below and around the platforms. All the un-vegetated areas will be maintained as un-vegetated areas to ensure their continued structural integrity or function. Landscaped areas will be limited to areas at the Railroad Street entrance, at the Maple Street entrance, and behind the platforms. Planted elements will include low maintenance trees and low lying shrubs.

V – PROJECT DEVELOPMENT ISSUES

A. Property Acquisition Requirements: Development of the station requires acquisition of some areas beyond the existing railroad right of way. Negotiations with the property owners have been initiated.

B. Hazardous Materials: Due diligence in investigation for the presence of hazardous materials is required as part of the property acquisition process. The past uses of the properties to be acquired and the history of incidents in the area have been investigated. A Phase I site assessment has been completed for the Montouri property. No issues have arisen which will interfere with the property acquisition process.

C. Wetlands Permitting Issues: A Massachusetts Wetlands Protection Act Order of Conditions is needed from the Acton Conservation Commission. A Notice of Intent has been filed with the Commission and a hearing date has been set for September 7, 2011.

D. Utilities Coordination: The utility needs for the station are limited to water supply and electric service. The water supply is planned to be obtained from the water main in Railroad Street owned by the Acton Water District. The electric service needs of the station have been reviewed with the local electric utility. There are overhead electric power lines in the Maple Street area which will be used to supply the power requirements of the station.

E. Elevator Operations and Maintenance Agreement: An elevator operation and maintenance Memorandum of Understanding (MOU) is being developed between the MBTA and the Town

of Acton to provide responsibility for the elevators to the Town once the station goes into operation.

VI– NEXT STEPS

A. MBTA Review: This report and the accompanying estimate, drawings, and specification sections will be reviewed by the various MBTA departments to determine if the design is satisfactory and compatible with commuter rail operations and maintenance standards and procedures. Modifications to the design will be made based on the review comments received.

B. Town of Acton Coordination: The availability of the 90% submittal provides the opportunity for continued discussions with the Acton Historic District Commission and the South Acton Train Station Advisory Committee. There will be continued discussions about station appearance. This will also be an appropriate time to renew discussions about station operations and the construction process with the Town's Public Safety Officials.

C. Continuation of the Property Acquisition Process: Continuing steps are being taken in the property acquisition process.

D. Further Submittals and Reviews: The design development process will continue on to the 100% submittal. Following the 100% design submittal will be the final design, the issuing of contract documents, a bidding process, and the start of construction.

CHAPTER 2

South Acton Station Changes

OPTIMIZE | Prioritize • Package • Perform

HNTB

I. CHANGES FROM THE 60% DESIGN SUBMITTAL

A. Overview: The design revisions listed below are based on discussions from meetings held with representatives of the MBTA Railroad Operations Group and the MBTA Design Group on August 17, 2011 the MBTA Project Development Group on July 28, 2011 and the Acton Historic District Commission (AHDC) and the South Acton Train Station Advisory Committee (SATAC) on July 29, 2011. These revisions, that have taken place since the 60% design submittal include refinements and minor changes to the platforms, entryways, headhouses, electrical systems parking areas and site work as follows.

- ¶ Reconfiguration of the south side Maple Street station entrance area and amenities.
- ¶ Increase in the width of the walkways and the canopy structure on the platform.
- ¶ Addition of several drainage structures and relocation of the stormwater bioretention area.
- ¶ Relocation of the bicycle storage area to be closer to the drop off area including new concrete pad.
- ¶ Change in electrical service location from the north side (Railroad St.) to the south side (Maple St.) Addition of utility poles (NStar to install), Change in transformer location to include a concrete pad and duct bank for secondary power feed to headhouse electrical room in the south headhouse.
- ¶ Refinement of the layout total and number of the accessible parking spaces in the Central Street parking lot.
- ¶ Reduction of curb top bollards at the plaza near the north headhouse entryway/drop off area.
- ¶ Addition of platform access ramps to accommodate large motorized snow removal equipment.
- ¶ Change in the configuration of the Gordon Richards property easement for contractor's use during pedestrian walkway build and installation work.

The various revisions and other refinements that have taken place since the 60% design are described in more detail below.

B. Project Development Group Meeting: The following describes the miscellaneous design changes or decisions resulting from a meeting held with the MBTA Project Development Group on July 28, 2011.

1. Purpose of the Meeting: This meeting provided an opportunity for all MBTA departments to be briefed on the design and to raise issues or any concerns they may have with the ongoing South Acton Station design. A set of design drawings and other project related material had been distributed to all MBTA departments by the MBTA Project Manager four weeks in advance of this meeting.

2. Overview: HNTB provided an overview of the South Acton station project as it related to the overall Fitchburg Line improvements project which involves track improvements, signal system improvements, bridge rehabilitation, grade crossing improvements, and communications system improvements over the entire length of the line. HNTB explained how the South Acton station design had evolved from a center island platform configuration with ramps to a side platform configuration with elevators and how the details of the project have undergone many refinements.

3. Elevator Tower Design: The design team presented the Architectural design of the station explaining how the design had evolved based on the Town's wishes for multiple routes of access and visual compatibility with the nearby South Acton Historic District. Part of the refinement of the design involved developing one elevator tower as a prominent visual feature and minimizing the visual presence of the second tower. The towers will now have flat roofs and vents on all sides. It was pointed out that true vents will be used only on the sides away from the predominant wind direction; this was acceptable to the MBTA group given their concerns about water entering the elevator shaft.

4. Communications and Storage Space: The plan for having a Town Communications Room and the Electrical Room in the Outbound Headhouse and having the MBTA Communications Room in the Inbound Headhouse was discussed. Also discussed were the plans for two storage containers for right of way maintenance located on either side of the station - one near the entrance from the Main Parking Lot and one near the entrance from Maple Street. No one voiced any objections to these arrangements.

5. Elevator Maintenance Agreement: Discussions were held with regards to the MBTA evolving elevator maintenance agreement with the Town of Acton. The MBTA inquired if the agreement was similar to the unsuccessful arrangement that was made in the past with the Town of Framingham. MBTA Project Management assured the PDG attendees that the agreement with the Town of Acton was being prepared by the MBTA Legal Department and that they were aware of problems in the past. It was pointed out that there will be no accessible route between the platforms without the elevators in operation and therefore it is imperative that the elevators are consistently in working condition.

6. Accessible Routes: The MBTA accessibility representative requested an explanation of the accessible routes of egress from the station. The Architecht reviewed the egress routes from the east end of the Inbound Platform onto Maple Street, from the west end of the Inbound Platform onto the right of way, from the east end of the Outbound Platform onto Railroad Avenue, and from the west end of the Outbound Platform into the Main Parking Lot. The elevators are not part of any accessible egress route.

7. Future Ticket Vending Machines: The MBTA Project Manager explained that Ticket Vending Machines are not part of the project but space will be allotted for providing such machines in the future at locations at the Maple Street Entrance, the Inbound Headhouse, and at the Outbound Headhouse. No one had any objections to the proposed locations, however the MBTA accessibly representative cautioned that sufficient headroom must be provided in these locations.

8. Access to Elevator Machine Room: The Architect explained that there originally was a plan to enter the access door to the elevator machine room at the Inbound Platform at ground level. Because there was no way to approach this door from the ground level due to the narrow right of way, there would have been a need for a gate in the back railing of the platform to allow someone to get down to ground level. Since this is unadvisable, the entry will now be moved up to platform level and the door will now be approached over the platform. The MBTA Project Manager reinforced that this was the appropriate approach since having a gate in the railing would be a security concern. No one had any objection to this approach.

9. Second Hand Rail: The Architect explained that recent code guidance suggests a second hand rail at a level lower than the normal hand rail level in facilities that are frequented by children. There is some question as to whether a commuter rail station would be considered such a facility. The MBTA's accessibility representative responded that the MBTA is now requesting that the second handrail be provided at all their station facilities.

10. Bicycle Facilities: The design engineer described the site layout with entrances from Maple Street, Railroad Street, and the Main Parking Lot giving special emphasis to the bicycle facilities which are of great importance at this station. The Project Manager explained that the MBTA is taking responsibility for providing bicycle racks as at all stations but will also be providing foundation pads for bicycle lockers which the Town will be responsible for relocating and maintaining.

11. Construction Phasing: The design engineer described the suggested construction phasing plan which involves working from the Maple Street side of the station to construct a single platform station and then working from the Railroad Street side of the station to construct the other platform once the single platform station is in operation. When work is taking place on the Maple Street side, station users from the Maple Street side must cross the Main Street Bridge and enter at Railroad Street; when work is taking place on the Railroad Street side, station users from the Railroad Street side must cross the Main Street Bridge and enter the station at Maple Street.

12. Pedestrian Routes During Construction: Regarding pedestrian routes during construction the MBTA's Accessibility representative inquired if the routes over the Main Street Bridge, Maple Street, and Railroad Street were accessible; the response was that the route involved all public roadways with sidewalks and that these paths had steep sections but that they followed the natural grades of the area.

13. Availability of Elevators: The MBTA accessibility representative inquired if the plan was to have the elevators available when the single platform station is opened. The Engineer confirmed that this was the plan. The interim single platform station will be fully accessible by the elevators while the second platform is being built.

C. Town of Acton Meeting: The following describes the miscellaneous design changes or decisions resulting from the meeting with the Town of Acton on July 29, 2011.

1. Communication Room: A Communications Room for the Town will be provided within the station. The committee members had no objection to locating the Town's Communication Room within the Outbound Headhouse.

2. Back Railing: Three options have been explored for the railing along the back of the platforms. These are (1) the traditional picket style, (2) frames of screening that would be similar to the screening used in the openings in the headhouses, and (3) punched metal panels similar to those used for windscreens along the platforms. The committee members preferred the picket style railing; they would like it painted black so that it will fade into the background.

3. Framing for Glazing: Both a steel frame system and an aluminum storefront system have been considered for the framing of glazing panels. The costs were found to be

roughly comparable so a decision has been made to go entirely with steel framing. The committee members concurred that steel framing is the more elegant choice.

4. Colors: The color choices are a copper green for roof surfaces, dark grey for wall paneling, and black for structural steel, miscellaneous metals, railings, fencing, sign frames, and storage boxes. The committee members had no objection to this general color scheme. They would like to be provided with color chips to participate in the selection of specific colors.

5. Gutters and Downspouts: Committee members suggested that gutters be eliminated to the extent possible to reduce visual clutter and to avoid an ongoing maintenance requirement. The gutters along the sides of the pedestrian bridge were thought to be a likely candidate for elimination. Some investigation will be done about the advisability of having runoff coming down onto the train set below. The flat roof on the towers will be a metal roof with a sloping insulation layer. The roof will drain to an exterior scupper box located at a break in the perimeter parapet. A down spout must run down the face of the tower to discharge onto the roof below since no drainage line can run internally down through the elevator shaft. The committee members recognized this need for an exterior down spout.

6. Bike Lockers and Racks: The MBTA agreed to provide a concrete pad sufficient to house an equivalent number of bike lockers and racks on the south side of the station as presently exists on the north side. They requested feedback from the Town as to comments related to the new arrangement and locations of these facilities. The MBTA will construct the concrete pad and provide bike racks, within reason, but has no plans to provide lockers. The Town agreed that they will own and operating the new lockers within the Town existing rental program. For the bike racks, the MBTA uses a ribbon style rack system and they plan to install it at the lot.

7. Other Site Considerations: The MBTA is still working out issues related to the final design elements of the facility and placement of the south-side bike lockers and racks, the Conex storage containers, potential ticket vending machine locations, fencing styles, sign locations, utilities, and other issues. The design regarding these issues will be advanced between 90% and 100% design.

8. Additional Landscaping/Site Improvements: The MBTA has a very limited budget for landscaping and any other site improvements that the Town may propose. Because the MBTA has no more funds available for additional items the thought was that the working group would approach the Board of Selectmen with ideas and a projected cost estimate to see if the Town would be willing to contribute the funds. The MBTA is willing to entertain enhancements to the project that are paid for by the Town as long as they don't negatively impact the Station construction schedule or MBTA operations or otherwise complicate the project.

D. Railroad Operations and Design Group Meeting: The following describes the miscellaneous design changes or decisions resulting from the meeting with Railroad Operations and the MBTA Design Group on August 17th

1. Elevator Maintenance Agreement: Railroad Operations inquired if the agreement with the Town with regard to elevator maintenance included any cleaning responsibilities.

MBTA Project Manager replied that it did not; the Town will only be responsible for a contract for elevator maintenance. Railroad Operations had a concern with the elevator maintenance agreement whereas if the Town of Acton does not choose to continue the elevator maintenance contract, the MBTA has no recourse but to maintain the elevators themselves in order to keep the station in operation. An elevator maintenance contract in a location remote from the rest of the system and requiring twenty four hour response imposes a tremendous financial burden. MBTA Project Manager pointed out that the MBTA legal Department is well aware of the situation that occurred in Framingham and will take it into account to the extent possible in developing the agreement with the Town of Acton. Since the Town of Acton has a stream of revenue from station parking operation that can be devoted to the maintenance of the elevators, it seems less likely that the Town will back away from the agreement.

2. Access for Snow Removal Equipment: Regarding platform access for snow removal equipment Railroad Operations requested that equipment access ramps be added to the ends of the platforms. It is preferable that snow removal equipment have an access route that is separate from the access routes for station users especially in this case where the entrance is enclosed. It was determined that an access ramp at the east end of the inbound platform and at the west end of the outbound platform would work best. Equipment could move directly from the maintenance storage box areas up onto the platform without passing through any other areas of the station. Snow removal operations could begin immediately at the far end of the platforms. These ramps would not be used at all for station user access or egress and would not be considered in the safe egress plan for the station. Ramps of this type have been used elsewhere on the system and there is no confusion with pedestrian access ramps as long as the equipment access ramps are gated and signed. Lynn Station was given as an example of an acceptable access ramp for equipment access. Also discussed was provision for truck access for MBCR vehicles to pull close to the storage box on the west end of the outbound platform for offloading materials.

3. Snow Removal at the Pedestrian Plaza: Regarding snow removal at the pedestrian plaza at the Central Street entrance, as a result of interaction with the Town, a large pedestrian plaza has been developed at the main entrance way to the inbound headhouse. The MBTA will acquire the property immediately around the headhouse but the pedestrian plaza will be built on Town property under a temporary construction easement. The Town will continue to plow the parking lot as they always have. It is assumed that the MBTA will be responsible for clearing snow from the pedestrian plaza even though this area is on Town property. Railroad Operations agreed that the MBTA should be responsible for clearing the pedestrian plaza since this clearing must be done with some urgency to keep the station operational. They questioned, however, the liability implications if a worker or a station user were to be injured in this area. The MBTA Project Manager thought that this issue would have to be covered in the agreement with the Town or through the MBTA taking a permanent easement at the pedestrian plaza area.

4. Bollards: A line of bollards will be provided along the edge of the pedestrian plaza facing the parking lot. The initial plan was to be very generous in the use of bollards, placing them even in areas where there was a vertical curb. Railroad Operations stated

that bollards are an impediment to snow removal and suggested that they be limited and used only where they are clearly required for safety purposes.

5. Plowing: The drop off area at the Maple Street entrance is the only area of the station where the MBTA would require snow plowing for maintenance. The main parking lot is in Town ownership and will be plowed by the Town as it always has been. The Railroad Street parking area is leased from the MBTA by the Town and the Town is responsible for plowing. All other areas of the station will be maintained using snow blowers. Railroad Operations agreed that it would be reasonable to request that the Town plow the drop off area as part of their plowing operation along Maple Street. The MBTA Project Manager felt that an arrangement could be worked out with the Town as part of an overall agreement. Since the Town's plow would be working on MBTA property, there would have to be some recognition of liability issues in case someone was injured in this area.

6. Gutter for the Pedestrian Bridge: Gutters are proposed for the pedestrian bridge to keep runoff from cascading down from the sheet metal roof onto the train equipment below. There would be downspouts to splash blocks in the area below the platform. The Town has suggested removing the gutters along the pedestrian bridge as a means of removing visual clutter and eliminating a potential maintenance nuisance. MBTA Railroad Operations suggested considering a rain dispersal system as a compromise.

7. Control of Platform Elevations: The construction phasing plan for the station requires that the inbound platform be built while the existing platform remains in operation. The existing track will then be moved over to align with the new inbound platform. The construction operation will then shift over to the other side of the right of way and the outbound platform will be constructed in the remaining area of the right of way. The second track will then be constructed to align with the outbound platform. MBTA Railroad Operations pointed out that it is more usual to construct the platform to match the track that to construct the track to match the platform. He cautioned that very careful control of the elevations of the new platforms will be necessary so that the tracks can be aligned with the platforms successfully.