

MONTHLY MONITORING REPORT

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

June 2013



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Cover: *Future street-level Transit Hall egress located in the Tower 2 podium.*

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

The replacement of storm-damaged equipment, systems, and related project elements that were damaged or destroyed by Hurricane Sandy is advancing along with the performance of other project work that was not significantly impacted by the storm. *Most of the replacement work has 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 is being funded from a separate operating account and is not expected to impact the Hub project's current 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 amount not to exceed of \$3.995 billion. The hurricane damage may delay the project.

Quarterly Progress Review Meeting

The Quarterly Progress Review Meeting (QPRM) for the first quarter of 2013 was held on May 20, 2013.

Design Activity

The designer continues to provide construction support services including the review of contractor shop drawings and other submittals. The designer has also been providing guidance

and technical criteria for the assessment and replacement of equipment, systems, and related project elements that were damaged by Hurricane Sandy.

Procurement Activity

World Trade Center Construction (WTCC) has completed all planned procurements for the Hub project. However, additional procurement actions related to address damage caused by Hurricane Sandy continue.

Construction Activity

At the PATH Hall in the west bathtub, the PATH Hall Construction (PHC) contractor continued work at the mezzanine level, Platform A, and the East-West Connector. *The PHC contractor also placed concrete for sections of the 1 Line box invert slab.*

At the Transit Hall in the east bathtub, the Oculus steel contractor is *undertaking the major welding of oculus steel abutment elements necessary to allow erection of additional upper portals, at both the eastern and western ends of the oculus. The fourth of seven shipments of Oculus steel departed from the fabrication facility in mid-June.*

Four emergency air-cooled chillers were delivered and rigged to the fifth floor of Tower 3 in June. Spot Network SN-TS testing commenced in June and Spot Network SN-TN installation advanced on an extended workshift basis.

Schedule

In May 2013, WTCC released Integrated Master Schedule (IMS) 67, (b) (4) which is a six-month delay from the previous IMS completion date. Activities to repair the damage caused by Hurricane Sandy, as well as sequencing associated with early demolition of the North Temporary Access, were preliminarily included in IMS 67. WTCC continues to assess workaround opportunities, particularly for platform construction. More details of the workaround plans are expected to be included in the draft IMS 68, which is scheduled for release in July 2013.

Cost Data

WTCC submitted its Cost Model Revision on *June 26, 2013*. Based on the contract awards and estimates through *May 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 *May 31, 2013*, to be *approximately \$2.6 billion*.

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 risk assessment workshops in June

2013 to discuss and quantify cost and schedule risks. The outcomes of this risk assessment will be a reference for updating the PEP.

Technical Capacity and Capability Review (TCCR)

An update to the TCCR and the resulting report are 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 provided a draft construction phase Force Account Plan and Justification in early May, and it is currently under PMOC review.

Project Quality Assurance

During June 2013, WTCC Quality Assurance (QA) and the Construction Manager (CM) QA performed seven quality assurance audits on both field construction and QA program activities, including the ongoing installation of oculus steel. In particular, WTCC QA completed an audit of the receiving, inspection, and storage practices for the PATH Hub oculus glass panels. The QA audits completed in June 2013 did not identify any issues that required corrective action.

Site Safety Review

The WTC PATH Hub project's year-to-date safety performance through April 2013 deteriorated slightly. The resultant year-to-date Total Case Incident Rate (TCIR) compares favorably with the national average. However, the year-to-date Lost-Time Incident Rate (LTIR) marginally exceeded the national average for the first time this year. WTCC has continued its proactive role in managing worker safety. *May safety data for the project was not available during the drafting of this report.*

Issues/Problems/Suggestions

- The completion of the PATH Hub project has been delayed as a result of Hurricane Sandy in late October of 2012. (b) (4)
- While the cost to complete the PATH Hub is expected to increase significantly as WTCC addresses the damage caused by Hurricane Sandy, WTCC has advised that the storm-related costs will be funded from a separate operating account and will not impact WTCC's current EAC. The adequacy of the current budget and schedule contingencies will be further evaluated as additional information becomes available.

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 first quarter 2013 QPRM was held on May 20, 2013. The FTA and the grantee discussed pertinent issues relating to construction, cost, schedule, safety, and quality as well as the recovery from Hurricane Sandy.

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.

The designer also continues to provide guidance and technical criteria for the assessment and replacement of storm-damaged equipment and systems for all categories of construction, including electrical, plumbing, HVAC, fire protection, compressed air, architectural, structural, and vertical transportation.

Procurement and Contracting Activities

WTCC has completed all planned procurements for the PATH Hub project. However, additional procurement actions related to address damage caused by Hurricane Sandy continue.

WTCC and its CM provide the PMOC with the construction and professional services Change Order (CO) logs and updates to the procurement schedule on a monthly basis.

Construction Status

Transit Hall Concrete: *During June, the concrete contractor continued placement of miscellaneous concrete items at elevation 241 and concrete wall sections located at the lower levels of the Transit Hall. Current work includes the filling of openings in concrete walls and floor slabs, which were omitted during larger concrete pours, to provide temporary construction access openings.*

Structural Steel to Grade (SSTG) – Area 3: *During June, the contractor continued corrective work on some of the horizontal J-fascia steel elements that were deemed out-of-tolerance along the storefronts at elevation 274'. The contractor also continued addressing open nonconformance reports and punchlist items in Area 3 from prior field inspections. The field-painting process of the Area 3 steel also advanced with touch-up and priming of various exposed steel surfaces. The start of top-coating with intumescent paint is anticipated during the 3rd quarter of 2013.*

Oculus Steel: *Fabrication and shipment of Oculus steel continued during June 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, 65 percent completion for upper portals, 68 percent completion for abutments, 78 percent completion for arches, 73 percent completion for transitions, and 16 percent completion for rafters. The fourth of seven shiploads of Oculus steel elements departed from the fabricator's local port on June 17, 2013, and is currently expected to arrive on July 12, 2013. On board are additional upper portals, arches, and transitions. Above-grade field erection is advancing in both the east and west abutment areas: Arch elements are being set and field welding has begun. Erection controls are currently in place that restrict the number of upper portals that can be erected before associated arch elements are connected and fully welded.*

Oculus Glass: *Several shipping containers of oculus glass were received and transferred to a storage facility in Harrison during June 2013. A return visit to the glass fabrication shop by WTCC's third-party consultant is planned for July, before the shipment of the remainder of the oculus glass.*

Oculus Skylight: *This contract was awarded in May 2012 in a design/build format. The skylight contractor is also the oculus glass contractor. The contractor has developed its mock-up drawings and expects to proceed with mock-up fabrication during July 2013. Preparation of a test chamber, where the mock-up will be subjected to various performance tests, is also expected to begin in July, and the test chamber will be completed approximately six weeks later. Performance testing of the mock-up is currently forecast to start in late September 2013.*

Transit Hall Interior Stone: *The stone fabrication and installation under this contract is divided into ten phases, and the first phase, consisting of the stone at the southern end of the lower level of the North-South Concourse, was released for fabrication in March 2013. This first phase*

stone is forecast to be delivered in September 2013, followed by installation. Shop drawings for the later phases of the work are being prepared currently and include the main floor of the transit hall. Those drawings are forecast to be submitted in the third quarter of the current year, and the corresponding site delivery is forecast for early 2014.

PATH Hall Construction (PHC): *The PHC contractor placed concrete sections of the 1 Line box invert slab under General Orders that suspended NYCT service during those placements. Approximately 900 cubic yards of concrete was placed. Work on the closed portions of Platform B at the north end of the station also advanced with sections of the new platform concrete structure placed, including the support walls and eastern portion of the platform deck slab. A new stair was activated on the open portion of platform B allowing the removal from service of another stair between the platform and the mezzanine levels. The public portion of the mezzanine level of the station was also reconfigured using new temporary barricades and partitions to free-up more of that level for construction activities. WTCC continues to forecast that Platform A will be placed into service in the fourth quarter of 2013.*

Mechanical, Electrical, and Plumbing (MEP) and Fire Protection Work: *Work by these four contractors advanced during June in several locations, including Spot Networks SN-TS, SN-TN, SN-PN, and SN-NW, along with work at the Central Fan Plant. Testing of the installed electrical equipment at Spot Network SN-TS commenced in late June in advance of its planned placement into service in August of 2013. Work in Spot Network SN-TN is being expedited, with craft overtime being selectively deployed to secure its placement into service to meet the forecast date of late October 2013. At the Central Fan Plant, piping for chilled water and steam is being installed. In addition, recently delivered air-handling units are now under active installation.*

Emergency Generator Plant and Emergency Chiller Plant: *During June, installation of the emergency generator control and paralleling gear advanced. This equipment is housed in space adjacent to the space occupied by the eight emergency diesel generators on the fourth floor of Tower 3. Also during June, the four emergency air-cooled chillers were brought to the site and rigged to the fifth floor of Tower 3 where their installation commenced.*

Primary Distribution Center (PDC) at Tower 1: *All eight line-ups at the PDC at Tower 1, which had been energized and placed into service to feed various locations, including some of the previously completed spot networks serving the PATH Hub, suffered damage during the October hurricane and were taken out of service. In June, the first two line-ups, PDC A and PDC B, were repaired and tested. Test reports were generated and submitted to Con Edison for review before a determination by Con Edison to allow those line-ups to be re-energized. Line-ups PDC C and PDC D have proceeded directly behind the first two; repair work on these two line-ups also was completed during June and testing began. Con Edison approval to re-energize PDCs A and B is anticipated to be received in early July, and PDCs C and D are expected to be approved to re-energize by month's end.*

Vertical Circulation: *The contractor continued to install the escalators in the East-West Connector and the Route 9A underpass. Replacements for the damaged sections of the Platform A escalators were delivered to the jobsite, and the contractor continued installing the escalator components. The contractor has delivered escalators located in the Transit Hall at elevation 274. The contractor began installing the platform A elevator cabs. The contractor continued installing the escalators located in Tower 4.*

Architectural Trades: Installation of the architectural steel members in the Transit Hall at elevation 274 continued. The storefront contractor *released for fabrication* sections of the North-South Concourse *storefront glass* at elevation 274. *Installation of the storefront glass in the East-West Connector was substantially completed in June 2013.*

Miscellaneous Metals: During *June 2013*, the contractor continued to install steel components at many PATH Hub locations, including the spot network rooms.

North Projection Structural Rehabilitation: *The contractor substantially completed the contract work during the month of June 2013.* The contractor continued cleaning areas and performing punch list work.

Construction Logistics

The WTCC Office of Program Logistics (OPL) continued weekly logistics and coordination meetings to facilitate construction progress and the sharing of access, egress, and work zones among all contractors on-site. *During June*, OPL continued to work with the Oculus steel contractor and to provide coordination with the New York City Department of Transportation (NYCDOT) with respect to the overnight deliveries to the site of larger Oculus steel elements. *Two off-hour oculus steel deliveries that required New York Police Department escort from Brooklyn to the site were made during the month.*

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 67 in May 2013. This latest IMS, with a data date of April 1, 2013, (b) (4)

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 will be included in the draft IMS 68 that will be released in July 2013.

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

Significant Activity	Action by
Oculus Abutments Steel Fabrication Complete	WTCC
Energization of Spot Network SN-TS	WTCC

D. Cost Data

WTCC submitted its Cost Model Revision on *June 26, 2013*. Based on the contract awards and estimates through *May 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 *May 31, 2013, to be approximately \$2.6 billion*.

On October 18, 2012, the Port Authority Board re-authorized the WTC PATH Hub project, at an estimated total project cost range of \$3.74 billion to \$3.995 billion. This 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. The total cost to complete the PATH Hub project includes the EAC and 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 being assigned to the Hub project.

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

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,831	\$1,965
Program Management and Design	683	590
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 amount not to exceed 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 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 will be funded from a separate operating account set up by PANYNJ for Hurricane Sandy and likely will not impact WTCC's current EAC of \$3.7 billion. The PANYNJ Board has taken action to provide for the costs associated with Hurricane Sandy outside of the PATH Hub project budget.

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 about the impacts of Hurricane Sandy became available, the PMOC conducted risk assessment workshops in June 2013 to discuss and quantify cost and schedule risks. The outcomes of this risk assessment will be a reference for 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, and it is currently under PMOC review.

Project Organization

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

Project Quality Assurance

During June 2013, WTCC QA and the CM QA performed seven quality assurance audits on both field construction and QA program activities, including the ongoing installation of oculus steel. In particular, WTCC QA completed an audit of the receiving, inspection, and storage practices for the PATH Hub's oculus glass panels. The QA audits completed in June 2013 did not identify any issues that required corrective action.

G. Site Safety Review

The WTC PATH Hub project's safety performance through April 2013 deteriorated slightly during the month. From the start of the year through the end of April 2013, there have been 11 recordable injuries and 6 lost-time injuries on the project, with 545,242 hours worked. The resultant year-to-date LTIR for the project is 2.20, which is slightly above the national average of 2.10. The corresponding TCIR for the project for the same period is 4.03, which compares favorably to the national average of 5.10. *May safety data for the project was not available during the drafting of this report.*

H. Issues/Problems/Suggestions

- The storm damage to the new PATH Hub facility construction was extensive. Much of the equipment and systems were submerged and thus require extensive repair or replacement, including some large, long-lead-time equipment, such as the emergency smoke purge fans and the electrical power distribution centers. WTCC has been proactive in procuring and installing replacement equipment throughout the areas affected by the storm.
- (b) (4)
- While the cost to complete the PATH Hub is expected to increase significantly as WTCC remediates and mitigates the effects of Hurricane Sandy, WTCC has advised that the costs related to Hurricane Sandy will be funded from a separate operating account and likely will not impact WTCC's current EAC. The PANYNJ Board has taken action to provide for the costs associated with Hurricane Sandy outside of the PATH Hub project budget. The adequacy of the current budget and schedule contingency will be evaluated as more information becomes available.

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
CO	Change Order
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
NYCDOT	New York City Department of Transportation
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.