

## MONTHLY MONITORING REPORT

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

*April 2012*

---

PMOC Contract Number: DTFT60-09-D-00008

Task Order Number: T09002, Project Number: RV-43-0001, Work Order No. 002

O.P.s Reference: 01, 02, 25

David Evans and Associates, Inc., 17 Battery Place, Suite 1328, New York, NY 10004

PMOC Lead: Craig Goodall, Contact Information: 212-364-2112, [cxgo@deainc.com](mailto:cxgo@deainc.com)

PMOC Length of Time: David Evans and Associates, Inc. October 2008

Craig Goodall December 2005

## TABLE OF CONTENTS

TABLE OF CONTENTS .....	2
THIRD-PARTY DISCLAIMER.....	3
REPORT FORMAT AND FOCUS .....	4
EXECUTIVE SUMMARY .....	4
Project Description.....	4
Construction Agreement (CA) .....	4
Quarterly Progress Review Meeting (QPRM) .....	4
Design Activity .....	4
Procurement Activity .....	4
Construction Activity .....	4
Schedule .....	5
Cost Data.....	5
Risk Management .....	5
Technical Capacity and Capability Review (TCCR).....	5
Project Management Plan (PMP).....	5
Project Quality Assurance.....	6
Site Safety and Security Review .....	6
Major Issues/Problems .....	6
MONITORING REPORT .....	7
A Project Description .....	7
B Project Status .....	7
C Schedule .....	10
D Cost Data .....	11
E Risk Management.....	11
F Technical Capacity and Capability Review .....	12
G Site Safety and Security Review .....	12
H Major Issues/Problems .....	13
I Action Items .....	13
APPENDICES.....	14
APPENDIX A – LIST OF ACRONYMS .....	14
APPENDIX B – LESSONS LEARNED .....	14

### **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 next QPRM, for the first quarter of 2012, is scheduled for 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 the award of the Oculus Skylight contract at the April 26, 2012 PANYNJ Board Meeting.*

### Construction Activity

*At the PATH Hall, the structural steel contractor completed the PATH Hall roof load transfer and the gravity transfer of east and west arch trusses of the 1 Line box on April 6, 2012. The general contractor began installation of formwork and reinforcing steel of the 1 Line box roof, continued concrete placement for the super-columns, continued Track 1 construction, and completed installation of columns at Platforms A and B. WTCC expects Platform A to be completed in the fourth quarter of 2012.*

*At the Transit Hall, superstructure concrete work continued at elevations 254 and 274. Structural steel erection of the framing above elevation 274 began during April 2012. Conversion of the east tower crane from a stationary to a traveler crane configuration was completed during the month, with the control of the crane reverting to the Package 20 Structural Steel to Grade (SSTG) contractor. Additionally, the contractor installed a temporary roadway extension structure from the Church Street side of the site to allow for truck deliveries of heavy Transit Hall structural steel members to be off-loaded and erected using the traveler crane. The SSTG contractor also completed all welding activity on the west end arch during April. Fabrication of Oculus steel continued during the month, with fabrication focusing on the structural elements needed for the start of erection in the third quarter of 2012. Oculus glass fabrication is in the start-up phase.*

*Mechanical, Electrical, and Plumbing (MEP) and fire protection contractors expanded their field construction activities during April 2012. Installation of a manpower and equipment hoist in the northeast corner of the site will aid efficient delivery of materials for the MEP and fire protection contractors.*

*Energization of four additional electrical system components was completed during April 2012, increasing the overall amount of electric power available to all users.*

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

#### Schedule

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

#### Cost Data

*WTCC submitted an updated cost model on April 16, 2012. The cost model is currently under review by the Project Management Oversight Contractor (PMOC). Based on awards through February 29, 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 approximately \$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 April 2012, WTCC Quality Assurance (QA) conducted three 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 March 2012, there have been five lost-time injuries and eighteen recordable injuries on the WTC PATH Hub project and 424,438 total hours worked. The resultant year-to-date Lost-Time Incident Rate (LTIR) for the WTC PATH Hub project is 1.88, which compares favorably to the national average of 2.10. The corresponding Total Case Incident Rate (TCIR) for the same period is 8.48, 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 next QPRM, for the first quarter of 2012, is scheduled for May 21, 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.

#### Procurement and Contracting Activities

*To date, WTCC has completed over 95 percent of its planned procurements. The PANYNJ Board authorized the award of the Oculus Skylight contract at the April 26, 2012 meeting. The contract is expected to be executed in May 2012. The remaining procurements planned for completion in the second quarter of 2012 are the stone installation and the Oculus coatings procurements.*

*The stone installation procurement was re-advertised for submission of proposals by June 5, 2012.*

*WTCC opened bids for the Oculus coatings procurement on April 20, 2012, and is currently reviewing the bids.*

WTCC and its Construction Manager (CM) provided to the PMOC 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.*

*Hudson & Manhattan (H&M) Wall Demolition: The contractor continued removal of applicable portions of the H&M east bathtub wall on the second shift. The contractor continued removal of the final section of the H&M east bathtub wall alongside the R Line subway structure; this removal is expected to be completed in May 2012.*

*Structural Steel to Grade (SSTG) – Area 3: The structural steel contractor continued erection of the structural steel framing above elevation 274 during April 2012. Conversion of the east tower crane from a stationary to a traveler crane configuration was completed during the month, with the control of the crane reverting to the SSTG contractor. Additionally, the contractor installed a temporary roadway extension structure from the Church Street side of the site to allow for truck deliveries of Transit Hall structural steel members to be off-loaded and erected using the traveler crane. The SSTG contractor also completed all welding activity on the west end arch during April. [REDACTED] Erection of the shorter-span east end arch commenced during April, with several arch sub-elements delivered and set in place in preparation for the start of field welding.*

*Oculus Steel: Fabrication of Oculus steel continued during April 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 85 percent complete for sub-portals, 32 percent complete for lower portals, 5 percent complete for upper portals, and 9 percent complete for abutments. WTCC is currently dispatching a representative to the fabrication facility for an early May 2012 visit and assessment of the progress of the fabrication of Oculus steel elements.*

*The planned erection sequence for the Oculus steel elements is generally in the following order: lower portals, followed by sub-portals, upper portals, abutments, transitions, arches, and rafters, with the rafter erection proceeding from smallest to largest.*

*Oculus Glass: Regular biweekly meetings with the contractor continued during April 2012. The CM, the designer, and WTCC have tentatively scheduled a mid-May visit to the glass manufacturing facility at the start of the manufacturing process for the Oculus glass. The visit is 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. Subsequent visits are also being planned.*

*PATH Hall Construction (PHC): The PHC contractor started the installation of formwork and reinforcing steel of the I Line box roof at the underpass and continued the concrete placement of the super-columns supporting the I Line box. The contractor continued to make progress on Track I construction and completed installation of columns at Platforms A and B. The precast ductwork installation on Platforms A and B continued. WTCC expects Platform A to be*

*completed in the fourth quarter of 2012. The PHC contractor continued placing concrete for Platform A. 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 completed the PATH Hall roof load transfer and the gravity transfer of east and west arch trusses of the 1 Line box on April 6, 2012. Completion of the load transfer will enable the installation of steel ribs to the East Box Girder (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 of the 1 Line box steel support structure.*

*MEP and Fire Protection Work: The three MEP contractors and the fire protection contractor expanded their field construction activities during April 2012. Authorization was received to begin work at Spot Network SN-TS, which is at the B-1 level of Tower 3, and that work is expected to begin during May.*

*Installation of a manpower and equipment hoist in the northeast corner of the east bathtub started during April and is expected to be completed and available for use during early May 2012. The hoist will provide additional capacity for the delivery of MEP and fire protection materials, as well as reducing the demand for usage of the two Area 3 cranes.*

*Permanent Electric Power System: Energization of four additional line-ups was achieved during April 2012: Primary Distribution Center (PDC) C, PDC D, PDC E, and PDC F were all energized during the month. The two remaining line-ups, PDC G and PDC H, are forecast to be energized during May 2012. Energization of these components provides the PATH Hub and other WTC projects with access to permanent electric power, and increases 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 submitting 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 May 2012 and commence the installation of the escalators located in the East-West Connector.*

*Architectural Trades: The designer has reviewed the mock-up of a typical storefront in the East-West Connector and will be providing comments on the mock-up in May 2012. The contractors continued submitting drawings and technical data for review and approval by the designers.*

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

*Route 9A Underpass: The contractor has substantially completed punch list work. This contract will no longer be reported.*

North Projection Structural Rehabilitation: The contractor continued repairs to the existing slurry wall and reinforcing steel installation of the north liner wall. *The contractor installed the hoist beam and completed placement of the concrete slab at elevation 284.*

PATH Harrison West Transfer Yard (Harrison Rail Yard): *A final inspection was conducted, and a Permit to Occupy/Use was requested. This contract will no longer be reported.*

**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.

**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] his 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:

<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
Removal of PATH Hall roof temporary shoring	WTCC
<i>SSTG Area 3 steel complete</i>	WTCC

## D Cost Data

WTCC submitted an updated cost model on April 16, 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 February 29, 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 February 29, 2012, as approximately \$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 February 29, 2012:

Description	EAC (WTCC's Forecast) (in millions)	Expenditures (in millions)
Construction	\$2,531	\$1,463
Program Management and Design	700	621
Contingency	153	0
Total	\$3,384	2,084

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 April 2012, WTCC QA conducted three 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 March 2012 year-to-date safety data shows that WTCC's PATH Hub safety performance worsened during the month. From the start of the year through the end of March 2012, there have been 5 lost-time injuries and 18 recordable injuries on the WTC PATH Hub project and 424,428 hours worked. The resultant year-to-date LTIR for the WTC PATH Hub project is 1.88, which compares favorably to the national average of 2.10. The corresponding TCIR for the project for the same period is 8.48, which is above the national average of 5.10.*

*WTCC is taking steps to improve [REDACTED] safety performance, including holding monthly safety meetings at the executive level. In addition, during April 2012, WTCC's insurance broker added a safety staff member. Last, WTCC safety management is addressing the contents of the PMOC's quarterly safety spot report for the fourth quarter of 2011, including addressing the recommendations and suggestions for improving project safety performance.*

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 [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	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.