

## MONTHLY MONITORING REPORT

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

July 2013



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

PMOC Lead: Erick Peterson, Contact Information: 212-364-2112, [egp@deainc.com](mailto:egp@deainc.com)

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Cover: *Oculus steel element being off-loaded at site from specially-equipped transport vehicle*

### **THIRD-PARTY DISCLAIMER**

This report and all subsidiary reports are prepared solely for the Federal Transit Administration (FTA). This report should not be relied upon by any party, except FTA or the project sponsor, in accordance with the purposes as described below.

For projects funded through FTA's Lower Manhattan Recovery program, FTA and its Project Management Oversight Contractor (PMOC) use a risk-based assessment process to review and validate a project sponsor's budget and schedule. This risk-based assessment process is a tool for analyzing project development and management. Moreover, the assessment process is iterative in nature; any results of an FTA or PMOC risk-based assessment represent a "snapshot in time" for a particular project under the conditions known at that same point in time. The status of any assessment may be altered at any time by new information, changes in circumstances, or further developments in the project, including any specific measures a sponsor may take to mitigate the risks to project costs, budget, and schedule, or the strategy a sponsor may develop for project execution.

Therefore, the information in the monthly reports may change from month to month, based on relevant factors for the month and/or previous months.

## REPORT FORMAT AND FOCUS

This monthly report is submitted in compliance with the terms of the Federal Transit Administration (FTA) Contract No. DTFT60-09-D-00008, Task Order No. 002. Its purpose is to provide information and data to assist the FTA in continually monitoring the grantee's technical capability and capacity to execute a project efficiently and effectively, and hence, whether or not the grantee continues to receive federal funds for project development.

This report covers the project management activities on the Permanent World Trade Center (WTC) Port Authority Trans-Hudson (PATH) Terminal (Hub) project, conducted by the Port Authority of New York and New Jersey (PANYNJ) as grantee and financed by the FTA's Lower Manhattan Recovery Office (LMRO).

## EXECUTIVE SUMMARY

The replacement of storm-damaged equipment, systems, and related project elements that were damaged or destroyed by Hurricane Sandy is advancing along with the performance of other project work that was not significantly impacted by the storm. Most of the replacement work has been completed, although several systems are yet to be tested and, in the case of electrical systems, re-energized. The cost of the work required because of Hurricane Sandy is being funded from a separate operating account and is not expected to impact the Hub project's current Estimate at Completion (EAC).

### Project Description

The PATH Hub facility is an intermodal terminal serving the PATH electrified rail transit system in Lower Manhattan. The PATH Hub is an extensive underground complex of pedestrian corridors and train station facilities that will replace the original WTC PATH Terminal destroyed by terrorist attack on September 11, 2001.

### Construction Agreement (CA)

The CA was signed by the LMRO on April 25, 2006. A Revised and Restated Construction Agreement (RRCA) was executed on September 18, 2012. The RRCA establishes a Required Completion Date (RCD) of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub. The RRCA includes an FTA-allowable amount not to exceed of \$3.995 billion. *The hurricane damage is expected to delay the project by a minimum of six months.*

### Quarterly Progress Review Meeting

*The next QPRM will be held for the third quarter of 2013 and is expected to occur in late October, 2013.*

### Design Activity

The designer continues to provide construction support services including the review of contractor shop drawings and other submittals. The designer has also been providing guidance

and technical criteria for the assessment and replacement of equipment, systems, and related project elements that were damaged by Hurricane Sandy.

#### Procurement Activity

World Trade Center Construction (WTCC) has completed all planned procurements for the Hub project. *Additional procurement actions to address damage caused by Hurricane Sandy continue, although all major replacement equipment has now been ordered with most replacement equipment also received and undergoing active installation.*

#### Construction Activity

At the PATH Hall in the west bathtub, the PATH Hall Construction (PHC) contractor continued work at the mezzanine level, Platform A, and the East-West Connector. The PHC contractor substantially completed concrete placements for the 1 Line box invert slab.

At the Transit Hall in the east bathtub, the Oculus steel contractor received the fourth of seven shipments of oculus steel and erected two major work platforms in preparation for expanding the above grade erection of oculus steel elements towards the oculus center.

#### Schedule

In May 2013, WTCC released Integrated Master Schedule (IMS) 67, (b) (4)

Activities to repair the damage caused by Hurricane Sandy, as well as sequencing associated with early demolition of the North Temporary Access, were preliminarily included in IMS 67. WTCC continues to assess workaround opportunities, particularly for platform construction. *More details of the workaround plans are expected to be included in the draft IMS 68, which was released for stakeholder reviews in July 2013.*

#### Cost Data

*WTCC submitted its Cost Model Revision on July 31, 2013. Based on the contract awards and estimates through June 30, 2013, WTCC's EAC for the federally funded PATH Hub project is just over \$3.7 billion. WTCC is reporting the PATH Hub expenditures through June 30, 2013, to be approximately \$2.6 billion.*

#### Risk Management

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. As information on the impacts of Hurricane Sandy became available, the PMOC conducted risk assessment workshops in June 2013 to discuss and quantify cost and schedule risks. *In July 2013, the PMOC completed the preliminary results of the risk assessment and in the process of reconciling the results with WTCC. The outcomes of this risk assessment will be a reference for updating the PEP.*

## Technical Capacity and Capability Review (TCCR)

*An update to the TCCR will be performed in conjunction with the updated PEP and is anticipated to be completed later in 2013.*

## Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan and Operations Management Plan, both of which are PMP sub-plans. The grantee provided a draft construction phase Force Account Plan and Justification in early May, and it is currently under PMOC review.

## Project Quality Assurance

*During July 2013, WTCC Quality Assurance (QA) and the Construction Manager (CM) QA performed four quality assurance audits on both field construction and QA program activities, including its oversight audits of the on-going installation of oculus steel. In addition, WTCC QA completed an audit to verify the receiving, inspection, and storage practices for the PATH Hub structural steel delivered to the PANYNJ's Red Hook logistics facility on July 5<sup>th</sup> and 8<sup>th</sup>. The QA audits completed in July 2013 did not identify any issues that required corrective action.*

## Site Safety Review

*The WTC PATH Hub project's year-to-date safety performance through June 2013 declined slightly. The resultant year-to-date Total Case Incident Rate (TCIR) increased but still compares favorably with the national average. The year-to-date Lost-Time Incident Rate (LTIR) also increased and is above the national average for the third consecutive month. WTCC has continued its proactive role in managing worker safety.*

## Issues/Problems/Suggestions

- The completion of the PATH Hub project has been delayed as a result of Hurricane Sandy in late October of 2012. (b) (4)
- While the cost to complete the PATH Hub is expected to increase significantly as WTCC addresses the damage caused by Hurricane Sandy, WTCC has advised that the storm-related costs will be funded from a separate operating account and will not impact WTCC's current EAC. The adequacy of the current budget and schedule contingencies will be further evaluated as additional information becomes available.



## MONITORING REPORT

### A. Project Description

The PATH Hub facility is an intermodal terminal serving the PATH electrified heavy rail transit system, which has a total of 13 PATH stations in New York and New Jersey. When completed, the PATH Hub will connect to 11 New York City Transit (NYCT) subway lines in Lower Manhattan. The PATH Hub will include a platform level, associated mezzanine and concourse levels called the PATH Hall, and a terminal building called the Oculus, or Transit Hall, with north-south and east-west pedestrian connections to the NYCT subways, the World Financial Center, and WTC above-grade site development. It will be a permanent replacement of the original WTC PATH Terminal complex destroyed by terrorist attack on September 11, 2001.

### B. Project Status

#### Construction Agreement

The CA was signed on April 25, 2006. An RRCA was executed on September 18, 2012. The RRCA establishes an RCD of December 17, 2015, and commits \$2.872 billion in federal funding to the PATH Hub project. It also includes an FTA-allowable not-to-exceed amount of \$3.995 billion.

#### Quarterly Progress Review Meeting

*The next QPRM will be held for the third quarter and is expected to occur in late October 2013.*

#### WTC Site Master Plan

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

#### Environmental Compliance

(Reported on separately by FTA's LMRO.)

#### Design Support during Construction

The designer continued providing post-award design support services for the PATH Hub construction, including responding to contractor Requests for Information and providing certifications of completion for elements of construction.

The designer also continues to provide guidance and technical criteria for the assessment and replacement of storm-damaged equipment and systems for all categories of construction, including electrical, plumbing, HVAC, fire protection, compressed air, architectural, structural, and vertical transportation.

## Procurement and Contracting Activities

WTCC has completed all planned procurements for the PATH Hub project. *Procurement actions to address damage caused by Hurricane Sandy continue. However, all major replacement items have been ordered, according to WTCC.*

## Construction Status

*Transit Hall Concrete: During July, the concrete contractor continued placement of miscellaneous concrete items at elevation 241 and concrete wall sections located at the lower levels of the Transit Hall. Current work includes the removal of formwork material, and the filling of openings in concrete walls and floor slabs, which were omitted during larger concrete pours, to provide temporary construction access openings.*

*Structural Steel to Grade (SSTG) – Area 3: During July, the contractor’s activities in Area 3 transitioned to the application of intumescent paint to the steel elements. Most of the contractor’s other activities in Area 3 have been completed or reduced to relatively minor completion work. Intumescent paint application is expected to continue through most of the third quarter of 2013.*

*Oculus Steel: Fabrication, shipment and erection of Oculus steel continued during July 2013. The current fabrication metrics, based on status reports issued by the fabrication subcontractor, are: 100 percent completion for sub-portals, 100 percent completion for lower portals, 71 percent completion for upper portals, 75 percent completion for abutments, 80 percent completion for arches, 75 percent completion for transitions, and 19 percent completion for rafters. The fourth of seven shiploads of Oculus steel elements arrived and was off-loaded at the Brooklyn receiving facility on July 6, 2013. On board were additional upper portals, arches, and transitions. The fifth shipload of oculus steel is currently scheduled to depart on August 8, 2013 and will carry additional upper portals, arches, transitions, and the first rafters to be sent. Above-grade field erection is advancing in both the east and west abutment areas. Two large work platforms were installed on shoring from the 274’ elevation with the top of the work platforms at approximate elevation 320’. The work platforms are being installed to allow access to the areas of the above grade oculus structure that require extensive amounts of field welding.*

*Oculus Glass: WTCC’s third-party consultant made a return visit to the glass fabrication shop during the second week of July 2013. Fabrication of the second half of the required oculus glass was nearing completion during this visit. Several of the fabrication processes were observed by the consultant including cutting and edge work, tempering, heat-soak testing, low-Emissivity coating, and panel assembly and deglazing. The shipment of these panels is expected to occur by the end of September. Upon receipt, they are expected to be handled into the contractor’s receiving location in Harrison, New Jersey with the other oculus glass that was previously received.*

*Oculus Skylight: Fabrication of a full-size mock-up of a typical section of the oculus skylight started during July. Preparation of a test chamber, where the mock-up will be subjected to various performance tests, also started during July. Twenty days of mock-up performance testing is currently forecast to start in September 2013, at the contractor’s testing facility located in eastern Pennsylvania.*



*Transit Hall Interior Stone: Bi-weekly job progress meetings continued to be held with this contractor during July 2013. The stone fabrication and installation under this contract is divided into ten phases, and the first phase, consisting of the stone at the southern end of the lower level of the North-South Concourse, was released for fabrication in March 2013. This first phase of stone is currently tracking for delivery to the site by September 1, 2013.*

*PATH Hall Construction (PHC): The PHC contractor placed the final concrete sections of the 1 Line box invert slab under General Orders that suspended NYCT service during those placements. Approximately 700 cubic yards of concrete was placed. The PHC contractor removed the temporary shoring system of the previously placed concrete sections of the 1 Line box invert slab, allowing follow on contractors to proceed with their work. Work on the closed portions of Platform B at the north end of the station continued. The contractor began construction of the temporary access to the PATH North Temporary Access to allow commuters to enter and exit the PATH station from the East West Connector. WTCC continues to forecast that Platform A will be placed into service in the fourth quarter of 2013.*

*Mechanical, Electrical, and Plumbing (MEP) and Fire Protection Work: Work by these four contractors advanced during July in several locations, including Spot Networks SN-TS, SN-TN, SN-PN, and SN-NW, along with work at the Central Fan Plant. Spot Network SN-TS, located within the podium of Tower 3, which had been forecast to be energized by August 2, 2013, has been delayed and recently re-forecast to be energized by the end of August instead. Work in Spot Network SN-TN continues to be expedited using selective craft overtime to secure its placement into service to meet the forecast date of late October 2013. At the Central Fan Plant, recently delivered air-handling units continue to be under active installation.*

*Emergency Generator Plant and Emergency Chiller Plant: During July, installation of the emergency generator equipment advanced. However, it was also learned that the manufacturer of two of the eight generators had identified a manufacturing defect with that particular model and would need to send technicians to perform corrective work on those units with that visit scheduled to begin on September 1, 2013. Also during July, one of the four emergency air-cooled chillers that were brought to the site and rigged to the fifth floor of Tower 3 during June, was found to have sustained damage in handling and is being assessed at present for possible return to its manufacturer for shop repair or replacement.*

*Primary Distribution Center (PDC) at Tower 1: Although originally targeted for re-energization in late June, PDC line-ups A and B remain under review by Con Edison with further testing performed during July. Current expectation is for Con Edison to authorize their re-energization during August. The subsequent series of line-ups, C through H, will follow a similar process of testing and Con Edison inspection and then be re-energized in sets of two.*

*Vertical Circulation: The contractor continued to install the escalators in the East-West Connector and the Route 9A underpass. The contractor continued installing the escalator components of Platform A. The contractor began installing the escalators located in the Transit Hall at elevation 274. The contractor continued installing the platform A elevator cabs and the escalators located in Tower 4.*

*Architectural Trades: The contractor began laying out architectural steel columns at elevation 296. Installation of the architectural steel members in the Transit Hall at elevation 274 continued.*

North Projection Structural Rehabilitation: *During the month of July 2013, the contractor continued cleaning areas and performing punch list work.*

#### 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. *During July, OPL continued to work with the Oculus steel contractor and to provide coordination with the New York City Department of Transportation (NYCDOT) with respect to the overnight site deliveries of larger Oculus steel elements. Three off-hour oculus steel deliveries that required New York Police Department escort from Brooklyn to the site were made during the month. OPL is currently coordinating the planned 4<sup>th</sup> quarter opening of Fulton Street between Church Street and Greenwich Street to limited traffic. Potential impacts on Hub construction are being assessed. OPL is also involved in the planned opening of the East-West Connector to pedestrian traffic, which is scheduled to occur in late September, 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.

#### Community Relations

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

#### C. Schedule

WTCC released IMS 67 in May 2013. This latest IMS, with a data date of April 1, 2013, (b) (4)

WTCC will continue to assess opportunities for workarounds, in particular for platform construction. *More detailed workarounds are expected to be included in the draft IMS 68 that was released in July 2013 for stakeholder reviews.*

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

| Significant Activity                        | Action by |
|---|-----------|
| Platform A Mezzanine Structure              | WTCC      |
| Opening of East-West Connector              | WTCC      |
| Oculus Abutments Steel Fabrication Complete | WTCC      |
| Energization of Spot Network SN-TS          | WTCC      |

#### D. Cost Data

*WTCC submitted its Cost Model Revision on July 31, 2013. Based on the contract awards and estimates through June 30, 2013, WTCC's EAC for the federally funded PATH Hub project is slightly more than \$3.7 billion. WTCC is reporting the PATH Hub expenditures through June 30 2013, to be approximately \$2.6 billion, which represents a \$33 million increase since the May 31, 2013 report.*

On October 18, 2012, the Port Authority Board re-authorized the WTC PATH Hub project, at an estimated total project cost range of \$3.74 billion to \$3.995 billion. This authorization provided for an increase in the budget from approximately \$3.4 billion to slightly more than \$3.7 billion.

The \$3.7 billion budget reflects the updated engineer's estimates for all packages in the completed procurement plan *and* includes the Hub project's share of the common infrastructure projects, such as Retail, the Central Chiller Plant (CCP), the Common Electrical System, and site-wide operational support elements. WTCC continues to update the cost allocations that are being assigned to the Hub project.

*The following chart summarizes the latest available EAC (WTCC's forecast) and expenditures as of June 30, 2013:*

| Description                   | EAC (WTCC's Forecast)<br>(in millions) | Expenditures<br>(in millions) |
|-------------------------------|--|-------------------------------|
| Construction                  | \$2,831                                | \$1,995                       |
| Program Management and Design | 683                                    | 594                           |
| Contingency                   | (b) (4)                                | (b) (4)                       |
| Total                         | \$(b) (4)                              | \$(b) (4)                     |

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

Although it was the opinion of the PMOC that the budget established after the October 18, 2012 project re-authorization by the Port Authority Board would not provide WTCC with adequate funding to complete the project, given the impacts of Hurricane Sandy, WTCC has advised that the costs related to Hurricane Sandy will be funded from a separate operating account set up by PANYNJ for Hurricane Sandy and likely will not impact WTCC's current EAC of \$3.7 billion. The PANYNJ Board has taken action to provide for the costs associated with Hurricane Sandy outside of the PATH Hub project budget.

## 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 PMOC, and WTCC completed the PEP in conjunction with the execution of the RRCA on September 18, 2012.

As information about the impacts of Hurricane Sandy became available, the PMOC conducted risk assessment workshops in June 2013 to discuss and quantify cost and schedule risks. *In July 2013, the PMOC completed the preliminary results of the risk assessment and in the process of reconciling the results with WTCC. The outcomes of this risk assessment will be a reference for updating the PEP.*

## F. Technical Capacity and Capability Review

An update to the TCCR and a new TCCR Spot Report are anticipated to be completed later in 2013. The FTA will use the PEP to measure WTCC's capability and capacity.

### Project Management Plan (PMP)

The grantee is preparing updates to its Project Quality Assurance Plan and Operations Management Plan, both of which are PMP sub-plans. The grantee provided a draft construction phase Force Account Plan and Justification in early May, and it is currently under PMOC review.

### Project Organization

WTCC updates consultant and contractor staff assignments across the project areas to address staffing needs as the project develops.

### Project Quality Assurance

*During July 2013, WTCC Quality Assurance (QA) and the Construction Manager (CM) QA performed four quality assurance audits on both field construction and QA program activities, including its oversight audits of the on-going installation of oculus steel. In addition, WTCC QA completed an audit to verify the receiving, inspection, and storage practices for the PATH Hub oculus structural steel delivered to the PANYNJ's Red Hook facility on July 5<sup>th</sup> and 8<sup>th</sup>. The QA audits completed in July 2013 did not identify any issues that required corrective action.*

## G. Site Safety Review

*The WTC PATH Hub project's safety performance through June 2013 declined during the month reversing a trend of strong performance in the earlier part of the year. From the start of the year through the end of June 2013, there have been 22 recordable injuries and 13 lost-time injuries on the project, with 1,023,792 hours worked. The resultant year-to-date LTIR for the project is*

2.54, which is above the national average of 2.10. The corresponding TCIR for the project for the same period is 4.30, which compares favorably to the national average of 5.10.

#### H. Issues/Problems/Suggestions

- The storm damage to the new PATH Hub facility construction was extensive. Much of the equipment and systems were submerged and thus require extensive repair or replacement, including some large, long-lead-time equipment, such as the emergency smoke purge fans and the electrical power distribution centers. WTCC has been proactive in procuring and installing replacement equipment throughout the areas affected by the storm.
- The overall completion of the PATH Hub project is expected to slip as the damage caused by Hurricane Sandy is addressed. (b) (4)
- While the cost to complete the PATH Hub is expected to increase significantly as WTCC remediates and mitigates the effects of Hurricane Sandy, WTCC has advised that the costs related to Hurricane Sandy will be funded from a separate operating account and likely will not impact WTCC's current EAC. The PANYNJ Board has taken action to provide for the costs associated with Hurricane Sandy outside of the PATH Hub project budget. The adequacy of the current budget and schedule contingency will be evaluated as more information becomes available.

#### I. Action Items

##### Key Project Action Item Checklist

| Key Project Action Item    | Agency                   | Target Completion | Status/Comments  |
|----------------------------|--------------------------|-------------------|--|
| PEP Milestone Review Point | PANYNJ/<br>LMRO/<br>PMOC | TBD               | This will be delayed until the schedule impacts from the hurricane are fully recognized. |

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                      |
| FTA    | Federal Transit Administration              |
| IMS    | Integrated Master Schedule                  |
| LMRO   | Lower Manhattan Recovery Office             |
| LTIR   | Lost-Time Incident Rate                     |
| MEP    | Mechanical, Electrical, and Plumbing        |
| NYCDOT | New York City Department of Transportation  |
| 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                 |
| 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           |
| RCD    | Required Completion Date                    |
| 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.