

MONTHLY MONITORING REPORT

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

November 2012

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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 immediate impacts of Hurricane Sandy to the PATH Hub project were largely dealt with during the month of November 2012. The water that infiltrated the site was pumped away, debris was removed and affected areas were cleaned. The damage assessment was substantially completed; cost estimating and equipment procurement planning are underway.

Normal construction activity, which had come to a standstill immediately after the storm, ramped up during November 2012 and is expected to return to pre-storm levels in December 2012. The cost and schedule impacts of the damage to the PATH Hub project are being assessed.

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 (QPRM)

The QPRM for the third quarter of 2012 will be re-formatted and re-scheduled due to the effect Hurricane Sandy recovery has had on normal operations.

Design Activity

The designer provided guidance and technical criteria for the assessment of storm damaged equipment and systems.

Procurement Activity

WTCC has completed all planned procurements. *It is likely that WTCC will require additional procurement actions to support its Hurricane Sandy recovery efforts.*

Construction Activity

Normal construction activity, which had come to a standstill immediately after the storm, ramped up during November 2012 and is expected to return to pre-storm levels during December 2012. In addition to storm recovery, permanent construction activity was performed.

At the PATH Hall in the west bathtub, the structural steel contractor continued with welding, application of intumescent paint, and installation of precast ductwork above Tracks 1 and 2. The general contractor was only able to resume limited permanent construction activity at the mezzanine level, Platform A and the East-West Connector.

At the Transit Hall in the east bathtub, the structural steel contractor continued welding of the east end arch. The superstructure concrete contractor continued placement of reinforcing steel and concrete for grade level slabs. The Oculus steel contractor continued mobilization, including the assembly of one of two high capacity cranes. Oculus steel was delivered to the contractor's staging area in anticipation of start of steel erection in December 2012.

Schedule

In October 2012, WTCC released Integrated Master Schedule (IMS) 64, [REDACTED] [REDACTED] *Damage caused by Hurricane Sandy will delay the construction progress and the scheduled completion date. WTCC plans to release IMS 65 in December 2012 but it will not reflect Hurricane Sandy impacts. IMS 65 will serve as a baseline against which the impacts of Hurricane Sandy will be evaluated.*

WTCC will continue to assessing and quantify the impacts and a re-baseline IMS with impacts of Hurricane Sandy included will be issued during the first quarter of 2013.

Cost Data

WTCC submitted its Cost Model Revision 15 on November 29, 2012. Based on the contract awards and estimates through October 31, 2012, WTCC's Estimate at Completion (EAC) for the federally funded PATH Hub project is approximately \$3.7 billion. WTCC is reporting the PATH Hub expenditures through October 31, 2012, at approximately \$2.4 billion.

Risk Management

The PMOC conducted a contingency update workshop in August 2011. 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. It is expected that risks associated with the recovery from Hurricane Sandy will be identified and quantified as information becomes available.

Technical Capacity and Capability Review (TCCR)

An update to the TCCR and resulting TCCR Spot Report was anticipated in the second quarter of 2013. The update will be delayed due to the Hurricane Sandy impacts.

Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan, Force Account Plan and its Operations Management Plan, which are all PMP sub-plans.

Project Quality Assurance

During November 2012, the WTCC and CM QA performed one Quality Assurance (QA) field activity audit. Due to project activities related with recovery from Hurricane Sandy, the WTCC and CM QA are adjusting their audit schedules.

Site Safety and Security Review

WTCC made preparations in advance of the hurricane to secure the construction sites and implement precautionary measures.

Post hurricane measures included using protective equipment, following FEMA guidelines, conducting decontaminating procedures, assessing environmental conditions, securing petroleum tanks and flammable material, and monitoring the air for contaminants and for carbon monoxide.

WTCC advised that no marked increase in safety incidents occurred as a result of the hurricane, although some additional tripping incidents were noted.

The WTCC's PATH Hub Project's October 2012 year-to-date safety indices changed very little during the month in comparison to the year-to-date safety performance through September, 2012. From the start of the year through the end of October 2012, there have been 28 lost-time injuries and 85 recordable injuries with 1,584,719 hours worked. The resultant year-to-date LTIR is 3.53, which compares unfavorably to the national average of 2.10. The corresponding TCIR for the project for the same period is 10.73, which is above the national average of 5.10.

Issues/Problems/Suggestions

The overall completion of the PATH Hub project is expected to slip as the effects of Hurricane Sandy are remediated. [REDACTED]

- *The overall completion of the PATH Hub project is expected to slip as the effects of Hurricane Sandy are remediated.* [REDACTED]
- *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 estimate at completion. The adequacy of current budget and schedule contingency will be evaluated as 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 original CA was signed 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.

Quarterly Progress Review Meeting

The QPRM for the third quarter of 2012 will be re-formatted and re-scheduled due to the effect Hurricane Sandy recovery has had on normal operations.

WTC Site Master Plan

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

Environmental Compliance

(Reported 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 certifications of completion of elements of construction.

In the aftermath of Hurricane Sandy, the designer provided guidance and technical criteria for the assessment of storm damaged equipment and systems for all categories of construction, including electrical, 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. *It is likely that WTCC will require additional procurements actions to support its Hurricane Sandy recovery efforts.*

WTCC and its Construction Manager (CM) provided the PMOC with the construction and professional services Change Order (CO) logs and updates to the procurement schedule.

Construction Status

The immediate impacts of Hurricane Sandy to the PATH Hub project were effectively dealt with during the month of November 2012. The water that infiltrated the site was pumped away, debris was removed and the affected areas were cleaned. The damage assessment was substantially completed; cost estimating and equipment procurement planning are underway.

Contractors demobilized their pumping equipment and have largely completed debris removal. Cleaning was substantially completed with only smaller areas that are difficult to access remaining to be completed. With the substantial completion of the damage assessment, contractors have begun to remove selected equipment and systems to make way for subsequent replacement.

Normal construction activity, which had come to a standstill immediately after the storm, ramped up during November 2012 and is now close to pre-storm levels.

Transit Hall Concrete: The contractor continued placement of multiple sections of the Transit Hall concrete slabs at the street and plaza levels during November 2012. As the MEP contractors complete the installation of embedded inserts and sleeves on completed sections of metal deck and formed deck, the installation of reinforcing steel continues. The Transit Hall concrete slabs at elevation 320 (ground level) are expected to be substantially completed in January 2013.

Transit Hall Waterproofing and Site Work: The contractor continued to install the waterproofing system on the Transit Hall structural concrete slab sections at elevation 320.

Structural Steel to Grade (SSTG) – Area 3: Structural Steel to Grade work in Area 3 continued during November with a diminishing work force as the structural steel work in this area continues to wind down. The contractor completed its erection of all structural steel and is currently finishing the welding of that steel, which is located at the far eastern and far western ends of Area 3. Removal of the SSTG contractor's east tower crane was completed during November. Removal of the west tower crane is underway and should be completed during the first week of December 2012. Both cranes are being replaced by higher capacity tower cranes for the use by the Oculus steel contractor. The SSTG contractor's remaining welding is forecast for completion in January 2013, essentially completing the SSTG contractor's work in Area 3

Oculus Steel: Fabrication of Oculus steel continued during November 2012. The current metrics issued by the fabrication subcontractor are: 100 percent completion for sub-portals, 100 percent completion for lower portals, 37 percent completion for upper portals, 48 percent completion for abutments, 12 percent completion for arches, and 18 percent completion for transitions. All of the 48 sub-portals and all of the 50 lower portals were received in New York City on November 19, 2012, and were off-loaded at the contractor's storage facility. Mobilization of the Oculus steel contractor's high capacity assist crane was completed during

November. The assist crane was then used by the oculus steel contractor to assemble the first of two high capacity tower cranes at the east end of the oculus area. The forecast start of oculus steel erection is currently set for December 19, 2012.

Oculus Glass: Although the control samples of glass panels were approved for fabrication on September 13, 2012, the production of the Oculus glass has not yet begun but is currently forecast to begin on January 3, 2013. WTCC has retained the services of a consultant to visit the fabrication facility once the production has shifted to assembly of glass units, which is currently forecast to occur in March of 2013.

Transit Hall Interior Stone: Mobilization is underway. This contract will provide the installation of stone flooring and other stone treatments at various Transit Hall locations, including the interior of the Transit Hall, the North-South Connector, and other areas in PATH Hub.

PATH Hall Construction (PHC): The PHC contractor has substantially completed pumping the water out of the site and made progress washing and cleaning the flooded areas. Some contract work has resumed at Platform A, South Mezzanine, and E-W Connector. The PHC contractor continued cleaning and washing the flooded MEP utilities which were installed below the Platform A slab. The PHC contractor and the WTCC continued to assess the damage to the flooded electrical systems and the mechanical equipment, including spot network system, power distribution center, and emergency smoke purge fans. The completion of Platform A will be delayed several months.

Structural Steel to Grade (SSTG): The SSTG contractor continued installation of the precast concrete box girders which also serve as ductwork over Tracks 1 and 2 at Platform A, and made progress erecting structural steel north of the East Box Girder (EBG). The contractor continued applying the intumescent paint coating to the structural steel at the East-West connector and the PATH Hall roof. The contractor continued performing punch list work on the 1 Line box steel support structure and the PATH Hall roof ribs.

MEP and Fire Protection Work: During November 2012, the three MEP contractors and the fire protection contractor were unable to progress most of their work due to the conditions and damage resulting from Hurricane Sandy. Additionally, much of the in-place work performed to date at the lower elevations suffered irreparable damage and will have to be re-done including Spot Network SN-TN, the North Fan Room, the South Fan Room, and initial work performed in the Central Fan Plant, located at elevation 229 in the East Bathtub.

Permanent Electric Power System: Work in Spot Network SN-TS, located in Tower 3, continued during November 2012.

Vertical Circulation: The contractor continued installation of the escalators in the East-West Connector. The Platform A escalators were fitted in place during the month of November 2012. The contractor continued installation of the Platform A elevator rails.

Architectural Trades: The storefronts are fabricated and are expected to be delivered to the job site in December 2012.

Miscellaneous Metals: During November 2012, the contractor crews continued to install steel components at many PATH Hub locations, including the spot network rooms.

North Projection Structural Rehabilitation: *The contractor continued to install the secant pile wall. The contractor has substantially completed the repairs to the existing slurry wall at elevations 253, 267, and 284. The contractor continued to construct the blast slab above the PATH tracks. The contractor continued installation of Concrete Masonry Units (CMUs).*

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. Emergency restrictions on street occupancy permits by NYCDOT were implemented following Hurricane Sandy and some delay in mobilizing the first oculus steel contractor's large capacity tower crane to the site occurred as a result. Those restrictions were subsequently lifted and the crane was delivered and assembled by month's end. Site handling of the individual oculus steel elements, which arrived in New York City via ship on November 19, 2012, are also dependent upon the contractor's ability to secure DOT permits for off-hour use of the streets comprising the delivery route between the storage facility and the site. The deliveries of these Oculus steel elements are currently forecast to begin on December 17, 2012.

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. OPL continued logistics coordination for the delivery of Oculus structural steel to the site.

Community Relations

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

C Schedule

WTCC released IMS 64 in October 2012. This latest IMS, with a data date of August 1, 2012, shows no slippage to the PATH Hub project overall completion date [REDACTED]. *The release of IMS 65 is expected in December 2012. Due to damages by Hurricane Sandy, potential impacts to construction progress are anticipated and accordingly cause delays to the scheduled completion date. WTCC is assessing and quantifying the impacts. The re-baseline IMS with impacts of Hurricane Sandy included will be issued during the first quarter of 2013.*

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

Significant Activity	Action by
Mobilization of Oculus steel contractor	WTCC
Start of oculus steel erection	WTCC
Completion of Area 3 structural steel	WTCC

D Cost Data

WTCC submitted its *Cost Model Revision 15* on November 29, 2012. Based on the contract awards and estimates through *October 31, 2012*, WTCC's Estimate at Completion (EAC) for the federally funded PATH Hub project is over \$3.7 billion. WTCC is reporting the PATH Hub expenditures through *October 31, 2012*, at approximately \$2.4 billion.

On October 18, 2012, the PA Board re-authorized the World Trade Center Transportation Hub (WTC Hub) Project, at an estimated total project cost range of approximately \$3.74 billion to \$3.995 billion. This allocation provided for an increase in the budget from \$3.4 billion to \$3.7 billion.

The \$3.7 billion budget reflects the updated engineer's estimates all packages in the completed procurement plan. The total cost to complete the PATH Hub project includes the EAC and the non-Hub shares of the common infrastructure projects, such as Retail, the Central Chiller Plant (CCP), the Common Electrical System, and operational support areas. WTCC continues to update the shared cost allocations associated with the non-Hub costs.

The following chart summarizes the latest available EAC (WTCC's forecast) and expenditures as of October 31, 2012:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,847	\$1,788
Program Management and Design	666	566
Contingency	■	■
Total	■	■

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

While it is the opinion of the PMOC that the budget established after the October 18, 2012 project re-authorization by the PA Board would not provide WTCC with adequate funding to complete the project given the impacts of Hurricane Sandy; WTCC 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 not impact WTCC's current EAC of the \$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 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.

It is expected that risks associated with the recovery from Hurricane Sandy will be identified and quantified during the first quarter of 2013.

F Technical Capacity and Capability Review

An update to the TCCR and a new TCCR Spot Report are anticipated in the second quarter of 2013. The PEP will be used by the FTA to measure WTCC's capability and capacity.

Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan, Force Account Plan and its Operations Management Plan, which are all PMP sub-plans.

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 November 2012, the WTCC and CM QA performed one Quality Assurance (QA) field activity audit. Due to project activities related with recovery from Hurricane Sandy, the WTCC and CM QA are adjusting their audit schedules.

G Site Safety and Security Review

The WTCC's PATH Hub Project's October 2012 year-to-date safety indices changed very little during the month in comparison to the year-to-date safety performance through September, 2012. From the start of the year through the end of October 2012, there have been 28 lost-time injuries and 85 recordable injuries on the WTC PATH Hub project, with 1,584,719 hours worked. The resultant year-to-date LTIR for the WTC PATH Hub project is 3.53, which compares unfavorably to the national average of 2.10. The corresponding TCIR for the project for the same period is 10.73, which is above the national average of 5.10.

WTCC made preparations in advance of the hurricane to secure the construction site and implement precautionary measures.

Post hurricane measures included following use of protective equipment, FEMA guidelines, conducting decontamination procedures, assessing environmental conditions, securing petroleum tanks and flammable materials, and monitoring the air for contaminants and for carbon monoxide.

WTCC advised that no marked increase in safety incidents occurred as a result of the hurricane, although some additional tripping incidents were noted.

H Issues/Problems/Suggestions

- The damage is extensive to the new PATH Hub construction. Much of the equipment and systems have been submerged and will need extensive rehabilitation or replacement, including large, long lead time equipment, like the emergency smoke purge fans and the electrical power distribution centers.

The overall completion of the PATH Hub project is expected to slip as the effects of Hurricane Sandy are remediated.

- *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 estimate at completion. The adequacy of current budget and schedule contingency will be evaluated as 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	First Quarter 2013	This will be delayed due to the hurricane damage.

End of report. Appendices follow.

APPENDICES

APPENDIX A – LIST OF ACRONYMS

CA	Construction Agreement
CCP	Central Chiller Plant
CM	Construction Manager
CMU	Concrete Masonry Unit
CO	Change Order
EAC	Estimate at Completion
EBG	East Box Girder
FD	Final Design
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
PE	Preliminary Engineering
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
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.