MONTHLY MONITORING REPORT

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

September 2013

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Cover: *View looking east within the East-West Connector.*

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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 financed by the FTA's Lower Manhattan Recovery Office (LMRO).

EXECUTIVE SUMMARY

Most of the replacement work associated with Hurricane Sandy has now been completed, although several systems are yet to be tested and, in the case of electrical systems, re-energized. The cost of the work required because of Hurricane Sandy has been funded from a separate operating account and does not impact the Hub project's Estimate at Completion (EAC).

Project Description

The PATH Hub facility is an intermodal terminal serving 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. The RRCA includes an FTA-allowable not-to-exceed amount of $3.995 billion. The hurricane damage is expected to delay the project by a minimum of six months.

Quarterly Progress Review Meeting (QPRM)

The next QPRM, for the third quarter of 2013, will be scheduled in November 2013.

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 Hub project.

Construction Activity

At the PATH Hall in the west bathtub, the PATH Hall Construction (PHC) contractor continued work at the mezzanine level, Platform A, *Partial Platform B,* and the East-West Connector *during September*. Platform A stone installation *continued,* and work to prepare for the planned opening of the East-West Connector, including the temporary egress path through the North Temporary Access, approached completion.

At the Transit Hall in the east bathtub, the oculus steel contractor *continued to* encounter difficulties in staying within prescribed tolerances for the locations of erected oculus steel elements, thus slowing the work.

Schedule

In August 2013, WTCC released Integrated Master Schedule (IMS) 68, (b) (4) [redacted] Activities to repair the damage caused by Hurricane Sandy, as well as sequencing associated with early demolition of the North Temporary Access, were included in IMS 68. WTCC continues to assess workaround opportunities, particularly for platform construction. *WTCC released a draft of IMS 69 in September, and stakeholder review of the draft schedule is in progress.*

Cost Data

WTCC submitted its cost model revision on September 30, 2013. Based on the contract awards and estimates through August 31, 2013, WTCC's EAC for the federally funded PATH Hub project is just over $3.7 billion. WTCC is reporting the PATH Hub expenditures through August 31, 2013, to be more than $2.63 billion, or nearly 71 percent of the EAC.

Risk Management

To provide an improved project risk tool, the FTA, the Project Management Oversight Contractor (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 project execution plan workshops in June 2013 to discuss and quantify cost and schedule impact. In July 2013, the PMOC was in the process of reconciling the results with WTCC. The outcomes of this effort will be utilized in updating the PEP.

Technical Capacity and Capability Review (TCCR)

An update to the TCCR will be performed in conjunction with the updated PEP and is anticipated to be completed later in 2013.

Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan and Operations Management Plan, both of which are PMP sub-plans. The grantee has provided a draft

construction phase Force Account Plan and Justification, and the PMOC is currently reviewing it.

Project Quality Assurance

During September 2013, WTCC Quality Assurance (QA) performed ten quality assurance oversight audits on both field construction and QA program activities, including reviews of Construction Manager (CM) QA field activities and the ongoing installation of oculus steel. WTCC QA also completed an audit on September 11, 2013, to verify the receiving, inspection, and storage practices for the oculus structural steel members delivered to the PANYNJ's Red Hook facility in Brooklyn, New York. For the QA audits completed in September 2013, no corrective actions were identified.

Site Safety and Security Review

The PATH Hub project's year-to-date safety performance through July 2013 remained relatively stable. The year-to-date (through July 2013) Total Case Incident Rate (TCIR) increased slightly but still compared favorably with the national average. The year-to-date Lost-Time Incident Rate (LTIR) declined slightly but remained above the national average. WTCC has continued its active role in managing worker safety. *August 2013 safety data for the project was not fully available at the time this report was drafted.*

Issues/Problems/Suggestions

- The completion of the PATH Hub project has been delayed as a result of the effects of Hurricane Sandy in late October of 2012. (b) (4) [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 Oculus, or Transit Hall, 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 establishes 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.

Quarterly Progress Review Meeting

The next QPRM, for the third quarter of 2013, will be scheduled in November 2013.

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 and providing certifications of completion for elements of construction.

Construction Status

Transit Hall Concrete: During *September*, the concrete contractor continued placement of miscellaneous concrete items and concrete wall sections located at the lower levels of the Transit Hall. Current work includes the removal of formwork material and the filling of openings in concrete walls and floor slabs that were omitted during larger concrete pours and that provided temporary construction access openings.

Structural Steel to Grade (SSTG) – Area 3: During *September*, the contractor's activities in Area 3, *which consisted of the* application of intumescent paint to the steel elements that remain exposed to public view *and the* application of spray-on fireproofing to concealed steel elements, was *essentially completed*.

Oculus Steel: Fabrication, shipment, and erection of oculus steel continued during *September* 2013. The current fabrication metrics, based on status reports issued by the fabrication subcontractor, are: 100 percent completion for sub-portals, 100 percent completion for lower portals, *100* percent completion for upper portals, 100 percent completion for abutments, *25* percent completion for abutment outer shells, *96* percent completion for arches, 100 percent completion for transitions, and *59* percent completion for rafters. *The sixth of seven shipments of oculus steel commenced loading at the fabricator's facility on September 27, 2013. The shipment consists of 16 upper portals, 26 transitions, and 10 rafters. This shipment is forecast to arrive before the end of October 2013.* Difficulties *continue to be* encountered in remaining within the required tolerances for the installed location during field erection of upper portals and transition arches. Theoretical target points in all three directions are being checked as each element is installed, and variances from allowable tolerances are occurring frequently. Incremental movement of the structure as each element is added to the structure is contributing to the tolerances being exceeded; temperature variations are also cited as a factor. This issue has slowed field erection significantly during the *past two months. As locations for erected elements are adjusted and accepted, the extensive welding required to install them is allowed to proceed and is currently being performed on a two-shift-per-day basis to limit the loss of additional time.*

Oculus Glass: The shipment of *the final 25 percent of the required glass* panels is now under way, and the shipment is expected to be *delivered* by the end of *November 2013*. Upon receipt, the final glass panels are expected to be handled into the contractor's receiving location in Harrison, New Jersey, with the other oculus glass that was previously received. The panels will be retained at that location until the oculus structure has advanced to a point where their installation can begin. T*his point is currently anticipated to be reached in the second quarter of 2014.*

Oculus Skylight: *During September, a* full-size mock-up of a typical section of the oculus skylight was assembled in a test chamber *at the contractor's testing facility,* where it will be subjected to visual inspection followed by 20 days of performance testing, starting in early *October* 2013. The testing facility *is* located in eastern Pennsylvania.

Transit Hall Interior Stone: *Under this contract, stone floor and wall finishes are to be furnished and installed throughout the Transit Hall side of the project, including at both of the grand stairs, the oculus floors at elevations 274 and 296, both levels of the north-south concourse, and various other associated stairs, passageways, and entryways. Phase 1 installation, consisting of the stone flooring at the southern end of the lower level of the north-south concourse, is currently forecast to start before the end of October 2013.*

PATH Hall Construction (PHC): The PHC contractor *continued the demolition and excavation work on the closed portions of Platform B at the north end and east section of the station. The PHC contractor has constructed multiple concrete sections of the east portion of Platform B.* The mechanical trades *continued* installing the overhead mechanical work under the PATH Hall roof. The contractor continued construction of the temporary access to the PATH North Temporary Access to allow commuters to enter and exit the PATH station from the East-West

Connector. The stone contractor *continued* the stone installation at Platform A. WTCC continues to forecast that Platform A will be placed into service by the end of the fourth quarter of 2013.

Structural Steel to Grade (SSTG): *During September*, the SSTG contractor continued erecting structural steel members at the north end of Platform B in the PATH station.

East Bathtub Mechanical, Electrical, Plumbing and Fire Protection Work: Work by these four contractors continued during *September* in several locations, including Spot Networks SN-TS, SN-TN, SN-PN, and SN-NW, along with work at the Central Fan Plant. Spot Network SN-TS, located within the podium of Tower 3, which had been forecast to be energized by August 2, 2013, is now expected to be energized by *mid-October*. Work in Spot Network SN-TN continues, *and its energization is* forecast *for* late October 2013. *Supply Fans SF-1, 2, and 3 were delivered and rigged to the fourth floor of Tower 3 on September 25, 2013. Plans are also being developed to coordinate the installation of 60 individual smoke purge fans for the oculus space into the oculus steel roof-level elements. This installation will occur during the brief period between the site delivery of these elements and their erection by the oculus steel contractor.*

Emergency Generator Plant and Emergency Chiller Plant: During *September*, installation of the emergency generator equipment *and emergency chiller equipment* advanced. However, *work to repair factory defects in emergency diesel generators 7 and 8 did not start on September 16 as previously planned. That work has been re-forecast to start in mid-November 2013.* Additionally, one of the four emergency air-cooled chillers that were brought to the site and rigged to the fifth floor of Tower 3 during June sustained damage in handling. The mechanical contractor is now indicating that it *intends* to replace *that chiller unit and is forecasting delivery of the new unit by mid-November 2013.*

Primary Distribution Center (PDC) at Tower 1: *PDC line-ups A and B were energized in August 2013, with line-ups C and D originally expected to be energized during September, after completion of testing and inspection by Con Edison. Line-ups C and D did not achieve that result, however, and have been re-forecast to be energized by mid-October 2013.*

Vertical Circulation: During *September*, the contractor continued to work on the escalators and elevators in the East-West Connector and the Route 9A underpass, which are scheduled to be in service in *October* 2013. The contractor continued installing the escalator components at Platform A and the escalator components located in the Transit Hall at elevation 274. The contractor continued installing the Platform A elevator cabs and the escalators located in Tower 4.

Architectural Trades: The contractor *continued* erecting multiple architectural steel columns at elevation 296 of the Transit Hall. The architectural steel members in the Transit Hall at elevation 274 *were substantially* completed in September 2013. Multiple sections of the storefronts at elevation 274 are in fabrication.

North Projection Structural Rehabilitation: During the month of *September* 2013, the contractor continued cleaning areas and performing punch list work.

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 on-site. OPL is currently coordinating the planned fourth quarter *partial openings of selected street sections* to limited traffic. *The street paving required to implement the planned opening of Greenwich Street adjacent to Tower 4 was completed in late September.*

Tower 4 commissioning of Mechanical, Electrical, and Plumbing (MEP) and Fire Protection systems continues. Tower 4 is being prepared for turnover and occupancy. *With the planned occupancy of Tower 4, Construction Gate 3C will be split and re-located northward to Cortland Way to allow limited public and construction access. Flagging protection and security will continue; however, modifying this gate will create congestion. With the opening of Gate 3C, the contractor will install perimeter fencing around the Memorial Plaza for added security*. The month of November remains the official target date for turnover of Tower 4. Potential impacts to Hub construction are being assessed. OPL is also involved in the planned opening of the East-West Connector to pedestrian traffic, which is still scheduled to occur *on or about October 1, 2013. At the time of this report, however, electrical, HVAC, and other facility systems elements were incomplete.*

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 68 in August 2013. This IMS, with a data date of June 1, 2013, (b) (4) [redacted] The delay is caused primarily by the effects of Hurricane Sandy. However, re-sequencing of platform construction in support of the early demolition of the North Temporary Access may further delay the project substantial completion date. WTCC will continue to assess opportunities for workarounds, in particular for platform construction. *More detailed workarounds are expected to be included in the draft IMS 69, which was released in September 2013 for stakeholder reviews.*

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

Significant Activity	**Action by**
Platform A Mezzanine Structure	WTCC
Opening of East-West Connector	WTCC
Energization of Spot Network SN-TN	WTCC

Significant Activity	Action by
Energization of Spot Network SN-TS	WTCC

D. Cost Data

WTCC submitted its cost model revision on September 30, 2013. Based on the contract awards and estimates through August 31, 2013, WTCC's EAC for the federally funded PATH Hub project is slightly more than $3.7 billion. WTCC is reporting the PATH Hub expenditures through August 31, 2013, to be over $2.63 billion, or nearly 71 percent of the EAC. This represents a $28 million increase since the July 31, 2013 report.

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 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 Hub project's share of the common infrastructure projects, such as Retail, the Central Chiller Plant (CCP), the Common Electrical System, and site-wide operational support elements. WTCC continues to update the cost allocations that are assigned to the Hub project.

The following chart summarizes the latest available EAC (WTCC's forecast) and expenditures as of *August 31, 2013*:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	$2,831	*$2,038*
Program Management and Design	683	*601*
Contingency	(b) (4)	(b
Total	(b) (4)	(b) (4)

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.

Although it was the opinion of the PMOC that the budget established after the October 18, 2012 project re-authorization by the PANYNJ 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.

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 project execution plan workshops in June 2013 to discuss and quantify cost and schedule impact. In July 2013, the PMOC was in the process of reconciling the results with WTCC. The outcomes of this effort will be utilized in updating the PEP.

F. Technical Capacity and Capability Review

An update to the TCCR and a new TCCR Spot Report are anticipated to be completed later in 2013. The FTA will use the PEP to measure WTCC's capability and capacity.

Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan and Operations Management Plan, both of which are PMP sub-plans. The grantee provided a draft construction phase Force Account Plan and Justification in early May 2013, and the PMOC is currently reviewing it.

Project Organization

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

Project Quality Assurance

During September 2013, WTCC QA performed ten quality assurance oversight audits of both field construction and QA program activities, including reviews of CM QA field observations and the ongoing installation of oculus steel. WTCC QA also conducted an audit on September 11, 2013, to verify the receiving, inspection, and storage practices for the oculus structural steel members that were delivered to the PANYNJ's Red Hook facility in Brooklyn, New York. For the QA audits completed in September 2013, no corrective actions were identified.

G. Site Safety and Security Review

The WTC PATH Hub project's safety performance through July 2013 remained relatively stable, varying little from the performance recorded through June 2013. From the start of the year through the end of July 2013, there have been 28 recordable injuries and 14 lost-time injuries on the project, with 1,216,048 hours worked. The resultant year-to-date LTIR for the project is 2.30, which is above the national average of 2.10. The corresponding TCIR for the project for the

same period is 4.61, which compares favorably to the national average of 5.10. *WTCC has continued its active role in managing worker safety on the site. August safety data for the project was not fully available at the time this report was being drafted.*

H. Issues/Problems/Suggestions

- The overall completion of the WTC PATH Hub project is expected to slip as *a result of the* damage caused by Hurricane Sandy. (b) (4) [redacted]

I. Action Items

Key Project Action Item Checklist

Key Project Action Item	Agency	Target Completion	Status/Comments
PEP Milestone Review Point	PANYNJ/ LMRO/ PMOC	TBD	This will be delayed until the schedule impacts from the hurricane are fully recognized.

End of report. Appendices follow.

APPENDICES

APPENDIX A – LIST OF ACRONYMS

CA	Construction Agreement
CCP	Central Chiller Plant
CM	Construction Manager
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
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
RRCA	Revised and Restated Construction Agreement
SSTG	Structural Steel to Grade
TCCR	Technical Capacity and Capability Review
TCIR	Total Case Incident Rate
WTC	World Trade Center
WTCC	World Trade Center Construction

APPENDIX B – LESSONS LEARNED

No update.