

MONTHLY MONITORING REPORT

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

November 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, 40

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

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Cover: *View of the Track 2 area looking north showing the completed base slab that will support the track slab.*

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 November, significant progress by the oculus steel contractor allowed for the setting of the last rafter elements and the de-mobilization of one of the oculus steel contractor's two tower cranes. As a consequence, larger areas of the exterior of the oculus structure were made available to the oculus glass contractor to perform installation of the fastening steel components that will ultimately hold the glass and metal panel curtain wall in place.

In the west bathtub, Platform B work continued to advance as multiple trades were working at the platform and mezzanine levels as well as in the back-of-house spaces necessary to support the opening of the platform to revenue service. Among the notable advances during the month were the delivery and setting in place of the remaining escalators, initiation of equipment installation in the fire alarm and electrical closets at the north end of the platform, start of the metal fascia installation over the two truss girders that run the length of the platform, and placement of additional remaining sections of the platform concrete slab.

World Trade Center Construction (WTCC) submitted an updated Integrated Master Schedule (IMS), IMS 76, in mid-November that recognized some of the accrued delay in completing the oculus steel work, which is turn caused the forecast for completion of oculus glazing to be extended by three months beyond the date forecast in IMS 75. (b) (4)

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. *Recovery Plan 02 was processed in early 2014 and established an updated RCD of December 31, 2016.*

Quarterly Progress Review Meeting (QPRM)

A QPRM for the third quarter of 2014 *was held on 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

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 November 2014, the PATH Hub project secured a Temporary Permit to Occupy/Use (TPTO) for the PATH Hub back-of-house spaces located in the podium of Tower 4, an objective that it had set as part of the plan to establish an early access pedestrian corridor through the east bathtub, a section of which runs through Tower 4. A second goal for November, the completion of the emergency generator plant located in the podium of Tower 3, was not achieved by the end of the month. Continued difficulties with maintaining adequate fuel supply from the fuel storage tanks to the generator sets were partially responsible for this shortfall.

At the Transit Hall, the oculus steel contractor set the last major structural element at the end of November. The final rafter, located at the southwest corner of the oculus structure, was set in place on November 25, 2014. Other oculus steel work, including the welding necessary to permanently secure the rafters in place, the setting and welding of shell plates at the east and west oculus abutments, the performance of welding punchlist work, and the heat-straightening of four other rafters will continue during December.

Construction of new Platform B advanced during the month of November. The installation of the two elevators and three escalators that will serve this platform is one of the critical activities for opening the platform to revenue service. The construction of the electrical and fire alarm system rooms at the north end of Platform B was completed during November and those spaces were turned over to the electrical and low voltage subcontractors for installation of equipment. Many of the conduit runs that will terminate at these rooms have already been installed in the under-platform utility chase that spans the platform from end to end. Additional sections of platform slab were also placed during November.

Also during November, WTCC re-structured its plan to implement an early access pedestrian corridor through the east bathtub, splitting the plan into two segments. During the month, work focused on the segment that will bring pedestrians up the grand staircase and through the northern portion of the temporary corridor before exiting onto Vesey Street via the street-level access on the north side of the Tower 2 podium. With cold weather approaching, WTCC is implementing a cold weather plan along this route. Installation of temporary heating and climate barriers along this route was started during the month. Under this re-structured plan, the North Temporary Access (NTA) will also remain in service.

Schedule

In November 2014, WTCC released IMS 76 (b) (4)

WTCC is expected to release IMS 77 (with a data date of *December 1, 2014*) at the beginning of *January 2015*.

Cost Data

WTCC submitted its monthly cost model revision on *November 30, 2014*. It shows that, based on the contract awards and estimates through *October 31, 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 *October 31, 2014*, to be *just over \$3.00 billion*, or *approximately 80.6 percent* of the EAC. That total of PATH Hub expenditures includes an additional \$25.4 million in PATH Hub expenditures over the total contained in the *October 31, 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. *The next potential release of risk retainage will be at the completion of oculus steel erection. Top risk drivers are mentioned within the body of the main report.*

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 *November* 2014, WTCC QA completed *four* oversight audits that included reviewing the Construction Manager (CM) QA's field audits *and performing its own field construction audit*. *As a follow-up to WTCC QA's October 2014 audit of WTCC Document Control, a subsequent audit was performed during November to review the WTCC Document Control unit*. The *November* 2014 audit total reflects the *four* 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 *October* 2014, the project recorded *five* recordable incidents and two lost-time incidents, resulting in a TCIR of *5.91* and an LTIR of *2.47*, based on *169,277* hours worked. In comparison, the *September* 2014 incident totals were *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 reviewing the *October* safety performance, WTCC Safety continues its active role in managing worker safety, evaluating the causes of each incident, *addressing actions to prevent recurrence* and developing lessons learned. The *November* 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-*December* 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)

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. (b) (4)

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 *was held on* November 17, 2014.

WTC Site Master Plan

WTCC's current site master plan is Master Plan Version 11, *dated October 10, 2013*.

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 *November*, the contractor *concluded* its double-shift operation, *following the setting of the last rafter elements and turnover of substantial portions of the exterior of the oculus structure to the oculus glass contractor. The final two rafters, one at the southwest corner of the oculus and the other at the northeast corner, had the unique characteristic of being spliced in the air rather than on the ground. Those splice welds are multi-day activities and were still underway at the end of the month for the northeast corner rafter. The only other major welding activity on the oculus structural elements that continues at present is occurring at the rafter bases, where 10 welds joining the rafters to the arch-transitions are yet to be completed. Completion of those 10 welds is expected by the end of December, 2014. In addition to its progress on welding, the oculus steel contractor de-mobilized its east tower crane during November, leaving the west tower crane intact to continue with the work. Other remaining work activities for the oculus steel contractor include the performance of the remaining welding punchlist work, heat-straightening of a small number of rafters on the north side of the structure, correcting the visual alignment of a handful of rafter tips on the south side of the structure, and de-mobilizing the west tower crane. The following table summarizes the rafter erection progress during November:*

Summary of Rafter Erection Progress (November 2014)

	Rafters Set	Purlin-to-Purlin Welds Completed	Rafter Base Welds Completed	Rafter Splice Welds Completed
Total Qty. Req'd	114	110	114	32
Last Month	24	32	28	20
This Month	2	10	25	1
Total to Date	114	110	104	31
Number Remaining	0	0	10	1

Oculus Glass: During *November*, the oculus glass contractor *began installing exterior and center clips onto the oculus steel upper portals. The contractor has been using fifteen boomlifts in an effort to complete the welding of clips before colder weather sets in. The glass contractor has been given access to the area between column lines +7 and -7 on both the north and south sides of the oculus. The glass contractor must nevertheless remain aware of overhead installations by others, such as drainage pipes, smoke purge fans and electrical work. The panel angle irons that will support the glass and metal panels are on site and the panels themselves are scheduled to arrive starting on December 1, 2014. Also during November, several field conditions related to the glass component fit to the upper portal steel remained under review with the designer for possible solutions.*

Oculus Skylight: The oculus skylight contractor, which is the same contractor as the oculus glass contractor, continued to advance the *assembly of finished skylight sections during November* at a facility located in Chester, Virginia. A total of 40 steel frames are required for the skylight panels: 8 large frames, 8 medium frames, and 24 small frames. *All of the frames have been fabricated.* A total of 224 glass cassettes are also needed for the skylights, and 204 of those

have been fabricated *through the end of the month*. The skylight sections will be delivered to the site when installation is ready to begin. 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, *a total length of 305'*. *Stair towers to access the hanging scaffold are planned at both ends. Some components for this scaffold were received onsite during November and are being temporarily stored on the oculus main floor level at elevation 274.* The skylight contractor's tower crane has been approved but will not be mobilized to the site until after the oculus steel contractor's remaining tower crane has been removed.

Platform B: During November, platform construction activities continued at Platform B. The hydraulic pistons for elevators 5 and 6 were installed and adjacent sections of platform slab were placed. Also during November, escalators 8 and 9 were set into position and baluster installation commenced. Escalator 10 (the third and final escalator for Platform B) was also delivered to the site during the month. The contractor also completed the construction of the rooms that will house the electrical and fire alarm equipment at the north end of the platform. These rooms were then turned over to the electrical and low voltage subcontractors to bring in conduits and install panels and equipment. However, a section of the platform just south of these rooms remains to be constructed and is required in order to complete conduit runs. Finger ducts that connect to the precast smoke purge ducts also must be completed in order to provide smoke purge capabilities at the back-of-house areas north of the platform. The mechanical contractor continued to install piping for heating, cooling, and drainage in the under-platform area during November. Metal ductwork installation continued below the platform and up onto the platform columns. Installation of metal ceiling panels at the platform level also proceeded. The stair subcontractor completed the installation of the Platform B staircases. During November the steel-encased column C-102 was constructed at the north end of the platform. At the mezzanine level, temporary heaters and temporary partitions were installed to maintain a warmer temperature in the area. Sections of concrete slab infill continued throughout the mezzanine area. At the north end of the mezzanine, two of the end columns were dropped down into position on the mezzanine floor slab. Fire smoke dampers still remain to be installed throughout the Platform B area. These devices have been ordered and are scheduled to be received in December. Twelve Metrocard Vending Machines (MVMs) are on site and ready to be installed in temporary locations.

Platform D: At the Platform D work area, the contractor continued to excavate rock for the section of the utility tunnel that passes under the platform, during November. Formwork and rebar were installed for the south wall of the south cell of the utility tunnel. Two temporary columns were also removed from the tunnel area during the month, with those loads transferred onto a temporary truss that was recently completed overhead in this area. At the north end of the platform D area, the contractor constructed a footing and received the steel encasement for a future support column.

East Bathtub Mechanical, Electrical, Plumbing, and Fire Protection Work: During November, WTCC secured a TPTO for the PATH Hub back-of-house spaces in the podium of Tower 4, fulfilling a priority that had been assigned in support of the plan to open an early access pedestrian corridor through the east bathtub. However, a second priority of placing the emergency generator plant located on the fourth floor of the podium of Tower 3 into service was

not completed, because efforts to isolate and remedy fuel delivery problems were still underway at the end of the month. Continued collaboration among the contractor, designer, and CM determined that replacing selected valves and piping with larger-diameter valves and piping was appropriate, and that replacement work started. Once the problems with the fuel delivery system are resolved, subsequent testing of the downstream electrical distribution components that are connected to the generators, including the emergency distribution switchboards housed at EDS-PN and EDS-NW, will commence. 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 NTA 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 NTA to the PDC in Tower 1 remained stalled during *November* 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. WTCC reported that one of the sources of delay in the migration of loads 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 NTA *in the event of a loss of primary power*. 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 *November*, work continued on the installation of the escalators and elevators located in the Transit Hall. Some of these units were required in support of WTCC's plan to reroute pedestrian traffic through the east bathtub. *Although this plan has been modified to only the northern portion of the early action access pedestrian corridor through to the street level entry at Tower 2, work on the other east bathtub elevators and escalators also continued during November. Preliminary testing for commissioning was also performed on the escalator units that have been completed thus far. Those units will require only minor final testing going forward.* The status of elevator and escalator installation at the end of *November* has been updated to reflect the delivery of *two escalators* to Platform B, and is summarized in the following table:

Item	In Service Last Month	In Service This Month	Onsite/Under Construction Last Month	Onsite/Under Construction This Month	Not Yet Onsite	Total
Escalators	8	8	30	32	7	47
Elevators	4	4	13	13	4	21

North-South Concourse: During *November*, the stone contractor continued the stone floor installations at the upper level (elevation 296') of the concourse located at Tower 3. At the Tower 2 street entrance area, wall panel, ceiling panel and stair stonework 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 and

ceiling panels. One of the critical elements for the opening of the *north early access* 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 at Tower 2. *The completion of two elevators is required to meet that requirement. One elevator at the north side of the PATH Hall mezzanine will provide service from elevation 266 to elevation 274. Another elevator in Tower 2 will provide service from elevation 274' to street level (elevation 326').*

Fire Alarm System: During *November*, fire alarm work necessary for the relocation of the temporary fire command station at the NTA 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. *During most of the month*, the Platform B fire alarm work *continued to be* constrained by *the construction of the just-completed fire alarm equipment room* at the north end of the *platform that still requires fit-out*. 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 NTA, will be replaced by the new Firecom fire alarm equipment and will report to the new fire command station in the Transit Hall.

Commissioning: Commissioning activities during *November* 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, *the elements necessary to secure a TPTO were successfully commissioned and a TPTO was received. However, fuel delivery system difficulties at the emergency generator plant prevented the advancement of various tests and also meant that the commissioning of that facility and the downstream electrical distribution elements that it will supply power to in the event of a loss of primary power had to be deferred. Troubleshooting activities continued to diagnose and repair the fuel delivery system at the end of the month.*

Low Voltage Work: During October, power was provided to telecommunications room PL-77, one of the critical rooms for network services. *Two other* critical rooms, *UT-028 and UT-081*, are not yet online and *are* 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. *Chilled water for the communications rooms is not available and temporary cooling units may be required if permanent cooling capability remains unavailable. When power is fully available to the rooms, testing of the fiber backbone will be possible.* A commissioning plan for the low-voltage equipment rooms is being developed.

Central Fan Plant: During *November*, work by others *included the installation of additional supports on the* completed the runs of temporary chilled water supply and return lines between the Central Fan Plant and the Central Chiller Plant This work, which was performed by Retail, is at least in part intended to bring cooling capability to the many retail spaces located in the east bathtub. Also during *November*, tinsmiths *continued* installing *sheet metal lining* at the ceilings and around columns in the fresh air plenum at elevation 237', which will provide fresh air to the Central Fan Plant for further distribution throughout the PATH Hub project spaces. The *sheet metal lining* 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 November workers installed insulation on the walls of the vertical shaft in Tower 3 that will supply fresh air to the Central Fan Plant. Also during November, the oculus steel contractor continued to provide 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. Also during November at the Central Fan Plant, steamfitters were installing piping for steam and hot water supply, tinsmiths were running additional ductwork from Air-handling units (AHUs), and electricians were installing controls and the associated control wiring. Fire alarm installations also progressed during November.*

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 NTA. 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. *In early November, an initial contingent of Tower 1's first tenant moved in. The temporary street-level loading dock built directly to the east of the tower was used to accomplish this move.*

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 76 in November 2014, with a data date of October 1, 2014. (b) (4)

[REDACTED]

In IMS 76, WTCC continued to refine 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 77 in early *January* 2015

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

Significant Activity	Action by
Platform B Operational	WTCC
Central Fan Plant Online	WTCC
Migrate PATH Hub Electrical Loads from the TPDC at the NTA 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 \$3.724 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 *October 31, 2014*:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,806	\$2,339
Program Management and Design	695	664
Contingency	(b)	■
Total	■	(b) (4)

WTCC submitted its monthly cost model revision on *November 30, 2014*. It shows that, based on the contract awards and estimates through *October 31, 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 *October 31, 2014*, of just over \$3.00 billion, or approximately 80.6 percent of the EAC. That total includes \$25.4 million more in PATH Hub expenditures than the total contained in the *October 31, 2014* report.

Over the last 12 months, the average project expenditure per month has been approximately \$25.0 million. That monthly expenditure is below the monthly burn rate of \$51.4 million that would be necessary to support the substantial completion date of December 2015.

Monthly project expenditures since the start of 2014 are as follows:

<i>January</i>	<i>\$28 million</i>	<i>July</i>	<i>\$29 million</i>
<i>February</i>	<i>\$17 million</i>	<i>August</i>	<i>\$59 million</i>
<i>March</i>	<i>\$28 million</i>	<i>September</i>	<i>\$3 million</i>
<i>April</i>	<i>\$39 million</i>	<i>October</i>	<i>\$25 million</i>
<i>May</i>	<i>\$24 million</i>	<i>November</i>	<i>Not yet available</i>
<i>June</i>	<i>\$18 million</i>	<i>December</i>	<i>Not yet available</i>

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 million is significantly lower than expenditures in other months because WTCC allocated \$15 million of PATH Hub cost to the line item designated "PATH Hub work performed by SPI".

E. 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. *The PMOC has reviewed both of these documents and is finalizing a draft spot report that discusses the results of that review. During November, increased focus was applied to the top schedule risk drivers associated with the impending Platform B milestone, including the vertical circulation elements, stone floor material delivery and installation, delivery of permanent power to the platform, and fire alarm installation.*

F. Technical Capacity and Capability Review

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

Project Management Plan

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 *submitted in August but it was found to lack essential elements. The grantee is now preparing a new updated version of the Operations Management Plan is being prepared by the grantee.* Finally, WTCC submitted an updated Construction Phase Force Account Plan and Justification to the PMOC in late August, *and it has been reviewed. The PMOC is finalizing a draft spot report that discusses the results of that review.*

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 *November 2014*, WTCC QA completed *four* oversight audits that included *reviewing the CM QA's field audits and performing its own field construction audit. As a follow-up to WTCC QA's October 2014 audit of WTCC Document Control, a subsequent audit was scheduled during November to review the WTCC Document Control unit.* The *November 2014* audit total reflects

the four WTCC QA audit reports that were issued and received at the time this report was drafted.

G. 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 *October* 2014, the project recorded *five* recordable incidents and two lost-time incidents, resulting in a TCIR of 5.91 and an LTIR of 2.47, based on 169,277 hours worked. In comparison, the *September* 2014 incident totals were *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 reviewing the *October* safety performance, WTCC Safety continues its active role in managing worker safety, evaluating the causes of each incident, *addressing actions to prevent recurrence* and developing lessons learned. *While a review of the incidents in October 2014 did not identify any specific trends, the increase in the TCIR to 5.91, which is above the goal of 5.0, warrants increased vigilance in the use of safe work habits. The impending completion of the oculus steel contractors' work that accounted for two of the five recordable incidents during October should eliminate some of the potential for future incidents.* The *November* 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-*December* 2014.

H. 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)

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. (b) (4)

End of report. Appendix follows. -

APPENDIX A – LIST OF ACRONYMS -

ADA	Americans with Disabilities Act
AHU	Air Handling Unit
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
NTA	North Temporary Access
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