

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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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 Construction Agreement (RRCA) is planned for the second quarter of 2012.

Quarterly Progress Review Meeting (QPRM)

The QPRM for the first quarter of 2012 was held on May 21, 2012.

Design Activity

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

Procurement Activity

To date, World Trade Center Construction (WTCC) has completed more than 95 percent of its planned procurements. *The remaining procurements are planned for the second quarter of 2012. The PANYNJ Board authorized award of the Oculus Skylight contract on May 21, 2012.*

Construction Activity

At the PATH Hall, the structural steel contractor continued the installation of steel ribs for the East Box Girder (EBG), removal of the temporary supports located in Platform A, and punch list work for the 1 Line box steel support structure. The general contractor continued installation of formwork and reinforcing steel for the 1 Line box roof at the underpass and placed concrete for several roof sections, advanced sub-grade construction for Track 1, continued precast ductwork installation above Tracks 1 and 2, and continued mechanical and electrical installations for Platform A.

At the Transit Hall, the superstructure concrete contractor continued slab construction at elevations 254 and 274. The structural steel contractor continued the framing above elevation 274 and continued erection of the east end arch. Fabrication of Oculus steel continued during the month of May 2012, with fabrication focusing on the structural elements needed for the start of erection in the third quarter of 2012. The Oculus steel erection contractor has begun off-site mobilization of the erection cranes. Oculus glass fabrication remains in the start-up phase, and close coordination with the European glass manufacturer continues.

Mechanical, Electrical, and Plumbing (MEP) and fire protection contractors continued their field construction activities during May 2012. A manpower and equipment hoist was installed in the northeast corner of the site to aid efficient delivery of materials for the MEP and fire protection contractors.

Energization of the two remaining electrical power distribution centers (PDCs) neared completion during May 2012. After cable splicing by Con Edison, these last two PDCs will be energized and will increase the overall amount of electric power available to all users.

The vertical circulation contractor is expected to mobilize in June 2012 and begin the installation of the escalators for the East-West Connector and Platform A.

Schedule

In April 2012, WTCC released Integrated Master Schedule (IMS) 61, [REDACTED]. The release of IMS 62 is expected in June 2012.

Cost Data

WTCC submitted an updated cost model on May 29, 2012. The cost model is currently under review by the Project Management Oversight Contractor (PMOC). Based on awards through March 31, 2012, the WTCC Estimate at Completion (EAC) for the federally funded PATH Hub project is \$3.4 billion. WTCC is reporting that PATH Hub expenditures through February 29, 2012, are just over \$2.1 billion, or 62 percent of the current EAC.

Risk Management

The PMOC conducted a contingency update workshop in August 2011. To provide an improved project risk tool, the FTA, the PMOC, and WTCC are completing the Project Execution Plan (PEP) in conjunction with the completion of the RRCA.

Technical Capacity and Capability Review (TCCR)

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

Project Management Plan (PMP)

The grantee is addressing FTA/PMOC comments on its final draft of the PMP version 5.5.

Project Quality Assurance

During May 2012, WTCC Quality Assurance (QA) conducted five audits to verify implementation of contractor quality programs and field construction activities. In addition, a meeting was held between WTCC, the FTA, and the PMOC focusing on the status of the WTCC QA Program and related PATH Hub construction activities.

Site Safety and Security Review

From the start of the year through the end of April 2012, there have been seven lost-time injuries and 35 recordable injuries on the WTC PATH Hub project and 710,631 total hours worked. The resultant year-to-date Lost-Time Incident Rate (LTIR) for the WTC PATH Hub project is 1.97, which compares favorably to the national average of 2.10. The corresponding Total Case Incident Rate (TCIR) for the same period is 7.04, which is above the national average of 5.10.

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.

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. WTCC and the LMRO continue to resolve issues related to the RRCA. Completion of the RRCA is planned for the second quarter of 2012.

Quarterly Progress Review Meeting

The QPRM for the first quarter of 2012 was held May 21, 2012. FTA and the grantee discussed all major project issues.

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.

Procurement and Contracting Activities

To date, WTCC has completed over 95 percent of its planned procurements. The PANYNJ Board authorized award of the Oculus Skylight contract on May 21, 2012. The remaining procurements planned for completion in the second quarter of 2012 are for the stone installation and the Oculus coatings.

WTCC received proposals on May 24, 2012, for the stone installation procurement.

WTCC has completed its review of the Oculus coatings package and is expected to recommend award at the June 2012 PANYNJ Board meeting.

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 elevations 254 and 274, working from the east to the west limits of the contract. The contractor is developing concrete placement drawings for slab sections above elevation 274.

Hudson & Manhattan (H&M) Wall Demolition: The contractor completed removal of the final panel section of the H&M east bathtub wall alongside the R Line subway structure during the month of May 2012; the final removal of miscellaneous openings of the H&M east bathtub wall is expected to be completed in June 2012.

Structural Steel to Grade (SSTG) – Area 3: The structural steel contractor continued erection of the structural steel framing above elevation 274 during May 2012. Erection of the shorter-span east end arch also continued during May. Fit-up of the arch members progressed from south to north, while the H&M wall demolition contractor continued to prepare the opening in the H&M wall at the north end of the arch location. The west tower crane, currently under the control of the structural concrete contractor, will be re-assigned to be under the control of the SSTG contractor on June 6, 2012. It will then be converted to a traveler crane similar to how the east tower crane was previously converted. Completion of the Area 3 structural steel to grade erection is currently forecast to occur in the third quarter of 2012.

Oculus Steel: Fabrication of Oculus steel continued during May 2012. Current metrics on the status of fabrication of the principal Oculus steel elements, based on recent shop status reports issued by the fabrication subcontractor, indicate that fabrication progress is presently 91 percent complete for sub-portals, 43 percent complete for lower portals, 8 percent complete for upper portals, and 13 percent complete for abutments. WTCC dispatched a representative to the fabrication facility for an early May 2012 visit and assessment of the progress of the fabrication of Oculus steel elements. Some slowing in the rate of Oculus steel fabrication was evident in recent weeks and was attributable to the multiple-day closures of the fabrication shops for Easter observance during April. Transatlantic delivery of the Oculus steel will be divided into six shiploads, with the first arrival in the United States currently forecast to occur in September 2012. That shipment will consist exclusively of lower portals and sub-portals. By contract, the Oculus steel contractor must have received at least 50 percent of the required steel before being permitted to start erection, so that there is a continuous process and there are no gaps while waiting for subsequent shiploads to arrive. The Oculus steel contractor will use two large-capacity cranes to erect the steel. One of the cranes has been received. The second crane is currently in transit.

Oculus Glass: Regular biweekly meetings with the contractor continued during May 2012. However, the tentative plan for the CM, designer, and WTCC to conduct a mid-May visit to the glass manufacturing facility did not materialize. The visit had been intended to address the application of the fabricator's quality control program, provide for the inspection of sample glass assemblies, and establish an acceptable control sample at the manufacturing facility. In place of the visit, a conference call among the parties was held on May 23, 2012.

PATH Hall Construction (PHC): The PHC contractor continued the installation of formwork and reinforcing steel of the 1 Line box roof at the underpass and placed concrete on several roof sections. The contractor continued the concrete placement of the super-columns supporting the 1 Line box and continued to make progress on Platform A. The sub-grade construction of Track 1 and the precast ductwork installation above Tracks 1 and 2 continued. 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, PATH substation No. 3, and level 4 in Tower 4. The PHC contractor continued interior fit-out work at the East-West Connector.

Structural Steel to Grade (SSTG): The structural steel contractor continued the installation of steel ribs to the EBG and the removal of the temporary supports that have delayed the completion of Platform A. The platforms are on the critical path to overall project completion. The contractor is completing punch list work on the 1 Line box steel support structure.

MEP and Fire Protection Work: The three MEP contractors and the fire protection contractor continued their field construction activities during May 2012. Of the six spot networks being constructed, SN-PS has been largely completed and energized; SN-TN is approaching completion although its location within Tower 2 continues to experience water infiltration; SN-SE, which is for the exclusive use of Retail and is located within Tower 4, is approaching completion; and SN-TS, located at the B3 level within Tower 3, is just starting to be installed. The remaining two spot networks will not be started until the space that they will occupy beneath the 1 Line box has been constructed.

Installation of a manpower and equipment hoist in the northeast corner of the east bathtub was completed in May, and the hoist was placed in service. The hoist provides additional capacity for the delivery of MEP and fire protection materials, and reduces the demand for usage of the two Area 3 cranes.

Permanent Electric Power System: The two remaining PDC line-ups, PDC G and PDC H, are awaiting additional Con Edison work, including the splicing of feeder cables in the Tower 1 splice chamber. Energization of additional line-ups was completed during March and April of 2012, thus increasing the overall amount of electric power available to all users. Ultimately, all PATH Hub electrical power will be delivered through the shared PDC facility at Tower 1.

Vertical Circulation: The contractor continued to submit engineering drawings and technical data for review and approval by the designers. Multiple elevators and escalators were fabricated and were placed in a storage facility, and several others are currently in fabrication and are anticipated to be shipped to the site in the second quarter of 2012. The contractor is expected to mobilize in June 2012 and will begin installing the escalators located in the East-West Connector and Platform A.

Architectural Trades: The designer has approved the mock-up of a typical storefront in the East-West Connector. The contractors continued submitting shop drawings and technical data for review and approval by the designers.

Miscellaneous Metals: Various miscellaneous metals items were delivered to the site during May 2012. The contractor crews continued installation of steel components at various PATH Hub locations, including the spot network rooms.

North Projection Structural Rehabilitation: The contractor continued repairs to the existing slurry wall and reinforcing steel installation of the north liner wall. *The contractor completed the removal of the temporary shield above the PATH railroad tracks.*

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. *The utilization of the Vehicular Security Center and associated roadway at elevation 254 as an access way for delivery of construction materials is currently targeted to occur by May 31, 2013.*

Interagency Coordination

OPL continued its coordination of site construction and logistics among the many project stakeholders, including contractors, construction managers, tenants, insurance firms, PATH operations, and the Port Authority Police Department. OPL began 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 61 in April 2012. This latest IMS, with a data date of February 1, 2012, shows no slippage to the PATH Hub project overall completion date [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 62 is expected in June 2012.

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

Significant Activity	Action by
Completion of RRCA	WTCC and FTA
Completion of Transit Hall foundation to elevation 274	WTCC
<i>Load transfer – 1 Line underpass structure</i>	WTCC
SSTG Area 3 steel complete	WTCC

D Cost Data

WTCC submitted an updated cost model on May 29, 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 March 31, 2012, 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 the PATH Hub expenditures through March 31, 2012, at just over \$2.1 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.

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

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,641	\$1,547
Program Management and Design	590	574
Contingency	153	0
Total	\$3,384	\$2,121

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.

F Technical Capacity and Capability Review

An update to the TCCR and a 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 final draft form, and the grantee is addressing FTA/PMOC comments on the final draft.

Project Organization

WTCC continues to update consultant and contractor staff assignments across the project areas to address staffing needs. During April 2012, WTCC adjusted construction management assignments for the west bathtub to include contractor/CM point persons for each element (e.g., Platform A, East-West Connector, 1 Line box) to better manage the work. WTCC personnel were temporarily reassigned from field to office duties to reduce the backlog of COs.

Project Quality Assurance

During May 2012, WTCC QA conducted five audits to verify implementation of contractor quality programs and field construction activities.

In addition, a meeting was held between WTCC, the FTA, and the PMOC focusing on the status of the WTCC QA Program and related PATH Hub construction activities.

G Site Safety and Security Review

The April 2012 year-to-date safety data shows that WTCC's PATH Hub safety performance was relatively unchanged during the month. From the start of the year through the end of April 2012, there have been 7 lost-time injuries and 25 recordable injuries on the WTC PATH Hub project and 710,631 hours worked. The resultant year-to-date LTIR for the WTC PATH Hub project is 1.97, which compares favorably to the national average of 2.10. The corresponding TCIR for the project for the same period is 7.04, which is above the national average of 5.10.

WTCC is taking steps to improve [REDACTED] safety performance. In mid-May, WTCC revised its policy on Fall Protection to specifically detail a sequence of progressively more severe penalties for workers and supervisors who do not properly deploy fall protection. Also in mid-May, WTCC issued a new policy on Eye Protection. Similar to the Fall Protection policy, workers and supervisors will be subjected to progressive discipline when found to be in violation of the Eye Protection policy. In both policies, permanent revocation of site access privileges will be imposed as the final step in the process for multiple offenses. Although these policy improvements apply to all PATH Hub contractors, they are aimed at the two primary types of accidents that have kept the safety indices of the SSTG contractor at excessively high levels.

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 61 does not show any delay to the completion of the PATH Hub project, which is scheduled for [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.

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	Second Quarter 2012	Analysis completed in fourth quarter 2011. Finalization of the report continues.

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
EBG	East Box Girder
FD	Final Design
FTA	Federal Transit Administration
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	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.