

## MONTHLY MONITORING REPORT

**World Trade Center Port Authority Trans-Hudson Terminal**  
**PORT AUTHORITY OF NEW YORK AND NEW JERSEY**  
New York, New York

*October 2014*



PMOC Contract Number: DTFT60-09-D-00008

Task Order Number: T09002, Project Number: RV-43-0001, Work Order No. 005

O.P.s Reference: 01, 02, 25

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PMOC / Start of Assignment: David Evans and Associates, Inc. / October 2008

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*Cover: One of the eight emergency diesel generator sets in the Tower 3 podium that will provide power to vital WTC PATH Hub project systems in the event of a loss of primary power.*

## **DISCLAIMER**

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except the FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through FTA's Lower Manhattan Recovery program, the FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a sponsor may develop for project execution.

Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the month and/or previous months.

## REPORT FORMAT AND FOCUS

This monthly report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60-09-D-00008, Task Order No. 002. Its purpose is to provide information and data to assist the FTA in continually monitoring the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether or not the grantee continues to receive federal funds for project development.

This report covers the project management activities on the Permanent World Trade Center (WTC) Port Authority Trans-Hudson (PATH) Terminal (Hub) project, conducted by the Port Authority of New York and New Jersey (PANYNJ) as grantee and funded by the FTA's Lower Manhattan Recovery Office (LMRO).

## EXECUTIVE SUMMARY

*During October, the WTC PATH Hub project focused on two self-imposed goals. The top priority was the securing of a Temporary Permit to Occupy/Use (TPTO) the PATH Hub back-of-house spaces located in the podium of Tower 4. The second priority was the completion and placement into service of the Emergency Generator Plant housed on the fourth floor of the Tower 3 podium. Achievement of these two priorities is critical to meeting other operational objectives of the project, including the rerouting of pedestrians through the east bathtub and the decommissioning of the North Temporary Access.*

*Progress was also made on Platform B construction and erection of the oculus steel structure during the month, notwithstanding the priorities mentioned above. At Platform B, two of the five vertical circulation elements were delivered and off-loaded at their installation locations. At the oculus structure, rafter setting approached completion, with only the last two anchorage rafters remaining to be set at the end of the month.*

## Project Description

The WTC PATH Hub Terminal serves the PATH electrified rail transit system in Lower Manhattan. The PATH Hub is an extensive underground complex of pedestrian corridors and train station facilities that will replace the original WTC PATH Terminal destroyed by terrorist attack on September 11, 2001.

## Construction Agreement (CA)

The CA was signed by the LMRO on April 25, 2006. A Revised and Restated Construction Agreement (RRCA) was executed on September 18, 2012. The RRCA establishes a Required Completion Date (RCD) of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub project. The RRCA establishes a not-to-exceed amount of \$3.995 billion for the project.

## Quarterly Progress Review Meeting (QPRM)

A QPRM for the third quarter of 2014 has been scheduled for November 17, 2014.

## Design Activity

The designer continues to provide construction support services, including the review of contractor shop drawings and other submittals.

## Procurement Activity

World Trade Center Construction (WTCC) has completed all planned procurements for the PATH Hub project. However, change orders continue to be issued as necessary under the active construction contracts.

## Construction Activity

*During October 2014, the PATH Hub project work focused on two priority activities: securing a TPTO for the PATH Hub back-of-house spaces located in the podium of Tower 4, and the completion of the Emergency Generator Plant located in the podium of Tower 3. While much of the base work of constructing these elements already had been completed, work on a host of other support elements needed to advance in order to fulfill these two goals. For the Tower 4 spaces, power and low-voltage work was still ongoing at the end of the month, as was testing of the features of the space, including the ventilation units and their emergency power supplies. For the Emergency Generator Plant, ongoing work included the fuel delivery system repair and testing, fire alarm system installation and testing at the plant, and installation of controls that will direct the power generated by the plant to the priority locations throughout the PATH Hub project. Although neither of the two priority activities was successfully achieved during the month, receipt of the TPTO for the PATH Hub project back-of-house spaces and equipment was reportedly imminent at the end of the month.*

Construction of the new Platform B continued to advance during the month of October. The commencement of elevator and escalator installations was a critical activity in maintaining the schedule. The construction of electrical and fire alarm system rooms at the north end of Platform B was also crucial in providing the power and communication systems required for Platform B operations. Another key activity in progressing Platform B construction that was completed during October was the restoration of Track 3 running rails, which allowed work trains to deliver construction materials and remove debris.

At the Transit Hall, the oculus steel contractor's ongoing double-shift operation continued: Twenty-four rafters were set during the month, and twelve additional rafter base welds were completed.

Also during October, WTCC continued to focus on completing the lower level of the North-South Concourse (NSC) in order to advance its goal of rerouting pedestrian traffic through the east bathtub by November 1, 2014. Work in adjacent areas, including the new fare control line, grand staircase, temporary pedestrian corridors, and PATH Hub street-level entrances at Tower 2 and Tower 4, continued to be expedited.

## Schedule

In September 2014, WTCC released Integrated Master Schedule (IMS) 75 (b) (4)

[REDACTED]

[REDACTED]

(b) (4)

#### Cost Data

WTCC submitted its monthly cost model revision on *October 31, 2014*. It shows that, based on the contract awards and estimates through *September 30, 2014*, WTCC's Estimate at Completion (EAC) for the federally funded PATH Hub project is just over \$3.7 billion, which is unchanged from the cost model revision submitted at the end of the prior month. WTCC reported total PATH Hub expenditures through *September 30, 2014*, to be *approximately \$2.98 billion*, or *80 percent* of the EAC. That total of PATH Hub expenditures includes an additional \$3.4 million in PATH Hub expenditures over the total contained in the *September 30, 2014 report*.

#### Risk Management

To provide an improved project risk tool, the FTA, the PMOC, and WTCC completed the Project Execution Plan (PEP) in conjunction with the execution of the RRCA on September 18, 2012. As information on the impacts of Hurricane Sandy became available, the PMOC conducted PEP workshops in June 2013 to discuss and quantify the impacts to cost and schedule from the storm. The PMOC then reconciled the results of the workshops with WTCC, and the outcome of this effort was used to update the PEP. The PEP was finalized in February 2014 and recognized WTCC's eligibility for receiving partial release of risk retainage by achieving beneficial use of Platform A on February 25, 2014. In July of 2014, the PMOC initiated a review of the 2013 PEP update in consideration of various project developments that had arisen during the intervening period. In August, the PMOC updated the contingency drawdown curve to reflect the evaluation of the project's residual risks and the potential risk retainage release amounts associated with each of the remaining PEP milestones. *During October 2014, the PEP exhibits were finalized, and a spot report reflecting those updates was issued through the FTA to WTCC.*

#### Technical Capacity and Capability Review (TCCR)

The TCCR will be updated as necessary in conjunction with the update of the PEP.

#### Project Management Plan (PMP)

The grantee updated its PMP and submitted version 6.0 of the plan in early August 2014. The PMOC is currently reviewing that submission.

#### Project Quality Assurance (QA)

During *October 2014*, WTCC QA completed six oversight audits that included observing the Construction Manager (CM) QA's field audits and performing its own audits of field construction activities. WTCC QA identified one required corrective action during *an audit of WTCC Document Control*. The *October 2014* audit total reflects the six WTCC QA audit reports that were issued and received at the time this monthly report was drafted.

## Site Safety

The WTC PATH Hub project has established safety performance goals for its Total Case Incident Rate (TCIR) and Lost-Time Incident Rate (LTIR) of less than 5.0 and less than 2.0, respectively. In *September* 2014, the project recorded *three* recordable incidents and *two* lost-time incidents, resulting in a TCIR of 3.77 and an LTIR of 2.51, based on 159,094 hours worked. In comparison, the *August* 2014 incident totals were two recordable incidents and *no* lost-time incidents, resulting in a TCIR of 2.75 and an LTIR of 0.0, based on 145,222.5 hours worked. In reviewing the *September* safety performance, WTCC Safety continues its active role in managing worker safety, evaluating the causes of each incident, and developing lessons learned. The *October* 2014 safety data for the project was not fully available at the time this report was drafted but is expected to be available after mid-*November* 2014.

## Issues/Problems/Suggestions

The widespread regional damage caused by Hurricane Sandy in late October of 2012 caused a delay to the forecast completion of the PATH Hub project. (b) (4)

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

## MONITORING REPORT

### A. Project Description

The PATH Hub facility is an intermodal terminal serving the PATH electrified heavy rail transit system, which has a total of 13 PATH stations in New York and New Jersey. When completed, the PATH Hub will connect to 11 New York City Transit (NYCT) subway lines in Lower Manhattan. The PATH Hub will include a platform level, associated mezzanine and concourse levels called the PATH Hall, and a terminal building called the Transit Hall, or oculus, with north-south and east-west pedestrian connections to the NYCT subways, the World Financial Center, and WTC above-grade site development. It will be a permanent replacement of the original WTC PATH Terminal complex destroyed by terrorist attack on September 11, 2001.

### B. Project Status

#### Construction Agreement

The CA was signed on April 25, 2006. An RRCA was executed on September 18, 2012. The RRCA established an RCD of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub project. It also includes an FTA-allowable not-to-exceed amount of \$3.995 billion. The FTA approved WTCC's February 18, 2014 Recovery Plan, thereby establishing a revised RCD of December 31, 2016. Also included in the Recovery Plan was a change in WTCC's forecasted substantial completion date to December 31, 2015.

#### Quarterly Progress Review Meeting

A QPRM for the third quarter of 2014 has been scheduled for November 17, 2014.

#### WTC Site Master Plan

WTCC's current site master plan is Master Plan Version 10, released October 1, 2010.

#### Environmental Compliance

(Reported on separately by FTA's LMRO.)

#### Design Support During Construction

The designer continued providing post-award design support services for the PATH Hub construction, including responding to contractor Requests for Information (RFIs) and providing design certifications for completed elements of construction. The designer also continues to prepare and issue addenda that incorporate multiple, issued RFI responses in which the designer authorized changes to the base design documents that bring those documents into conformance with the RFI responses. *Contractor RFIs are tracked by the CM for each of the prime contractors working on the project. The CM, in concert with WTCC, then prioritizes the order in which those RFIs are answered by the designer based on their relative importance to advancing project work.*



## Construction Status

**Oculus Steel:** *During October, the contractor continued its double-shift operation, which again yielded significant progress in oculus steel erection. Twenty-four additional rafters were set during the month, bringing the total number of rafters set to 112 at the end of the month. Two rafters remain to be set. Those two rafters are unique in that they are attached to the abutments at each end of the oculus and serve as anchorages for the entire set of rafters on their respective sides of the oculus structure. Unlike all of the other two-piece rafters, which were splice-welded on the ground, the two final rafters will be splice-welded in the air. Welding progress at the rafter bases and the purlin-to-purlin connections slowed during October. The lag in purlin-to-purlin welds completed rose slightly from 20 in September to 21 during October, and the lag in rafter base welds completed grew from 37 in September to 49 during the month. These lags are expected to require the continued presence of the oculus steel contractor's forces into early 2015 in order to complete those welding activities. The following table summarizes the rafter erection progress during October:*

**Summary of Rafter Erection Progress (October 2014)**

	<b>Rafters Set</b>	<b>Purlin-to-Purlin Welds Completed</b>	<b>Rafter Base Welds Completed</b>	<b>Rafter Splice Welds Completed</b>
Total Qty. Req'd	114	110	114	32
Last Month	29	29	21	7
This Month	24	23	12	20
Total to Date	112	91	63	30
Number Remaining	2	19	51	2

**Oculus Glass:** *During October, the oculus glass contractor completed the installation of the glass panel support at the oculus steel upper portals on both sides of the oculus. The contractor also took advantage of the warmer weather to coat all of the clip welds. Currently, WTCC and the CM are reviewing the logistics for the laydown area and work areas around the oculus in anticipation of the demobilization of the oculus steel contractor, and are finalizing a logistics plan. This plan will describe work areas and laydown locations for the oculus glass and other contractors. The plan calls for work to commence simultaneously at the northwest corner and the southeast corner, where the rafter welding work has been completed. Metal panels are projected to arrive onsite in mid-November, and glass panels are scheduled to arrive in mid-December.*

**Oculus Skylight:** *The oculus skylight contractor, which is the same contractor as the oculus glass contractor, continued to advance the shop fabrication of skylight elements at multiple locations during October. Ultimately, finished skylight sections will be assembled at a facility located in Chester, Virginia, and will be delivered to the site when installation is ready to begin. A total of 40 steel frames are required for the skylight panels: 8 large frames, 8 medium frames, and 24 small frames. Of those, all but 2 of the large frames and 10 of the small frames have been fabricated. A total of 224 glass cassettes are needed for the skylights, and 116 of those have been fabricated at present. Safe access for skylight installation will be provided by the contractor's*

planned installation of a hanging scaffold, which will be located just below the oculus roof line and will span from the eastern end of the oculus to the western end. *The glass contractor has received approval of its crane plan. The crane will arrive onsite after the steel contractor's two tower cranes have been removed. The hammerhead crane will be situated just south of the Tower 2 podium on Fulton Street and will be able to reach up and over the oculus and its rafters.*

PATH Hall Construction (PHC): During *October*, platform construction activities continued at Platform B, with the construction of *vertical circulation elements beginning during the month. The caissons for elevators 5 and 6 were also installed. Escalator 8 was delivered and set into position. Plans are being formalized to deliver escalator 9 to the site in the early November.* The contractor continues to construct the electrical and fire alarm equipment rooms at the north end of the platform. The Concrete Masonry Unit (CMU) walls have been constructed, and preparations are being made to construct the room roof slabs. At the south end of the Platform B work area at Track 3, the contractor has completed the utility work and restored Track 3, thereby allowing it to receive work trains. At the Track 2 area, the contractor has completed the base slab for the track bed. At both Tracks 2 and 3, track beds remain to be constructed north of the platform. Electricians continued to install conduits under the platform and above the platform for power, communication, and fire alarm systems. The mechanical contractor continued to install piping for heating, cooling, and drainage in the under-platform area. Installation of metal channels and blocking to accept finish panels along the precast overhead smoke purge ducts also continued during *October*. The radio system contractor installed the antenna system along the ceiling of Track 2. The stair subcontractor continued to install steel as required for the metal staircases between the platform and the mezzanine (elevation 266) levels. At the mezzanine level, temporary partitions were installed to demark the early access pedestrian corridor route through the east bathtub. A temporary shield was constructed over the grand stairs. The fare collection systems were energized, and all of the required data lines are in place in preparation for testing. Twelve Metrocard Vending Machines (MVMs) were delivered to the mezzanine to be installed in temporary locations. At the Platform D work area, the contractor continued to excavate rock for the section of the utility tunnel that passes under the platform. Ironworkers completed construction of a temporary steel truss system over the utility tunnel area that will support overhead loads when two temporary columns are removed from the utility tunnel area, thereby allowing the utility tunnel work to continue. At the extreme north area, the contractor has constructed a footing for a future support column.

East Bathtub Mechanical, Electrical, Plumbing, and Fire Protection Work: During *October*, the PATH Hub back-of-house spaces in the podium of Tower 4 and on the Emergency Generator Plant located on the fourth floor of the podium of Tower 3 were the priority areas of work for this group of contractors, as established by WTCC. Securing a TPTO for the Tower 4 back-of-house spaces and putting the Emergency Generator Plant on-line were the top two priority objectives being pursued during the month. Progress on achieving the Tower 4 TPTO was significant, with testing and commissioning activities approaching completion by the end of the month. The expected time frame for the receipt of the TPTO for these spaces and equipment elements is by early November 2014. However, a fire watch is expected to be required as a condition of occupancy. At the Emergency Generator Plant, difficulties with the fuel delivery system continued to be encountered and required the deferral of the subsequent testing of the downstream electrical distribution components that are connected to the generators. Once the



*problems with the fuel delivery system are resolved, the Port Authority Hi-Tension will begin inspection and testing, which will include the downstream emergency distribution switchboards housed at EDS-PN and EDS-NW. November activities are slated to include those activities at present. In the final, built-out configuration, the Emergency Generator Plant will be connected to a total of 201 Automatic Transfer Switches (ATSs) via the eight EDSs that are located around the site. All of the EDSs and ATSs will need to be tested under simulated emergency conditions before the current temporary emergency generators at the North Temporary Access can be decommissioned.*

Primary Distribution Center (PDC) at Tower 1: Migration of PATH Hub project electric loads from the Temporary Primary Distribution Center (TPDC) in the North Temporary Access to the PDC in Tower 1 *remained* stalled during *October* following the successful completion of the first of six load transfers during *August*. The migration of loads was initially expected to advance in two-week increments through the six-step transfer process. *One of the sources of delay in the migration of loads reported by WTCC is the unavailability of the permanent Emergency Generator Plant. At present, the TPDC power supply is feeding Spot Networks SN-TN and SN-PS. Those facilities have associated EDSs that will receive emergency power from the temporary emergency generators located at the North Temporary Access. Until similar coverage exists for power supplied from the PDC, including backup power from the new permanent emergency generator facility, further load migration will continue to be deferred.*

Vertical Circulation: During *October*, work continued on the installation of the escalators and elevators located in the Transit Hall. Some of these units are required in support of WTCC's plan to reroute pedestrian traffic through the east bathtub. Work also continued on the installation of the escalators located in the segments of the NSC that fall within the footprints of Towers 2, 3, and 4, which are also needed in support of the rerouting of pedestrian traffic *to the east*. During *October*, the caissons for elevators 5 and 6 on Platform B were installed. Also, escalator 8 was delivered and set into position at Platform B. Installation of the vertical circulation elements at Platform B is one of the critical schedule activities for opening the platform for revenue service. The status of elevator and escalator installation at the end of *October* has been updated to reflect the delivery of two elevators and one escalator to Platform B, and is shown on the following table:

Item	In Service	Onsite/Under Construction	Not Yet Onsite	Total
Escalators	8	30	9	47
Elevators	4	13	4	21

North-South Concourse: During *October*, the stone contractor continued the stone floor installations at the upper (296') level of the concourse located between Towers 3 and 4. At the Tower 2 street entrance area, wall panel and ceiling panel work continued to progress. The stone contractor has installed most of the stone in the Tower 2 lobby area, as well as stone treads and risers on the first landing down from street level. At the Tower 4 street entrance area, stone work on the stairs and floors continued along with the installation of wall panels. In some areas, temporary walls, railings, and ceilings are being constructed as interim measures to avoid additional delays to WTCC's schedule. One of the critical elements for the opening of the NSC

*is the availability of Americans with Disabilities Act (ADA) treatments, thus allowing barrier-free travel from the WTC PATH Station platforms to the street level. Based on WTCC's projection that the elevator running between the main floor of the oculus and the street level will not be available until the end of December 2014, the new date for initiating use of the lower level of the NSC has been re-forecast to occur at the end of the year.*

*Fire Alarm System: During October, fire alarm work necessary for the relocation of the temporary fire command station at the North Temporary Access to the new permanent fire command station at elevation 306 of the Transit Hall continued. Among the other ongoing priority fire alarm activities was the fire alarm work at Platform B, and the installation of fire alarm cables and equipment at a data gathering panel (DGP-9) located in a separate fire alarm equipment room at the main-floor level of the Transit Hall (elevation 274). The Platform B fire alarm work is being constrained by the absence of a completed equipment room, which is still being built at the north end of the platform. The urgency of the DGP-9 work is the fire alarm coverage that it will provide to portions of the early access pedestrian corridor through the east bathtub. Ultimately, all of the Siemens fire alarm equipment, which comprises the fire alarm system for the temporary portions of the WTC PATH Station and temporary fire command station at the North Temporary Access, will be replaced by the new Firecom fire alarm equipment and will report to the new fire command station in the Transit Hall. In addition, a secondary fire alarm reporting location is at the Operations Command Center at the southern end of the South Mezzanine, although that facility will not serve as a fire command station.*

*Commissioning: Commissioning activities during October focused on the PATH Hub project back-of-house spaces located in the podium of Tower 4 and on elements of the Emergency Generator Plant that were available for testing. In the case of the Tower 4 back-of-house spaces, testing of emergency lighting and operation of the ventilation units housed in the back-of-house spaces advanced, although some smoke damper malfunctions were noted and need to be corrected. At the generator plant, testing of the fuel delivery system was again unsuccessful, triggering a review of the piping and valve conditions at the diesel fuel pumps located in the tank room. The commissioning entity also raised the topic of the facilities and systems that will need to be in place in order to implement WTCC's plan to reroute pedestrian traffic eastward through the early action pedestrian corridor. WTCC deferred this topic pending completion of the higher priority commissioning work.*

*Low Voltage Work: During October, power was provided to Telecommunications rooms PL-77, one of the critical rooms for network services. Another critical room, UT-081, is not yet online and is required for protecting redundant network services. There are twelve low voltage equipment rooms that need to be commissioned in order to provide network connectivity for fire alarm, security and building control systems. A commissioning plan for these low voltage equipment rooms is being developed. The current forecast date for completion of these network services is the end of December, 2014.*

*Central Fan Plant: During October, work by others completed the runs of temporary chilled water supply and return lines between the Central Fan Plant and the Central Chiller Plant, although additional pipe supports are still being installed before the pipes can be fully charged. This work was performed by Retail and is at least in part intended to bring cooling capability to the many retail spaces located in the east bathtub. Also during October, tinsmiths are installing*



*metal panels at the ceilings and around columns in the fresh air plenum at elevation 237 that will provide fresh air to the Central Fan Plant for further distribution throughout the PATH Hub project spaces. The metal panels will reduce friction loss as supply air passes through the plenum. Supply of fresh air via supply fans SF-1, SF-2, and SF-3 is one of the critical elements of the work on the Central Fan Plant that is currently being advanced. During October, the oculus steel contractor began providing support steel in the fresh air supply shaft that originates on the fourth floor of Tower 3, and that subsequently will be used by the east bathtub mechanical contractor for the installation of sound traps and associated hardware, which are currently forecast for delivery in December 2014.*

### Construction Logistics

The WTCC Office of Program Logistics (OPL) continued biweekly logistics and coordination meetings to facilitate construction progress and the sharing of access, egress, and work zones among all contractors onsite. The sidewalk on Church Street adjacent to Tower 4 was opened for public access during July. During August, a sidewalk shed was installed along Cortlandt Way, adjacent to Tower 4, in preparation for the initiation of structural work above the podium level of Tower 3. During September, the site boundary fencing was relocated along Vesey Street, thereby widening the available walkway for pedestrian traffic to the PATH Temporary Station at the North Temporary Access. *During October, the northern and southern sidewalk areas around Tower 1 were opened to the public in preparation for the initial occupancy of Tower 1 by its first tenant in early November 2014.*

### Interagency Coordination

OPL continued its coordination of site construction and logistics among the many project stakeholders, including contractors, construction managers, tenants, insurance firms, PATH operations, and the Port Authority Police Department.

### Community Relations

OPL continued to distribute construction alerts, updates, and monthly construction progress newsletters to the community and stakeholders.

### C. Schedule

WTCC released IMS 75 in September 2014, with a data date of August 1, 2014. (b) (4)

Although the construction of the west bathtub platforms remains critical for substantial completion (b) (4)

. In IMS 75, WTCC included additional details related to the oculus MEP, painting, and glazing trades in response to the risk drivers outlined by the PMOC. The added schedule logic potentially reduces risk exposures to the coordination of the oculus trades. WTCC is expected to release IMS 76 in early November 2014.

The following table summarizes the 90-day look-ahead for significant activities:

<b>Significant Activity</b>	<b>Action by</b>
<i>Platform B Operational</i>	WTCC
Central Fan Plant Online	WTCC
Migrate PATH Hub Electrical Loads from the TPDC at the North Temporary Access to the PDC at Tower 1	WTCC
Start of Oculus Glazing Panel Installation	WTCC
Erect/Bolt/Weld Oculus Steel Rafters and Purlins	WTCC

#### D. Cost Data

The RRCA commits \$2.872 billion in federal funding to the PATH Hub project and includes an FTA-allowable not-to-exceed amount of \$3.995 billion.

On October 18, 2012, the Port Authority Board re-authorized the WTC PATH Hub project, at an estimated total project cost range of \$3.74 billion to \$3.995 billion. This re-authorization provided for an increase in the budget from approximately \$3.4 billion to slightly more than \$3.7 billion.

The \$3.7 billion budget reflects the updated engineer's estimates for all packages in the completed procurement plan, and includes the PATH Hub project's share of the common infrastructure projects, such as Retail, the Central Chiller Plant, the Common Electrical System, and site-wide operational support elements. WTCC continues to update the cost allocations that are assigned to the PATH Hub project.

Although it was the opinion of the PMOC that the budget established after the October 18, 2012 project re-authorization by the Port Authority Board would not provide WTCC with adequate funding to complete the project given the impacts of Hurricane Sandy, WTCC has advised that the costs related to Hurricane Sandy are being funded from a separate operating account set up by PANYNJ for Hurricane Sandy and will not impact WTCC's current EAC of \$3.7 billion.

The following table summarizes the latest available EAC (WTCC's forecast) and expenditures as of *September 30, 2014*:

<b>Description</b>	<b>EAC (WTCC's Forecast) (in millions)</b>	<b>Expenditures (in millions)</b>
Construction	\$2,806	\$2,325
Program Management and Design	695	653
Contingency	(b)	(b)
Total	(b) (4)	(b) (4)

WTCC submitted its monthly cost model revision on *October 31, 2014*. It shows that, based on the contract awards and estimates through *September 30, 2014*, WTCC's EAC for the federally funded PATH Hub project is just over \$3.7 billion, which is unchanged from the cost model revision submitted at the end of the prior month. WTCC reported total PATH Hub expenditures through *September 30, 2014*, of *approximately \$2.98 billion*, or *80.0 percent* of the EAC. That total includes *\$3.4 million* more in PATH Hub expenditures than the total contained in the *September 30, 2014* report.

Over the last 12 months, the average project expenditure per month has been approximately *\$23.0 million*. That monthly expenditure is below the monthly burn rate of *\$49.7 million* that would be necessary to support the substantial completion date of December 2015.

For the first *nine* months of 2014, project expenditures have been \$28 million, \$17 million, \$28 million, \$29 million, \$24 million, \$18 million, \$29 million, \$59 million, and \$3 million, respectively. It should be noted that the June value (\$18 million) understated the actual project expenditure, because it incorporated a downward adjustment of \$6.04 million for soft costs that had been incorrectly charged to the project in prior periods. Those costs were allocated to other stakeholders during June, thus skewing the PATH Hub project expenditure value. The August expenditure of \$59 million is higher than typical because it includes an amount of approximately \$40 million in payment to the Structural Steel to Grade (SSTG) contractor consisting of accumulated payments for prior work and the PATH Hub project share of a settlement of multiple commercial issues. *The September expenditure of \$3.4 million is significantly lower because WTCC allocated \$15 million of HUB cost to the line item designated "PATH Hub work performed by SPI".*

## Risk Management

The PMOC conducted a contingency assessment workshop in August 2011 to facilitate the completion of the PEP and the RRCA. WTCC and the PMOC reviewed the results of the cost and schedule risk models. Results from this workshop and subsequent analyses were used to develop the executed RRCA and PEP. To provide an improved project risk tool, the FTA, the PMOC, and WTCC completed the PEP in conjunction with the execution of the RRCA on September 18, 2012.

As information on the impacts of Hurricane Sandy became available, the PMOC conducted PEP workshops in June 2013 to discuss and quantify the hurricane's impacts on cost and schedule. The PMOC then reconciled the workshop results with WTCC, and the outcome of this effort was used to update the PEP. In July 2014, the PMOC began assessing the impacts of oculus steel delays on the project's critical path. In August, the PMOC updated the contingency drawdown curve to reflect the evaluation of the project's residual risks and the potential risk retainage release amount associated with each of the remaining PEP milestones. *During October 2014, the PEP exhibits were finalized, and a spot report reflecting those updates was issued through the FTA to WTCC. Also during October, WTCC submitted drafts of its Risk Management Plan and Contingency Management Plan. Both of these documents are under review by the PMOC.*

## E. Technical Capacity and Capability Review

The FTA uses the PEP to measure WTCC's technical capability and capacity.

### Project Management Plan (PMP)

The grantee updated its PMP and submitted version 6.0 of the plan in early August 2014. The PMOC is currently reviewing that submission. An updated draft of WTCC's Operations Management Plan, a PMP sub-plan, was also received in August and is being reviewed. Finally, WTCC submitted an updated Construction Phase Force Account Plan and Justification to the PMOC in late August, and it is also currently under review by the PMOC.

### Project Organization

WTCC continues to update consultant and contractor staff assignments across project areas to address staffing needs as the project advances.

### Project Quality Assurance

During *October* 2014, WTCC QA completed *six* oversight audits that included observing the CM QA's field audits and performing its own audits *on both program and* field construction activities. *WTCC QA identified one* required corrective action during *an audit of WTCC Document Control*. *WTCC QA found that the WTCC-controlled drawing list contained revision numbers for two drawings that were inconsistent with the actual drawing revisions. A response has been submitted to WTCC QA for review.* The *October* 2014 audit total reflects the *six* WTCC QA audit reports that were issued and received at the time this report was drafted.

## F. Site Safety

The WTC PATH Hub project has established safety performance goals for its TCIR and LTIR of less than 5.0 and less than 2.0, respectively. In *September* 2014, the project recorded *three* recordable incidents and *two* lost-time incidents, resulting in a TCIR of 3.77 and an LTIR of 2.51, based on *159,094* hours worked. In comparison, the *August* 2014 incident totals were two recordable incidents and *no* lost-time incidents, resulting in a TCIR of 2.75 and an LTIR of *0.0*, based on *145,222.5* hours worked. In reviewing the *September* safety performance, WTCC Safety continues its active role in managing worker safety, evaluating the causes of each incident, and developing lessons learned. The *October* 2014 safety data for the project was not fully available at the time this report was drafted but is expected to be available after mid-*November* 2014.

## G. Issues/Problems/Suggestions

The widespread regional damage caused by Hurricane Sandy in late October 2012 caused a delay to the forecast completion of the PATH Hub project. WTCC submitted its formal Recovery Plan document to the FTA on February 18, 2014. (b) (4)



(b) (4)

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*Coordination of construction trades and multiple prime contractors at the Transit Hall has been challenging during the ongoing double-shift operation used for oculus steel erection. Follow-on work by the oculus glazing contractor, oculus skylight contractor, and the MEP, fire protection, and painting contractors has been delayed while the oculus steel contractor erects the structural elements.*

End of report. Appendix follows.

## APPENDIX A – LIST OF ACRONYMS

ADA	Americans with Disabilities Act
ATS	Automatic Transfer Switches
CA	Construction Agreement
CM	Construction Manager
CMU	Concrete Masonry Unit
EAC	Estimate at Completion
FTA	Federal Transit Administration
IMS	Integrated Master Schedule
LMRO	Lower Manhattan Recovery Office
LTIR	Lost-Time Incident Rate
MEP	Mechanical, Electrical, and Plumbing
MVM	Metrocard Vending Machine
NSC	North-South Concourse
NYCT	New York City Transit
OPL	Office of Program Logistics
PANYNJ	Port Authority of New York and New Jersey
PATH	Port Authority Trans-Hudson
PDC	Primary Distribution Center
PEP	Project Execution Plan
PHC	PATH Hall Construction
PMOC	Project Management Oversight Contractor
PMP	Project Management Plan
QA	Quality Assurance
QPRM	Quarterly Progress Review Meeting
RCD	Required Completion Date
RFI	Request for Information
RRCA	Revised and Restated Construction Agreement
SSTG	Structural Steel to Grade
TCCR	Technical Capacity and Capability Review
TCIR	Total Case Incident Rate
TPDC	Temporary Primary Distribution Center
TPTO	Temporary Permit to Occupy/Use
WTC	World Trade Center
WTCC	World Trade Center Construction