Baggage Handling Systems Experience

ARORA®

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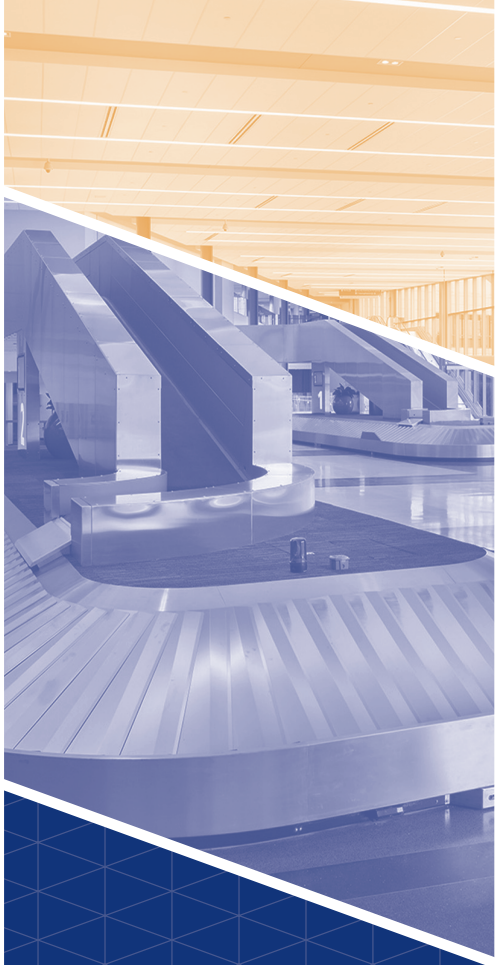

INTRODUCTION

Arora Engineers
aroraengineers.com
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Dear Prospective Client,

Since 1986, Arora has specialized in providing engineering services tailored for complex infrastructure projects including parking and transportation facilities and have re-thought the role played by a traditional MEP engineering provider and our practice has evolved to emphasize the technology that connects systems infrastructure, improves operations and longevity, and makes life safer and easier for those who use it.

We are airport people who understand that aviation facilities are among the most complex and dynamic environments for systems design. Continuously evolving user needs, security concerns, and technology demand that airport system architectures be open to facilitate change, as well as the exchange of information with users and other systems. Arora consistently ranks amongst the top airport engineering firms, earning #9 on Building Design+Construction's (BD+C) 2024 Top 70 Airport Terminal Engineering Firms, and ranking overall as one of BD+C's 2024 Top 70 engineering firms.

Arora has substantial knowledge of Airport Baggage Systems Operations through their life cycle from planning, to design, construction management, testing and commissioning, and finally continued operations and preventative maintenance. Our primary engineering experience around BHS systems has been related to the terminal building systems design and how they integrate and tie into a baggage system. This includes the security and special systems interface, fire alarm, suppression, and the MEP power and ventilation requirements.. We design for clients in every sector with the future in mind and live our tagline of Rethinking Infrastructure as we approach each unique project. Despite constantly evolving transportation needs, all parking facilities must ultimately be designed for optimal user convenience, efficiency, durability and long-term return on investment.

We are familiar with a host of BHS manufacturers, and Arora understands how to implement a turnkey project solution, its key components and the coordination of stakeholders including the Airport, Airlines, TSA, and CBP to insure a successful project.

No project is too big or too small, and we look forward to working with you and exceeding your expectations for quality and service.

Sincerely,

Manik Arora, PE
President and CEO

Arora Engineers

At Arora Engineers, we believe infrastructure needs to do far more than provide seamless, safe, sustainable and comfortable environment. Our goal is to maximize its role, impact and value through highly intelligent solutions that not only meet operational needs, but forward business objectives.

We meet the evolving needs of the world's most critical industries – aviation, transportation and education – through more intelligent, sustainable and connected infrastructure solutions that maximize value for our clients and partners.

Expertise

Throughout our history of more than 30 years, we have held ourselves to rethinking the role of the traditional MEP firm. As a result, we've evolved our practice to emphasize the technology and processes that connect systems infrastructure, improve operations and longevity and make life safer and easier for those who use it.

Arora specializes in providing engineering services tailored for clients in transportation, aviation, education, government and commercial sectors and has developed a unique understanding of the challenges and opportunities facing these critical industries.

Services

SPECIAL SYSTEMS / TECHNOLOGY

+ Mass Notification & Public Address
+ WiFi systems
+ Voice/data systems
+ Network architecture
+ Data centers
+ MDF/IDF room layouts
+ Network design via fiber or copper backbone
+ Plant cabling systems
+ Fiber optic and copper structured cabling systems
+ Communications system design
+ CCTV/MATV/CATV systems
+ Access control
+ Duress systems
+ Perimeter intrusion detection
+ Risk and needs assessments
+ Video walls
+ Security operations and procedures evaluation
+ Passenger/customer information display systems
+ Signage systems/Electronic video information display systems (EVIDS)
+ Software and equipment evaluation and recommendations
+ FIDS/BIDS/GIDS/CUPPS/SUPPS
+ Multi-lingual/International traveler

ATLANTA

BALTIMORE

BENGALURU

BOSTON

DALLAS

LOS ANGELES

MIAMI

NEW YORK

ORLANDO

PHILADELPHIA

PUNE

SAN JOSE

ST LOUIS

ELECTRICAL

+ Low and medium voltage power distribution
+ Emergency and standby power systems
+ Lighting design and photometrics
+ Substation/switchgear
+ Grounding and lightning protection
+ Single-line diagrams
+ Short circuit & coordination studies
+ Power and lighting equipment selection and specifications
+ Motor control centers
+ Electrical equipment sizing
+ Energy efficient systems
+ Electrical code analysis
+ Electrical plan review and master plan development

HVAC / PLUMBING

+ Sustainable/Green Building design
+ HVAC
+ Central plant design
+ Underfloor Air Systems design
+ Constant and variable air volume systems
+ Radiant heating systems
+ Geothermal system design
+ Building automation and digital controls
+ Domestic water systems
+ Storm and sanitary system design
+ Fuel system design
+ Lifecycle Costing, Energy Analyses

FIRE PROTECTION AND LIFE SAFETY

+ Fire alarm and detection system design
+ Standpipes and water-based sprinkler system design
+ Foam systems and special hazard suppression design
+ Fire pumps and fire protection water supply system design
+ Smoke management
+ Code analysis and consulting
+ Plan review
+ Due diligence reports
+ Performance based analysis
+ Risk/hazard assessment
+ Site conditions survey

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

+ Database setup and implementation plans
+ CAD to GIS conversion plans
+ FAA Airport GIS program compliance
+ Legacy data access integration
+ Web-based GIS portal development
+ Asset and utility data management
+ Field inspection and inventory
+ GPS data capture and attribution

PROGRAM MANAGEMENT

+ Project management
+ Procurement coordination
+ Information management
+ All-inclusive project control
+ Runway Incursion Mitigation
+ Pavement Surface Sensor Systems
+ Airfield Lighting Vaults and Power Distribution
+ Sustainable Solutions
+ Construction Safety and Phasing

CONSTRUCTION MANAGEMENT & INSPECTION

+ Project administration
+ Master systems integrator
+ Daily inspection
+ Project documentation
+ Submittal review/tenant permit reviews
+ Design support
+ Constructability reviews
+ Value engineering
+ Runway Incursion Mitigation
+ Airfield Lighting Vaults and Power Distribution
+ Pavement Surface Sensor Systems
+ Construction Safety and Phasing

PROJECT DETAILS

Client

Bob Bruno
Vice President of Engineering
Connecticut Airport Authority
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Construction

Approx. $151-188M

Project Start

2020

Project Completion

Est. 2026

Highlights

+ Delivered MEP/FP and Special Systems design for the CBIS, Departures Level Fit Out, and apron infrastructure.
+ Redesigns included two electrical substations and CTX-supporting UPS systems.
+ Provided full CA and resident inspection services through multiple project phases and TSA compliance cycles.
+ Supported PGDS v7.0 testing, commissioning, and functional integration for long-term operational success.

CONNECTICUT AIRPORT AUTHORITY

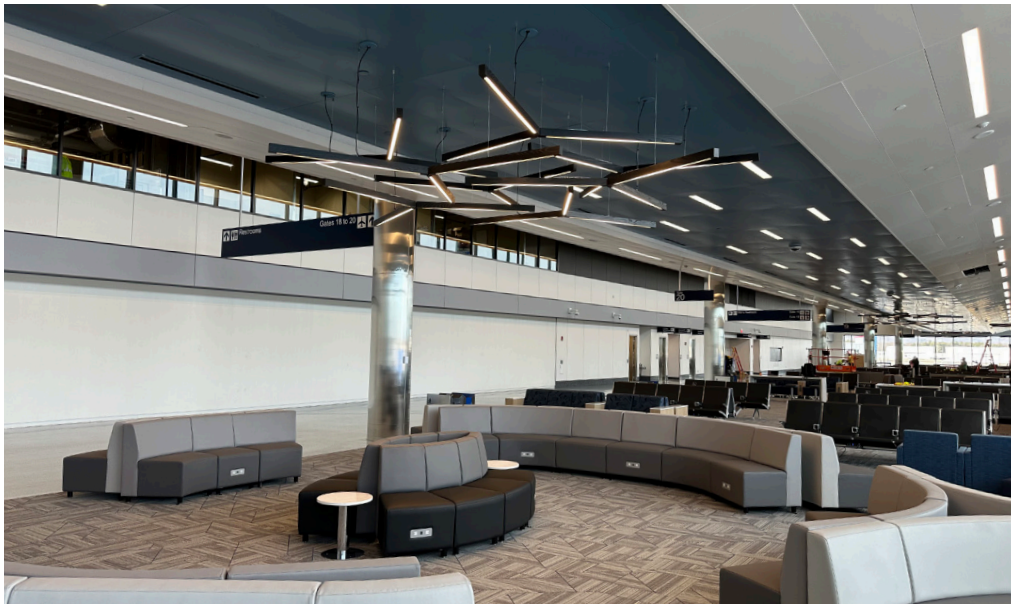
TERMINAL DEVELOPMENT PROGRAM - INLINE CBIS & TERMINAL EXPANSION

Bradley International Airport (BDL), Windsor Locks, CT

Arora Engineers (Arora) served as a subconsultant to AECOM in support of the Connecticut Airport Authority (CAA) for the Terminal Development Program at Bradley International Airport (BDL) in Windsor Locks, Connecticut. A central focus of the program was the replacement of legacy stand-alone lobby screening equipment with a modern Inline Checked Baggage Inspection System (CBIS). The new system was developed to align with updated TSA Planning Guidelines and Design Standards (PGDS v6.0 and v7.0), improve baggage screening throughput, and support the airport's long-term capacity and infrastructure goals.

Arora provided full MEP/FP and Special Systems engineering for the CBIS facility and other associated terminal improvements, working across multiple task orders and amendments. Located within a newly constructed airside structure, the CBIS required complex system integration with existing terminal infrastructure. Arora's design responsibilities included HVAC, electrical, plumbing, fire protection, fire alarm, data/communications, CCTV, and access control. The project scope grew to include the Departures and Upper Level Fit Out, which added new passenger gates above the CBIS footprint, requiring careful mechanical system planning and coordination with TSA, CMR, and multiple trade partners.

In addition to design services, Arora supported bidding, construction administration, and stakeholder engagement activities. The team redesigned two new electrical substations, developed high mast lighting for the expanded apron, which included additional modifications to the existing Express Parking Lot #1, and upgraded UPS infrastructure for CTX machine loads. Arora also led field inspections, reviewed contractor submittals and RFIs, and supported TSA commissioning and ISAT pre-testing. This ongoing work continues to help ensure BDL's baggage handling infrastructure remains flexible, secure, and responsive to future passenger demand.

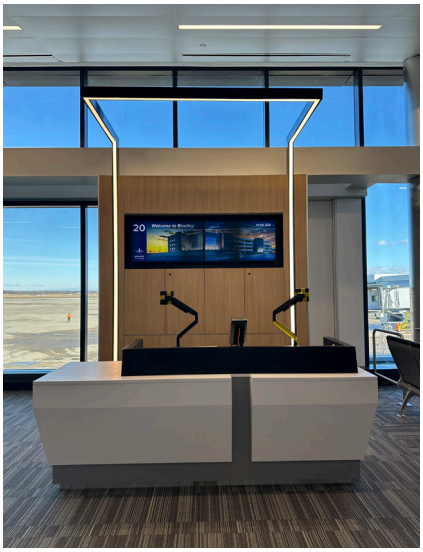


CONNECTICUT AIRPORT AUTHORITY

TERMINAL DEVELOPMENT PROGRAM - INLINE CBIS & TERMINAL EXPANSION

Bradley International Airport (BDL), Windsor Locks, CT

Scope of work included:



+ Validated baggage throughput and system planning criteria for the CBIS facility.
+ Advanced design documentation from 30% studies through 100% CDs for CBIS and terminal improvements.
+ Designed HVAC, electrical, plumbing, fire alarm, fire protection, CCTV, access control, and data/communications systems.
+ Engineered infrastructure for new high mast lighting (HMLP) on the aircraft apron.
+ Designed two 4000A double-ended electrical substations to support the new baggage handling system and all other MEP/FLS loads.
+ Developed and coordinated UPS upsizing to accommodate CTX machine loads.
+ Replaced an existing 750kW generator with a 1500kW generator to support critical airport operations
+ Provided planning and design for the Departures and Upper Level Fit Out above the CBIS facility.
+ Created terminal holdroom layouts, gate reconfigurations, furniture plans, and PBB positions.
+ Participated in value engineering sessions and TSA stakeholder design charrettes.
+ Supported bid-phase services, including walkthroughs and addendum responses.
+ Delivered full construction administration services, including RFIs, submittals, pay apps, PCOs, CCDs, and punch lists.
+ Oversaw system integration, ISAT pre-testing, and TSA PGDS v7.0 commissioning.
+ Provided resident engineering services across multiple amendments.

PROJECT DETAILS

Client

AECOM
Terry Rookard
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(617) 371-4493

Construction

$185,000,000

Project Start

2018

Project Completion

2026

Highlights

+ 80,000 Square-Foot Checked Baggage Inspection System
+ Planning, Design, Engineering Construction Oversight
+ BHS Structural Support, Control System Schematics and Details, Signage Details
+ Project/Phasing Scheduling

CONNECTICUT AIRPORT AUTHORITY

BAGGAGE SYSTEM DEVELOPMENT

Bradley International Airport, Windsor Locks, CT

Arora Engineers (Arora) provided professional MEP, Fire/Life Safety, and Systems Systems engineering to AECOM for the Terminal Development Program at Bradley International Airport, which is the state's largest airport serving the capitol of Connecticut and the surrounding southern New England region. The program involved planning, design, engineering, architectural and construction oversight services related to the 80,000 square-foot checked baggage inspection system, funded primarily by the Federal Aviation Administration.

Scope of work included:

Under this agreement, Arora provided engineering services for the design of a new In-Line Checked Baggage Inspection System (CBIS) utilizing explosive detection systems (EDS) for Terminal A at Bradley International Airport (BDL). The system will transport the nearly two million checked bags BDL screens each year along a mile-long network of conveyor belts to a new, 80,000 SF building for security screening. This facility will eliminate baggage screening from the terminal lobby, freeing up space for up to 16 new airline ticket counters.

The initial phases of work included reviewing and commenting on the 30% package developed and submitted to the TSA in 2013. The 30% package envisioned replacing all existing "in-lobby" CT80 stand-alone screening machines with an in-line CBIS/CBRA located in a new airside facility. The review was accomplished with ILDT participation to validate/verify the overall system capacity requirements, location, and other operational requirements.

Upon completion of this review, the team provided complete design and bid phase services for the new CBIS in accordance with the OTA and based upon the Transportation Security Administration Planning Guidelines and Design Standards (PGDS) v6.0, for all phases of design from schematic through final design and construction phase services.

Overall Design Phase services for the Baggage Handling Checked Baggage Inspections System included:

+ Development of the BHS/CBIS plans and sections to provide the content and the level of detail to the TSA for final review and approval to proceed to construction.
+ Development of conveyor maintenance catwalk and access drawings, BHS structural support and loading details, user interface details, control system schematics and details, signage details.
+ Conveyor manifest (approximate conveyor lengths and belt speeds).
+ BHS/CBIS Description of Operation.
+ Estimate of BHS/CBIS power requirements.
+ Assistance with completion of project/phasing schedule and contingency Plan.
+ Specifications for the BHS/CBIS.
+ Preparation of 100% Construction Documents suitable for public bidding, including front end specifications and submit for CAA review.

PROJECT DETAILS

Client

PhiliTEC
Lori Gomez
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AvAirPros Services
Philadelphia International Airport
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734-658-0272

Project Start

2017

Project Completion

2024

Highlights

+ Baggage Handling System (BHS) Control room operators and supervisors for the Secor 3 (A-West), A-East/ Sector 23, B/C and D/E control rooms at PHL
+ Consistent on-site Facility Maintenance presence at PHL since 2004
+ 20/7 oversite of control room operations since 2007

PHILADELPHIA TERMINAL & EQUIPMENT COMPANY

OPERATIONS AND MAINTENANCE SERVICE FOR BAGGAGE HANDLING SYSTEMS

Philadelphia International Airport, Philadelphia, PA

Arora Systems Group (ASG), as a subcontractor to JBT / Oshkosh, has performed on PhiliTEC RFP#17-0001 since 2017, as a continuation of similar services under the previous City of Philadelphia Facility Maintenance contract starting in 2012. Under the Operations and Maintenance services contract at Philadelphia International Airport (PHL), ASG oversees the Checked Baggage Inspection Systems (CBIS), Baggage Handling Systems (BHS), staffing all BHS Control Room Operators and required supervision.

Scope of work included:

ASG employs a team of 22 Baggage Handling System (BHS) room operators and supervisors for the Sector 3 (A-West), A-East/Sector 23, B/C and D/E control rooms at PHL, providing comprehensive services for the baggage handling system contributing to the efficient operation of PHL.

ASG's responsibilities primarily include constantly monitoring the status of the maintained systems and alerting the Work order Coordinators/Dispatchers, Jam Runners, Technicians and the Contract Manager when situations occur that need their attention. Our team has a deep understanding of the physical system layout and associated controls functionality in order to efficiently manage the baggage flow during the daily operation through the BHS and direct the response staff to the incidents.

The ASG team fully understands all the functions of the BHS Control Systems, the Aviation approved System Contingency Plan, and how to use these functions to monitor, control/manage the operational control functions of the BHS for dispatching appropriate Mechanics/Technicians to troubleshoot and address system faults.

Additionally, ASG works to support preparing reports and trending analysis in addition to our daily shift reports and statistics completed by each operator following each shift.

CITY OF PHILADELPHIA, DEPARTMENT OF AVIATION

OPERATIONS AND MAINTENANCE SERVICE FOR BAGGAGE HANDLING SYSTEMS

Philadelphia International Airport, Philadelphia, PA

Through its dedicated team of operators and supervisors, ASG ensures the efficient and reliable operation of the BHS control rooms, contributing significantly to the seamless management of baggage handling systems at the airport.

The primary duties of the Control Room Operators include:

+ Monitoring the conveyor line baggage flow balancing;
+ Monitoring laser array statistics;
+ Monitoring statistical reports;
+ Monitoring/set make-up assignments;
+ Obtaining, editing and loading flight schedules;
+ Responding to operations inquires, complaints and issues;
+ Making BHS operational decisions, initiating and coordinating implementation of any backup/fallback procedures necessary to allow continued operations (e.g., choosing alternative routings via reversible conveyors, initiating use of Fallback tags, coordination with user airlines);
+ Interface directly with the user airlines, airport, PhiliTEC and the TSA;
+ Ensure smooth daily start-ups by reviewing start-up check lists and procedures; and
+ Assume the responsibility of staffing the BHS Control Room and the monitoring of the BHS via the BHS Management Information System (“MIS”) and Maintenance Diagnostics System (“MDS”) during the system’s operational period.

PROJECT DETAILS

Client

Elliott-Lewis Corporation Jay Ruhnke
Director of Facility Services
2900 Black Lake Place
Philadelphia, PA 19154 jay.ruhnke@phl.org
215-937-6701

Project Start

2012

Project Completion

2016

Highlights

- Project features systems testing and inspection, upgrades, maintenance, and emergency repairs.
- ASG provides an on-site NICET – certified fire alarm team
- Staff coverage provided 24/7/365
- BHS Control Room Operators for A-East and Sector 23 Control Rooms

CITY OF PHILADELPHIA, DIVISION OF AVIATION

FACILITIES MAINTENANCE CONTRACT V S2Z57010

Philadelphia International Airport, Philadelphia, PA

Arora Systems Group (ASG), participated on the City of Philadelphia's Division of Aviation (DOA) Facilities Maintenance Contract (FMC V). This is ASG's second FMC contract with the DOA having previously served on the FMC IV agreement

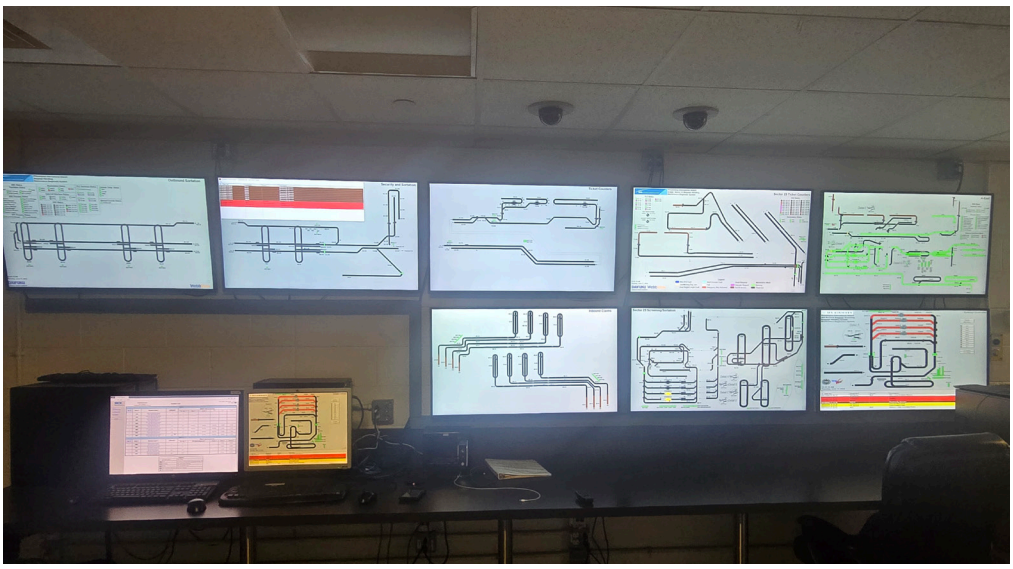
ASG provided services for the following schedules under the current FMC V contract:

- Schedule "F" Fire Sprinkler Protection
- Schedule "L" Fire Alarm Test and Inspection
- Schedule "B" Baggage Operators and Jammers
- Schedule "H" Airfield Lighting Control Systems

BAGGAGE HANDLING SYSTEM – OPERATORS

ASG manages a team of 8 factory certified BHS operators for PHL's terminal A-East and Sector 23 Baggage areas as well as a team of 7 for Terminal D and E baggage areas. The A-East and Sector 23 are manufactured Jervis Webb system and D/E is manufactured by Alliant technologies. ASG also creates and manages the schedule as well as directs the 15-20 baggage jammers in each area, and monitors the system on 2 shifts 20 hours or more per day, 7 days a week.

ASG is the point person for resolution of all system issues and coordinating with all stakeholders including the airport, airlines, maintenance staff, and contractors. In addition to system monitoring and problem rectification, ASG performs continuous preventative maintenance and system diagnostics to ensure smooth operations.



CITY OF PHILADELPHIA, DIVISION OF AVIATION

FACILITIES MAINTENANCE CONTRACT V S2Z57010

Philadelphia International Airport, Philadelphia, PA

FIRE PROTECTION

These services include fire protection inspection and emergency service repair for wet, pre-action and special hazards sprinkler systems. This requires visual and functional tests and system monitoring 24/7, 365. Inspections are performed monthly, quarterly, and annually in accordance with NFPA 25.

ASG has signed on with Philadelphia Bargaining Unit Local 692 for our sprinkler fitter work force guaranteeing the best possible workmanship. Full-time sprinkler fitters are stationed on-site to provide continuous services. The Airport consists of 133 Wet Systems, 34 FM-200 Systems, 43 Backflows, 150 Hydrants, 26 Fire Hose Stations, 10 Dry Standpipes, and 5 Preaction systems

FIRE ALARM

These services include fire alarm detection systems inspection and testing of each fire alarm detection device within the airport facilities including pre-action and special hazards sprinkler systems. This requires visual inspections and functional tests. Inspections are performed on an annual cycle in accordance with NFPA 72. ASG maintains an on-site full-time NICET-certified fire alarm team to provide continuous services. This Simplex alarm system ties into the airports central control station and is one of the largest Networked Alarm System on east coast consisting of 7576 Devices

AIRFIELD LIGHTING CONTROL SYSTEM (ALCS)

These services include maintenance and monitoring of specialty hardware such as network switches, fiber control modules for the regulators, Dell PC Hardware and software manufactured by Crouse Hinds and serviced quarterly. These items are a 24/7 operation for the airfield in five field lighting vault locations across the airport and play a vital role in Airfield operations.

Routine tasks include emergency repairs, upgrades, testing and inspection, maintenance, and operation of the various systems. Work is being performed at Philadelphia International Airport, Northeast Philadelphia Airport, and surrounding facilities such as warehouses, maintenance shops, cargo rooms, etc

PROJECT DETAILS

Client

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Department of Aviation
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Gilbane Building Company
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MSchlechtweg@GilbaneCo.com

Project Start

August 2016

Project Completion

October 2016

Highlights

+ Off hours staffing for in support of the preparatory ISAT testing in Terminal D and E Baggage Handling System areas
+ Provided systems training for many of the airlines
+ ASG Control Room Operator Staff received training and certification from Alliant Technologies

CITY OF PHILADELPHIA, DIVISION OF AVIATION

TERMINAL D/E CHECKED BAGGAGE INSPECTION SYSTEM STARTUP AND ISAT TESTING SUPPORT

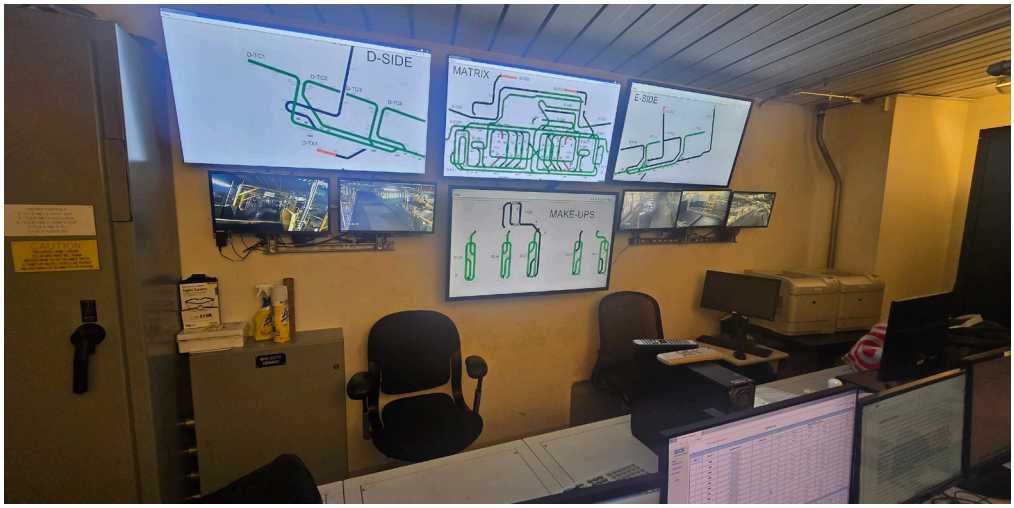
Philadelphia International Airport, Philadelphia, PA

Arora Systems Group (ASG), has been delivering specialized operational support for the Baggage Handling Systems (BHS) at Philadelphia International Airport (PHL) since 2007, which included assistance with the City of Philadelphia, Division of Aviation Program Management team, Gilbane Building Company, Elliot Lewis, JBT, and Alliant Technologies for the testing, startup, repairs, and TSA ISAT Testing of the Terminal D and E Check Baggage Inspection System (CBIS). (Reference Project: J06214.000)

Baggage Handling System (BHS) Support
ASG helped bring the previously dormant and uncompleted Terminal D/E CBIS and control room to fruition by providing numerous levels of support to the various stakeholders.

This culminated in ISAT testing with the TSA to clear and open the Terminal D and E Baggage Handling System areas. ASG's scope included Control Room Operator support for System Testing, trouble shooting and corrective repairs, Owner's Functional and Load Testing, pre-TRR and TRR, performing an 800 bag rate test, Delta Training, and formal ISAT Testing. ASG offered off-hours staffing for the Alliant upgrade to the Terminal D/E BHS control room workstations. This included setting up remote terminals and assisting with testing to enhance report processing capabilities, ensuring the upgrades were implemented efficiently and with minimal disruption to operations.

The scope of work also included support to correct issues discovered during owner's inspections like BHS roll-up doors not opening or closing properly, improper transfer of normal to emergency power during loss of power to a motor control panel, etc. to assist with BHS operation, as needed with Alliant. As part of this process, all ASG Control Room Operator Staff received training and certification on the operations of the systems in addition to internally hiring and training a new team to assume responsibility for the control room operations following testing.



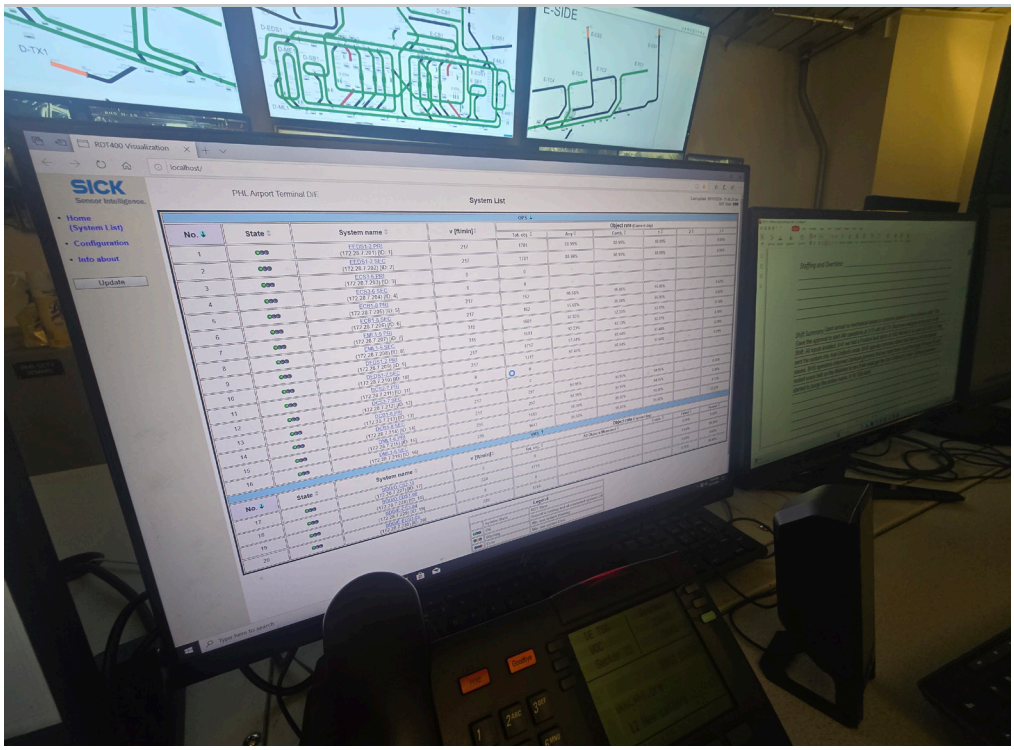
CITY OF PHILADELPHIA, DIVISION OF AVIATION

TERMINAL D/E CHECKED BAGGAGE INSPECTION SYSTEM STARTUP AND ISAT TESTING SUPPORT

Philadelphia International Airport, Philadelphia, PA

The ASG team participated alongside DOA and TSA staff in systems training for many of the airlines operating in this area including Spirit and Delta among others related to PHL Baggage Loading Guidelines, PHL Contingency plan, and TSA Best Practices.

Related to the BHS Contingency Plan, the ASG team provided reviews, input and ultimate ownership for its implementation and training.



PROJECT DETAILS

Client

Nashville International Airport
Traci Holton, PE, CM
Assistant Vice President
Development & Engineering
One Terminal Drive, Ste. 501
Nashville, TN 37214
Traci.Holton@flynashville.com
615-275-4139

Construction

$86 Million

Project Start

2022

Project Completion

Est. 2025

Highlights

+ $86 Million Expansion
+ Progressive Design Build Delivery Method
+ Telecommunications Infrastructure
+ Structured Cabling System

METROPOLITAN NASHVILLE AIRPORT AUTHORITY

BAGGAGE HANDLING SYSTEM EXPANSION PROJECT

Nashville International Airport, Nashville, TN

Arora Engineers (Arora) provided special systems design and engineering services including development of drawings and specifications for Nashville International Airport (BNA) baggage handling system (BHS) with a progressive design build delivery method. The overall scope of work of this project included a budget of approx. $86 million for expansion of the BHS system at BNA.

Scope of work included:

+ Evaluation of one final alternative based on architectural layouts and designs
+ Review of contractor product shop drawing submittal
+ Passive and active telecommunications infrastructure including raceways and structured cabling to service area within building per MNAA requirements
+ Telecommunications infrastructure including raceways and cabling to connect new infrastructure to existing terminal infrastructure.

+ Coordination of structured cabling system (phone and data) requirements with MNAA
+ Coordination and layout of CCTV device coverage with MNAA
+ Coordination and layout of access control devices as required, coordinated with MNAA
+ Raceways and infrastructure to support CCTV and access control systems.

PROJECT DETAILS

Client

City of Philadelphia, Division of Aviation
Jim Jones, PE
Project Manager
International Plaza II
Suite 540
Philadelphia, PA 19113
james_t.jones@phl.org
215-937-6229

Construction

$ 20,700,000

Project Start

2017

Project Completion

2020

Highlights

+ Provided engineering construction phase services for MEP/FP/SS for the PHL CBIS Recapitalization Project.
+ Provided special systems and electrical inspections for PHL CBIS Recapitalization Project

CITY OF PHILADELPHIA, DIVISION OF AVIATION

PHL TERMINAL A-WEST SECTOR 3 CHECKED BAGGAGE INSPECTION SYSTEMS (CBIS) RECAPITALIZATION PROJECT

Philadelphia International Airport (PHL), Philadelphia, PA

The City of Philadelphia, Division of Aviation (DOA) completed a Checked Baggage Inspection System (CBIS) recapitalization renovation and a new Check Baggage Resolution Area (CBRA) addition for Philadelphia International Airport's (PHL) Terminal A West Sector 3. Arora Engineers (Arora) was the engineer of record for the mechanical, electrical, plumbing, fire protection, and special systems engineering construction phase services and special systems and electrical inspections for the CBIS Recapitalization Project.

The entire design was completed as a REVIT virtual building model, with all building systems, architectural, and structural components and baggage handling belts, etc., shown in the 3-D model. This allowed precise interdisciplinary coordination during the design process to minimize field conflicts.

SCOPE OF WORK INCLUDED:

+ Removal of existing ductwork and other HVAC and plumbing systems in Sector 3, and the installation of new HVAC and plumbing systems to serve renovated areas in coordination with the new Baggage Handling System. The area was provided with new gas-fired infrared heaters and door heaters and protected by a new CO2/NO2 detection system and exhaust fans.
+ Removal of existing ductwork and other HVAC and plumbing systems in Sector 4 and the installation of new HVAC and plumbing systems to serve renovated areas in coordination with the new Baggage Handling System (BHS) and security fence.
+ A new gas-fired single zone VAV rooftop unit was provided for the Sector 4 CBRA addition. Central plant limitations precluded the connection to the airport's central chilled-water system. The use of a VAV system ensured continuous dehumidification for occupant comfort while saving fan energy.
+ The Sector 23 BHS Control Room had its HVAC reconfigured, as required by the new layout.
+ Modifications to condensate drain piping from existing EDS equipment in A-West Ticket Lobby to support new EDS equipment.

Construction Phase Services:

+ Reviewed change orders for MEP/FP/SS work.
+ Reviewed contractor submittals and shop drawings.

CITY OF PHILADELPHIA, DIVISION OF AVIATION

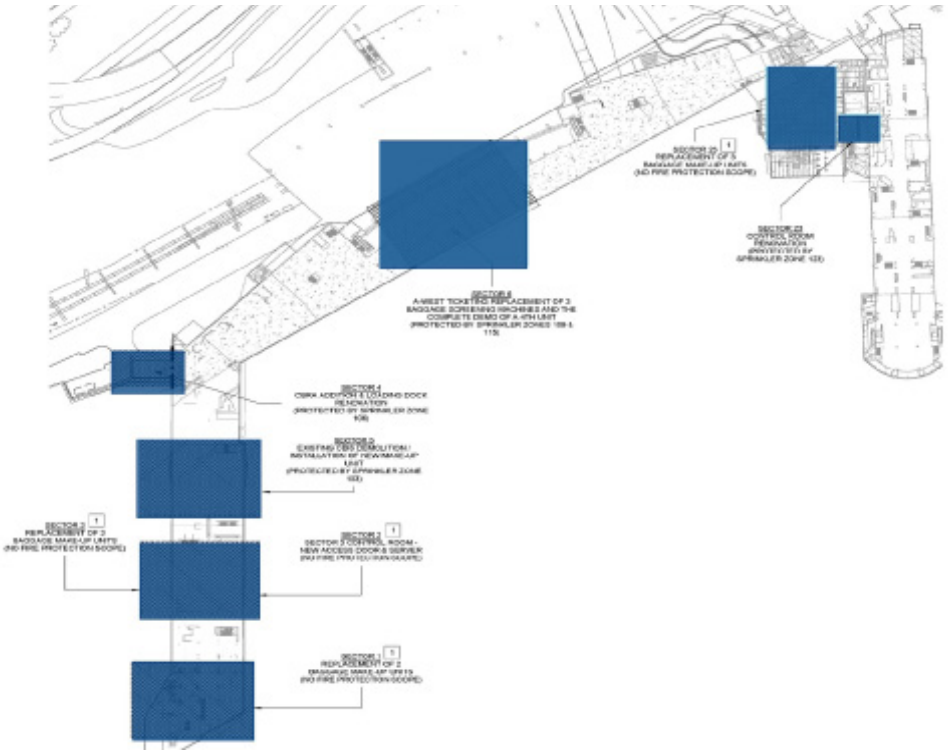
RECAPITILIZATION PROJECT

Philadelphia International Airport (PHL), Philadelphia, PA

+ Responded to Contractor Requests for Information (RFI's).
+ Provided supporting documentation for bulletins where appropriate.
+ Attended on-site construction meetings
+ Participated in AECOM team project calls.
+ Developed a pre-final and final punch list.
+ Reviewed as-built drawings submitted by the contractor.
+ Produced final as-built drawings / updated REVIT files for owner.

Special Systems and Electrical Inspections:

+ Interfaced with different departments at PHL, including security, engineering, and construction groups.
+ Reviewed shop drawings to ensure compliance with project specification and DOA security requirements.
+ Provided on-site inspection services during the construction and coordinating work in the field with all trades.
+ Conducted project coordination meetings.
+ Performed testing and commencing systems as a PHL representative.
+ Generated all testing and certification paperwork to be given to DOA.
+ Escorted and supervised all access on the AOA and throughout all back of house areas.
+ Coordinated all access for construction in the terminal for peak and off-peak hours.
+ Collected and validating as-built drawings from the contractor.
+ Provided project closeout.



PROJECT DETAILS

Client

City of Philadelphia
Division of Aviation
Imad Haq, PE
Airport Engineering Manager
Capital Development Group
Philadelphia International
Airport 1 International Plaza,
Suite 200, Philadelphia, PA
imad.haq@phl.org
215-937-7878

Construction

$40,000,000

Project Start

2007

Project Completion

2014

Highlights

+ Design and Construction Administration
+ Fire Protection Engineering For Baggage Screening System
+ Clean Agent Suppression System
+ New CCTV Camera Design
+ New Access Control System Doors Design
+ Universal Cabling Distribution Design

CITY OF PHILADELPHIA, DIVISION OF AVIATION

IN-LINE BAGGAGE SCREENING (CBIS) SYSTEM

Philadelphia International Airport, Philadelphia, PA

Arora Engineers (Arora) performed MEP, Special Systems, Fire Protection Engineering, and Construction Management services for the Checked Baggage Inspection Systems (CBIS) in Terminals A-West and A-East at Philadelphia International Airport.

Scope of work included:

The scope included modifications to the existing A East Pier to include a new connector bridge for baggage conveyors, two new baggage handling rooms, and modifications to the existing baggage handling system in Terminal A-East.

Mechanical design included HVAC, radiant heating, door heaters, CO2 sensing, and ventilation. Electrical engineering services included design for new motor control panels, a new electrical substation, lighting, and low voltage power distribution. The plumbing design included engineering for drainage, new restrooms, and condensate.

The fire protection scope of work included modifications to the existing wet sprinkler systems that were necessary to accommodate the new space layouts. New pre-action and clean agent systems were also required for the new space layout. The scope also involved fire alarm and detection system design tasks, such as notification appliance and initiating device relocations per NFPA codes and fire alarm programming matrix revisions per DOA standards. New notification appliance and initiating device layouts were required for the new structures, in addition to all new devices that were required for the pre-action and clean agent systems.

Special systems engineering included the addition of approximately 50 new CCTV cameras, 20 new security doors, universal cabling distribution design, telecom room modifications, multi-user flight information display systems, TSA systems, and full systems design for a new OSR and BHS rooms.

PROJECT DETAILS

Client

Philadelphia International Airport
Mr. Imad Haq, PE
Airport Engineering Manager
Capital Development Group
1 International Plaza
Suite 200
Philadelphia, PA 19113
imad.haq@phl.org
215-937-7878

Construction

$40,000,000

Project Start

2007

Project Completion

2014

Highlights

+ Program management
+ Construction management and inspection
+ Project cost estimating and coordination

CITY OF PHILADELPHIA, DIVISION OF AVIATION

CONSTRUCTION / PROGRAM MANAGEMENT SERVICES

Philadelphia International Airport, Philadelphia, PA

Arora Engineers (Arora) performed construction management for the new Checked Baggage Screening System (CBIS) in Sector 23 and Terminal A-East baggage areas at the Philadelphia International Airport. The project included a new CBIS in Terminal A-East and an upgrade of the existing CBIS serving the east half of Terminal A-West to comply with the latest TSA standards.

Scope of work included:

Arora's services consisted of on-site inspection, design, and design review services. The tasks entailed construction management (CM) and contractor quality control (C.Q.C.) services to ensure that electrical, plumbing, and mechanical construction was completed in accordance with the requirements of construction documents and applicable codes/standards on various projects.

Scope of work included:

+ Program management
+ Construction management and inspection
+ Project logistics
+ Cost estimating
+ Project coordination
+ Representation at stakeholder meetings
+ Project close out
+ Assistance in the management of tenant project

PROJECT DETAILS

Client

City of Philadelphia
Division of Aviation
Jim Jones, PE
Project Manager
International Plaza II,
Suite 540
Philadelphia, PA 19113
james_t.jones@phl.org
215-937-6229

Construction

$150,000,000

Project Start

2008

Project Completion

2015

Highlights

+ Design-Bid-Build
+ Project Included 86,000 Sf Baggage Claim Building
+ Provided MEP Fire Protection, And Security/ Special Systems Engineering
+ Construction Administration Support and Inter-Agency Coordination

CITY OF PHILADELPHIA, DIVISION OF AVIATION

TERMINAL F HUB EXPANSION

Philadelphia International Airport, Philadelphia, PA

Arora Engineers (Arora) provided design for the mechanical, plumbing, fire protection, fire detection, electrical, special systems, and security engineering services for an expansion of Terminal F at the Philadelphia International Airport. Improvements involved approximately 88,400 SF of new floor space, a new baggage claim building, additions and modifications to the existing building, new architectural finishes, and systems upgrades. Terminal F has three concourses connected by a central hub, 38 gate positions, a ticketing building, a baggage claim, and a skybridge leading to the parking structure.

Scope of work included:

+ Electrical: Power distribution; lighting design and controls, power ductbank design, motor control panel, substation modification and analysis, and concession space low voltage power.
+ Mechanical: Study of future cooling and heating capacity, satellite thermal plant expansion systems, including pumps and pipelines, domestic water piping, sanitary and stormwater design, and gas piping modifications required.
+ Fire/Life Safety: code review; fire alarm and detection system, clean agent suppression (Fm 200 or other), fire sprinkler systems (wet, dry, pre-action), hydrant and hose reel systems, and fire egress interfaces.
+ Special Systems/Security: Multi-use flight information displays, visual paging advertising/wayfinding, network architecture (Mac minis, cat 6 Cabling, upgrade G4 Platform), horizontal structured cabling design, access control and intrusion detection, access control doors, CCTV, digital video recording, TACS, ambient noise sensing and automatic compensation, amplification of Live Speech announcements originating at microphone stations, UCDS, and MDF/IDF analysis and design.

Arora also provided construction administration support and inter-agency coordination. With this expansion, the airport hoped to create a better passenger experience and generate additional concession sales by expanding available space and improving retail options.

PROJECT DETAILS

Client

Neil McLean
Gensler
Senior Associate
500 S. Figueroa St
Los Angeles, CA 90071
(213) 327-3801
Neil_Mclean@gensler.com

Project Start

2023

Project Completion

2025

Highlights

+ 8,000 SF Baggage Claim
+ Data Collection & Site Investigation
+ Code Analysis
+ It/Comm, PA, EVIDS, ACAMS/ CCTV Security Systems

PALM SPRINGS INTERNATIONAL AIRPORT

BAGGAGE CLAIM EXPANSION

Palm Springs International Airport (PSP), Palm Springs, CA

Arora Engineers (Arora) provided professional engineering services for the PSP Bag Claim Expansion. The project improved the passenger experience by providing more area for customers queuing at the rental car counters and at the baggage claim devices through the expansion of the building of approximately 5,000 SF to 8,000 SF. The project included the replacement of the existing claim devices with new carousel devices and up and over belts conveying bags from the insertion point to the device.

Scope of work included:

+ Data collection for existing documents and preparation of REVIT backgrounds for use in developing the design.
+ Site investigation to review visible building systems, existing facility, and adjacencies.
+ Stakeholder discussions with the airport executive staff for input on their operational and space needs, and overall design goals. Through executive staff, discussions with the rental car companies facilitated for their functional needs.
+ Development of a basic program for the project.
+ Preparation of a code analysis for the project.
+ Initial development of 3 high level concepts for evaluation.
+ Developed one concept scheme (accepted by client from the options developed during concept).
+ Schematic development of documents. Created cartoon set of the CD documents set.
+ Reviewed basic building systems and their potential impact on the design of the space (IT/Comm, PA, EVIDS and ACAMS/CCTV security systems)
+ Prepared initial equipment device selections.
+ Formalized functional layouts. Identified design elements and coordinated with the team.

Photo Credit: Wikipedia

PROJECT DETAILS

Client

Urban Engineers, Inc.
Stephen Ehrlich, Vice President Facilities/CM Practice Lead
530 Walnut Street
Philadelphia, PA 19106
sehrlich@urbanengineers.com
(215) 837-6570

Construction Cost

$19 Billion (JFK Redevelopment Program)

Project Start

2023

Project Completion

2026

Highlights

+ Baggage Handling System – Construction Inspector

PORT AUTHORITY OF NEW YORK & NEW JERSEY (PANYNJ)

JFK VERTICAL FACILITIES, INSPECTOR STAFFING, TERMINALS 1 & 6

John F. Kennedy International Airport (JFK) New York, NY

Arora Engineers (Arora) is providing full-time, on-site Baggage Handling Inspector services for The Port Authority of New York & New Jersey (PANYNJ) $19 Billion John F. Kennedy (JFK) Redevelopment Program.

Terminals 1 and 6 are under construction and scheduled to open in 2026. Vanderlande is designing and building the Baggage Handling System (BHS) for Terminal 1. This system utilizes both standard (RAW) conveyor with ACS post CBRA. There is early bag storage being installed as well. The system is comprised of (8) ticket counter inputs, (8) baggage claims carousels and (9) sortation makes up devices. There are also oversized inbound and outbound conveyor lines being installed. Terminal 6 is utilizing a baggage handling system manufactured by Daifuku. This system is a standard RAW conveyor design. The CBRA is designed with MIT (manual inspection tables), (4) ticket counters (2) being installed in each phase, (5) make up units (3) in Phase 1, and (6) baggage claims carousels (international and domestic).

Scope of work included:

Arora is providing full-time, on-site, Baggage Handling System Construction Inspector support services for coordinating and monitoring the integration of an innovative baggage handling system in Terminals 1 and 6. Services include reviewing contract documents (plans and specifications), attending contractor coordination meetings, monitors electrical construction contractor's activities, verifying the work-in-place complies with the plans and specifications, documents activities, and communicating and resolving issues and conflicts with the contractors. Our inspector is successfully representing PANYNJ's interests and maintains positive working relationships with user groups, consultant staff, A/E contacts, and construction personnel.

PROJECT DETAILS

Client

AECOM
Dana Heffernan, Project Manager
1700 Market Street
Suite 1600
Philadelphia, PA 19103
Dana.heffernan@aecom.com
215-789-2112

Project Start

2013

Project Completion

2014

Highlights

+ Cctv Upgrade
+ Access Control
+ Universal Cabling Distribution Design

ALLEGHENY COUNTY AIRPORT AUTHORITY

SOUTH MATRIX EXPLOSIVES DETECTION SYSTEM (EDS) REPLACEMENT

Pittsburgh International Airport (PIT), Pittsburgh, PA

Arora Engineers provided special systems design and engineering associated with the replacement of the south matrix EDS at Pittsburgh International Airport (PIT). The scope included CCTV, access control and universal cabling distribution design (UCDS) for the redesign of the EDS system including new detection machine locations, a new OSR room and new CBRA room, and the associated demolition required for the existing systems.

Scope of work included:

The project included an upgrade of the entire facility's CCTV video-management system and viewing solutions to add new technology CCTV cameras and video storage.

The project also included access control doors and system expansion, universal cabling-distribution design, telecommunications-room modifications and control cabling for EDS machines. New system features included design for a new on-screen resolution room as well as new checked-baggage resolution area. Special systems design was completed for all the new areas.

The project design required communications and coordination with structural, architectural, mechanical and electrical engineering firms to complete a detailed phasing plan. Specifications were also included as part of the design package.

Arora Systems Group, LLC

Arora Systems Group, LLC, (ASG), a subsidiary of Arora Engineers, provides specialized facilities maintenance testing, inspection, repair, installation, operations and on-site staffing solutions for clients ranging from small facilities to complex infrastructure sites. Fire and life safety, security, special systems and baggage handling systems are the core focus of our business. Acting as an owner's representative, ASG offers clients an extra level of technical expertise, supervision and coordination – no matter what the scope or schedule.

Key Services

+ On-site maintenance management
+ 24-hour emergency response
+ Fire/Life Safety testing, inspections, repairs, and installation
+ Fire detection systems
+ Fire suppression systems
+ Fire pumps
+ Special agent/high hazard extinguishing systems
+ Foam systems
+ Smoke evacuation systems
+ UL listed central station monitoring
+ Emergency lighting
+ Surveillance – CCTV
+ Access control
+ Security alarm detection systems
+ Baggage Handling Systems Control Room Operations management and staffing
+ Troubleshooting and preventative maintenance

Representative Clients

+ Philadelphia International Airport
+ Philadelphia Family Court
+ Pennsylvania Convention Center
+ City of Philadelphia, Free Libraries
+ City of Philadelphia, Streets Dept.
+ School District of Philadelphia
+ City of Philadelphia, Parks and Rec.
+ City of Philadelphia, Warehouses
+ PhilaPort
+ Pennsylvania Turnpike Commission
+ University of the Sciences
+ Keystone Care

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