

MONTHLY MONITORING REPORT -

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

October 2013



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Cover: The grand staircase takes shape at the eastern end of the main floor of the Transit Hall.

THIRD-PARTY 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 FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through FTA's Lower Manhattan Recovery program, 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 financed by the FTA's Lower Manhattan Recovery Office (LMRO).

EXECUTIVE SUMMARY

During October, multiple significant project accomplishments were recorded. The opening of the East-West Connector providing direct off street public access from the Temporary PATH Station to the World Financial Center was achieved on October 24, 2013. Also during October, the high-tension sides of spot networks SN-TS and SN-TN were energized, thereby providing the project with increased capability to distribute permanent electrical power. Focus has now shifted to the next upcoming major project milestone which is the opening of Platform A and Track 1 to regular revenue service.

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 *October 2012* hurricane damage is expected to delay the project by *as much as one year*.

Quarterly Progress Review Meeting (QPRM)

The QPRM for the third quarter of 2013 is scheduled for December 5, 2013.

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.

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 *completed* the East-West Connector, during *October*. *Stone installation at Platform A was also completed during the month with stone installation commencing at the mezzanine level above platform A, starting from the southern end.* The East-West Connector, including the temporary egress path through the North Temporary Access, *opened for public use on October 24, 2013.*

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.

Also during October, the high-tension sides of spot networks SN-TN and SN-TS were energized, thereby providing the project with increased capability to distribute permanent electrical power.

Schedule

In *September 2013*, WTCC released Integrated Master Schedule (IMS) 69, (b) (4)

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 69. WTCC continues to assess workaround opportunities, particularly for platform construction. WTCC will release a draft of IMS 70 for stakeholder review in *November 2013*.

Cost Data

WTCC submitted its cost model revision on *October 31, 2013*. Based on the contract awards and estimates through *September 30, 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 *September 30, 2013*, to be more than \$2.66 billion, or *approximately 71.5 percent of the EAC*. This represents a *\$30 million increase in PATH Hub expenditures since the August 31, 2013 report*.

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 *PEP* workshops in June 2013 to discuss and quantify *the impacts to cost and schedule*. *During the intervening period*, the PMOC

has been reconciling the results with WTCC. The outcome of this effort is being utilized to update the PEP.

Technical Capacity and Capability Review (TCCR)

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

Project Management Plan (PMP)

The grantee *provided an* update to its Project Quality Assurance Plan *on October 31, 2013. An update to its* Operations Management Plan, which *is another* PMP sub-plan, *remains outstanding.* The grantee has provided a draft construction phase Force Account Plan and Justification, and the PMOC is currently reviewing it.

Project Quality Assurance

During October 2013, WTCC Quality Assurance (QA) performed five 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. For the QA audits completed in October 2013, no corrective actions were identified. *WTCC QA is in the process of completing an audit of the oculus steel contractor to review an outsized transition arch and any related quality process issues. The results of this audit will be documented in an audit report.*

Site Safety and Security Review

The PATH Hub project's year-to-date safety performance through *August 2013* remained relatively stable. The year-to-date (through *August 2013*) Total Case Incident Rate (TCIR) decreased slightly *and* compared favorably with the national average of 5.10. The year-to-date Lost-Time Incident Rate (LTIR) *also* declined slightly *and was below* the national average of 2.10. WTCC has continued its active role in managing worker safety. *September 2013* safety data for the project was not fully available at the time this report was drafted.

Issues/Problems/Suggestions

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

[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 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 QPRM for the third quarter of 2013 is scheduled for December 5, 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 *October*, 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.

Oculus Steel: Fabrication, shipment, and erection of oculus steel continued during *October* 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, 42 percent completion for abutment outer shells, 100 percent completion for arches, 100 percent completion for transitions, and 74 percent completion for rafters. The sixth of seven shipments of oculus steel *arrived at the contractor's receiving location on October 19, 2013*. The shipment consisted of 16 upper portals, 26 transitions, and 10 rafters. *Shipment 7, which was to have been the final shipment from the fabricator, has been sub-divided into two smaller shipments. Loading of the first of those two smaller shipments is targeted to start by mid-November, 2013, and its arrival is expected in early December.* Difficulties encountered in remaining within the required tolerances for the installed location during field erection of upper portals and transition arches *have created delays to the contractor's erection schedule, setting that work behind plan by approximately three months. A second shift, which is intended to offset some of the lost time, continued throughout October. Of the total quantity of 110 upper portals and arch transitions, approximately 50 upper portals have now been set in position, and approximately 44 arch transitions also have been set. No rafters have yet been erected.*

Oculus Glass: *Of the required quantity of glass panels, 80% have been received from the contractor's fabrication sub-contractor, and the remaining 20% is expected to arrive by the end of November 2013.* Upon receipt, the final glass panels *will be transported to the contractor's storage location in Harrison, New Jersey, with the other oculus glass that was previously received.* The glass panels will be retained at that location until the oculus structure has advanced to a point where their installation can begin. This point is currently anticipated to be reached in the second quarter of 2014.

Oculus Skylight: During *October, testing of a full-size mock-up of a typical section of the oculus skylight commenced at the contractor's testing facility. Testing is expected to continue through most of November 2013 and includes tests for air infiltration, static water penetration, dynamic water penetration, thermal cycling, soft body impacts, hard body impacts, breakage, and roof cycling at various temperatures.* 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 staircases, 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, *commenced during October. Stone installation is expected to continue on an uninterrupted basis through all ten phases of the Transit Hall stone contract. The second phase, currently forecast to start in March 2014, is the grand staircase at the western end of the Transit Hall.*

PATH Hall Construction (PHC): *During October, 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 completed 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 began the stone installation at the mezzanine level above 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 *October*, 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 *October* in several locations, including Spot Networks SN-TS, SN-TN, SN-PN, and SN-NW, along with work at the Central Fan Plant. *On October 24, 2013, the high tension sides of spot networks SN-TS and SN-TN were both energized although work continued on the 480-volt sides of both facilities. Energization of those portions of both spot networks is expected to follow within a matter of days.* Plans to coordinate the installation of 60 individual smoke purge fans into the oculus steel roof-level elements *advanced during October with the assembly of an on-site mock-up that integrates the fan assembly into the corresponding oculus steel element. Final decisions on the most efficient method for this work are expected during November 2013.*

Emergency Generator Plant and Emergency Chiller Plant: During *October*, 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 *and* 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. *Work is also ongoing to complete the fuel delivery system that will supply diesel fuel from the fuel tanks located at the 240' elevation of Tower 3 up to the fourth floor location of the emergency generators.*

Primary Distribution Center (PDC) at Tower 1: *During October, PDC line-ups C and D were energized. When combined with the A and B line-ups that were previously energized in August 2013, line-ups C and D bring the capacity of the permanent power available to 50 percent of the total capacity that will be available when all eight line-ups are completed. Electrical load transfer from the temporary PDC at the North Temporary Access will advance in the coming period with the current plan to shed all load from the temporary PDC and move it over to the permanent Tower 1 PDC, before June 2014.*

Vertical Circulation: During *October*, the contractor *completed commissioning* the escalators and elevators in the East-West Connector and the Route 9A underpass. *The East-West Connector was opened to the public on October 24, 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 *also continued to work on* 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, *and expected to be delivered to the job site in November 2013*

North Projection Structural Rehabilitation: During the month of *October 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. *New York City Department of Transportation (NYC DOT) has increased enforcement of oversized construction vehicles due to a recent blockage of a fire lane during construction. The Tower 4 contractor was fined for improper operation of construction equipment that obstructed a fire truck from exiting a fire station. Fulton Street in the area of the Oculus steel construction remains a heavily congested area due to the number of construction activities and on-going steel erection. The PMOC has recommended that WTCC provide a single-point of contact for all work in this highly congested area. OPL is currently coordinating the planned fourth quarter partial openings of selected street sections to limited traffic. Additional security will be provided in areas where public access is permitted.*

Tower 4 commissioning of Mechanical, Electrical, and Plumbing (MEP) and Fire Protection systems continues. Tower 4 is being prepared for turnover and occupancy. *A ribbon cutting ceremony in the building lobby will be held on November 13, 2013 for the turnover of Tower 4. Potential impacts to PATH Hub construction are being assessed. OPL has also been involved in the opening of the East-West Connector to pedestrian traffic, which successfully occurred on October 24, 2013. The opening of the connector eliminated the need for pedestrian crossing guards at the street level above the connector and those guards were eliminated on October 28, 2013.*

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 69 in *September 2013*. This IMS, with a data date of *August 1, 2013*,

(b) (4)

█ 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's substantial completion date. WTCC continues to assess opportunities for workarounds, in particular for platform construction. More detailed workarounds are expected to be included in the draft IMS 70, which will be released in *November 2013* for stakeholder reviews.

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

Significant Activity	Action by
Platform A Mezzanine Structure	WTCC
<i>Platform A Operational</i>	<i>WTCC</i>
<i>Mobilization of Oculus Glazing</i>	<i>WTCC</i>
<i>Erection/Bolt/Weld Oculus Steel Upper Portals and Transitions</i>	<i>WTCC</i>

D. Cost Data

WTCC submitted its cost model revision on *October 31, 2013*. Based on the contract awards and estimates through *September 30, 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 *September 30, 2013*, to be over \$2.66 billion, or approximately 71.5 percent of the EAC. This represents a \$30 million increase in PATH Hub expenditures since the *August 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, 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 *September 30, 2013*:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,831	\$2,059
Program Management and Design	683	604
Contingency	(b) (4)	(b) (4)
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 *PEP* workshops in June 2013 to discuss and quantify *the impacts on* cost and schedule. In *the intervening period*, the PMOC *has been* reconciling the results with WTCC. The outcome of this effort *is being* utilized to *update* 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 *provided an* update to its Project Quality Assurance Plan *on October 31, 2013. An update to its* Operations Management Plan, which *is another* PMP sub-plan, *remains outstanding.* The grantee *previously* provided a draft construction phase Force Account Plan and Justification, and the PMOC is currently reviewing it.

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 2013, WTCC QA performed *five* 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. For the QA audits completed in October 2013, no corrective actions were identified. *WTCC QA is in the process of completing an audit of the oculus steel contractor to review an oversized transition arch and any related quality process issues. The audit results will be documented in an audit report.*

G. Site Safety and Security Review

The WTC PATH Hub project's safety performance through *August* 2013 remained relatively stable, varying little from the performance recorded through July 2013. From the start of the year

through the end of *August* 2013, there have been 31 recordable injuries and 14 lost-time injuries on the project, with 1,413,836 hours worked. The resultant year-to-date LTIR for the project is 1.78, which is *below* the national average of 2.10. The corresponding TCIR for the project for the same period is 3.94, which compares favorably to the national average of 5.10. WTCC has continued its active role in managing worker safety on the site. *September* safety data for the project was not fully available at the time this report was being drafted.

H. Issues/Problems/Suggestions

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

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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.