

## **MONTHLY MONITORING REPORT**

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

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Cover: *Looking southeast, a view of the completed opening in the H&M wall that will allow connection of the WTC PATH Hub to the Fulton Street Transit Center.*

### **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. Completion of the Revised and Restated CA (RRCA) is planned for the first quarter of 2012.

### Quarterly Progress Review Meeting (QPRM)

The QPRM for the fourth quarter *is scheduled for February 27, 2012.*

### Design Activity

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

### Procurement Activity

To date, World Trade Center Construction (WTCC) has completed over 95 percent of its planned procurements. *In January 2012, WTCC awarded the Graphics and Signage package.* The remaining procurements are planned for the first quarter of 2012.

### Construction Activity

At the Greenwich Street Corridor, invert slab construction was completed in Areas 17 through 20, *and load transfer of the 1 Line box to the permanent support structure north of the PATH Hub Underpass (Areas 17 through 20) was completed in January 2012.*

At the PATH Hall, the contractor continued platform and track construction. Concrete placement on the roof continued. Mechanical, electrical, and plumbing (MEP) fit-out work continued at the Bermuda triangle, south mezzanine, and Platform A. The Package 20 Structural

Steel to Grade (SSTG) contractor has completed the welded connections for the PATH Hall roof and East Box Girder (EBG). The final load transfer is expected in the second quarter of 2012.

At the Route 9A Underpass, concrete placement for Zones 3, 4, and 5 is substantially complete.

At the Transit Hall, superstructure concrete work continued with concrete slab placement at elevations 254 and 274. The Hudson & Manhattan (H&M) east bathtub wall demolition continued, as did removal of existing vent structures along the R Line. The MEP contractors continued installations in coordination with the work of the concrete contractors. Oculus steel fabrication continued.

Progress continued on site-wide infrastructure with the preparation for energizing equipment in the PATH Primary Distribution Center (PDC) in Tower 1. The PDC will feed all six of the spot network substations throughout the overall WTC site, including those that supply permanent power to the PATH Hub.

#### Schedule

WTCC released Integrated Master Schedule (IMS) 59 in December 2011. [REDACTED]

#### Cost Data

WTCC submitted a partial cost model on January 23, 2012. The cost model is currently under review by the Project Management Oversight Contractor (PMOC). Based on awards through December 31, 2011, the WTCC Estimate at Completion (EAC) for the federally funded PATH Hub project is approximately \$3.4 billion. WTCC is reporting that the PATH Hub expenditures through December 31, 2011 are approximately \$2.0 billion, or about 59 percent of the current EAC.

#### Risk Management

The PMOC conducted a contingency update workshop in August 2011. WTCC and the PMOC reviewed the results generated by their respective risk models. The FTA and the PMOC expect WTCC to complete the Project Execution Plan (PEP) in conjunction with the completion of the RRCA. WTCC is currently reviewing a draft of the PEP.

#### Technical Capacity and Capability Review (TCCR)

An update to the TCCR and the ensuing TCCR Spot Report are anticipated in 2012, after the FTA receives the completed RRCA from WTCC.

#### Project Management Plan (PMP)

The PMOC submitted to FTA its PMP Review Spot Report in January 2012.

#### Project Quality Assurance

During January 2012, WTCC Quality Assurance (QA) conducted one QA construction contractor audit, and the Construction Manager (CM) QA independently conducted three audits to verify implementation of its contractors' respective quality programs. In addition, WTCC QA

*monitored the status of SSTG critical weld repair activities to determine their effectiveness in complying with the quality program.*

#### Site Safety and Security Review

*The current data shows that WTCC's safety program continues to operate within the national norms, with the exception of the safety performance of the Transit Hall concrete superstructure contractor and the SSTG contractor. From January 2011 through December 2011, there were 18 lost-time injuries and 85 recordable injuries on the WTC PATH Hub project for 2,227,371 hours of work. The Lost-Time Incident Rate (LTIR) for the WTC PATH Hub project in 2011 was 1.62, which compares favorably to the national average, but the Total Case Incident Rate (TCIR) for the project in 2011 was 7.63, which compares unfavorably to the national average.*

#### Major Issues/Problems

- 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. However, it should be noted that this opinion may change as WTCC advances the project and either incurs or mitigates risk.
- 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 with the large quantity of steel installation remaining, additional delays continue to be a concern. WTCC continues to mitigate schedule delays to prevent further slippage.
- *There has been only limited progress to date on the fabrication of the Oculus steel, and the previously scheduled fabrication start dates for the initial group of steel elements have been missed.*

## 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. *In January 2012, WTCC and the LMRO continued to work on issues related to the RRCA. Completion of the RRCA is planned for the first quarter of 2012.*

#### Quarterly Progress Review Meeting

The QPRM for the fourth quarter *is scheduled for February 27, 2012.*

#### WTC Site Master Plan

WTCC's current site master plan is Master Plan Version 10, which was released on 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. The designer has the equivalent of 90 full-time personnel on staff for this work.

#### Procurement and Contracting Activities

To date, WTCC has completed over 95 percent of its planned procurements. *WTCC reports that the procurements that are planned to be completed in the first quarter of 2012 are the Oculus Coating and the Oculus Skylight.*

*On January 6, 2012, WTCC executed the contract for the Graphics and Signage package. Meanwhile, WTCC reported the following on the Oculus Skylight package:*

- *Responses to requests for clarifications were received from proposers on January 4, 2012.*
- *The selection committee member evaluations of technical proposals that had been clarified were collected on January 12, 2012.*

*Based on the current process, it is the opinion of the PMOC that the Oculus Skylight package will not be awarded until early in the second quarter of 2012.*

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

#### Construction Status

**Package 20 Greenwich Street Corridor (GSC):** The GSC contractor *completed the concrete placement for the invert slab in Areas 17 through 20, as well as the load transfer of the 1 Line box in Areas 17 through 20 to the permanent support structure. The contractor is continuing the punch list work in Areas 1 through 10 and Areas 17 through 20.*

**Package 20 Transit Hall Foundations:** The contractor *has substantially completed the Transit Hall slab-on-grade and underground utility work. The punch list work is expected to continue through the month of February 2012.*

**Package 20 Transit Hall Concrete:** The contractor continued placement of multiple sections of the Transit Hall concrete slabs at elevations 254 and 274. *The concrete placement of the walls supporting the precast plenum level is continuing.*

**Package 20 H&M Wall Demolition:** Removal of applicable portions of the H&M east bathtub wall continued on the second shift. *The contractor submitted engineered documents for partially removing a section of the H&M east bathtub wall alongside the R Line subway structure.*

**Package 20 Structural Steel to Grade (SSTG):** The structural steel contractor continued working double shifts on the EBG *and on the east and west arch trusses (formerly known as the tied arches) located immediately adjacent to the 1 Line box. The contractor continued a third shift operation, performing radiographic examination of certain fracture critical welds and weld repairs. Completion of these major structural steel elements and turnover to the follow-on contractors had been forecast for mid-January but has been delayed. Completion and turnover are now forecast to occur during the first half of February 2012.*

**Package 20 Structural Steel to Grade – Area 3:** The structural steel contractor continued to supply and weld steel elements, such as spall plates and column jackets, required for the placement of the Transit Hall concrete walls and slabs at elevations 254 and 274. Plans for the erection of the structural steel superstructure starting at elevation 274 continue to advance in anticipation of the transfer of the Transit Hall work area (Area 3) from the concrete contractor to the structural steel contractor. *Plans to build an 80-foot temporary roadway extension at street level over Area 3 and to install rails and a slider crane on the slab at elevation 274 are being completed by the contractor. These treatments are required to allow for off-loading and erection of the structural steel members.*

**Package 20 PATH Hall Construction (PHC):** The PHC contractor continues to make progress on Track 1 construction and has completed the installation of columns at Platforms A and B. The precast ductwork installation on Platforms A and B continues. WTCC expects Platform A to be completed in the third quarter of 2012. The structural steel contractor completed steel installation of the PATH Hall roof and *EBG during January 2012.* The PHC contractor continues placing concrete for the PATH Hall roof and for the Cortlandt Street Station roof. WTCC now expects that the PATH Hall roof load transfer will be completed late in the first



quarter of 2012. The PHC contractor is also making progress on extensive MEP installation and architectural construction for the operational support areas on elevations 266 and 284 in the south mezzanine, the Bermuda triangle, Platform A, PATH substation No. 3, and level 4 in Tower 4. *The PHC contractor commenced interior fit-out work at the East-West Connector. The exhaust fans that are scheduled for installation at the north projection were delivered and stored on-site.*

**Package 20 MEP Work:** The three MEP contractors and the fire protection contractor continued field construction activities in the east bathtub during *January 2012*. In coordination with the concrete placements, the MEP contractors continued installing embedded elements into the slabs and walls being constructed by the Transit Hall foundations contractor and the Transit Hall concrete contractor. Equipment deliveries commenced with ductwork and air handling units (AHUs) provided by the Mechanical contractor during the month.

**Permanent Electric Power System:** *Testing and punch list work at the PDC in Tower 1 advanced during January 2012. Con Edison is currently expected to energize PDC A at the end of February 2012.* It is also expected that Con Ed will energize PDCs B through H sequentially over the next several months.

**Package 20 Oculus Steel:** Fabrication of Oculus sub-portal elements is underway at the fabricator's shop in Italy. Shop drawing submittal and designer review for lower portal and upper portal elements continued, and some items were released for fabrication. *However, the start of fabrication for lower portal elements did not commence as planned. Efforts to assess this situation and to recover the time lost to date are underway.*

**Package 20 Vertical Circulation:** The contractor *continued submitting engineering drawings and technical data for review and approval by the designers.* Multiple elevators and escalators are currently in fabrication and are anticipated to be shipped to the site in the second quarter of 2012.

**Package 20 Architectural Trades:** *A mock-up of a typical storefront in the East-West Connector is currently being installed and is expected to be completed during the month of February 2012.*

**Package 20 Miscellaneous Metals:** Some of the major elements to be provided under this contract have been fabricated and are awaiting delivery to the site. Elements that will be produced and installed in the coming quarter include embedded steel items for some of the spot networks and seismic clips for various applications.

**Package 18bx Route 9A Underpass:** *The contractor has substantially completed the concrete placement for Zones 3, 4, and 5. The punch list work is expected to continue through the month of February 2012.*

**Package 18by North Projection Structural Rehabilitation:** *The contractor commenced the repairs to the existing slurry wall and the reinforcing steel installation of the north liner wall. The concrete slab demolition at elevation 267 was completed, and the installation of the formwork and reinforcing steel has commenced.*

**Package 2.06 General Site Work via Work Order #6, PATH Harrison West Transfer Yard (Harrison Rail Yard):** Utilization of the yard for loading and delivering materials via work train to the WTC site is pending activation of the signal system. In the meantime, staging of the work trains is performed elsewhere on the PATH system.

### Construction Logistics

The WTCC Office of Program Logistics (OPL) continued chairing weekly logistics and construction coordination meetings for the west bathtub, the Greenwich Street Corridor, and the east bathtub for all projects and contractors on-site. The meetings facilitate construction progress and the sharing of access, egress, and work zones.

### 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 continues its coordination with Metropolitan Transportation Authority Capital Construction for work on the 1 Line Cortlandt Street Station, the R Line Cortlandt Street Station, and the H&M wall demolition.

### Community Relations

OPL continued to distribute construction alerts, updates, and monthly construction progress newsletters to the community and stakeholders. OPL continued its regular release of the “World Trade Center Two-Week Projected Construction Status” report.

### C Schedule

WTCC released IMS 59 in December 2011. This latest IMS, with a data date of October 1, 2011, 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 following summarizes the 90-day look-ahead for significant activities:

<b>Significant Activity</b>	<b>Action by</b>
Award of the Oculus Skylight contract	WTCC
Completion of RRCA	WTCC and FTA
Completion of Transit Hall Foundation to Elevation 274	WTCC
PATH Hall roof complete	WTCC
Load transfer of PATH <i>Hall roof</i>	WTCC
<i>Start of Area 3 Steel erection</i>	WTCC

## D Cost Data

WTCC submitted an updated portion of its cost model on *January 23, 2012*. The PMOC is reviewing the model and continues to discuss the cost model with WTCC. Meanwhile, based on the contract awards and estimates through *December 31, 2011*, WTCC's EAC for the federally funded PATH Hub project is approximately \$3.4 billion or approximately \$1.1 billion more than the 2006 CA budget. *WTCC is reporting that the PATH Hub expenditures through December 31, 2011 are approximately \$2.0 billion.*

The \$3.4 billion budget reflects the updated engineer's estimates for many of the packages awarded over the past several months. 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 Facilities. 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.

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 approximately \$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 FTA and WTCC are working on an RRCA to address the budget and schedule issues.

## 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. Preliminary results from this workshop and subsequent analyses are being used to develop the final RRCA and PEP. The FTA and the PMOC expect WTCC to complete the PEP in conjunction with the completion of the RRCA. WTCC is reviewing a draft of the PEP.

## F Technical Capacity and Capability Review

An update to the TCCR and work on the new TCCR Spot Report are anticipated in 2012, after the FTA receives the completed RRCA and PEP. It is expected that the PEP will be used by the FTA to measure WTCC's capability and capacity.

### Project Management Plan (PMP)

The WTCC PATH Hub PMP version 5.5 is currently in draft form. *The PMOC submitted its PMP Review Spot Report and recommendations to FTA in January 2012.*

### Project Organization

WTCC continued to reorganize the consultant and contractor staff in various project areas to address staffing needs.

## Quality Management Program

During January 2012, WTCC QA conducted one QA construction contractor audit, and CM QA independently conducted three audits to verify implementation of its contractors' respective quality programs. In addition, WTCC QA monitored the status of SSTG critical weld repair activities to determine their effectiveness in complying with the quality program.

## G Site Safety and Security Review

*The current data shows that WTCC's safety program continues to be within the national norms, with the exception of the safety performance of the Transit Hall concrete superstructure contractor and the SSTG contractor. From January 2011 through December 2011, there were 18 lost-time injuries and 85 recordable injuries on the WTC PATH Hub project for 2,227,371 hours of work. The LTIR for the WTC PATH Hub project in 2011 was 1.62, which compares favorably to the national average as reported by The Bureau of Labor Statistics. The TCIR for the project in 2011 was 7.63, which compares unfavorably to the national average. The PMOC received the December 2011 safety data in January 2012. The January 2012 data is expected to be available in February 2012.*

## H Major Issues/Problems

- Although the PANYNJ increased the PATH Hub project budget to \$3.4 billion, it is the opinion of the PMOC that the project cost may increase to approximately \$3.8 billion, based on the PMOC's evaluation of the continuing trends and analysis of remaining risks (such as risks associated with steel fabrication and erection and with the contract packages not yet awarded). However, it should be noted that this opinion may change as WTCC advances the project and either incurs or mitigates risk. WTCC should complete an evaluation of the remaining project risks and update its cost model and forecast as part of its completion of the RRCA.
- The trend for current project construction indicates that delays have occurred in several construction packages. IMS 59 does not show any delay to the completion of the PATH Hub project [REDACTED]. WTCC continues to mitigate schedule delays to prevent further slippage. However, with the large quantity of steel installation remaining, delays to the completion of the project remain a concern.
- *There has been only limited progress to date on the fabrication of the Oculus steel at the shop in Italy, and previously scheduled fabrication start dates for the initial group of steel elements have been missed. Submittal and approval of the shop drawings for this steel have also not kept pace with the established schedule. WTCC is dispatching representatives to visit the shop to assess the situation and establish a corrective action plan.*

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	[REDACTED]	[REDACTED]

End of report. Appendices follow.

## APPENDICES

### APPENDIX A – LIST OF ACRONYMS

AHU	Air Handling Unit
CA	Construction Agreement
CCP	Central Chiller Plant
CM	Construction Manager
CO	Change Order
EAC	Estimate at Completion
EBG	East Box Girder
FD	Final Design
FTA	Federal Transit Administration
GSC	Package 20 Greenwich Street Corridor
H&M	Hudson & Manhattan
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
PE	Preliminary Engineering
PEP	Project Execution Plan
PHC	Package 20 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	Package 20 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.