

MONTHLY MONITORING REPORT

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

September 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

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.*

Quarterly Progress Review Meeting (QPRM)

The QPRM for the third quarter of 2012 is to be scheduled.

Design Activity

The designer continued to provide post-award design support services.

Procurement Activity

World Trade Center Construction (WTCC) has completed all planned procurements.

Construction Activity

At the PATH Hall, the structural steel contractor continued with remaining welding, application of intumescent paint, and installation of precast ductwork above Tracks 1 and 2. The general contractor continued Mechanical, Electrical, and Plumbing (MEP) installations at Platform A. The support area spaces in the South Mezzanine were prepared for acceptance testing and inspection, and are now available for operational use. The general contractor completed rail installation for Track 1 to the north end of Platform A. The general contractor continued stone installation and painting in the East-West Connector.

At the Transit Hall, the structural steel contractor continued welding of the east end arch, and completed additional sections of metal deck installation at grade level. The superstructure concrete contractor continued placement of reinforcing steel and concrete for grade level slabs. Fabrication of Oculus steel continued during the month of September 2012 for the structural elements needed for the start of steel erection later in 2012. Oculus glass visual and performance mock-ups were tested and accepted.

During September 2012, the three MEP contractors and the fire protection contractor continued with initial activities in the Central Fan Plant, located at elevation 229 in the East Bathtub.

The vertical circulation contractor continued with installation of the escalators for the East-West Connector. Escalator trusses were delivered to Platform A, and the contractor began to install the trusses.

Schedule

In August 2012, WTCC released Integrated Master Schedule (IMS) 63, [REDACTED]
[REDACTED] The release of IMS 64 is expected in October 2012.

Cost Data

WTCC provided a further updated excerpt of its Cost Model Revision 11 on September 28, 2012. Based on the contract awards and estimates through July 30, 2012, WTCC's Estimate at Completion (EAC) for the federally funded PATH Hub project is approximately \$3.4 billion. WTCC is reporting the PATH Hub expenditures through August 31, 2012, at approximately \$2.3 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.

Technical Capacity and Capability Review (TCCR)

An update to the TCCR and resulting TCCR Spot Report are anticipated in the fourth quarter of 2012.

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 September 2012, the PMOC oversaw one Quality Assurance (QA) activity audit on the WTCC Document Control/Records Center to verify that completed QA records for Package 18bx2 had been received by the WTCC Document Control/Records Center. However, the

records had not been received by the date of the audit. WTCC QA conducted two additional audits on: (1) the placement of rebar and welding of column jackets by the North Projection Rehabilitation contractor, and (2) the review of welding activities and completed records for the structural steel to grade (SSTG) contractor on the PATH Hall and Transit Hall.

Site Safety and Security Review

From the start of the year through the end of August 2012, there have been 17 lost-time injuries and 60 recordable injuries on the WTC PATH Hub project and 1,193,263 total hours worked. The resultant year-to-date Lost-Time Incident Rate (LTIR) for the WTC PATH Hub project is 2.85, which compares unfavorably to the national average of 2.10. The corresponding Total Case Incident Rate (TCIR) for the same period is 10.06, which is above the national average of 5.10.

Issues/Problems/Suggestions

- *It is the opinion of the PMOC, based on its assessment of risk and evaluation of the available information and current trends, recent contract awards, and engineer's estimates, that the cost of the project may increase to approximately \$3.8 billion. With the commitment of federal funding that the RRCA provides for the PATH Hub, WTCC is now in a position to review its cost projections and request a reauthorization of the project by the PANYNJ Board in October 2012.*
- *The trend for current project construction indicates that delays have occurred in several construction packages. The overall completion of the PATH Hub project has not slipped in the past quarter; but given the complexity of coordination for the construction that remains, additional delays continue to be a concern. WTCC continues to manage the PATH Hub to its [REDACTED] substantial completion date and mitigates potential schedule delays to prevent slippage. As the project moves toward completion, the opportunities for mitigating delay will become limited. However, the schedule contingency should be adequate for WTCC to complete the PATH Hub by the RRCA RCD by December 2015.*

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 is to be scheduled.

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.)

Preliminary Engineering (PE) and Final Design (FD)

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.

Procurement and Contracting Activities

WTCC has completed all planned procurements for the PATH Hub project.

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

Transit Hall Concrete: The contractor continued placement of multiple sections of the Transit Hall concrete slabs at the street and plaza levels. As the MEP contractors complete the installation of embedded inserts and sleeves on completed sections of metal deck, the installation of reinforcing steel continues. The Transit Hall concrete slabs at elevation 296 are substantially complete. The Transit Hall concrete slabs at elevation 320 are expected to be substantially completed by the end of October 2012.

Transit Hall Waterproofing and Site Work: The contractor mobilized to the site in September 2012 and began the installation of the waterproofing system on the Transit Hall structural concrete slab at elevation 320.

Structural Steel to Grade (SSTG) – Area 3: During September, the SSTG contractor completed erection of the remaining metal decking, up to and including the plaza level between column lines -12 and +12, and also completed the removal of the temporary truck ramp. Remaining work, primarily composed of welding at the east and west abutments, continued throughout September and is expected to approach completion by the end of October 2012.

Oculus Steel: Fabrication of oculus steel continued during September 2012. The current metrics issued by the fabrication subcontractor are: 100 percent completion for sub-portals, 97 percent completion for lower portals, 26 percent completion for upper portals, 33 percent completion for abutments, 3 percent completion for arches, and 7 percent completion for transitions. All of the 48 sub-portals and 50 lower portals will be transported in the first of several shipments. That first shipment has just been deferred to October 15, 2012, because of the remaining sandblasting and shop priming of approximately half of the lower portals that need to be completed. Additionally, the mobilization of the oculus steel contractor's high capacity assist crane has been deferred from September 24, 2012, to October 27, 2012, as a result of the ongoing work required to prepare the northeast corner of the oculus area of the site at street level to accept the crane delivery and assembly. Concrete curing, followed by waterproofing and placement of fill, must take place before mobilization of the crane can commence. Based on the deferrals of both the crane mobilization and the departure of the first shipment, the start of erection of oculus steel has been reforecast to occur during December 2012.

Oculus Glass: Fabrication of the oculus glass began during September 2012 at the subcontractor's facility, following the designer's approval of control samples on September 13, 2012. In addition, performance testing of the glass panel and metal panel mock-ups to the criteria detailed in the contract specification was also carried out during September 2012.

Transit Hall Interior Stone: A kickoff meeting was held in September 2012 for the stone installation contract. 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 substantially completed removal of the temporary support system of the 1 Line box at the PATH Underpass. The contractor continued to make progress on Platform A, and track work installation for Platform A Track 1 continued during September 2012. WTCC expects Platform A to be completed in the fourth quarter of 2012. The PHC contractor also made progress on the extensive MEP installation and

architectural construction for the operational support areas on elevations 266 and 284 in the South Mezzanine, Platform A, south and north ventilation plants, PATH substation No. 3, and level 4 in Tower 4. The PHC contractor continued interior fit-out work at the East-West Connector and began the installation of the marble stone along the East-West Connector south wall.

Structural Steel to Grade (SSTG): The SSTG contractor continued installation of the precast concrete 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 September 2012, the three MEP contractors and the fire protection contractor continued with initial activities in the Central Fan Plant, located at elevation 229 in the East Bathtub. Material deliveries and preparatory work are now under way at that location, which will ultimately provide heating, cooling, and ventilation to the majority of the PATH Hub.

Permanent Electric Power System: Work in Spot Network SN-TS, located in Tower 3, continued during September 2012. The MEP contractors are currently outfitting that facility with the equipment that will ultimately yield one of a total of six spot network facilities. Spot Network SN-TS, although located in Tower 3, will feed permanent electric power to various components that will serve the PATH Hub.

Vertical Circulation: The contractor continued installation of the escalators in the East-West Connector. Work trains from the PATH Harrison West Transfer Yard (Harrison Rail Yard) in New Jersey delivered the Platform A escalators to the job site in September 2012. The contractor is expected to deliver the Platform A elevators during October 2012.

Architectural Trades: The storefronts are being fabricated and are expected to be delivered to the job site in October 2012. The contractors continued submitting shop drawings and technical data for review and approval by the designers.

Miscellaneous Metals: Miscellaneous metals submittals are under review by the designer. 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 making repairs to the existing slurry wall and reinforcing steel installation of the north liner wall at elevations 253, 267, and 284. 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. Among the issues currently under active pursuit are the delivery and erection of the oculus steel contractor's assist crane, which is currently forecast to be mobilized on October 27, 2012, and the deliveries of the individual oculus steel elements, which will consist of approximately 500 individual oversized truckloads being transported from the

staging area to the WTC site. The deliveries of these oculus steel elements will be via city streets over a period of approximately 9 months, and are currently forecast to begin in December 2012. These deliveries will require roadway use permits from the New York City Department of Transportation.

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 63 in August 2012. This latest IMS, with a data date of June 1, 2012, shows no slippage to the PATH Hub project overall completion date of [REDACTED]. *This projection is based on the PMOC's assessment of risk and its evaluation of the available information and current productivity trends. However, WTCC's current projected completion date of [REDACTED] is achievable if risks are properly managed. The release of IMS 64 is expected in October 2012.*

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

Significant Activity	Action by
Completion of metal deck concrete at street level	WTCC
Platform A in operation	WTCC
Mobilization of oculus steel contractor	WTCC
<i>Start of oculus steel erection</i>	<i>WTCC</i>
SSTG Area 3 steel complete	WTCC

D Cost Data

WTCC provided a further updated excerpt of its Cost Model Revision 12 on September 28, 2012. Based on the contract awards and estimates through July 31, 2012, WTCC's EAC for the federally funded PATH Hub project is approximately \$3.4 billion. WTCC is reporting the PATH Hub expenditures through August 31, 2012, at approximately \$2.3 billion.

The \$3.4 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. Updated information was not available at the time of this report.

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

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,636	\$1,726
Program Management and Design	590	559
Contingency		
Total		

Although the PANYNJ increased the PATH Hub budget to \$3.4 billion, it is the opinion of the PMOC that the budget may increase to \$3.8 billion, based on the PMOC's evaluation of the continuing trends, including delays to construction, and the PMOC's analysis of remaining risks. However, it should be noted that this opinion may change as WTCC advances the project and either incurs or mitigates risk. *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.*

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.*

F Technical Capacity and Capability Review

An update to the TCCR and a new TCCR Spot Report are anticipated in early 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 updated consultant and contractor staff assignments across the project areas to address staffing needs as the project develops.

Project Quality Assurance

During September 2012, the PMOC oversaw one QA activity audit on the WTCC Document Control/Records Center. This was a follow-up to an August 31, 2012 audit to verify that completed Package 18bx2 QA records were received by the WTCC Document Control/Records Center. However, the records had not been received by the date of the audit. WTCC QA conducted two additional audits on: (1) the placement of rebar and welding of column jackets by the North Projection Rehabilitation contractor, and (2) the review of welding activities and completed records for the SSTG contractor on the PATH Hall and Transit Hall.

Because of other priorities and because the WTCC QA manager was completing an evaluation of staffing and projected audits for the balance of 2012, biweekly WTCC/PMOC QA meetings were not held during September 2012. The WTCC QA manager's evaluation will be submitted to the FTA/PMOC for review.

G Site Safety and Security Review

The August 2012 year-to-date safety data showed no significant change in WTCC's PATH Hub safety performance during the month compared to the safety performance through July 2012. From the start of the year through the end of August 2012, there have been 17 lost-time injuries and 60 recordable injuries on the WTC PATH Hub project, with 1,193,263 hours worked. The resultant year-to-date LTIR for the WTC PATH Hub project is 2.85, which compares unfavorably to the national average of 2.10. The corresponding TCIR for the project for the same period is 10.06, which is above the national average of 5.10.

Data compiled through August regarding the effectiveness of the WTC site-wide policy on eye protection revealed that while an initial decrease in eye-related incidents following the May 16, 2012 issuance of the policy was evident, the August data showed a return to the pre-policy level of eye-related incidents.

H Issues/Problems/Suggestions

- *It is the opinion of the PMOC, based on its assessment of risk and evaluation of the available information and current trends, recent contract awards, and engineer's estimates, that the cost of the project may increase to approximately \$3.8 billion. With the commitment of federal*

funding that the RRCA provides for the PATH Hub, WTCC is now in a position to review its cost projections and request a reauthorization of the project by the PANYNJ Board in October 2012.

- The trend for current project construction indicates that delays have occurred in several construction packages. The overall completion of the PATH Hub project has not slipped in the past quarter; but given the complexity of coordination for the construction that remains, additional delays continue to be a concern. *WTCC continues to manage the PATH Hub to its [REDACTED] forecasted substantial completion date and mitigates potential schedule delays to prevent slippage. As the project moves toward completion, the opportunities for mitigating delay will become limited. However, the schedule contingency should be adequate for WTCC to complete the PATH Hub by the RRCA RCD by December 2015.*

I Action Items

Key Project Action Item Checklist

Key Project Action Item	Agency	Target Completion	Status/Comments
A risk assessment update will be conducted to support the completion of an executable RRCA.	PANYNJ/ LMRO/ PMOC	Fourth Quarter 2012	Analysis completed in fourth quarter 2011. Report was finalized in September 2012. This action item is now completed.
<i>PEP Milestone Review Point</i>	<i>PANYNJ/ LMRO/ PMOC</i>	<i>Fourth Quarter 2012</i>	

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.