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Attachment A

In-Line Application Form Instructions and Sample Application

U.S. Department of Homeland Security
Arlington, VA 22202

For Public Distribution

Funding Application Process

In-Line Support Application Form

Completion Guidance

Prepared for

Transportation Security Administration

January 28, 2009

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GENERAL

The Transportation Security Administration (TSA) In-Line Support Application for the Electronic Baggage Screening Program (EBSP) is the basis for TSA's internal planning and budgeting process, and as such is designed to capture airport requirements for proposed checked baggage inspection systems (CBIS). The application consists of eight (8) sections, with sections five (5) and eight (8) having an additional three (3) subsections each. Grey sections of the application form are strictly reserved for TSA's use only. Airports seeking funding, equipment or other support are expected to complete the fields in the blue shaded portion of the application form.

Airports should provide as much detail as possible regarding each proposed effort with **separate applications being filed for each project.** Airports with multiple terminals, nodes or concourses installing separate CBIS for each, **must provide a separate application for each project.** Similarly, airports only requesting equipment or funding to support CBIS design efforts at multiple locations within an airport **must provide a separate application for each**.

Single applications covering more than one (1) project will **NOT** be accepted or reviewed for consideration.

SECTION BY SECTION GUIDANCE

The following provides section by section guidance for each field within the In-Line Application form.

APPLICATION NUMBER

The application number field will be completed by the Federal Security Director (FSD) or Assistant Federal Security Director (AFSD), when the application is entered into TSA's requirements tracking database. Including this Application Number, also known as the Requirements Management (ReMAG) number, in all correspondence between the Airport, TSA and/or TSA's contractor support will help alleviate confusion regarding which project is being discussed or the project for which information (additional information) is being submitted.

SECTION 1 AIRPORT WHERE PROJECT IS LOCATED:

Airport Name:

> This field should contain the complete name for the airport as registered with the Federal Aviation Administration (FAA) or the International Air Transport Association (IATA). It should not include any abbreviations, colloquial names, or commonly utilized name. For example: Ronald Reagan Washington National Airport is commonly referred to as Reagan National Airport, Washington National Airport or simply National Airport. The name registered with the FAA or IATA is the only name that should be utilized in this field.

Airport Three Letter Code

Similar to the airport name, only FAA or IATA registered three (3) letter airport identification code (sometimes referred to as airport code or location indicators or LocID) are the only entries that should be made in this field. The airport code utilized must coincide with the airport name provided above.

SECTION 2 AIRPORT SPONSOR CONTACT INFORMATION

This section of the application contains contact information pertinent to the airport and the proposed project. Individuals identified in this section must be able to address technical questions, as well as have the authority to commit the airport financially in regards to the proposed project. The Title, Department, Organization, Telephone Number and E-mail Address are applicable to both the Airport Executive and Airport Project Point of Contact.

Airport Executive Contact:

This field must identify individual(s) capable of financially committing the airport to executing the proposed project. Typically this individual will be the airport director or the chief financial officer for the airport. If other parties are capable of committing the airport, their name may be included in this field.

Airport Project Point of Contact:

This field must identify the individual (s) responsible for managing or overseeing the actual design, construction and implementation of the project proposed in the In-Line Application. TSA recognizes that for larger projects an entire team of individuals may hold responsibility for managing the program. However, where possible a single individual should be identified who will facilitate addressing technical queries, collect and provide additional information, and make agreements on technical aspects of the project should be identified. This individual is anticipated to be the person TSA would contact to coordinate technical review meeting or other technical meetings related to the project.

Title:

The title of individual identified above.

Department:

The internal, airport specific department the individual specified above is associated with or assigned to.

Organization:

The organization, such as the specific airport authority, state transportation department, or city government to which the individual identified above may belong.

Telephone Number:

The telephone number at which the individual identified above can be reached. This should not be the number of a deputy, executive assistant or administrative assistant, but the direct line for the individual. Further, general department numbers or general offices numbers should not be included.

E-mail Address:

The e-mail address for the individual identified above.

Airport Information

Address
The address to which all financial and other projects related correspondence should be submitted. This may differ from the address of the Airport Executive or Chief Financial Officer, or the Project point of contact. Once established the airport should ensure that TSA is informed of any changes to the address to ensure correspondence is accurately relayed.

City, State and Zip Code
This information should be per the mailing address specified above.

Tax Identification Number
The Tax Identification Number (TIN) should be specific to the organization, whether state, city, municipal or other entity requesting equipment or funding from TSA.

SECTION 3 REQUEST FOR
This section provides a general scope of the project under consideration, identifying whether the airport is only requesting equipment, funding for facility modifications or funding for design of a CBIS. Each is explained in further detail below:

Equipment

Projects just seeking Explosive Detection Systems (EDS), Explosive Trace Detectors (ETD), Search Work Stations, or other equipment regardless of the configuration the equipment will be utilized in should only check this box. Projects seeking to implement a new CBIS, which will require both equipment and Facility Modification and/or Design funds should also check this box. If the required screening equipment necessary to support the proposed project is already on-site or is included in another In-Line Application or approved request, already filed with TSA, DO NOT check this box. However, reference to the other request (by Application Number also known as the ReMAG number) should be included in the Project Description (see Section 5).

Facility Modification Funding

CBIS projects requiring construction, including demolition or renovation of existing spaces, expansion of existing terminals or construction of new terminals (of which TSA will only fund the reimbursable portion) must check this box to be considered for construction funding. Projects seeking to implement a new CBIS, which requires Equipment and/or Design funds, should also check the Equipment and Design box, as applicable. If the required screening equipment necessary to support the proposed project is already on-site or is included in another In-Line Application or approved request, already filed with TSA, DO NOT check this box. However, reference to the other request (by Application Number also known as the ReMAG number) should be included in the Project Description (see Section 5).

Design

Airports seeking funds to only initiate a CBIS design and that are just entering the planning process should check this box. Airports seeking funding to complete or finalize an on-going CBIS design should also check this box. Airports seeking Facility Modification Funding and Equipment should mark the other boxes as applicable, realizing that Facility Modification Funding already incorporates some level of design funding and so marking both boxes will not necessarily result in additive funding levels. Further, airports marking the Design box should identify any existing applications or ReMAG request numbers that are associated with the project in the Project Description (see Section 5).

SECTION 4 PROJECT TITLE

This field should include the name and, if applicable, project number the airport has assigned to the project for which funds or equipment is being requested. This should be the name that will appear on all designs, specifications, plans or other project related documentation. Once established, the airport must ensure that any changes to the project name or project number are clearly communicated to TSA to avoid potential confusion regarding which specific project request funding, correspondence or other information is related to.

SECTION 5 PROJECT INFORMATION

Sub-Section A Project Description

The airport should provide an executive summary of the effort for which support is being requested from TSA. For projects requesting equipment only this should include a description of any equipment being replaced, the proposed configuration the equipment will be installed in and the exact locations where the equipment is proposed to be utilized.

Projects seeking funding and support for construction of entirely new CBIS, or upgrades to existing systems, should provide a succinct narrative of the overall goal of the project. Further, the description should identify any necessary construction of new facilities, or renovation or expansion of existing facilities. If the project is an upgrade a description of the existing system and a statement regarding the rational for upgrade of the system should be provided. Other pertinent information, such as the number of bags, anticipated growth in service, number and type of EDS or other equipment being requested should be included.

Sub-Section B Nature of Project

This section requests the airport to identify whether the project is an upgrade of an existing baggage handling system (BHS), in support of construction of a new or expansion of an existing terminal, or will involve the retrofit/renovation of an existing baggage handling room.

Sub-Section C Design Criteria, Assumptions and Anticipated Equipment Requirements

Design Year
The design year is the year the airport anticipates receiving beneficial use (i.e., the system will beginning actively screening baggage).

Design for Peak Bags/Hour
This information should coincide with the Flight Schedule Analysis (FSA) or static model developed as part of the projects basis of design and should identify the number of bags, including surge, being used to determine the number and type of EDS.

Screening Matrix Name
The specific name for the CBIS proposed. For example, Central East Matrix or West Patio or other unique designation which the airport has assigned to the proposed screening area. This name must be unique to avoid confusion with other security related projects that airport may have proposed, that may be on-going or may have been recently completed. Further, some airports have multiple CBIS within a single terminal, node or concourse and establishing an agreed to naming convention ensures all parties understand the scope of the project being submitted.

Terminal And Node or Concourse
The specific designation of terminal, node or concourse associated with the project in the In-Line Application. For example, Terminal 1 South, Boarding Area D may be an entirely different matrix from Terminal 1 South. The terminal, node or concourse designation and the screening matrix name should constitute a unique identification

for the proposed matrix, such that it cannot be confused with any other that may exist within the airport.

Airlines Served
The airport should list all airlines that are proposed to be serviced by the proposed CBIS or screening equipment. If the proposed matrix services all airlines within a terminal, then all airlines within the terminal should be identified. For airports where each airline has or possibly a few airlines have joined together in establishing a separate CBIS, the specific airline(s) utilizing or projected to utilize the equipment should be identified. Airports constructing expansions or entirely new terminals should provide a list of the airlines projected to utilize the proposed system.

Percentage of Airlines Bags Using Matrix
Airports at which the proposed screening matrix will only screen a percentage of an airline's bags (i.e., the airline may span multiple terminals, concourses or nodes) should identify the percentage of the airline's bags that will be handled by implementation of the proposed project. This will aid TSA in validating the number and type of equipment required for the project.

Number of EDS and Type of EDS
The number and type of EDS should be based on the projected Peak Bags per Hour and the number of bags per hour the proposed EDS type can screen as identified in the tables included in Chapter 5 of the latest version of the TSA CBIS Planning Guidelines and Design Standards (PGDS). (A link for this document can be found in the reference portion of this guidance.) For example, an L3-6000 can process 470 international bags or 540 domestic bags per hour. Therefore, if the system is projected to handle 2,160 bags per hour at peak, a minimum of four (4) EDS would be required. The number of and type of EDS must be coordinated, and should include redundancy as spelled out in the PGDS.

Requested Delivery Date
Specify the anticipated calendar month and year, based on the projected/planned construction schedule for the project, in which the EDS would need to be delivered for the project to be completed on-time/on-schedule. This date should be as realistic as possible based on the current design status, design review timeframes, contract bidding and award process, and projected construction schedule. The airport should keep TSA apprised of changes to the projected delivery dates to ensure TSA can plan, procure and deliver the equipment as necessary to maintain the airport's project schedule.

Sub-Section D Design Status

The airport should identify any of the five (5) items (as included in Table 1 below), which have been or are being submitted for TSA review and consideration. Airports already engaged in the design review process with TSA at greater than the schematic level, should identify their latest design package (30%, 70% or 100%)

and other corroborating information (such as specifications, flight schedule, basis of design reports, cost estimates and/or modeling data) previously submitted in the *Airport Operator Comments* field. Regardless of the current design phase, airports are required to submit an Alternative and Preferred Alternative Analysis (separately or combined), as well as a cost estimate, basis of design and flight schedule analysis if they are seeking funding from TSA.

Table 1: Sub-Section 5.D Submittals Required

1. Has a schematic design or higher (30%, etc.) been previously submitted?
2. Has an Alternative Analysis been previously submitted?
3. Has a Preferred Alternative been previously identified?
4. Has a cost estimate for the current system design been submitted?
5. Has a Basis of Design and Flight Schedule Analysis been submitted?

SECTION 6 PROJECT OBJECTIVES/JUSTIFICATION

The airport should provide a detailed narrative discussing the rationale for the proposed project, specifically addressing how the proposed system will improve baggage screening and airport security. Further, the airport should identify any projected cost savings based on the projected life-cycle cost analysis required under the Alternative and Preferred Alternative Analysis.

SECTION 7 PROJECT SCHEDULE

Estimated Start of Project Construction

The airport must provide the projected calendar month and year when construction is anticipated to begin based on the current design status, design review timeframes, and bidding environment.

Estimated System Operational Date

Based on the project schedule the airport should provide the best available estimate of the calendar month and year when they anticipate receiving beneficial use from the CBIS and BHS (i.e., when the system is projected to be fully operational).

SECTION 8 FINANCING PLAN FOR PROJECT
Sub-Section A TSA Funds

This section contains four (4) fields requiring data, to be filled out as identified below. See the yellow – highlighted fields in Table 2.

Table 2: Section 8 Sub-Section A TSA Funds

				Facility Modification Funding
Previous Funding in Project (if applicable)				
Previous Agreement #:				
Current Funding Request				
Subtotal TSA Funds				

Previous Funding/Previous Agreement
If the airport has previously received funding for the project identified in the application, the airport must identify the Letter of Intent (LOI) or Other Transaction Agreement (OTA), by contract/agreement number, under which the airport received the funding. Further, the airport must identify the amount of funding received. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Current Funding Request
The airport should identify the specific funding level being requested for the project identified in the application. The funding request should be the total dollar value the airport is seeking from TSA and should not be based on project cost share (i.e., do not base requested funding on a 75% or 90% cost share). TSA will assign pertinent cost share percentages based on congressional appropriation language, when issued. The funding being requested should not be based on any attempted analysis of allocable or non-allocable, eligible or ineligible, reimbursable or non-reimbursable costs. The reimbursable and non-reimbursable cost whitepaper distributed as part of the FY10 application information package is solely to provide the airports insight into items TSA typically funds. However, each airport is evaluated on a case-by-case basis, and therefore the actual allowable costs may vary from airport to airport. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Subtotal TSA Request
This field should contain the aggregate of any previous funding received, the specific project identified in the application and any funding currently being requested. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Sub-Section B PFC Funds

This section includes a total of five (5) fields the airport must complete, as applicable. The highlighted yellow fields in Table 3 should be completed as identified below.

Table 3, Section 8, Sub-Section B PFC Funds

				Facility Modification Funding
Pay-As-You-Go				
	PFC Approval #:			
Bond Capital				
	PFC Approval #:			
	Subtotal PFC Funds:			

Pay-As-You-Go/PFC Approval #
If the airport has received or implemented an authorization for a Pay-As-You-Go process, to support this project, or general improvements which include this project, the airport must specify the PFC Approval Number in the appropriate PFC Approval # field. Further, the airport must specify the amount of funding it will collect under the Pay-As-You-Go process included in the specific PFC Approval. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Bond Capital/PFC Approval #
If the airport has been authorized to issue bonds backed by PFC funds for capital construction/improvements that include this project, the airport must specify the PFC Approval Number in the appropriate PFC Approval # field. Further, the airport must specify the amount of funding it will collect under the bond included in the specific PFC Approval. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Subtotal PFC Funds
The airport must include the aggregate of any Pay-As-You-Go or Bond funding collected for the specific project identified in the application and any funding currently being requested. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Sub-Section C Other Funds

This section includes a total of six (6) fields, highlighted in yellow in Table 4 below, requiring airport information. The fields should be completed as identified in the pertinent section below.

Table 4, Section 8, Sub-Section C, Other Funds

State Grants		
Airport Funds		
Airport Revenue Bonds		
Other *(please specify)*		
Subtotal Other Funds:		

State Grant
The airport must identify any state grant funding received for this specific project, or for other airport improvements that include this project. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Airport Funds
The airport must identify any capital or project funds it will be providing in support of this project. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Airport Revenue Bonds
The airport must identify any funds it will receive from revenue bonds issued to support this project or other capital projects, which include this project. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Other
The airport shall identify any other sources of funding being used to support this specific project, or other capital projects of which this project is a part. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Subtotal Other Funds
The airport must include the aggregate of any funds identified as part of Sub-Section C, as identified above. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

Total Project Costs

The airport shall sum all funding identified in Section 8 and include the sum in the Total Project Cost field. All dollar entries shall be in complete numbers and shall not be abbreviated. For example, the airport should utilize $13,500,000 and not $13.5M or $13.5 million.

REFERENCES

Transportation Security Administration, Planning Guidelines and Design Standards for Checked Baggage Inspection Systems, dated October 10, 2007 or nay more current version published by TSA at:

http://www.tsa.gov/assets/pdf/bsis_planning_guidelines_and_design_standards_10-10-07.pdf

In-line Support Application

Transportation Security Administration

INSTRUCTIONS: Please email this completed application as a Microsoft Excel file to ScreeningSupportRequest@dhs.gov. Upon determination of completeness and acceptance of this application, directions will be given on how to submit the required 30% Design Package, Basis of Design Report, Cost Estimate, and Project Schedule.

For TSA HQ Use

APPLICATION NUMBER:

1. AIRPORT WHERE PROJECT IS LOCATED:

Airport Name: XXX International Airport
Airport Three Letter Code: XXX

2. AIRPORT SPONSOR CONTACT INFORMATION: **Please list the person(s) who would be able to address any questions or blanks**

	Airport Executive Contact		Airport Project Point of Contact
Name:	Mr. John Smith, AAE	Name:	Ms. Jane Doe
Title:	Chief Executive Officer	Title:	Project Manager
Department:	Board of Directors	Department:	Corporate Real Estate
Organization:	XXX Airport Authority, Inc.	Organization:	XXX Airport Authority, Inc.
Telephone Number:	866-555-1212 Ext. 001	Telephone Number:	Jane.Doe@XXX.com
Email Address:	John.Smith@XXX.com	Email Address:	

Airport Information

Address: 1234 Airport Blvd.
City, State and Zip Code: Anytown, NY 12345
Tax Identification Number: 123456

3. REQUEST FOR *(check all that apply)* **:**

Equipment [X] Facility Modification Funding [X] Design [ ]

4. PROJECT TITLE (and Public Agency Project Number, if appropriate):

XXX Terminal 3 Redevelopment Projecrt

5. PROJECT INFORMATION:

A. Project Description:

XXX International Airport is undergoing a substantial redevelopment project at Terminal 3, consisting of replacement ticketing, bag claim, and FIS recheck facilities, as well as a new multi-level parking garage. The overall security system will consist of a brand-new integrated outbound baggage handling system witha full centralized inline Checked Baggage Inspections System (CBIS), including remote onscreen resolution and two matrices of 3-4 each inline EDS units. The system will be fed by a new state-of-the-art ticketing and FIS Recheck system, and will feed a centralized outbound sortation system installed in December 2007. Master Planning for this effort commenced in the Spring of 2006, followed by engagement of design firms to begin architectural, structural, MEP, and baggage

B. Nature of Project

Upgrade of existing BHS [ ] New Terminal [ ] Expansion of existing terminal [ ] Retrofit of existing terminal [X]

C. Design Criteria Assumptions and Anticipated Equipment Requirements:

Design Year (One design year is sufficient)	Designed for Peak Bags/Hour	Screening Matrix Name	Terminal and Node or Concourse	Airlines Served (2-letter codes of each airline)	If airline uses mulitple matrices % of airline's bags using this matrix	Number of EDS	Type of EDS	Requested Delivery Date
2010	3000	East Matrix	Terminal 3 East	AA, BA, CO	45%, 40%, 15%	3	Analogic XLB	Jul-10
2011	3000	West Matrix	Terminal 3 West	UA, F9, SW	50%, 10%, 40%	3	Analogic XLB	Dec-10

D. Design Status:

	Yes	No
1. Has a schematic design or higher (30%, etc.) been previously submitted?		X
2. Has an Alternative Analysis been previously submitted?		X
3. Has a Preferred Alternative been previously identified?		X
4. Has a cost estimate for the current system design been submitted?	X	
5. Has a Basis of Design and Flight Schedule Analysis been submitted?	X	

Upon acceptance of this application, further directions will be given on how to submit the design package.

Airport Operator Comments (Optional):

For TSA HQ Use

A. Is the Project Description adequate? [ ] Adequate [ ] Not Adequate

B. Has a Schematic Design or higher been reviewed by TSA? [ ] Yes [ ] No
B1. Is the design supported by the Flight Schedule Analysis? [ ] Yes [ ] No
B2. Is the preferred alternative the "optimal" solution? [ ] Yes [ ] No

C. Has the Design been endorsed by TSA? [ ] Yes [ ] No

D. Are the reimbursable estimated costs reasonable? [ ] Yes [ ] No

E. Has TSA OST validated the requirements? [ ] Yes [ ] No

F. Has TSA OSO validated the requirements? [ ] Yes [ ] No

F. Comments:

In-line Support Application

6. PROJECT OBJECTIVE/JUSTIFICATION:

The existing Terminal 3 complex was first constructed in 1964. The current baggage handling system was first installed in 1986, with multiple retrofits occurring over the years since. Current baggage screening occurs through CTX-5500 EDS units originally installed during the December 2002 roll-out. Previous attempts to construct a centralized CBIS were deemed unfeasible due to the confifguration of the existing terminal structure in that combining ticketing feeds to prior to transport to the outbound baggage sortation system were virtually impossible. With the construction of the replacement landside terminal facility, accommodations have been made for a centralized screening system.

For TSA HQ Use

A. TSA Objectives/Justifications

- [ ] Accelerate Security Enhancement
- [ ] Reduce On-the-Job injury rates
- [ ] Improve speed and efficiency
- [ ] Expand system to increase capacity
- [ ] Reduce number of baggage screeners
- [ ] Other (explain in Comments)
- [ ] Mitigate lobby congestion
- [ ] Project does not meet objectives

B. Comments:

7. PROJECT SCHEDULE:

Estimated start of project construction (Month and Year): Sep-09

Estimated system operational date (Month and Year): December 2010 (Phase 1); March 2011 (Phase 2)

For TSA HQ Use

a. Project to begin within 3 years of application submittal date? [ ] Yes [ ] No

b. System will be operational within 6 years of application submittal date? [ ] Yes [ ] No

c. Comments:

8. FINANCING PLAN FOR PROJECT:

For TSA HQ Use (Equipment)

		Facility Modification Funding	Equipment
A. TSA Funds:	Previous Funding in Project (if applicable) Previous Agreement #: N/A	N/A	
	Current Funding Request	$60,000,000	
	Subtotal TSA Funds	$60,000,000	
B. PFC Funds:	Pay-As-You-Go PFC Approval #:		
	Bond Capital PFC Approval #: 123456	$250,000,000	
	Subtotal PFC Funds:	$250,000,000	
C. Other Funds:	State Grants		
	Airport Funds	$700,000,000	
	Airport Revenue Bonds		
	Other *(please specify)*		
	Subtotal Other Funds:	$700,000,000	
	Total Project Cost:	$1,010,000,000	

For TSA HQ Use

Public agency information confirmed? [ ] Yes [ ] No [ ] Partially *(explain below)*

Application reviewed by:

TSA FSD (Name)	Routing Symbol	Date

TSA Headquarters (Name)	Routing Symbol	Date

Comments:

.

Attachment B

Reimbursable and Non-Reimbursable Cost

And Cost Estimating Guidance

REIMBURSABLE/NON-REIMBURSABLE COSTS
For The
ELECTRONIC BAGGAGE SCREENING PROGRAM

June 2008

VERSION 1.0

Prepare By:
CB/TSA TEAM

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ACRYONYM LIST

ACWP	Actual Cost of Work Performed
ATR	Automatic Tag Reader
BAC	Budget at Completion
BCWP	Budgeted Cost of Work Performed
BCWS	Budgeted Cost of Work Scheduled
BDR	Basis of Design Report
BHS	Baggage Handling System
BHSC	Baggage Handing System Contractor
BOE	Basis of Estimate
BSIS	Baggage Screening Investment Study
CBIS	Checked Baggage Inspection System
CBRA	Checked Baggage Resolution Area
CCI	Construction Cost Index
CPI	Cost Performance Index
CSI	Construction Standards Institute
CWE	Current Working Estimate
EAC	Estimate at Completion
EBSP	Electronic Baggage Screening Program
EDS	Explosive Detection System
ETD	Explosive Trace Detection
EVM	Earned Value Management
HVAC	Heating, Ventilation and Cooling
IATA	International Air Transport Association
LOI	Letter of Intent
OSR	On Screen Resolution
OTA	Other Transaction Agreement
PGDS	Planning Guidelines and Design Standards dated October 10, 2007
PLC	Programmable Logic Controller
PMO	Program Management Office
PSP	Passenger Screening Program
ROM	Rough Order of Magnitude
SV	Schedule Variance
TEC	Total Estimated Cost
TSA	Transportation Security Administration
VAC	Variance at Completion
WBS	Work Breakdown Structure

1.1. Overview

The Transportation Security Administration (TSA) Electronic Baggage Screening Program (EBSP) is currently responsible for the deployment and installation of Explosive Detection Systems (EDS) at airports across the nation. As part of the deployment program, EBSP may issue Letters of Intent (LOI) or Other Transaction Agreements (OTA) to provide funding to support facility modifications and/or provide equipment to airports implementing checked baggage inspection systems (CBIS) that comply with the TSA's Planning Guidelines and Design Standards (PGDS) for CBIS, issued October 10, 2007, as well as maximizing the number of projects that can be executed during any given fiscal year through ensuring the level of funding provided to airports is only that required to fund the changes to the Baggage Handling System (BHS) necessary comply with TSA requirements for CBIS.

1.2. Purpose

This document is provided as a tool to identify allocable and allowable costs associated with awarded OTAs, which are potentially reimbursable by the TSA during the review of funding applications or requests submitted by airports or projects sponsors. It also proposes draft policies and procedures for submittals required from the airports or project sponsors seeking TSA funding that more clearly indicate portions of the project potentially eligible for TSA funding, as well as establishing submittal guidance that allow for more accurate tracking and correlation of project progress to invoice submittals by the airport sponsor.

The processes and procedures outlined in this document for are based on industry accepted standard practices for cost estimating, and are representative of the processes and procedures already in use by the airports, airlines or project sponsors in estimating proposed baggage handling system projects.

1.3. Allowable/Allocable and Reasonable Costs

As used in this document allowable, allocable and reasonable costs are referred to as reimbursable costs. Non-reimbursable costs, as used in this document are costs that are not currently deemed allowable, allocable or reasonable costs by TSA.

To be allowable, costs must be necessary and reasonable for proper and efficient performance of federal awards, be allocable (see next paragraph), and be authorized by state and/or local regulations. Additionally, the costs must conform to any limitations or exclusions set forth in federal funding guidelines, federal laws, terms and conditions of any federal awards, or other governing regulations as to the types or amounts of costs. The costs must be consistent with polices, regulations and process that apply uniformly to both federal awards and other activities of governmental units, and must be determined in accordance with generally accepted accounting principles. Allowable costs must be accorded consistent treatment and may not be assigned to a federal award as a direct cost if any other cost incurred for the same purpose in like circumstances has been allocated to the federal award as an indirect cost. Finally, allowable costs must be adequately documented and cannot include or be used to meet cost sharing or matching requirements of any other federal award in either the current or prior period, except as specifically provided by federal law or regulation.

Costs are allocable to a particular cost objective if the goods or services involved are chargeable or assignable to such cost objective in accordance with the relative benefits received. Additionally, allocable costs identified or submitted to TSA are not allowed to be charged to other federal agencies to overcome funding deficiencies or to avoid restrictions imposed by law.

A cost is reasonable if, in its nature and amount, if it does not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the decision was made to incur. In determining reasonableness of a given cost, consideration is given to:

a. Whether the cost is of a type generally recognized as ordinary and necessary for the operation of the governmental unit or the performance of the Federal funding.
b. The restraints or requirements imposed by such factors as: sound business practices; arms length bargaining; Federal, State and other laws and regulations; and, terms and conditions of the Federal funding;
c. Market prices for comparable goods or services;
d. Whether the individuals concerned acted with prudence in the circumstances considering their responsibilities to the governmental unit, its employees, the public at large, and the Federal Government; and
e. A significant deviation from the established practices of the governmental unit which may unjustifiably increase the Federal funding (i.e., deviation from standard agencies practices, that will increase the cost to the government, without providing adequate justification).

Allowability is defined as follows:

1. Reasonableness (cost is reasonable if, in its nature and amount, it does not exceed that which would be incurred by a produce person in the conduct of competitive business.)
2. Allocability (cost is allocable if assignable or chargeable to one or more cost objectives on the basis of relative benefits received; incurred specifically for the effort, & necessary to the operation)
3. Cost Accounting Standards
4. Terms of the Contract

1.3.1. Typical Reimbursable and Non-Reimbursable Costs for TSA Baggage Screening Projects

In evaluating and identifying reimbursable costs the TSA design expert should assess each design against the following items:

1. Reimbursable costs:
   (a) TSA supports basic interior wall construction only. Costs in excess of basic interior wall construction are Non-Reimbursable. TSA supports basic interior wall finishes in bag inspection rooms. Costs in excess of basic finishes are TSA Non-Reimbursable.
   (b) TSA supports costs associated with the demolition of existing spaces, modification or renovation of existing spaces or fit out of newly constructed spaces, necessary to support the TSA's operations. However, TSA will only considers those costs associated with areas necessary for its operation or directly supporting baggage screening operations (e.g., checked baggage resolution area, the On-Screen Resolution Room (OSR) and the CBIS matrix). (See Section 1.3.1(2)(a) regarding exterior walls and building shell.)
   (c) TSA supports air conditioning of bag screening rooms, OSR and CBRA/ETD and other areas that will be staffed by TSA field personnel. The exact extent of the HVAC cost that will be considered eligible for TSA reimbursement is assessed on a case by case basis.
   (d) TSA requires lighting in checked baggage inspection system areas, CBRA and the OSR meeting minimum building code and Occupational Safety and Health Administration requirements for lighting (lumen per square foot) for office space. TSA supports basic light fixtures necessary to meet lighting requirements in bag inspection and OSR rooms, costs in excess of basic fixtures are TSA Non-Reimbursable.
   (e) Automatic Tag Readers (ATR) are only eligible for reimbursement by TSA if utilized to support bag tracking. Eligibility and the exact amount of reimbursement will be determined on a case by case basis. If the ATR's are only used for reading the IATA bag tags for the purposes of identifying the bag destination and associated passenger/s for baggage reconciliation then they are Non-Reimbursable.
   (f) ATR may be considered reimbursable for systems that have been modified from a single carrier per make-up/sortation unit to multiple carriers per make-up sortation unit, where the carriers are now forced to sort baggage for loading to the appropriate plane. The only way to do this is via IATA carrier code or some type of additional tag. Either way the BHSC will need to supply some type of scanning array for sortation that was not needed prior to EDS.

(g) Due to the remoteness, in some airports, of the OSR room from some CBIS and CBRA areas, and the need for communications during BHS maintenance, LEO, BOA and to notify personnel in the CBIS of OSR decisions, phone or other telecommunication systems are supported and reimbursable by TSA.
(h) Closed caption television at the entrance and exit of the EDS is reimbursable by TSA on a case by case basis.
(i) Centralized Baggage System Control rooms may be considered, subject to negotiation, if the airport is installing a centralized control room to minimize operational costs and this will be the ONLY area where the system can be monitored from.
(j) TSA will only consider reimbursement of Programmable Logic Controllers (PLC) if the addition of an in-line screening system requires a modification/addition to current systems. TSA will only consider reimbursement for the additional programming to control the in-line screening portion, and will only reimburse that portion of the controls necessary to support the CBIS, OSR and CBRA operations. See Section 1.3.1(2)(g) regarding eligibility of full replacement of the PLC.
(k) TSA will consider specific replacement and upgrade of the conveyor system necessary to support the integration of the screening matrix. Conveyor systems to support high throughput EDS screening system will be considered on a case by case basis.

2. Non-Reimbursable Costs:
   (a) The TSA does not reimburse costs associated with the buildings shell or exterior enclosure. TSA does not reimburse the cost of construction of terminal expansions, whether necessary to support TSA operations or for other purposes. See Section 1.3.1 (1)(b) regarding fit out of new spaces.
   (b) TSA does not reimburse construction costs for TSA leased spaces. If TSA is leasing the space from the airport or airline, funding for facility construction costs or modification costs will not be approved, as it will be assumed that the airport will recoup the funds for the construction of spaces, such as the OSR or CBRA rooms.
   (c) Centralized Bag System Control Rooms are not reimbursed by TSA if the Baggage Handling System (BHS) has been equipped with flow sensors with visual and audible alarms for jams, faults and other system related errors. See Section 1.3.1(1)(h)
   (d) Extended warranties and the procurement of extended warranties are not reimbursed by TSA.
   (e) On-site technical support has no bearing on the in-line screening system operation and therefore, is not reimbursable by TSA. [except during start-up and preparing for ISAT]

(f) Spare parts are covered under the standard one-year warranty for all EDS equipment purchased by TSA, therefore TSA does not require and does not reimburse the cost of any spare parts nor areas for storage of spare parts.
(g) The full replacement of an existing Programmable Logic Controller (PLC) package is a decision made by the airport/airline when soliciting bids. TSA will not reimburse full replacement of existing PLC programs to integrate EDS screening. See Section 1.3.1(1)(i) regarding sections of the PLC eligible for reimbursement consideration.
(h) TSA does not reimburse the cost of laptop computers used for maintenance of the BHS and CBIS.
(i) Baggage reconciliation (carrousels or sortation systems) systems are not required in support of CBIS and are therefore non-reimbursable by TSA.
(j) TSA does not reimburse costs associated with connectivity to Baggage System Management (BSM) data providers and/or BSM systems as the BSM is solely used by the airlines for internal processing, and is not a requirement of in-line screening. CBIS systems where TSA requests or supports initiation of selectee screening will require BSM. Reimbursement of BSM in these areas will be evaluated on a case by case system.
(k) Manual encoding consoles are required only for sorting baggage with either unreadable tags, no bag tag destinations in the system or damaged tags. Manual encoding systems are not required as part of the TSA supported CBIS and are therefore are not reimbursable by TSA.
(l) TSA does not support full replacement of conveyor systems as new in-feed, take away and transfer point conveyors are to the benefit of the airport (i.e., ticket counter belts and conveyor for the sortation area are not eligible for reimbursement).

1.4. Cost Estimating

The October 7th, 2007 version of the Planning Guidelines and Design Standards (PGDS) requires airports and/or project sponsors to submit cost estimates as part of the design package submission at each design phase (Pre-Design, Schematic, 30%, 70% and 100%). While the Pre-design and Schematic design phases require rough order of magnitude (ROM) costs, the 30% through 100% designs require detailed cost estimates based on the Basis of Design Report. However, format and requirements for the Basis of Estimate are not stipulated.

In order to ensure that TSA is only funding that portion of a project that is necessary to implement an automated, semi-automated (mini-in-line) or stand-alone CBIS the airports, airlines or other organizations requesting funding support from TSA should provide a detailed cost estimate summary as included in Appendix A at each phase of design. Additionally, estimates submitted for funding request purposes should include a Basis of

Estimate (BOE), developed from the perspective of the prime contractor for construction, document that includes, at a minimum, the following elements:

- Purpose
- Executive Summary
- Project Scope Description
- Estimate Methodology
  - Work Breakdown Structure (WBS)
  - Tools and Data Bases
  - Level of Project Definition “Contingency”
  - Estimate Practices for Labor; Equipment and Material
  - Prime and Subcontractor General Requirements and Fees
  - Other Cost
- Schedule
- Assumptions, Inclusions, Exclusions, Risks, etc

Further explanation of each section of the each BOE component is furnished below.

1.4.1. Purpose:

This section of the BOE is to provide a brief concise description of the major components of the project scope, level of the estimate and those major exclusions. A clearly stated Purpose will provide an Executive Summary of the project and those efforts that took place prior to preparing the estimate as well as readying the user for the ensuing detail through the body of the estimate.

1.4.2. Executive Summary

This section provides a brief statement of the design level the estimate was based on and states if the Current Working Estimate (CWE) is authored by a single entity or a reconciliation of two (2) or more estimates. The executive summary will also state if the estimate has been escalated based on a project schedule, and summarize the CWE at a high level to show BHS, Other Construction Related Costs, and Soft Costs. If the design level has not incorporated an Existing Conditions study then Areas of Risk and their associated potential impact should also be assessed. This will provide TSA with a Total Estimated Cost (TEC) range from which to base decisions knowing that certain risks for lack of existing conditions will be further ascertained and will or will not become part of the base scope in subsequent design stages. Areas of Risk are further described later in this document.

1.4.3. Project Scope Description:

This section of the estimate should be organized to correspond to the Work Breakdown Structure “WBS” and will include a more detailed description of the major components of the project and the means and methods assumed in the estimate to construct them.

1.4.4. Methodology used to prepare the Estimate

1.4.4.1. Work Break down Structure (WBS)

Explaining the estimate structure plays a significant role in any future required reconciliation, as such a generic description of the estimate format and relationships of detailed cost items to their hierarchy should be given. A sample WBS is provided in **Appendix A**.

1.4.4.2. Tools and Data Bases

The BOE should indicate the primary estimating methodology used in preparing the cost estimate including those for cost resources, historical data, estimating tools and documents.

1.4.4.3. Major Cost Components: Labor, Equipment, Material

Major cost elements used in preparing the estimate should be described, thereby further demonstrating the Estimator's level of effort and knowledge of the project requirements. For example: equipment cost in the estimate was derived from multiple indexes including R.S. Means, Blue Book Equipment Rental Rates, and in the case of the casting yard equipment and specialized erection equipment actual invoices from other projects were utilized.

1.4.4.4. Sub Contractor and Prime Contractor Markups and Fees

Since mark-ups and fees can be subjective, articulating the style of contract and the expected General Requirements and Fees used is inherent to the BOE's purpose.

1.4.4.5. Allowances

Allowances used in the estimate and the reason they were used should be clearly stated.. For example: a 10% cost allowance for project phasing due to the contractor being required to fully mobilize and de-mobilize workers and equipment to the project site each day.

1.4.4.6. Other Factors

In order for the effort to be factual and complete the Estimator should describe any other elements bearing on the estimated calculations including: Project Options; Cost Risks; and deviation from Standard Practices.

1.4.4.7. Schedule Requirements:

A complete BOE must address the project schedule. A well versed BOE will address those specific requirements provided for in the estimate to maintain all major and interim milestones including: procurement, fabrication, anticipated shift work and work week schedule. Any assumptions made regarding the Projects Key milestones should be stated.

Once TSA has made the determination to fund the Project and the LOI/OTA has been negotiated, the airport or project sponsor should submit a cost and resource loaded schedule in Microsoft Project within 30 days of signature of the LOI or OTA The schedule should be submitted in both hard and soft copy, and must contain enough detail for TSA to monitor that status of activities related to the design, construction, and installation and testing of the Checked Baggage Inspection System (CBIS), the On-Screen Resolution (OSR) room and the Checked Baggage Resolution Area (CBRA). In addition the schedule should include the anticipated delivery dates for Explosive Detection Systems, Explosive Trace Detectors (ETD) and any other equipment TSA is anticipated to provide.

This schedule, in conjunction with the project cost estimate provides the basis for the Earned Value Management required in Section 1.9.

1.4.4.8. Assumption / Exclusions/ Exemptions

The BOE should include three separate and distinct bulleted listings, that concisely identify the assumptions, exclusions and exemptions utilized in developing the estimate. The assumptions should document any assumed premiums for shift work, compressed phasing, and work anticipated to be completed by other entities. Additionally, a clear list of all activities and work that is not included in the assumption or presumed to be excluded based on the statement of work, should be clearly identified.

1.4.4.9. Areas of Risks

Once existing conditions have been established and reflected in design documents, the estimate should include, as either pricing factors on line items or as estimate-wide factors that inflate the costs of labor, material and equipment cost as globally as necessary, as well as assessments for:

- The Sequence of Work to adjust for Labor Productivity, Shift Premiums, unusual daily access to the site, multiple and phased staging;
- Area/space constraints that may require hand tool versus large equipment utilization;
- Any other subsidiary work the contractor will be required to perform in order to safely proceed with construction; and
- Any other constructability issues

Up to the 30% design phase when an Existing Condition study has not been performed, the estimate should provide a “Range” based on the design’s team assessment of Areas of Risk. A Rule of Thumb for the Low Range is to reduce the Design Contingency to half of what the base estimate has provided. The High Range can be assessed by identifying Risk Factors and their corresponding probability and cost impact. A formal process is not being recommended in this document. However, factors to consider have been provided in **Appendix B**. Figure 1 below is a sample range estimate.

Figure 1: Areas of Risk Breakout Sample

ESTIMATED PROJECT COMPLETION DATE:	TBD	Estimate Construction Cost at Award ($s)				
Current Working Estimate - Effective Pricing Date:	May-08	CBIS Matrix Estimate	CBRA Area Estimate	OSR Room Estimate	Infra-structure Estimate	TOTAL ESTIMATE
CWE Scope Based on Design Level of:	10%					
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		31,954,000	1,331,000	250,000	14,800,000	48,335,000

Areas of Risk	Cost Impact
Sequence of Work - Productivity Loss, Congested areas, Site access, Stakeholder constraints	$ 4,625,000
Labor Avalability for NYC Area	$ 4,070,000
CBIS Technology Issues	$ 2,362,000
Unknown/TBD Constructability Issues - Interface w/existing BHS systems	$ 4,834,000
Commissioning	$ 1,181,000
Range of Risk	**$ 17,072,000**
Low Range of TEC	**$ 44,307,000**
High Range of TEC	**$ 65,407,000**

1.5. Cost Estimate Breakouts

Additionally, estimates submitted for funding request purposes should, at a minimum, include the elements below as Figure 2: Sample Cost Estimate Breakout.

- The Current Working Estimate (CWE) sheet included herein as **Appendix C** "Current Working Estimate Summary" includes;
  - Subtotal estimated construction values as cost accounts (columns):
    - Baggage handling system (BHS)
    - Checked Baggage Inspection System (CBIS)
    - On-Screen Resolution (OSR) Area
    - Checked Baggage Resolution Area (CBRA)
    - Infrastructure Construction (IC)
  - Each account above should be organized in a report by CSI Division summary Master Format 2004.
  - The following SoftCosts:
    - Construction Contingency
    - Design and programming
    - Project/Construction Management
    - Escalation
  - BHS estimates listed separately under CSI division 34 "Transportation" as noted in Appendix C and include as separate items each of the following:

- Project Management
- Equipment
- Installation
- Engineering
- Controls
- Testing

Figure 2: Sample Cost Estimate Breakout

CURRENT WORKING ESTIMATE SUMMARY	By ABC Cost Consulting					
AIRPORT IDENTIFIER:	JFK					
AIRPORT NAME:	John F. Kennedy International Airport					
PROJECT NAME:	Terminal One - Option 2					
ESTIMATED PROJECT COMPLETION DATE:	TBD	Estimate Construction Cost at Award ($s)				
Current Working Estimate - Effective Pricing Date:	May-08	CBIS Matrix Estimate	CBRA Area Estimate	OSR Room Estimate	Infra-structure Estimate	TOTAL ESTIMATE
CWE Scope Based on Design Level of:	10%					
HARD COSTS (ECCA)						
a. Subtotal BHS (Rounded)		23,615,000				23,615,000
b. Subtotal Other Construction Related Costs (Rounded)		3,014,000	1,109,000	208,000	12,333,000	16,664,000
c. Hard Costs Sub-Total (a. + b.)		26,629,000	1,109,000	208,000	12,333,000	40,279,000
SOFT COSTS						
Construction Contingency	5.00%	1,331,000	55,000	10,000	617,000	2,013,000
Design w/Const Admin	8.00%	2,130,000	89,000	17,000	987,000	3,223,000
Project & Construction Management	7.00%	1,864,000	78,000	15,000	863,000	2,820,000
Escalation NONE	0.00%	-	-	-	-	-
Soft Costs Sub-total		5,325,000	222,000	42,000	2,467,000	8,056,000
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		31,954,000	1,331,000	250,000	14,800,000	48,335,000

1.5.1. Project Management/Construction Management

Project Management as discussed in this document refers solely to the airport or airport's existing Program Management Office (PMO) contractor's oversight and management of activities necessary to install a CBIS solution (whether in-line, stand-alone or otherwise). Conversely, construction management as discussed in this document is the management activities undertaken by the general construction contractor and/or baggage handling system contractor (BHSC) to construct and install the CBIS solution (whether in-line, stand-alone or otherwise). Allowable Project Management and Construction Management costs are outlined in Table 1: Allowable Fee Percentages.

1.6. Determination of Funding Level

Project Management, construction management, design fees and other so-called "soft costs", many of which are undefined, can range from 2-3% to as much as 47% of the project construction cost.

TSA should only reimburse project management, construction management, escalation and design fees that can be directly apportioned to the TSA "allocable" portion of the BHS project. For example: if the overall project is $100M, but TSA's allocable costs are only 25% (or $25M) of that, all project management, construction management, escalation and other costs will only be reimbursed against the $25M in cost attributable to TSA's requirements. All cost sharing apportionments (i.e., 75-25, 90-10, 95-5) should be based solely on the allocable costs negotiated. Using the example above, if the allocable/allowable costs from a $100M project are only $25M, then a 75%-25% cost sharing would only allow TSA to fund up to $18.75M.

Further, TSA should only reimburse project management, construction management and design fees up to the levels identified below, unless specific justification is provided and approved in writing by the TSA Contracting Officer (CO) at the time of the negotiation (i.e., rates varying from those identified directly in the OTA, will not be accepted).

Description	Allowable Percentages
Project Management	2%
Construction Management	4-6%
Escalation	See Section 1.7
Design Fees	6% (up to 8% if including Construction Administration)
Contingency – Design	See Section 1.6.1.1
Contingency – Construction	5% of Projected Construction Cost, See Section 1.6.1.2

Table 1: Allowable Fee Percentages

1.6.1. Contingency

1.6.1.1. Design Contingency

Design contingency should be noted as separate and distinct items apart from direct construction costs and other associated mark-ups. Design contingency is understood to represent an amount added to the estimate to allow for items, conditions, or events for which the state, occurrence, and/or effect is uncertain but that experience shows will likely result, in aggregate, in additional costs[1].

Design contingency may account for:

- Errors and omissions in the estimating process
- Variability associated with the quantification effort

[1] AACE International Recommended Practice No. 10S-90 "COST ENGINEERING TERMINOLOGY", copyright 2004.

- Incomplete design of anticipated final quantities
- Minor variability in labor (productivity, availability, etc.)
- Historically supported weather impacts
- Minor variability in wage rates
- Minor variability in material and equipment costs
- Substitute construction materials

Design contingency does **not** account for:

- Significant changes in scope
- Errors and Omissions in Design
- Major unexpected work stoppages (strikes, etc.)
- Disasters (hurricanes, tornadoes, etc.)
- Excessive, unexpected inflation
- Excessive, unexpected currency fluctuations
- Other Areas of Risks

Design contingency amounts shall correspond to the level of project design as per the following table:

% Overall Design Completion	% Contingency
0-30	20
30-70	15
70-90	10
90-100	5
100	0

Table 2: Allowable Design Contingency Percentages by Design Phase

Design contingency shall be applied to the sum total of the direct construction costs, including labor, material and equipment costs. Application of business concerns such as general conditions, overhead and profit, escalation and other related mark-ups shall be based on the sum total of direct construction costs and design contingency.

1.6.1.2. Construction "Contingency"

In most construction budgets, there is an allowance for contingencies or unexpected costs occurring during construction. Construction contingencies cover the uncertainty associated with inadequacies of incomplete project scope definition, estimating methods and estimating data. For example, construction contingencies may include:

- Design development changes,
- Schedule adjustments,
- General administration changes (such as wage rates),

- Differing site conditions for those expected, and
- Third party requirements imposed during construction, such as new permits.

TSA should allow construction contingencies of up to 5% of the total construction budget for allocable items. For example: If the total project budget is $100M, but TSA has determined that it's allocable share of the project is $25M, then the 5% contingency would be developed against the $25M budget only.

However, contingency should not be added into the base budget for negotiation but should require submission of "change orders", outlining the change in condition that requires the additional funding and should require supporting documentation including modified plans and specifications for the change. Further, the contractor/airport should submit a cost estimate, meeting all the requirements of this document, with the "change order" justifying the change in cost.

Access to the 5% contingency funding should only be provided based on written approval by TSA's CO of the proposed change order.

1.7. Escalation

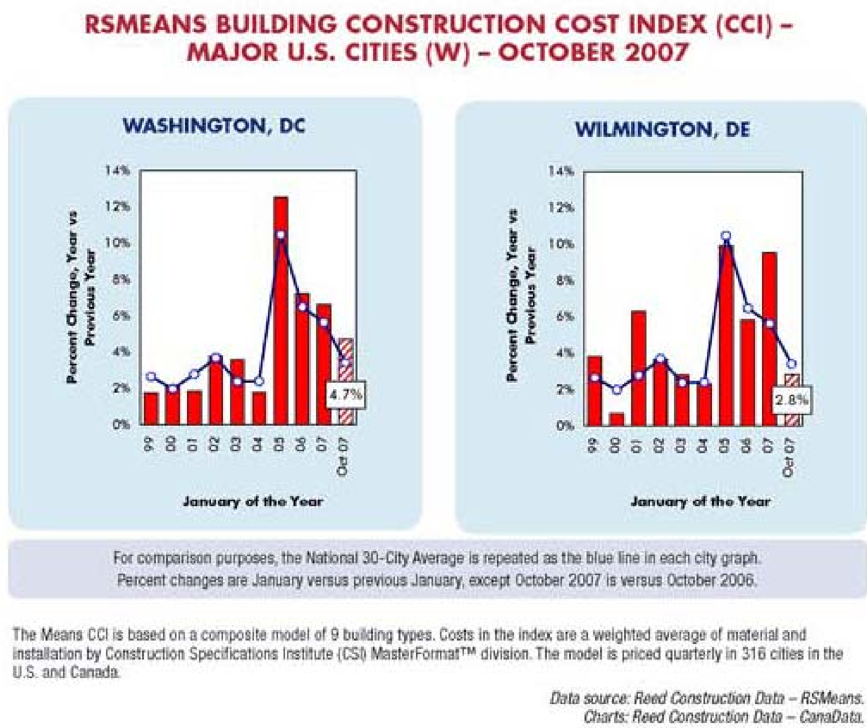
1.7.1. Current Escalation

It is typical practice for estimators to use or reference legacy estimate/quotes, and commercial databases that have aged several months to a couple of years as part of their CWE. The body/details of the estimate should have all cost items in current year dollars ($'s). The historical escalation used to bring data current should be based on RS Means Building Construction Cost Index (CCI) from the relevant source date to the current date.

1.7.2. Forward Escalation

Escalation should be based on the average annual rate for the three years prior to the estimate development date as established by the most current quarterly published RS Means Building Construction Cost Index (CCI). The rate used should be based on the nearest city provided in the CCI. The following is an excerpt from the CCI as

Figure 3: RSMEANS Building Construction Cost Index (CCI).



Escalation should be noted as separate and distinct items apart from direct construction costs and other associated mark-ups. Escalation is understood to represent a provision in actual or estimated costs for an increase in the cost of equipment, material, labor, etc, over that specified in the purchase order or contract due to continuing price level changes over time[2].

Escalation should be calculated from the scheduled construction start date to the midpoint of construction on a compounding basis. Escalation should be applied to the sum total of direct construction costs, contingency, general conditions and overhead and profit. Other related mark-ups should be based on the sum total as described above.

Should a construction schedule not be available, the CWE should be represented in Non-Escalated $'s and clearly noted as such.

[2] AACE International Recommended Practice No. 10S-90 "COST ENGINEERING TERMINOLOGY", copyright 2004.

1.7.3. Cost Estimate Currency/Age

CWE's should have an Effective Pricing Date no later than 90 day from the time of submittal and/or use for funding reimbursement request purposes. The Basis of Estimate documentation should clearly indicate the estimate is reflective of current market conditions. Estimates dated prior to 90 calendars days from the funding submittal date will require updating.

Estimates submitted for funding reimbursement request purposes should be accompanied by a market analysis specific to the airport location and timeframe during which proposed improvements will be performed. At a minimum, the analysis should include:

b) Description of current bidding climate relative to number bidders responding to requests for proposals
c) Use of Davis Bacon Wage rates, where applicable
d) List of current construction projects, including project name, type, approximate construction value and schedule
e) Use of union versus non-union labor
f) Narrative of labor availability
g) Narrative of material and equipment availability
h) Review of typical contracting methods used in location

1.7.4. Estimate Reconciliation

It is common practice to have two (2) or more independent estimates prepared at a given design level to increase confidence and accuracy in the CWE for project and budget decisions. If a Reconciled Estimate is sought, the approach to reconcile the estimate should proceed with the following ground rules:

(1) The formats for the estimate should strictly adhere to a WBS to evaluate scope of the project. A sample WBS is provided in Appendix A. Scope variance should be reconciled prior to review of pricing. Once scope differences are resolved updated estimate summaries should be generated.
(2) Estimate Summaries should strictly adhere to the CWE format illustrated in Appendix C. As a rule of thumb variances in excess of 10% for each Division should be reconciled further. An explanation or rationale should be documented to provide an understanding of the reconciled value.
(3) The "Reconciled" Estimate should be used as the Go-Forward estimate.

A sample report of the Reconciled CWE is provided as **Appendix D**.

1.7.5. Estimate Trending

As the subsequent design level is completed the CWE should be compared with the prior design phase CWE. Major changes to scope should be identified in a report along with the associated cost impacts. These changes should be approved by TSA prior to commencing with the next design phase. Once a project budget has been established, minor changes in cost should be added or deducted from design contingency. Hence with the exception of Major changes, the TEC should remain the same as the prior phase's CWE.

1.8. Facility Costs

Projects submitted to TSA for funding can typically be divided into four (4) primary categories:

1) Modification of existing baggage handling systems (BHS)
2) New facilities/terminal including BHS
3) BHS requiring extensive modification with the expansion of existing facilities (bump outs)
4) Redesign/retrofits and/or upgrades of BHS to meet new CBIS performance requirements

The primary rule that should be applied to each of these project types can be found in Section 3.3.2 of the *Working Group Report, Baggage Screening Investment Study* prepared for the Aviation Security Advisory Committee, dated 9 August 2006.

> "In the Framework, known new terminal construction projects were assumed in the analysis, but no costs were assumed for yet-to-be-announced new terminals. Given that some new terminals will replace old terminals (i.e., they will replace rather than supplement existing terminal capacity), the Technical Team requested that some additional costs be assumed for providing in-line screening systems at future new terminals.
>
> To include these costs, an estimated annual rate of terminal construction was developed for 2010 and beyond based on surveys conducted by industry associations, as discussed in Appendix B. The included costs only represent the portion of the construction cost for a new terminal associated with an in-line EDS screening system."

Transportation Security Administration should only reimburse or fund those construction costs at a new terminal or facility directly associated with an in-line EDS screening system, i.e., the electrical, mechanical, plumbing etc., requirements necessary to implement an in-line EDS screening solution and support the OSR Room and CBRA. Funding should be provided based on an agreed to percentage of the "allocable" costs for the TSA requirements at the facility plus facility costs based on the average national square foot price for similar functional space. Any agreed to program management, construction management, escalations or design fees will be in addition to funding for the BHS and facility costs. The square foot facility cost will be adjusted based on locality in accordance with the most current version of the RS Means locality modifiers.

A TSA Baggage Handling Expert should identify those portions of the baggage handling system design that are required to meet TSA screening requirements as outlined in the most current version of the PGDS. Facility costs, structural, mechanical (HVAC), plumbing, electrical, etc., necessary to support the portion of the airport facility utilized to meet TSA screening requirements should be funded/reimbursed on a square foot basis as identified above. This includes any areas necessary for the OSR Area or the CBRA.

1.9. TSA Reimbursement

In general, the CWE should be for reimbursable costs only. If the CWE includes Non-Allocable Costs they should be factored from the estimate is a manner shown in **Appendix E.** The format illustrated in Appendix E also provides a worksheet from which the appropriate TSA funding percentage can be applied to the reimbursable portion of the estimate. From this the additional funding (non-TSA) that is needed for a complete budget can be calculated as shown in Figure 4.

Figure 4: TSA Reimbursable Funding Breakout Sample

		ECCA ($'s)	TSA ALLOCABLE COSTS		TSA AGREED TO FUNDING		Additional Allocable Funding Needed (Non-TSA)
ESTIMATED PROJECT COMPLETION DATE:	TBD						
Current Working Estimate - Effective Pricing Date:	May-08	TOTAL ESTIMATE					
CWE Scope Based on Design Level of:	10%		%	$s	%	$s	
HARD COSTS (ECCA)							
a. Subtotal BHS (Rounded)		23,615,000	100%	23,615,000	90%	21,254,000	2,362,000
b. Subtotal Other Construction Related Costs (Rounded)		16,702,000	100%	16,702,000	75%	12,527,000	4,176,000
c. Hard Costs Sub-Total (a. + b.)		40,317,000	100%	40,317,000	84%	33,781,000	6,538,000
SOFT COSTS							
Construction Contingency	5.00%	2,015,000	100%	2,015,000	75%	1,511,250	503,750
Design w/Const Admin	8.00%	3,226,000	100%	3,226,000	75%	2,419,500	806,500
Project & Construction Management	7.00%	2,823,000	100%	2,823,000	75%	2,117,250	705,750
Escalation NONE	0.00%	-	100%	-	75%	-	-
Soft Costs Sub-total		8,064,000	100%	8,064,000	75%	6,048,000	2,016,000
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		48,381,000	100%	48,381,000	82%	39,829,000	8,554,000

1.10. Invoicing and Earned Value Management (EVM)

Invoices/requests for payment should include a summary page utilizing the same format as the cost estimate to allow for ease of tracking and comparing actual expenses to agreed costs.

Additionally, because of the widely accepted practices of EVM and the equations ability to measure cost performance, airports, airlines or other organizations requesting funding support from TSA should provide a current EVM analysis. This analysis should identify work completed to date and include a forecast of the work anticipated to be completed during the next month or invoicing period, whichever is longer.. The EVM data should be representative of the entire project scope in the WBS format utilizing the most current up to date cost loaded project schedule. Estimates with EVM calculations submitted for funding reimbursement request purposes should include, at a minimum, the following EVM elements:

- Budgeted Cost of Work Scheduled "BCWS"
    - Literally, representative of all cost including in-directs that are planned or scheduled. A well design schedule usually reflect these planned cost as a traditional S-curve shape
- Actual Cost of Work Performed "ACWP"
    - Once again literally representative of all cost including in-directs charged against activities that are completed
- Budgeted Cost of Work Performed "BCWP"
    - More traditionally described as the "Earned Value" these are representative of the cost including in-directs for the activities that are completed, and are distinct from the BCWS which is for activities that are planned to be completed.
- Budget at Completion "BAC"
- Estimate at Completion "EAC"
- Schedule Variance "SV"
- Variance at Completion "VAC"
- Cost Performance Index "CPI" (ACWP/BCWP)

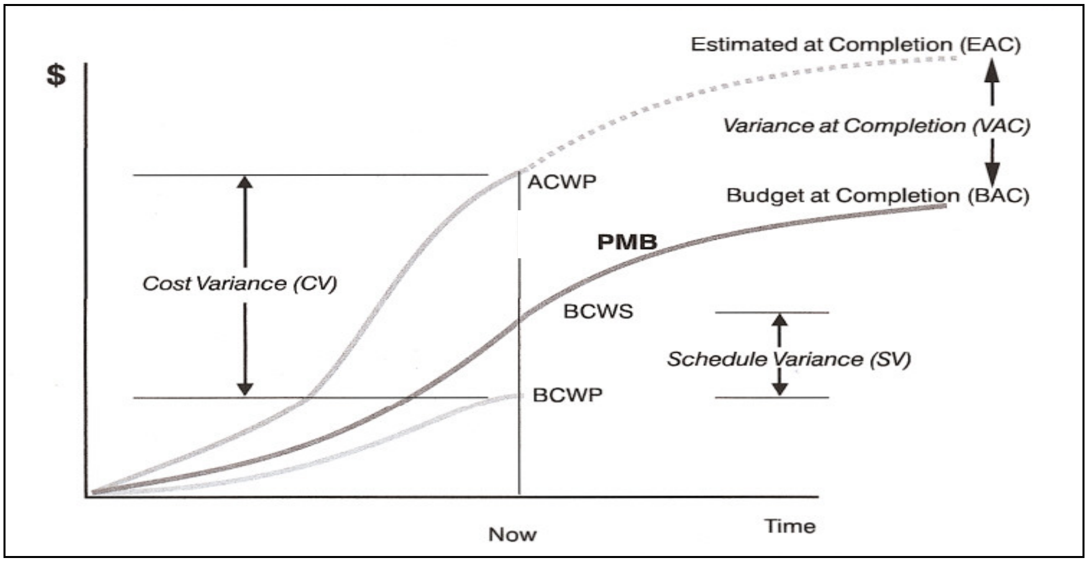
The BCWS, ACWP and ACWS provide the mechanics for a full analysis of the Projects progress and performance in the EVM environment. As depicted in Figure 5, the forecast of Estimate at Completion; Schedule Variance and Variance At Completion will be derived from these initial investments.

Where the EAC for the data date compiled is:

$$EAC = \frac{(BAC-BCWP)}{CPI} + ACWP$$

Note: CPI = ACWP/BCWP (poor performance is greater than one)

Figure 5: EVM Graph


$
Estimated at Completion (EAC)
Variance at Completion (VAC)
Budget at Completion (BAC)
ACWP
PMB
Cost Variance (CV)
BCWS
Schedule Variance (SV)
BCWP
Now
Time

APPENDIX A

NY/NJ EBSP MASTER PLAN
JFK T-1 CBIS EDS Facility Option 2
10% Design Phase Estimate
Carter & Burgess

WBS

WBS LEVEL DESCRIPTION

JFK T-1 CBIS EDS Facility Option 2

```
|--- IC - INFRASTRUCTURE CONSTRUCTION
|    |--- DIVISION 01 GENERAL REQUIREMENTS
|    |--- A. SUBSTRUCTURE
|    |    |--- A10 Foundations
|    |    |    |--- A1010 Standard Foundations
|    |    |    |--- A1020 Special Foundations - Driven Piles
|    |    |    |--- A1030 Slab on Grade
|    |    |--- A20 Basement Construction
|    |         |--- A2010 Basement Excavation
|    |--- B. SHELL
|    |    |--- B10 Superstructure
|    |    |    |--- B1010 Floor Construction
|    |    |    |--- B1020 Roof Construction
|    |    |--- B20 Exterior Closure
|    |    |    |--- B2010 Exterior Walls
|    |    |    |--- B2020 Exterior Windows
|    |    |    |--- B2030 Exterior Doors
|    |    |--- B30 Roofing
|    |         |--- B3010 Roof Coverings
|    |         |--- B3020 Roof Openings
|    |--- C. INTERIORS
|    |    |--- C10 Interior Construction
|    |    |    |--- C1010 Partitions
|    |    |    |--- C1020 Interior Doors
|    |    |    |--- C1030 Specialties
|    |    |--- C20 Staircases
|    |    |    |--- C2010 Stair Construction
|    |    |--- C30 Interior Finishes
|    |         |--- C3010 Wall Finishes
|    |         |--- C3020 Floor Finishes
|    |         |--- C3030 Ceiling Finishes
|    |--- D. SERVICES
|    |    |--- D10 Conveying Systems
|    |    |    |--- D1010 Elevators
|    |    |    |--- D1030 Material Handling Systems - Crane
|    |    |--- D20 Plumbing
|    |    |    |--- D2020 Domestic Water Distribution
|    |    |    |--- D2030 Sanitary Waste
|    |    |    |--- D2040 Rain Water Drainage
|    |    |    |--- D2050 Special Plumbing Systems
|    |    |--- D30 HVAC
|    |    |    |--- D3040 Distribution Systems
|    |    |    |--- D3050 Terminal & Package Units
|    |    |    |--- D3070 Testing Balancing & Commissioning
|    |    |--- D40 Fire Protection
|    |    |    |--- D4010 Fire Protection Sprinkler Systems
|    |    |--- D50 Electrical
|    |         |--- D5010 Electrical Service & Distribution
|    |         |--- D5040 Special Electrical Systems
|    |--- G. BUILDING SITEWORK
|         |--- G10 Site Preparation
|         |    |--- G1020 Site Demolition & Relocations
|         |    |--- G1030 Site Earthwork
|         |--- G20 Site Improvements
|              |--- G2040 Site Development
|--- CBRA - CHECKED BAGGAGE RESOLUTION AREA
|    |--- DIVISION 01 GENERAL REQUIREMENTS
|    |--- C. INTERIORS
|    |    |--- C10 Interior Construction
|    |    |    |--- C1010 Partitions
|    |    |    |--- C1020 Interior Doors
|    |    |    |--- C1030 Specialties
|    |    |--- C30 Interior Finishes
|    |         |--- C3010 Wall Finishes
|    |         |--- C3020 Floor Finishes
|    |         |--- C3030 Ceiling Finishes
|    |--- D. SERVICES
```

WBS LEVEL DESCRIPTION

```
|    |    |--- D20 Plumbing
|    |    |    |--- D2010 Plumbing Fixtures
|    |    |    |--- D2030 Sanitary Waste
|    |    |--- D30 HVAC
|    |    |    |--- D3040 Distribution Systems
|    |    |    |--- D3050 Terminal & Package Units
|    |    |    |--- D3060 Controls & Instrumentation
|    |    |    |--- D3070 Testing Balancing & Commissioning
|    |    |--- D50 Electrical
|    |         |--- D5010 Electrical Service & Distribution
|    |         |--- D5020 Lighting & Branch Wiring
|    |         |--- D5030 Communication & Security Systems
|    |         |--- D5040 Special Electrical Systems
|    |--- E. EQUIPMENT & FURNISHINGS
|         |--- E10 Equipment
|         |    |--- E1040 Other Equipment
|         |--- E20 Furnishings
|              |--- E2010 Fixed Furnishings
|              |--- E2020 Movable Furnishings
|--- OSR ON-SCREEN RESOLUTION AREA
|    |--- DIVISION 01 GENERAL REQUIREMENTS
|    |--- C. INTERIORS
|    |    |--- C10 Interior Construction
|    |    |    |--- C1010 Partitions
|    |    |    |--- C1020 Interior Doors
|    |    |    |--- C1030 Specialties
|    |    |--- C30 Interior Finishes
|    |         |--- C3010 Wall Finishes
|    |         |--- C3020 Floor Finishes
|    |         |--- C3030 Ceiling Finishes
|    |--- D. SERVICES
|    |    |--- D30 HVAC
|    |    |    |--- D3040 Distribution Systems
|    |    |    |--- D3050 Terminal & Package Units
|    |    |    |--- D3060 Controls & Instrumentation
|    |    |    |--- D3070 Testing Balancing & Commissioning
|    |    |--- D40 Fire Protection
|    |    |    |--- D4010 Fire Protection Sprinkler Systems
|    |    |--- D50 Electrical
|    |         |--- D5010 Electrical Service & Distribution
|    |         |--- D5020 Lighting & Branch Wiring
|    |         |--- D5030 Communication & Security Systems
|    |         |--- D5040 Special Electrical Systems
|    |--- E. EQUIPMENT & FURNISHINGS
|         |--- E20 Furnishings
|              |--- E2010 Fixed Furnishings
|              |--- E2020 Movable Furnishings
|--- CBIS - CHECKED BAGGAGE INSPECTION SYSTEM
     |--- DIVISION 01 GENERAL REQUIREMENTS
     |--- C. INTERIORS
     |    |--- C10 Interior Construction
     |    |    |--- C1010 Partitions
     |    |--- C20 Staircases (Ladder)
     |    |    |--- C2010 Stair Construction
     |    |--- C30 Interior Finishes
     |         |--- C3010 Wall Finishes
     |--- D. SERVICES
          |--- D30 HVAC
          |    |--- D3040 Distribution Systems
          |    |--- D3050 Terminal & Package Units
          |    |--- D3060 Controls & Instrumentation
          |    |--- D3070 Testing Balancing & Commissioning
          |--- D50 Electrical
          |    |--- D5020 Lighting & Branch Wiring
          |    |--- D5040 Special Electrical Systems
          |--- D10 Conveying Systems
               |--- D1030 Baggage Handling Sytems
```

APPENDIX B

Aviation
Risk Factors

RISK CATEGORY	Risk Weighting						
Physical Risks	**Project Phasing**	**Latent Site Conditions**	**Quantity Variations**	**Site Access**	**Weather Condition**		
	Costs associated with seqencing of project including maintenance of traffic and temporary construction necessary to maintain airport/airline operations	Subsurface & Physical Conditions are materially different and cause an increase or decrease in the time or the cost of the project.	Unit Price Work, where quantity variations can result in an adjustment of the agreed Unit Price for any item differing materially and significantly from the estimated quantity.	Availabilty of Lands, site access, easements and rights-of-ways.	Abnormal weather conditions, that cause delay to any part of the work resulting in an excusable, time extension.		
Capability Related Risk	**Labor Forces/Market Conditions**	**Material/Equipment Availability**					
	Availability of Labor Forces their level of competence and experience for the tasks being completed.	Availability of certain commodities and raw materials based on demand					
Economic Risks	**Bonding**	**Contract termination**	**Cost Escalation**	**Economic Disasters**	**Failure to Pay**	**Insurance**	**Taxes**
	Performance, Payment and Other Bonds	Owner termination for convenience/default, Contractor stoppage or termination for owner non-response or lack of payment.	Changes in economic conditions causing escalation of costs beyond what normally would have been provided for or expected.	Damage to completed operations, fire, theft, vandalism.	Owner fails to make payment, see Contract Terminations. Contractor failure, see Bonding.	Owner provided insurance, contractor loss of insurance or failure to obtain or ability to	Changes in the tax rate(s).
Time Related Risks	**Acceleration**	**Delays & Disruption**	**Airport Operations**	**Early Use of Facility**	**Suspension of Work**	**Untimely Responses**	**Union Strife**
	Change in time of performance, causing overtime, weekend and holiday working schedule.	Delays to the work by owner, contractor, and third parities.	Delays to the work caused by Airport Operations such as runway closures, heightened security incidents, airport shutdown, etc.	Partial utilization and early occupancy.	Owner suspension for convenience.	Slow or untimely response by owner.	Strike, work slowdown, and "sick out"
Engineering & Construction Risks - Part 1	**Changes**	**Contractor Furnished Equ./Matls.**	**Coordination**	**Defective Contract Documents**	**Interpretation of Requirements**	**Means & Methods of**	**Owner Furnished Equ./Materials**
	Time and cost impacts caused by owner directed changes to the work scope.	Failure or delay of equipment procured and installed by the contractor or their subcontractors.	Coordination and sequencing of subcontractors, suppliers, owner forces, and other general contractors.	Deficient plans, specifications, and contracts.	Ambiguities in the plans, specifications, and contracts requiring interpretation and resolution resulting in changes in the work.	Changes in site conditions, changes in equipment technology or construction sequencing to accomplish the work.	Late or defective delivery
Engineering & Construction Risks - Part 2	**Permits & Licenses**	**Productivity**	**Site Safety/Security**	**Work Quality**			
	Changes in requirements of building or environmental permits and/or licenses.	Owner interferences, other general contractors interferences, unexpected needs to coordinate with other site activities or occurrences.	Changes in the expected or normal requirements for safety & security.	Rejection of defective work. Testing and inspection to determine if work may be defective and interpretation of the test results.			

APPENDIX C

CURRENT WORKING ESTIMATE SUMMARY	**By ABC Cost Consulting**					
AIRPORT IDENTIFIER:	**JFK**					
AIRPORT NAME:	**John F. Kennedy International Airport**					
PROJECT NAME:	**Terminal One - Option 2**					
ESTIMATED PROJECT COMPLETION DATE:	**TBD**	**Estimate Construction Cost at Award ($s)**				
Current Working Estimate - Effective Pricing Date:	**May-08**	**CBIS Matrix Estimate**	**CBRA Area Estimate**	**OSR Room Estimate**	**Infra-structure Estimate**	**TOTAL ESTIMATE**
CWE Scope Based on Design Level of:	**10%**					
HARD COSTS (ECCA)						
BAGGAGE HANDLING SYSTEM/CHECKED BAGGAGE INSPECTION SYSTEM COSTS						
Div. 34 Transportation, includes items below		23,615,188				23,615,188
Project Management						-
Equipment						-
Installation						-
Engineering						-
Controls						-
Testing						-
a. Subtotal BHS (Rounded)		23,615,000				23,615,000
OTHER CONSTRUCTION RELATED COSTS						
Div. 1 General Requirements		2,420,812	100,790	18,947	1,121,174	3,661,722
Div. 2 Existing Conditions		-	-	-	655,037	655,037
Div. 3 Concrete		-	4,592	-	1,042,148	1,046,740
Div. 4 Masonry		31,569	31,573	-	323,398	386,539
Div. 5 Metals		1,270	-	-	4,688,101	4,689,371
Div. 6 Woods and Plastics, and Composites		-	40,770	45,559	-	86,329
Div. 7 Thermal and Moisture Protection		-	-	-	908,692	908,692
Div. 8 Openings		-	12,525	6,934	934,680	954,139
Div. 9 Finishes		6,429	14,624	16,256	457,619	494,928
Div. 10 Specialties		-	19,309	9,726	6,116	35,150
Div. 11 Equipment		-	11,416	-	-	11,416
Div. 12 Furnishings		-	2,025	816	-	2,841
Div. 13 Special Construction		-	-	-	-	-
Div. 14 Conveying Systems4		-	-	-	269,085	269,085
Div. 21 Fire Suppression		-	-	4,566	228,379	232,945
Div. 22 Plumbing		-	27,561	-	503,787	531,348
Div. 23 Heating Ventilation, and Air Conditioning		423,483	240,659	48,407	360,881	1,073,430
Div. 25 Integrated Automation		-	-	-	-	-
Div. 26 Electrical		64,689	441,314	34,695	833,818	1,374,515
Div. 27 Communications		-	86,429	12,060	-	98,489
Div. 28 Electronic Safety and Security		65,490	75,095	10,454	-	151,039
Div. 31 Earthwork		-	-	-	-	-
Div. 32 Exterior Improvements		-	-	-	-	-
Div. 33 Utilities		-	-	-	-	-
Div. 34 Transportation w/o BHS		-	-	-	-	-
Div. 35 Waterway and Marine Construction		-	-	-	-	-
Div. 40 Process Integration		-	-	-	-	-
Div. 41 Material Processing and Handling Equipment		-	-	-	-	-
Div. 42 Process Heating, Cooling and Drying Equipment		-	-	-	-	-
Div. 43 Process Gass and Liquid Handling, Purification and Storage Eqp.		-	-	-	-	-
Div. 44 Pollution Control Equipment		-	-	-	-	-
Div. 45 Industry Specific Manufacturing Equipment		-	-	-	-	-
Div. 48 Electrical Power Generation		-	-	-	-	-
b. Subtotal Other Construction Related Costs (Rounded)		3,014,000	1,109,000	208,000	12,333,000	16,664,000
c. Hard Costs Sub-Total (a. + b.)		26,629,000	1,109,000	208,000	12,333,000	40,279,000
SOFT COSTS						
Construction Contingency	**5.00%**	1,331,000	55,000	10,000	617,000	2,013,000
Design w/Const Admin	**8.00%**	2,130,000	89,000	17,000	987,000	3,223,000
Project & Construction Management	**7.00%**	1,864,000	78,000	15,000	863,000	2,820,000
Escalation NONE	**0.00%**	-	-	-	-	-
Soft Costs Sub-total		5,325,000	222,000	42,000	2,467,000	8,056,000
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		31,954,000	1,331,000	250,000	14,800,000	48,335,000

APPENDIX D

CURRENT WORKING ESTIMATE SUMMARY	**RECONCILED**										
AIRPORT IDENTIFIER:	**JFK**										
AIRPORT NAME:	**John F. Kennedy International Airport**						Reconcile Method:		Meeting		
PROJECT NAME:	**Terminal One - Option 2**						Reconciled by:		SS		
ESTIMATED PROJECT COMPLETION DATE:	**TBD**	**Estimate Construction Cost at Award ($s)**									
Current Working Estimate - Effective Pricing Date:	**May-08**								Variance		
CWE Scope Based on Design Level of:	**10%**	**CBIS Matrix Estimate**	**CBRA Area Estimate**	**OSR Room Estimate**	**Infra-structure Estimate**	**TOTAL ESTIMATE**	By U.S. Cost	By Other Cost Consultant	%	$	Reconciliation Notes
HARD COSTS (ECCA)											
BAGGAGE HANDLING SYSTEM/CHECKED BAGGAGE INSPECTION SYSTEM COSTS											
Div. 34 Transportation		23,615,188				23,615,188	23,615,188	23,615,188	0.0%	-	
Project Management		-				-	-	-	0.0%	-	
Equipment		-				-	-	-	0.0%	-	
Installation		-				-	-	-	0.0%	-	
Engineering		-				-	-	-	0.0%	-	
Controls		-				-	-	-	0.0%	-	
Testing		-				-	-	-	0.0%	-	
a. Subtotal BHS (Rounded)		23,615,000				23,615,000	23,615,000	23,615,000	0%	-	
OTHER CONSTRUCTION RELATED COSTS											
Div. 1 General Requirements		2,420,812	100,790	18,947	1,121,174	3,661,722	3,661,722	3,070,050	16.2%	591,672	Estimate 1 was more resonable.
Div. 2 Existing Conditions		-	-	-	655,037	655,037	655,037	655,037	0.0%	-	
Div. 3 Concrete		-	4,592	-	1,042,148	1,046,740	1,046,740	1,046,740	0.0%	-	
Div. 4 Masonry		31,569	31,573	-	323,398	386,539	386,539	386,539	0.0%	-	
Div. 5 Metals		1,270	-	-	4,688,101	4,689,371	4,689,371	4,689,371	0.0%	-	
Div. 6 Woods and Plastics, and Composites		-	40,770	45,559	-	86,329	86,329	86,329	0.0%	-	
Div. 7 Thermal and Moisture Protection		-	-	-	908,692	908,692	908,692	908,692	0.0%	-	
Div. 8 Openings		-	12,525	6,934	934,680	954,139	954,139	954,139	0.0%	-	
Div. 9 Finishes		6,429	14,624	16,256	457,619	494,928	494,928	494,928	0.0%	-	
Div. 10 Specialties		-	19,309	9,726	6,116	35,150	35,150	35,150	0.0%	-	
Div. 11 Equipment		-	11,416	-	-	11,416	11,416	11,416	0.0%	-	
Div. 12 Furnishings		-	2,025	816	-	2,841	2,841	2,841	0.0%	-	
Div. 13 Special Construction		-	-	-	-	-	-	-	0.0%	-	
Div. 14 Conveying Systems4		-	-	-	269,085	269,085	269,085	269,085	0.0%	-	
Div. 21 Fire Suppression		-	-	4,566	228,379	232,945	232,945	232,945	0.0%	-	
Div. 22 Plumbing		-	27,561	-	503,787	531,348	531,348	531,348	0.0%	-	
Div. 23 Heating Ventilation, and Air Conditioning		461,741	240,659	48,407	360,881	1,111,688	1,073,430	1,149,947	-7.1%	(76,517)	
Div. 25 Integrated Automation		-	-	-	-	-	-	-	0.0%	-	
Div. 26 Electrical		64,689	441,314	34,695	833,818	1,374,515	1,374,515	540,697	60.7%	833,818	Estimate 2 exclued these costs
Div. 27 Communications		-	86,429	12,060	-	98,489	98,489	98,489	0.0%	-	
Div. 28 Electronic Safety and Security		65,490	75,095	10,454	-	151,039	151,039	151,039	0.0%	-	
Div. 31 Earthwork		-	-	-	-	-	-	-	0.0%	-	
Div. 32 Exterior Improvements		-	-	-	-	-	-	-	0.0%	-	
Div. 33 Utilities		-	-	-	-	-	-	-	0.0%	-	
Div. 34 Transportation w/o BHS		-	-	-	-	-	-	-	0.0%	-	
Div. 35 Waterway and Marine Construction		-	-	-	-	-	-	-	0.0%	-	
Div. 40 Process Integration		-	-	-	-	-	-	-	0.0%	-	
Div. 41 Material Processing and Handling Equipment		-	-	-	-	-	-	-	0.0%	-	
Div. 42 Process Heating, Cooling and Drying Equipment		-	-	-	-	-	-	-	0.0%	-	
Div. 43 Process Gass and Liquid Handling, Purification and Storage Eqp.		-	-	-	-	-	-	-	0.0%	-	
Div. 44 Pollution Control Equipment		-	-	-	-	-	-	-	0.0%	-	
Div. 45 Industry Specific Manufacturing Equipment		-	-	-	-	-	-	-	0.0%	-	
Div. 48 Electrical Power Generation		-	-	-	-	-	-	-	0.0%	-	
b. Subtotal Other Construction Related Costs (Rounded)		3,052,000	1,109,000	208,000	12,333,000	16,702,000	16,664,000	15,315,000	8.1%	1,349,000	
c. Hard Costs Sub-Total (a. + b.)		26,667,000	1,109,000	208,000	12,333,000	40,317,000	40,279,000	38,930,000	3.3%	1,349,000	
SOFT COSTS											
Construction Contingency	5.00%	1,333,000	55,000	10,000	617,000	2,015,000	2,013,000	1,945,000	3.4%	68,000	
Design w/Const Admin	8.00%	2,133,000	89,000	17,000	987,000	3,226,000	3,223,000	3,115,000	3.4%	108,000	
Project & Construction Management	7.00%	1,867,000	78,000	15,000	863,000	2,823,000	2,820,000	2,726,000	3.3%	94,000	
Escalation NONE	0.00%	-	-	-	-	-	-	-	0.0%	-	
Soft Costs Sub-total		5,333,000	222,000	42,000	2,467,000	8,064,000	8,056,000	7,786,000	3.4%	270,000	
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		32,000,000	1,331,000	250,000	14,800,000	48,381,000	48,335,000	46,716,000	3.3%	1,619,000	

Areas of Risk	**Cost Impact**
Sequence of Work - Productivity Loss, Congested areas, Site access, Stakeholder constraints	$ 4,625,000
Labor Avalability for NYC Area	$ 4,070,000
CBIS Technology Issues	$ 2,362,000
Unknown/TBD Constructability Issues - Interface w/existing BHS systems	$ 4,838,000
Commissioning	$ 1,181,000
Range of Risk	**$ 17,076,000**
Low Range of TEC	**$ 44,349,000**
High Range of TEC	**$ 65,457,000**

APPENDIX E

CURRENT WORKING ESTIMATE SUMMARY	**RECONCILED**	
AIRPORT IDENTIFIER:	**JFK**	
AIRPORT NAME:	**John F. Kennedy Internatio**	
PROJECT NAME:	**Terminal One - Option 2**	
ESTIMATED PROJECT COMPLETION DATE:	**TBD**	**ECCA ($'s)**
Current Working Estimate - Effective Pricing Date:	**May-08**	
CWE Scope Based on Design Level of:	**10%**	

		TOTAL ESTIMATE	TSA ALLOCABLE COSTS		TSA AGREED TO FUNDING		Additional Allocable Funding Needed (Non TSA)	FUNDING SOURCES ($s)							Funding Balance	Comments
								Other Federal		PFC		Other Funding				
			%	$s	%	$s		AIP	Other	Paygo	Bonds[1]	Cash	Revenue Bonds[1]	Other[2]		
HARD COSTS (ECCA)																
BAGGAGE HANDLING SYSTEM/CHECKED BAGGAGE INSPECTION																
Div. 34 Transportation		23,615,188	100%	23,615,188	90%	21,253,669	2,361,519								$ (2,361,519)	
Project Management		-	100%	-	90%	-	-								$ -	
Equipment		-	100%	-	90%	-	-								$ -	
Installation		-	100%	-	90%	-	-								$ -	
Engineering		-	100%	-	90%	-	-								$ -	
Controls		-	100%	-	90%	-	-								$ -	
Testing		-	100%	-	90%	-	-								$ -	
a. Subtotal BHS (Rounded)		23,615,000	100%	23,615,000	90%	21,254,000	2,362,000	-	-	-	-	-	-	-	$ (2,362,000)	
OTHER CONSTRUCTION RELATED COSTS																
Div. 1 General Requirements		3,661,722	100%	3,661,722	75%	2,746,292	915,431								$ (915,431)	
Div. 2 Existing Conditions		655,037	100%	655,037	75%	491,278	163,759								$ (163,759)	
Div. 3 Concrete		1,046,740	100%	1,046,740	75%	785,055	261,685								$ (261,685)	
Div. 4 Masonry		386,539	100%	386,539	75%	289,904	96,635								$ (96,635)	
Div. 5 Metals		4,689,371	100%	4,689,371	75%	3,517,028	1,172,343								$ (1,172,343)	
Div. 6 Woods and Plastics, and Composites		86,329	100%	86,329	75%	64,747	21,582								$ (21,582)	
Div. 7 Thermal and Moisture Protection		908,692	100%	908,692	75%	681,519	227,173								$ (227,173)	
Div. 8 Openings		954,139	100%	954,139	75%	715,604	238,535								$ (238,535)	
Div. 9 Finishes		494,928	100%	494,928	75%	371,196	123,732								$ (123,732)	
Div. 10 Specialties		35,150	100%	35,150	75%	26,363	8,788								$ (8,788)	
Div. 11 Equipment		11,416	100%	11,416	75%	8,562	2,854								$ (2,854)	
Div. 12 Furnishings		2,841	100%	2,841	75%	2,131	710								$ (710)	
Div. 13 Special Construction		-	100%	-	75%	-	-								$ -	
Div. 14 Conveying Systems4		269,085	100%	269,085	75%	201,814	67,271								$ (67,271)	
Div. 21 Fire Suppression		232,945	100%	232,945	75%	174,709	58,236								$ (58,236)	
Div. 22 Plumbing		531,348	100%	531,348	75%	398,511	132,837								$ (132,837)	
Div. 23 Heating Ventilation, and Air Conditioning		1,111,688	100%	1,111,688	75%	833,766	277,922								$ (277,922)	
Div. 25 Integrated Automation		-	100%	-	75%	-	-								$ -	
Div. 26 Electrical		1,374,515	100%	1,374,515	75%	1,030,886	343,629								$ (343,629)	
Div. 27 Communications		98,489	100%	98,489	75%	73,866	24,622								$ (24,622)	
Div. 28 Electronic Safety and Security		151,039	100%	151,039	75%	113,279	37,760								$ (37,760)	
Div. 31 Earthwork		-	100%	-	75%	-	-								$ -	
Div. 32 Exterior Improvements		-	100%	-	75%	-	-								$ -	
Div. 33 Utilities		-	100%	-	75%	-	-								$ -	
Div. 34 Transportation w/o BHS		-	100%	-	75%	-	-								$ -	
Div. 35 Waterway and Marine Construction		-	100%	-	75%	-	-								$ -	
Div. 40 Process Integration		-	100%	-	75%	-	-								$ -	
Div. 41 Material Processing and Handling Equipment		-	100%	-	75%	-	-								$ -	
Div. 42 Process Heating, Cooling and Drying Equipment		-	100%	-	75%	-	-								$ -	
Div. 43 Process Gass and Liquid Handling, Purification and Storage Eqp.		-	100%	-	75%	-	-								$ -	
Div. 44 Pollution Control Equipment		-	100%	-	75%	-	-								$ -	
Div. 45 Industry Specific Manufacturing Equipment		-	100%	-	75%	-	-								$ -	
Div. 48 Electrical Power Generation		-	100%	-	75%	-	-								$ -	
b. Subtotal Other Construction Related Costs (Rounded)		16,702,000	100%	16,702,000	75%	12,527,000	4,176,000	-	-	-	-	-	-	-	$ (4,176,000)	
c. Hard Costs Sub-Total (a. + b.)		40,317,000	100%	40,317,000	84%	33,781,000	6,538,000	-	-	-	-	-	-	-	$ (6,538,000)	
SOFT COSTS																
Construction Contingency	5.00%	2,015,000	100%	2,015,000	75%	1,511,250	503,750								$ (503,750)	
Design w/Const Admin	8.00%	3,226,000	100%	3,226,000	75%	2,419,500	806,500								$ (806,500)	
Project & Construction Management	7.00%	2,823,000	100%	2,823,000	75%	2,117,250	705,750								$ (705,750)	
Escalation NONE	0.00%	-	100%	-	75%	-	-								$ -	
Soft Costs Sub-total		8,064,000	100%	8,064,000	75%	6,048,000	2,016,000	-	-	-	-	-	-	-	$ (2,016,000)	
TOTAL ESTIMATED COSTS (TEC) (CURRENT $s)		48,381,000	100%	48,381,000	82%	39,829,000	8,554,000	-	-	-	-	-	-	-	$ (8,554,000)	

Attachment C

Cost Estimate Template

CURRENT WORKING ESTIMATE SUMMARY	Prepared by:				
AIRPORT IDENTIFIER:					
AIRPORT NAME:					
PROJECT NAME:					
ESTIMATED PROJECT COMPLETION DATE:	Estimate Construction Cost at Award ($s)				
Current Working Estimate - Effective Pricing Date:	CBIS Matrix Estimate	CBRA Area Estimate	OSR Room Estimate	Infra-structure Estimate	TOTAL ESTIMATE
Current Working Estimate - Level of Design:					
Currency:					
HARD COSTS (ECCA)					
BAGGAGE HANDLING SYSTEM/CHECKED BAGGAGE INSPECTION SYSTEM COSTS					
Div. 34 Transportation, includes items below					$ -
Project Management					$ -
Labor					$ -
Equipment					$ -
Materials					$ -
Engineering					$ -
Controls					$ -
Testing					$ -
a. Subtotal BHS (Rounded)	$ -				$ -
OTHER CONSTRUCTION RELATED COSTS					
Div. 1 General Requirements					$ -
Div. 2 Existing Conditions					$ -
Div. 3 Concrete					$ -
Div. 4 Masonry					$ -
Div. 5 Metals					$ -
Div. 6 Woods and Plastics, and Composites					$ -
Div. 7 Thermal and Moisture Protection					$ -
Div. 8 Openings					$ -
Div. 9 Finishes					$ -
Div. 10 Specialties					$ -
Div. 11 Equipment					$ -
Div. 12 Furnishings					$ -
Div. 13 Special Construction					$ -
Div. 14 Conveying Systems4					$ -

Div. 21 Fire Suppression						$ -
Div. 22 Plumbing						$ -
Div. 23 Heating Ventilation, and Air Conditioning						$ -
Div. 25 Integrated Automation						$ -
Div. 26 Electrical						$ -
Div. 27 Communications						$ -
Div. 28 Electronic Safety and Security						$ -
Div. 31 Earthwork						$ -
Div. 32 Exterior Improvements						$ -
Div. 33 Utilities						$ -
Div. 34 Transportation w/o BHS						$ -
Div. 35 Waterway and Marine Construction						$ -
Div. 40 Process Integration						$ -
Div. 41 Material Processing and Handling Equipment						$ -
Div. 42 Process Heating, Cooling and Drying Equipment						$ -
Div. 43 Process Gas and Liquid Handling, Purification and Storage Eqp.						$ -
Div. 44 Pollution Control Equipment						$ -
Div. 45 Industry Specific Manufacturing Equipment						$ -
Div. 48 Electrical Power Generation						$ -
b. Subtotal Other Construction Related Costs (Rounded)		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
Hard Costs Subtotal (a + b)		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
SOFT COSTS						
Construction Contingency	**0.00%**	$ -	$ -	$ -	$ -	**$ -**
Design w/Const Admin	**0.00%**	$ -	$ -	$ -	$ -	**$ -**
Project & Construction Management	**0.00%**	$ -	$ -	$ -	$ -	**$ -**
Escalation NONE	**0.00%**	$ -	$ -	$ -	$ -	**$ -**
Soft Costs Subtotal		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**
TOTAL ESTIMATED COSTS (TEC) (CURRENT $'s)		**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

NOTES:

1) Only Items with Finance and Interest

2) Include State and Local funding

3) CBIS Matrix begins at divert from BHS Main-line to the EDS and ends at the On-Screen Resolution Decision Point

4) All BHS related costs should be included in Division 34

5) For descriptions and use of Division refer to the Construction Specification Institute, Master Format, 2004 Editions Numbers & Titles

Areas of Risk	**Cost Impact**
Sequence of Work - Productivity Loss, Congested areas, Site access, Stakeholder constraints	$ -
Labor Availability for Area	$ -
CBIS Technology Issues	$ -
Unknown/TBD Constructability Issues - Interface w/existing BHS systems	$ -
Commissioning	$ -
Range of Risk	**$ -**
Low Range of TEC	**$ -**
High Range of TEC	**$ -**

Attachment D

Example Basis of Design Report

XXX INTERNATIONAL

XXX International Airport (the Airport) recently undertook a study to identify optimally scaled CBIS alternatives for Terminal 1.

In the spring of 2004 a design study was initiated by the airport to replace the existing ETD-based baggage screening system with an in-line EDS screening system serving Southwest Airlines (the sole airline tenant at Terminal 2). The design concept called for a conveyor system to transfer baggage from ticket counters to an in-line EDS screening area adjacent to the terminal where EDS machines automatically screen baggage for explosives and divert false alarm and oversize baggage to a CBRA for resolution. Baggage cleared by the EDS machines proceeds to Southwest's outbound baggage make-up carousel. Terminal 2 in-line system became operational in February 2006. Since this earlier study already identified an optimal screening solution for Terminal 2, it was not included in the above-mentioned study for Terminal 1.

Key objectives for the optimally scaled alternatives for Terminal 1 at the airport included: (1) minimizing the number of manual baggage screening operations involved and (2) improving the overall level of customer service at the Airport while maintaining 100% checked baggage screening. This study is presented as an example to illustrate the methodology used to identify a preferred alternative as described in the BSIS Guidelines.

The following paragraphs will describe the steps taken in identifying a number of CBIS alternatives for a given terminal and then the iterative process to select the preferred alternative. The following topics are covered:

- Zoning schema definition
- In-line system types
- Demand estimation
- Baggage screening equipment requirements
- Preliminary alternative concepts definition
- Analysis and evaluation

C.1 Background

Terminal 1 serves a mix of domestic air carriers and affiliated commuter operators. Currently there are three EDS machines used for screening checked baggage at Terminal 1.

United Airlines uses one stand-alone EDS machine (GE CTX-2500) located behind the airline ticket counter. Selectee bags moving along the conveyor to the United Airlines' make-up area are manually removed and sent through the EDS machine for security screening.

JetBlue use a semi-integrated EDS machine (GE CTX-5500) located behind the JetBlue ticket counter. A conveyor connects the ticket counters to the EDS machine. All of the JetBlue bags are first screened by the CTX-5500. Cleared bags are sent to the make-up area and alarmed bags are sent to a CBRA where alarms are resolved by TSA agents.

The remainder of Terminal 1 airlines use manual ETD screening located in the baggage make-up rooms. Selectee bags are manually carried to the third EDS machine (GE CTX-5500) located in the lobby, where they are screened and then sorted and manually placed on the conveyor and sent to the appropriate airline make-up room.

The Airport is achieving 100% baggage screening; however the process is labor intensive, with the majority of the bags undergoing ETD screening as opposed to being screened by EDS machines. The Airport wants to move ahead with an in-line EDS system to improve customer service, scalability, and airport growth opportunities. In the Spring of 2006, a study was conducted to identify feasible CBIS alternatives that could be implemented at the Airport.

Terminal 1 existing conditions are shown on Figure C-1.

Figure C-1

EXISTING CONDITION TERMINAL 1

C.2 zoning schema definition

As explained in Chapter 5 of the BSIS Guidelines, there are several ways of combining checked baggage into screening systems. Taking into consideration spatial and operational constraints, two zone hierarchy schemas were developed for Terminal 1 and are shown on Figures C-2 and C-3.

Figure C-2

ZONING SCHEMA TERMINAL 1, OPTION A

Figure C-3

ZONING SCHEMA TERMINAL 1, OPTION B

For Terminal 1, the F3 Zones correspond to each take-away belt, while the F1 Zone comprises the entire terminal. At the F2 Zone level, there are several options to combine checked baggage into screening systems. For the purpose of this case study, two options are considered for F2 Zone groupings: Option A (Figure C-2) divides the ticket counters into three groups combining checked baggage into three screening systems, while Option B (Figure C-3) divides the ticket counters into two groups combining checked baggage into two screening systems.

C.3 IN-LINE system types

As explained in detail in Chapter 5, there are several system types and EDS equipment for in-line system, ranging from highly centralized systems using high-throughput EDS machines to very decentralized systems using low-throughput EDS machines. Since the zoning schema, the system type selection, and the demand estimation are inter-related, it is expected that several iterations will be necessary to find an optimally scaled solution for each terminal. Thus, it is recommended that, at this early stage of analysis, all spatially feasible system type options be considered and carried forward in the evaluation.

The following is a general description of potential system types for three zoning levels at Terminal 1 that were considered as initial candidates for screening alternatives:

- **Terminal 1, F3 Zone Groupings**—For screening systems reflecting the F3 Zone groupings, decentralized system types are recommended. Thus, at F3 Zone level, mini in-line systems are acceptable options. Stand-alone EDS systems were not considered because they would present spatial constraints to any expansion that would be necessary to accommodate growth beyond the design year.

- **Terminal 1, F2 Zone Groupings**—At F2 Zone level, depending on the expected checked baggage demand volumes, high-throughput centralized systems, such as high-volume and medium-volume in-line systems, or lower-throughput systems, such as mini in-line systems are acceptable options.

- **Terminal 1, F1 Zone Grouping**—At Zone 1 level, a centralized system is recommended. Thus, both high-volume and medium-volume in-line systems are acceptable options for this terminal. The choice between the two system types depends on the date of beneficial use (DBU), since that will dictate the type of EDS equipment expected to be certified by that date. Since DBU is expected to be after 2008, both high-volume and medium-volume in-line systems would be viable. If a medium-volume system is ultimately selected, all the necessary steps should be taken to make the system flexible enough to accommodate high-volume EDS machines when they become available.

An initial pass of a relatively large number of alternatives was done and all alternatives that are clearly not feasible were immediately eliminated without further consideration. In this initial pass it was determined that structural and spatial constraints render any expansion or major building modification required to accommodate the in-line systems, cost prohibitive. Accordingly at Terminal 1, all of the full in-line concepts were found to be infeasible. Only the mini-in-line system type layouts designed for the F-3 Zone were found to be operationally and spatially feasible at Terminal 1.

Of the F3 Zone alternatives, the Reveal CT-80 (CT-80) and Analogic King Cobra (AN KC) EDS machines are considered to be better options for the Airport when compared to the L-3 3DX 6000 and GE CTX-5500 with Viewlink. The CT-80 and AN KC machines are considered superior products because they are newer, have better performance capabilities, and strong upgrade possibilities for the future. Therefore the L-3 3DX 6000 and GE CTX-5500 with Viewlink are also removed from further consideration.

The EDS machines mentioned in this case-study were the original EDS machines considered for the study commissioned by OAK and do not necessarily match the list of EDS machines as specified in the BSIS Guidelines.

Table C-1 provides a list of all initial alternatives considered and brief reason of rejecting those initial alternatives.

Table C-1

INITIAL EVALUATION OF ALTERNATIVES

Terminal 1

	Accepted/ Rejected	Alternative Name / Reason for Rejection
F3 ZONE - MINI-IN-LINE SYSTEM TYPE		
Reveal CT-80	Accepted	Alternative 1
Analogic King Cobra	Accepted	Alternatives 2 and 3
L-3 3DX 6000	Rejected	Inferior Performance and Limited Upgrading Opportunities
GE CTX-5500 (with ViewLink)	Rejected	Inferior Performance and Limited Upgrading Opportunities
F2 ZONE OPTION 1 – MINI IN-LINE SYSTEM TYPE		
Reveal CT-80	Rejected	Spatial Constraints
Analogic King Cobra	Rejected	Spatial Constraints
L-3 3DX 6000	Rejected	Spatial Constraints
GE CTX-5500 (with ViewLink)	Rejected	Spatial Constraints
F2 ZONE OPTION 2 - MEDIUM-VOLUME IN-LINE SYSTEM TYPE		
GE CTX-9000	Rejected	Spatial Constraints
GE CTX-9800	Rejected	Spatial Constraints
L-3 3DX 6000	Rejected	Spatial Constraints
L-3 3DX 6500D	Rejected	Spatial Constraints
F1 ZONE - MEDIUM-VOLUME IN-LINE SYSTEM TYPE		
GE CTX-9000	Accepted	Spatial Constraints
GE CTX-9800	Accepted	Spatial Constraints
L-3 3DX 6000	Accepted	Spatial Constraints
L-3 3DX 6500D	Accepted	Spatial Constraints

The list of possible system types has been reduced to three preliminary alternatives (Alternative 1 for the CT-80 machines and Alternatives 2 and 3 for the AN KC machines). These preliminary alternatives are investigated further in the following sections.

C.4 DEMAND ESTIMATION

Existing checked baggage screening flows have to be estimated for each screening zone described above.

C.4.1 List of Airlines

Table C-2 lists Terminal 1 airlines by screening zone. The F1 and F2 zone groupings have been removed, since all of the F1 and F2 alternatives were deemed spatially infeasible during the initial pass of alternatives in Section C-3 above.

Table C-2

LIST OF AIRLINES BY SCREENING ZONE

Terminal 1

Zone	Airlines
$F3_1$	B6
$F3_2$	AQ, CO
$F3_3$	AA
$F3_4$	HP, YV, US
$F3_5$	AS, QX
$F3_6$	DL, OO, TZ
$F3_7$	UA, A296, XX (a)

(a) Assumed new entrant using currently occupied gates that will be availability after completion of expansion of Terminal 2

Legend:

AQ - Aloha Airlines	CO - Continental Airlines
AA - American Airlines	HP - America West
YV - Mesa Airlines	US - US Air
AS - Alaska Airlines	QX - Horizon Airlines
DL - Delta Airlines	OO - Sky West
TZ - ATA	UA - United Airlines
A296 - United Express	B6 - JetBlue

C.4.2 Peak Month and Associated Passenger Characteristics

Based on data received from the Airport, discussions with the airlines, and a detailed analysis of flight schedules, the peak month for all screening zones was determined to be August. The Average Day of the Peak Month (ADPM) and the peak day of the peak month (PDPM) for 2006 at Terminal 1 are August 24 and August 25, respectively.

Load factors and O/D percentages were directly obtained from the airlines for the month of August. Typical earliness distributions for domestic carriers were assumed and later confirmed by the airlines. The number of checked bags per passenger was either provided by the airlines or derived form surveys conducted at the Airport in the summer of 2002.

Airline-provided data is commercially sensitive information and accordingly, this data is not reported here.

C.4.3 Determination of the Design Day

Based on the airport future strategy it is unlikely that the capacity at Terminal 1 will increase substantially in the foreseeable future. The reasons for this slow down in growth at Terminal 1 include:

1. The Terminal 2 expansion plan is under way and, once completed, all international flights and Southwest Airlines (Southwest) flights will be gated in Terminal 2 (making the current 4 Southwest gates located at Terminal 1 available).

2. It is expected that either a new airline will begin service at Terminal 1 or a current airline located at Terminal 1 will expand in subsequent years, requiring two of the four Terminal 1 gates used by Southwest. This new airline is represented by XX Airlines (XX).

Therefore, to ensure that the screening system alternatives were designed based on a realistic growth rate given the constraints on the terminal, two design days were compared as described below:

1. **Standard methodology** – This design day was constructed based on the methodology outlined in Chapter 6 of the BSIS Guidelines. The ADPM flight schedule for Terminal 1 was identified, and using the TAF forecasted growth rates, grown to reflect 2013 passenger volumes (2013 is DBU + 5 years for the proposed in-line system). According to the TAF forecasts, total enplaned passengers (excluding general aviation) are expected to grow from 7.12 MAP in 2006 to 9.90 MAP in 2013. This represents an annual growth of 4.82%. Using this method, baggage flows for the ADPM were grown by 4.82% annually to 2013.

2. **Strategy-orientated methodology** – This design day was built based on the Airport's future strategy, namely that no additional gates will be built at the terminal and that Southwest will move completely to Terminal 2. Two of the four vacated gates in Terminal 1 will be used by a future airline (XX Airlines). The remaining two gates could be used to accommodate growth of carriers currently serving the Airport. In order to properly reflect the terminal's capacity, the design day flight schedule was based on the 2006 PDPM flight schedule. This schedule was sent to the airlines for verification, and new flights were added to the schedule as per the airlines' request. In line with the Airport's strategy, Southwest was removed from the flight schedule and XX Airlines was put in its place. The flight schedule for XX airlines was based on Southwest's gating schedule for two of Southwest's four gates at Terminal 1. Gate utilizations were analyzed based on gating information provided by the Airport staff. For gates with low utilizations additional flights are added to create the design day flight schedule. Using this method, a design day flight schedule based on the detailed information provided by the airlines and Airport staff was created and baggage flows were generated from this flight schedule.

A comparison of the two design day baggage flows for Terminal 1 is provided in Table C-3 below:

Table C-3

COMPARSION OF DESIGN DAY BAGGAGE FLOWS AT

TERMINAL 1 (EXCLUDING SOUTHWEST AIRLINES) (a)

	ADPM (August 24, 2006) *(b)*	Standard Methodology Design Day 2013 ADPM	PDPM (August 25, 2006) *(b)*	Strategy-Orientated Methodology Design Day
Peak Hour Baggage Flow (bags)	675	938	701	760

(a) Southwest currently uses their own in-line system located at Terminal 2. Therefore Southwest flights have been removed from all baggage flow calculations.
(b) The ADPM and PDPM flight schedule used in this analysis was based on OAG forecasted data from March 2006 and could vary from the actual schedule that occurred on this day.

The peak hour baggage flows of the PDPM (701 bags) and ADPM (675 bags) were very similar, as can be seen in Table C-3 above. The strategy-orientated methodology increased the peak hour baggage flow by only 8% from the PDPM, while the peak hour baggage flows of the Standard methodology grew by 39%. A 39% increase in the predicted peak hour baggage flow is considered to be very aggressive given operational constraints of the carriers at Terminal 1.

Based on the above findings and further consultation with the airport, the strategy-oriented design day based on the airport's future strategy was selected as the preferred design day. This design day is used throughout the remainder of this case study.

The design day accepted by the airport is summarized as follows:

- 116 departing operations
- 15,585 departing seats
- 12 gates available (approximately 10 daily turns per gage)

The method for estimating baggage demand differs from the standard methodology described in Chapter 6 of the BSIS Guidelines and is included here as an example where an alternative method may be used if there is sufficient rationale for doing so. The rationale in this case is based on two key observations. The first observation is that the high gate utilization indicates that the terminal is currently operating at or near maximum capacity. The second observation is that site constraints limit future gate expansion to 2 gates. The schedule that was developed represents a reasonable estimate of the maximum demand that the terminal could ever accommodate. When using a demand estimation methodology different than that described in Chapter 6 of the BSIS Design Guidelines, justification for doing so must be provided to the TSA. TSA must review and approve the method and results before proceeding with design.

C.4.4 Future Checked Baggage Flow Projections

Checked baggage flows by screening zone were generated using the design day flight schedules, load factors, O/D percentages, earliness distributions, and checked bags per passenger assumptions.

Figure C-4 shows hourly baggage profile for the Terminal 1 design day.

Figure C-4

HOURLY BAGGAGE PROFILE

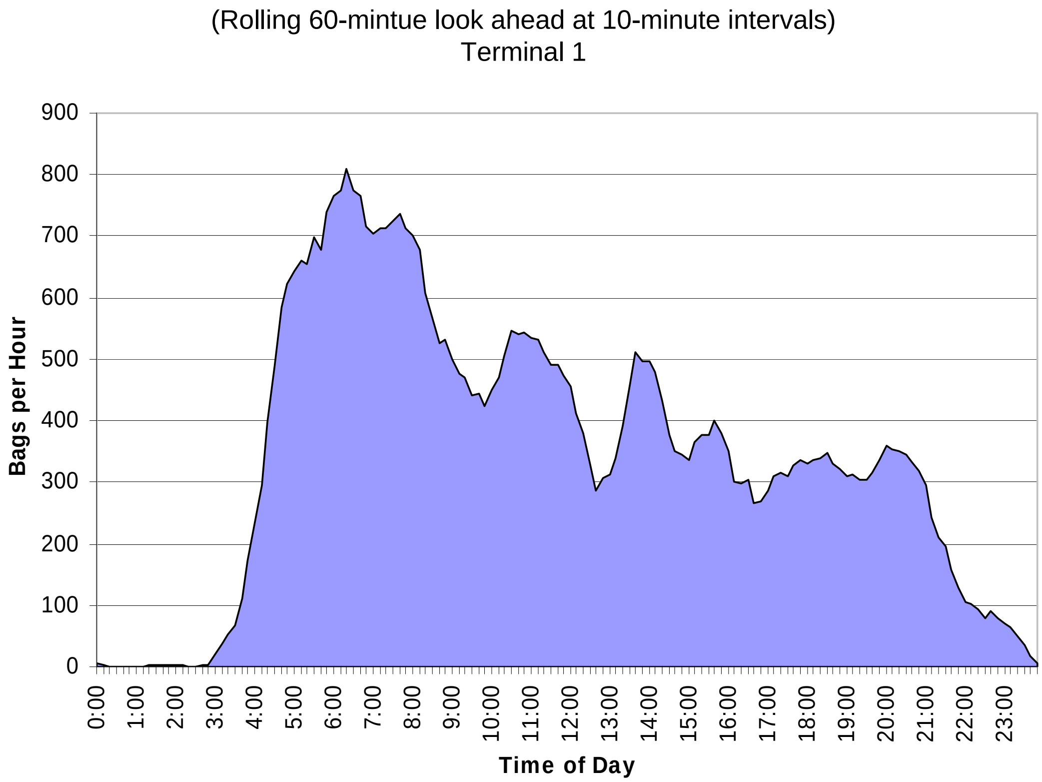


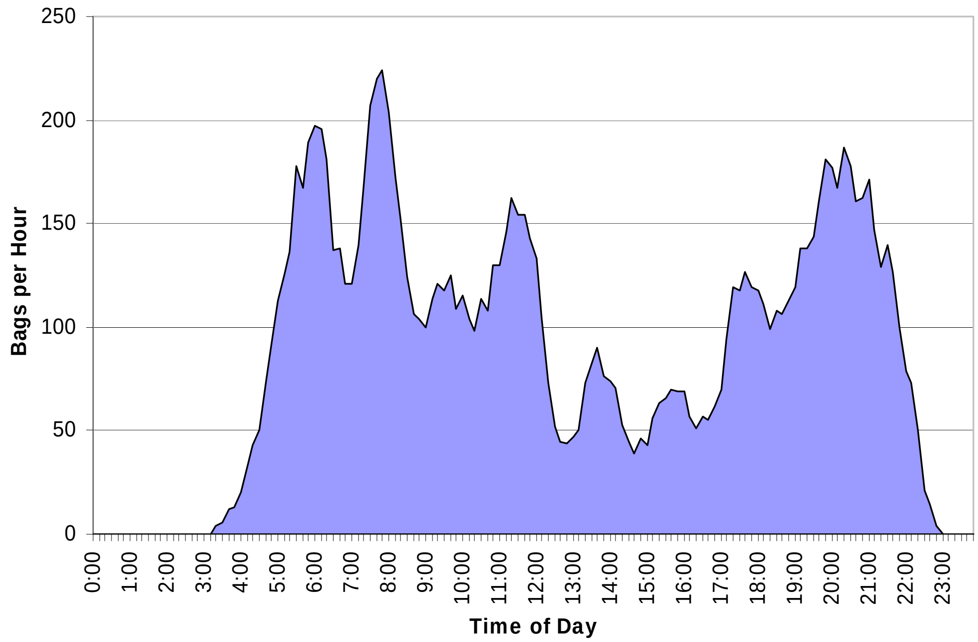
Figure C-5 shows the baggage demand profile for one of the F3 zone levels at Terminal 1. The peak hourly flow will be used as the basis for calculating high-level equipment requirements for the Pre-Design Phase. The same method was applied to all F3 zones to calculate high-level equipment requirements per each zone.

Figure C-5

HOURLY BAGGAGE PROFILE

(Rolling 60-mintue look ahead at 10-minute intervals)

Zone $F3_1$, Terminal 1



C.5 Baggage Screening Equipment Requirements

The following paragraphs show the calculation of screening equipment requirements based on the high-level methodology described in Chapter 6 of the BSIS Design Guidelines.

C.5.1 EDS, OSR, and ETD Equipment Requirements

Table C-4 below compares candidate system types for each zoning group identified in Section C.2. The table lists the candidate system types, estimated peak-hour surged design year baggage volumes, assumed EDS machine throughputs, estimated number of EDS machines and required number of OSR and ETD stations by airline screening zone for Terminal 1. More detail regarding the calculations and assumptions used in creating Table C-4 is provided in the following paragraphs.

Table C-4

EDS, OSR AND ETD EQUIPMENT REQUIREMENTS BY SCREENING ZONE

Zone	Airlines	Peak-Hour Surged Baggage Volume	EDS Machines: Throughput (bags per hour)	EDS Machines: No.	EDS Machines: With redundancy	No. of Combined OSR ETD Stations	Separate OSR ETD: No. of OSR Stations	Separate OSR ETD: No. of ETD Stations
F3 ZONE - MINI-IN-LINE SYSTEM TYPE								
Reveal CT-80 – Alternative 1								
$F3_1$	B6	311	120	3	Same	3	1	3
$F3_2$	AQ, CO	256	120	3	Same	3	1	3
$F3_3$	AA	129	120	2	Same	2	1	2
$F3_4$	HP, YV, US	224	120	2	Same	2	1	2
$F3_5$	AS, QX	229	120	2	Same	2	1	2
$F3_6$	DL, OO, TZ	215	120	2	Same	2	1	2
$F3_7$	UA, A296, XX	253	120	3	Same	3	1	3
Analogic King Cobra – Alternatives 2 and 3								
$F3_1$	B6	311	350	1	Same	2	1	2
$F3_2$	AQ, CO	256	350	1	Same	2	1	2
$F3_3$	AA	129	350	1	Same	2	1	2
$F3_4$	HP, YV, US	224	350	1	Same	2	1	2
$F3_5$	AS, QX	229	350	1	Same	2	1	2
$F3_6$	DL, OO, TZ	215	350	1	Same	2	1	2
$F3_7$	UA, A296, XX	253	350	1	Same	2	1	2

C.5.1.1 Peak Hour Surged Baggage Volume

The peak 10-minute baggage flow calculated in Section C.4.2 is surged and then converted into an hourly value and used in Table C-4. The surge factor is applied to the baggage flow to account for randomness in the bag arrival process into the screening system.

C.5.1.2 System Type

The system types listed in Table C-4 dictate the EDS equipment and its throughput. The peak-hour surged baggage volume is divided by the assumed EDS equipment throughput for each of the candidate system types (a detailed summary of EDS equipment assumptions by system type is reported in Chapter 5 of the BSIS Design Guidelines).

For the mini-in-line system, throughputs and EDS equipment requirements for the AN KC and CT-80 EDS machines are listed.

C5.1.3 Redundancy

As discussed in previous paragraphs, activity at Terminal 1 is constrained by the number of gates, thus it is unlikely that additional growth will occur at this terminal beyond the design year. For this reason, the system does not need additional flexibility to accommodate growth beyond the design year. Given the decentralized nature of Terminal 1 mini in-line systems, redundancy will be provided through the use of nearby systems. While the demand profiles indicate the peaks generally occur early in the morning, some of the EDS equipment are not fully utilized and can offer spare capacity if needed.

Redundant equipment is only cost-effective for high-speed and medium-speed in-line systems, where machine downtime can have a significant impact on system performance due to the high throughput of each EDS machine.

C.5.1.4 OSR and ETD Station Requirements

Mini-in-line systems support the use of a centralized or remotely located OSR facility. In addition, for mini-in-line systems, OSR and ETD screening functions can be combined and performed by the same ETD screener with individual CBRAs dedicated to each system.

The formulas for calculating dedicated OSR and combined OSR and ETD station requirements are explained in detail in Chapter 7 of the BSIS Design Guidelines, however an example of the calculations used in Table C-4 is provided below. For the example the AN KC EDS machines proposed for the F3 Zone level are used. Please note that all of the values used in these calculations are based on the equipment assumptions listed in Tables 5-2 and 5-3 of the BSIS Design Guidelines.

The number of separate OSR and ETD screening stations required:

$$N_{OSR} = (\text{Sum of Throughput}_{EDS} * FA_{EDS})/(\text{Throughput}_{OSR})$$

$$= (350 \text{ bph} * 0.13)/(180 \text{ bph})$$

$$= 0.26 \approx 1$$

$$N_{ETD\ Station} = (\text{Sum of Throughput}_{EDS} * FA_{EDS} * (1-CR_{OSR}))/(\text{Throughput}_{ETD\ Screener})$$

$$= (350 \text{ bph}*0.13*(1-0.6))/13.6 \text{ bph}$$

$$= 1.34 \approx 2$$

The number of combined OSR and ETD screening stations required:

$$N_{ETD\ Station} = (\text{Sum of Throughput}_{EDS} * FA_{EDS})/(\text{Throughput}_{OSR/ETD\ Screener})$$

$$= (350 \text{ bph} * 0.13)/30.5 \text{ bph}$$

$$= 1.50 \approx 2$$

C.5.6 Preliminary Evaluation of Initially Accepted Alternatives

As mentioned above an initial pass of each of the alternatives has been conducted in which all alternatives that were not feasible from an operational or spatial stand-point were rejected therefore all of the full in-line concepts were found to be infeasible (due to severe spatial constraints as well as requirement that screened bags are redistributed to dedicated make-up devices at Terminal 1. If bags are not conveyed back to dedicated make-up devices, there is undue burden on airlines operation requiring them to sort bags at a common-use make-up device).

Only mini-in-line system type layouts designed for the F-3 Zone are feasible at Terminal 1. Of these alternatives, the CT-80 and AN KC EDS machines are considered to be better options for the Airport when compared to the L-3 3DX and GE CTX-5500 with Viewlink. The CT-80 and AN KC machines are considered superior products because they are newer, have better performance capabilities, and strong upgrade possibilities for the future. Therefore the L-3 3DX 6000, L-3 3DX 6500D, and GE CTX-5500 with Viewlink were also removed from further consideration.

Based on baggage flow projections, and equipment requirements, the AN KC and CT-80 machines remained as viable alternatives, as shown in Table C-5. These two machine types used at the F3 Zone level are all that remain as viable alternatives from the multitude of alternatives that were initially considered.

Table C-5

PRELIMINARY EVALUATION OF INITIALLY ACCEPTED ALTERNATIVES

Terminal 1

		Alternative Name
F3 ZONE - MINI-IN-LINE SYSTEM TYPE		
Reveal CT-80	Accepted	Alternative 1
Analogic King Cobra	Accepted	Alternatives 2 and 3

These preliminary alternatives are investigated further in the following sections.

C.6 PRELIMINARY ALTERNATIVE CONCEPTUAL LAYOUTS

Alternative conceptual layouts were developed based on the zone groupings, equipment requirements, and system types and the initial evaluation of alternatives summarized in Table C-1. The initial evaluation of the alternatives resulted in three alternatives being short listed and developed for Terminal 1.

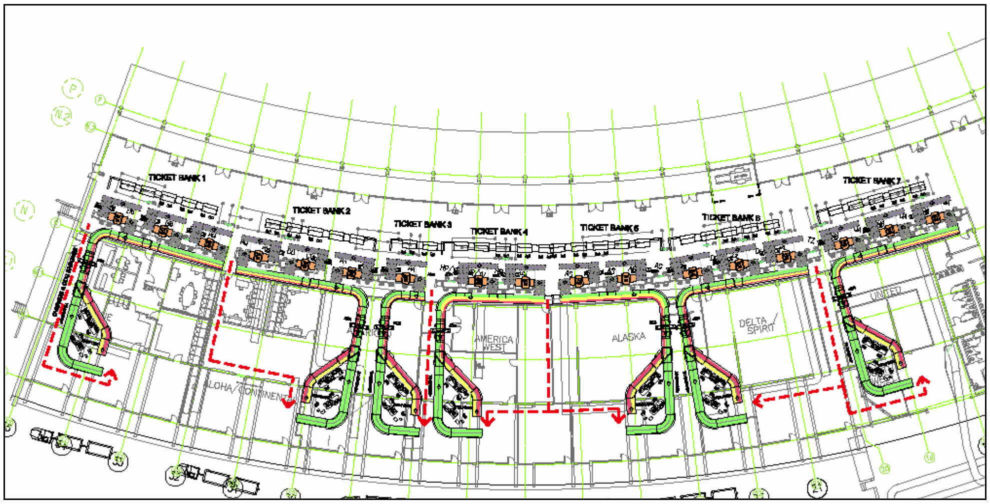
C.6.1 Alternative 1 – Mini In-Line (Reveal CT-80) Systems

This alternative is a conceptual layout for the F3 Zone grouping of Terminal 1. Seventeen Reveal CT-80 EDS machines are placed directly behind the ticket counters. The ticket counters are divided into 7 ticket counter groups (F3 Zone grouping). Each group is served by 1, 2, or 3 EDS machines and 1 CBRA, where combined OSR and ETD screening functions are performed. The machines are located directly behind the ticket agents and are parallel to the ticket counters. Each grouping of machines has a single conveyor leading to the make-up area and CBRA. The OSR and ETD screening functions are combined and performed in the CBRAs. The differences between dedicated and combined OSR functionality would be investigated further if Alternative 1 was chosen as a preferred alternative; however, given the highly decentralized nature of this alternative, combined OSR/ETD is likely to be the most cost-effective approach. A conceptual drawing of

Alternative 1 is provided in Figure C-9.

Figure C-9

TERMINAL 1 ALTERNATIVE 1 CONCEPTUAL DRAWING

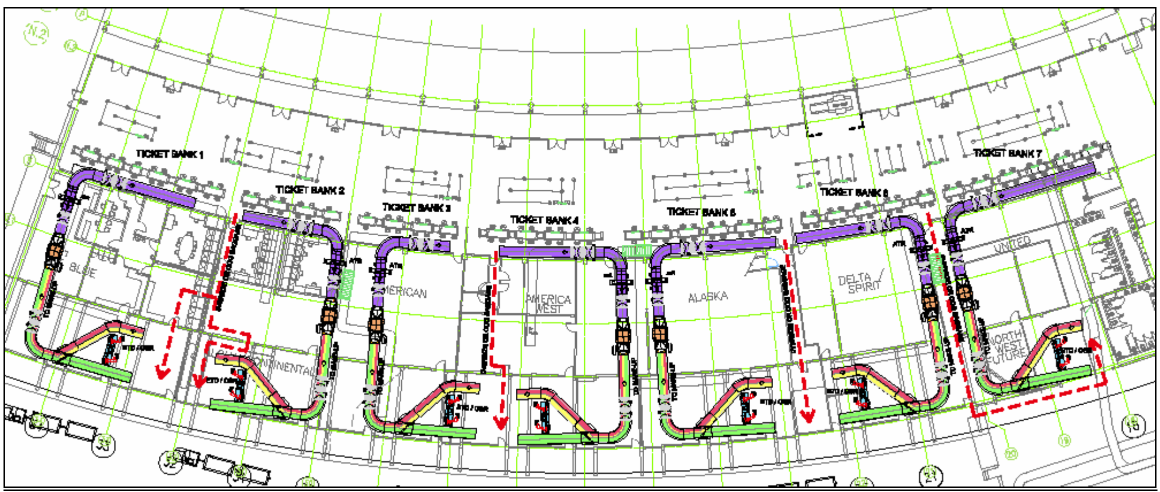


C.6.2 Terminal 1 Alternative 2 – Decentralized Mini In-Line (Analogic King Cobra) Systems

This alternative is a conceptual design for the F3 Zone grouping of Terminal 1. As shown in Figure C-10, 7 AN KC EDS machines are used. The ticket counters are divided into the same 7 ticket counter groups as in Alternative 1. However, each group is served by one EDS machine integrated downstream of the ticket counter take-away conveyor. This alternative was further split into two parts, Alternative 2a and Alternative 2b. Alternative 2a has combined OSR and ETD screening functions, similar to Alternative 1. Alternative 2b uses dedicated OSR screening, which would be conducted in a separate screening room. The conceptual drawings for Alternative 2a and Alternative 2b are the same, except for the remote OSR room which is already built as part of the existing in-line system in Terminal 2.

Figure C-10

TERMINAL 1 ALTERNATIVE 2A AND 2B CONCEPTUAL DIAGRAM

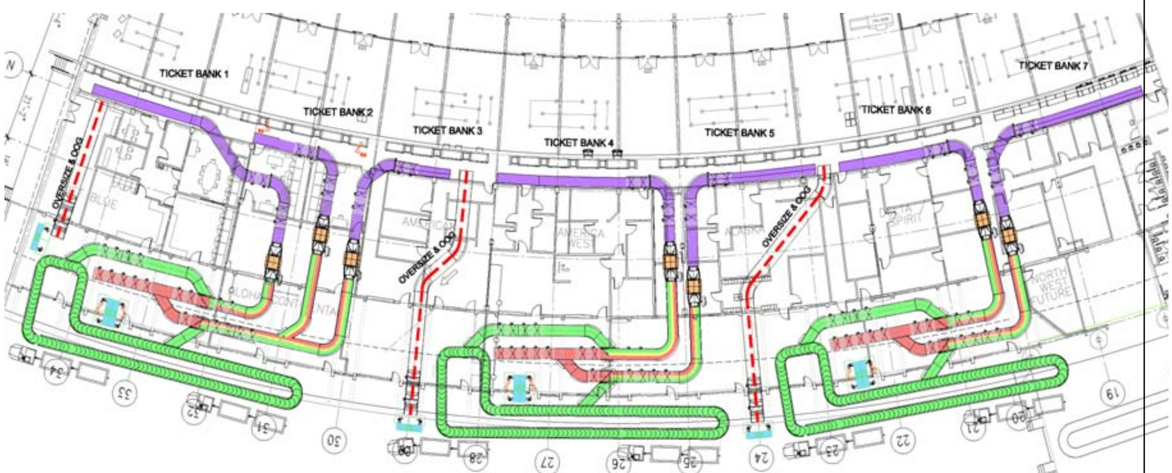


C.6.3 Terminal 1 Alternative 3 – Partially Consolidated Mini In-Line (Analogic King Cobra) Systems

This alternative is also a conceptual design for the F3 Zone grouping of Terminal 1. 7 AN KC EDS machines are used. The ticket counters are divided into 7 ticket counter groups. Each group is served by a single EDS machine integrated downstream of the ticket counter take-away conveyor. ETD screening and baggage make-up functions are partially consolidated since there is a common CBRA and make-up area for every two EDS machines. In addition, OSR is performed remotely, while ETD screening functions are performed in the CBRA since this is a more staff-efficient screening method which can be effectively used when the CBIS design calls for common use CBRAs. A conceptual drawing of Alternative 3 is provided in Figure C-11.

Figure C-11

TERMINAL 1 ALTERNATIVE 3 CONCEPTUAL DIAGRAM



C.7 Analysis and Evaluation

Alternatives evaluation was conducted using both qualitative assessments based on expert judgment and quantitative analysis of the life-cycle costs of the alternatives.

C.7.1 Qualitative Assessment

Table C-6 shows the Qualitative Assessment Matrix and criteria used for assessing all spatially feasible alternatives for Terminal 1. There were several qualitative criteria used to evaluate the alternatives based on expert judgment, namely:

1. Customer level of service – the impact that each of the alternatives will have on the passengers experience at the airport,

2. Impact to airport operations –the reliability and maintainability of the EDS equipment and the contingency procedures that can be implemented if a machine is down during a peak period as well as the impact that the alternative will have on the airlines,

3. Economic considerations – the costs associated with TSA staffing salaries and with implementing and maintaining the alternative, and

4. Design criteria – the impact that the alternative will have on the existing facilities as well as the ease with which the alternative will be constructed or expanded.

Results of the qualitative assessment are shown in Table C-6 by alternative:

Table C-6

QUALITATIVE ASSESSMENT MATRIX

	Alternative 1	Alternative 2a	Alternative 2b	Alternative 3
Screening Capacity	Adequate	Adequate	Adequate	Adequate
Customer Level of Service	Impacted	Same	Same	Same
Operations				
Performance	Adequate	Adequate	Adequate	Adequate
Utilization of EDS equipment	Moderate	Moderate	Moderate	Moderate
Reliability and availability	Lower	Moderate	Moderate	Moderate
Contingency operations	Adequate	Moderate	Moderate	Moderate
Maintainability	Adequate	Adequate	Adequate	Adequate
Impact to airline operations	Moderate	Moderate	Moderate	Higher
Design				
Impact on existing facilities	Higher	Lower	Lower	Moderate
Expandability	More difficult	Feasible	Feasible	Feasible
Constructability and phasing	More difficult	Moderate	Moderate	More difficult

All alternatives provide adequate screening capacity, meet performance standards, are equally maintainable, and provide moderate EDS utilization (typical to decentralized alternatives).

Alternative 1. Alternative 1 has the highest impact on customer level of service since lobby space would be reduced by approximately 40% to accommodate the EDS machines behind the ticket counters. The maintainability of this alternative is the lowest due to the highest number of EDS machines. Alternative 1 is the worst performing alternative from economic and design standpoints since it has high capital, maintenance and operating costs; requires the highest number of TSA screeners; has the highest impact on existing facilities; and is the most difficult to construct, phase, and expand.

Alternative 2a. Alternative 2a was rated the highest in terms of the evaluation criteria. At the end of the workshop it was decided that Alternative 2a is the most suitable type of checked baggage screening system to be implemented in Terminal 1. Alternative 2a has cost and operational characteristics consistent with the Port expansion plans and is sufficiently flexible to permit relatively quick adaptability to change (e.g., different EDS equipment).

Alternative 2b. Alternative 2b was rated the second highest in terms of the evaluation criteria. It is not as well suited to the Airport as Alternative 2a because of the higher capital cost required to install the remote OSR. Also the 95th% bag time in system was 8.90 minutes as opposed to 6.34 minutes for Alternative 2a. Although fewer bags were processed in the BIR for Alternative 2b than for Alternative 2a, Alternative 2b still had a higher 95th% bag time in system because all of the bags that were sent to the BIR were subjected to a directed

ETD search which requires a longer processing time than the combined OSR/ETD search that is done in Alternative 2a.

Alternative 3. Alternative 3 has a high impact on airline operations because of the combined make-up areas, which are not airline specific. In addition, the BIR is not easily accessible and that may create operational and security difficulties. Alternative 3 has high capital costs; is difficult to construct and phase; and would have a significant impact on the airline make-up operations because it requires airlines to share baggage carousels. In addition, it occupies more space because of the increased amount of automated conveyors.

Alternatives 2a and 2b had the highest score, while Alternative 1 had the lowest score when the 4 alternatives were ranked, based on the above high-level qualitative evaluation and expert judgment.

C.7.2 Life-Cycle Cost Analysis

A life cycle cost analysis (LCCA) was then conducted on the alternatives. Based upon the LCCA of each alternative, the preliminary ranking, and discussions with the TSA and the Airport a decision was made as to the optimal solution that will best meet the Airport's needs while remaining a viable cost-effective alternative for the TSA.

The LCCA was based on the methodology presented in Chapter 9 of the BSIS Design Guidelines. A real discount rate of 7% per annum was used as well as an analysis period of 20 years. The costs used in the LCCA were based on the costs provided in Chapter 9 unless otherwise stated. A summary of these costs is provided below in Table C-7.

Table C-7

UNIT COSTS USED IN THE LIFE CYCLE COST ANALYSIS

Life Cycle Costs (a)	Alternative 1 CT-80	Alternative 2a AN KC	Alternative 2b AN KC	Alternative 3 AN KC
Capital Costs				
Screening equipment purchase	$285,000	$350,000	$350,000	$350,000
Screening equipment installation	$100,000	$100,000	$100,000	$100,000
Screening equipment refurbishment	$80,000	$85,000	$85,000	$85,000
Screening equipment replacement	$50,000	$50,000	$50,000	$50,000
EDS cost of removal (b)	$20,000	$20,000	$20,000	$20,000
Required infrastructure modifications to the building and BHS	$350,000	$650,000	$700,000	$2,100,000 (c)
Operating and Maintenance Costs				
Screening equipment maintenance	$28,500	$35,000	$35,000	$35,000
Screening equipment power consumption	1.6 KWH	4.4 KWH	4.4 KWH	4.4 KWH
Incremental BHS maintenance costs (including additional maintenance personnel)	$33,040	$33,040	$33,040	$33,040
Staffing Requirements (d)				
Number of TSA screeners and supervisors required in Year 1	24	16	14	12
Maximum number of TSA screeners and supervisors required	25	19	15	13

(a) All of the costs listed are unit costs per machine.
(b) Cost not provided in the BSIS Design Guidelines but instead determined using expert judgment.
(c) The costs vary by alternative due to the fact that some alternatives require significantly more infrastructure modifications than others. Whenever necessary expert judgment was used.
(d) The staffing requirements represent the total number of full-time equivalent staff needed for the alternative

The LCCA methodology used to calculate the LCCs is listed below:

- It is assumed that the installation of the in-line system would begin in 2007 and the in-line system's DBU would be 2008.
- All EDS machines will be refurbished after 7 years and replaced with new machines 4 years later.
- All maintenance costs will be covered by the manufacturer during the first year of operation for a new EDS machine.
- Using expert judgment, incremental BHS operating costs were calculated at 10% of the screening equipment operating costs.
- It is assumed that the EDS machine residual value is equal to the disposal cost of the EDS machine. Since these two costs balance each other, they have not been included in the calculations.

Based on the assumptions and costs provided above, the total net present value of the LCCs for each of the alternatives is presented below. Please refer to the Table C-9 through C-12 for more detailed calculations.

Table C-8

ALTERNATIVE LIFE CYCLE COSTS

Alternatives	Life Cycle Cost*
T1 Alternative 1	$41,348,128
T1 Alternative 2a	$25,272,491
T1 Alternative 2b	$22,771,578
T1 Alternative 3	$31,577,852

*Present value costs over 20 years.

The lowest LCC for Terminal 1 was Alternative 2b ($22.77 million) with Alternative 2a having the next lowest LCC ($25.27 million).

The difference in Terminal 1 LCCs between Alternatives 2a and 2b was relatively small (Alternative 2b is approximately 10% less than Alternative 2a on a life-cycle cost basis), so these two alternatives were kept for presentation to stakeholders while Alternatives 1 and 3 are removed from further consideration.

Since the LCCs for Alternative 2a and Alternative 2b were similar and Alternative 2a was rated as qualitatively superior to Alternative 2b as identified in the Qualitative Assessment Matrix (Table C-6), it was chosen as the preferred alternative for Terminal 1. Note that this decision was based on input from stakeholders, assessment of the qualitative impacts of the systems, and the marginal difference in LCCs between Alternatives 2a and 2b. Therefore, while Alternative 2a was slightly more expensive from a life-cycle cost perspective, the qualitative benefits of the system outweighed the slightly higher life-cycle cost.

C.8 Final Considerations

The development of conceptual alternatives and the selection of the preferred solutions for any airport terminal is an iterative process that is based both on quantifiable analysis and good judgment. Terminal spatial constraints, airlines' preferences, and TSA security and operational considerations play a major role in determining which zoning schema can be successfully translated into a feasible alternative concept. Cost considerations are fundamental in trimming down the alternatives to select the preferred option(s).

In this particular Case Study, the preferred alternative that was selected had the lowest-cost as identified by the LCC analysis and the best design and operational impacts to the airport as identified in the Qualitative Assessment Matrix.

Attachment E

List of Minimally Required Concept Drawings

Check Baggage Inspection System
Schematic Design
Preliminary Drawings Delivery Package

Description	Information
Demolition	Building modification; site structures to be removed
Plans	General arrangement of CBIS Space including: • Personnel Exiting; • Access for equipment Maintenance and removal; • Locations for OSR Room, CBRA, OS & OOG Search area; • Connections to upstream and downstream BHS portions. Project Phasing
Sectional Views	Vertical Dimensions
Large Scale Views	Detail for the Checked Bag Reconciliation Area
Airfield Plans	Airfield and ramp changes that affect BHS
Plans	System configuration: • Existing Systems • CBRA • Number EDS • EDS Access • Queues before and after EDS • Clear Bag route • Suspect Bag Route • OSR Decision Point • Identify OOG, Purge and Re-feed lines.
Elevations (Vertical Views)	Vertical clearances.
Outbound Isometric	Configuration of System

[1] Based on GSA PBS CAD Standards

Attachment F

Example Alternative Analysis Report

[redacted]

High Volume Baggage Screening Assessment Study

- Options 1, 2 & 3
- Oversize Luggage Screening

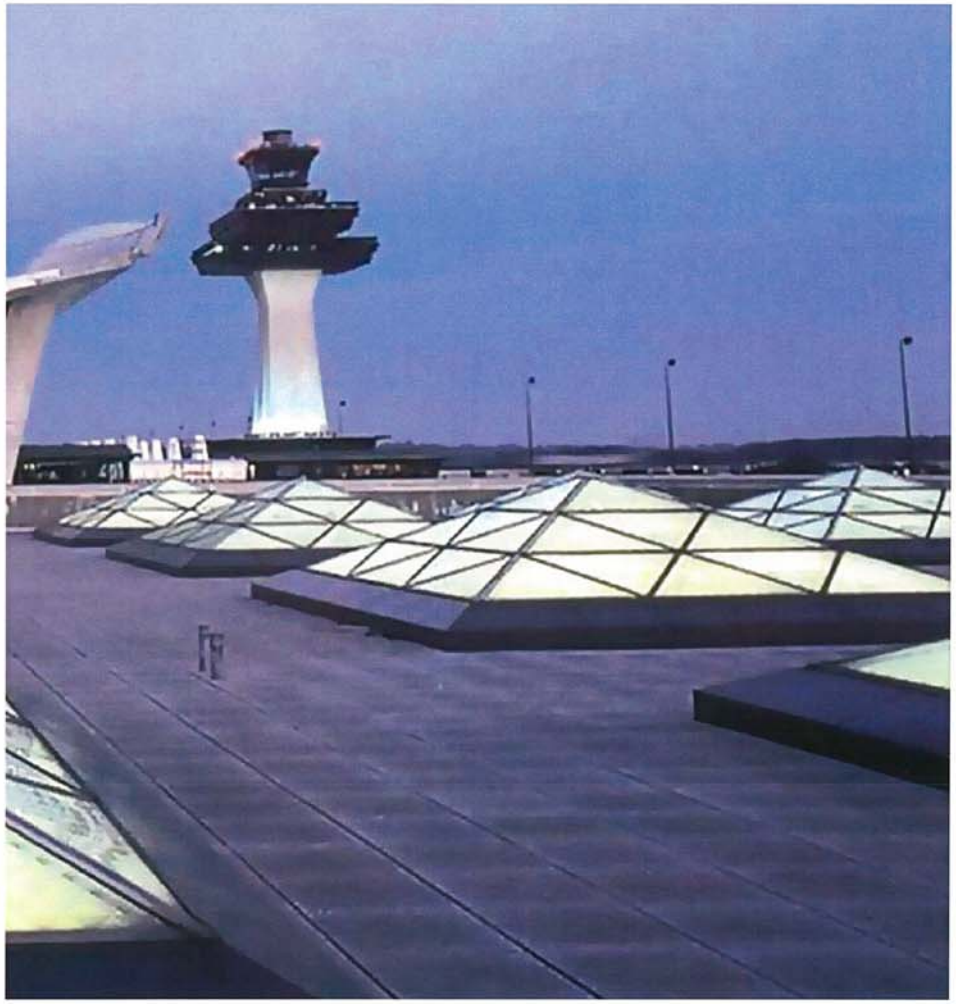
[redacted]

[redacted]

FINAL - September 25, 2007

Revised - October 18, 2007

[redacted]



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High Volume Baggage Screening
Assessment Study

- Option 1, 2 & 3
- Oversize Luggage Screening

Prepared by

[redacted]

FINAL - September 25, 2007

Revised - October 18, 2007

[redacted]

[redacted]

Acronyms

MTBB-EDS: Main Terminal Baggage Basement - Explosive Detective Systems.

IAD: Washington Dulles International Airport

MWAA: Metropolitan Washington Airports Authority.

MWAC: Metropolitan Washington Airlines Committee.

TSA: Transportation Security Administration.

PMC: Parsons Management Consultants.

SOM: Skidmore Owings Merrill, LLP.

EBB: East Baggage Basement.

SBB: South Baggage Basement.

WBB: West baggage Basement.

ROW: Right of Way.

CBIS: Checked Baggage Inspection System

CBS: Checked Baggage Screening

CT: Computed Tomography

EDS: Explosive Detection Systems

ETD: Explosive Trace Detection

MT: Main Terminal

IFP: Issue for Procurement

ROM Rough Order of Magnitude

NIC Not in Contract

IFP Issued For Procurement

Figures

Figures

Figures

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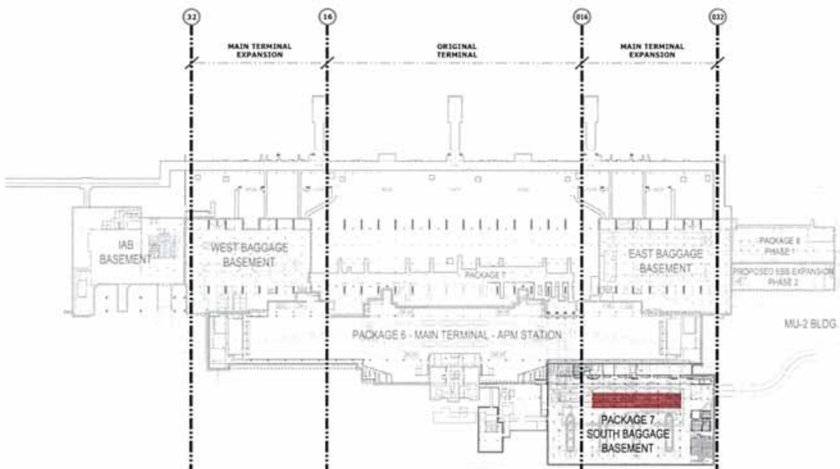


figure 5.0 -Hi Speed Key Plan Mezzanine Level

MAIN TERMINAL BAGGAGE BASEMENT EDS IN-LINE – SOUTH (SBB)- Hi Speed Study

Purpose of Report

The basis of this document is to give a synopsis of the study that was performed by the design team to compare the SBB In-Line EDS design, to the recent developments that have taken place, since the design documents were issued for procurement (IFP) on June 26, 2007; developments, which have (or will have) an effect on what was originally considered for the SBB re-design effort.

Project Overview

During the first quarter of 2007, MWAA resumed coordination with the TSA in an effort to obtain funding associated with Dulles International Airport Main Terminal EDS In-Line Projects (ie. SBB/EBB/WBB) As a result of the MWAA/TSA meeting on March 15th 2007, MWAA directed the design team to proceed with the following

MTBB EDS In Line SBB - Issue for proposal documents (Based upon 7/25/07. 100% documents)

Early this year the 100% Design Submittal documents dated July 25th 2005 were taken off the shelf for a re-design effort, between March and June, to include changes/updates to EDS equipment and TSA requirements on the commissioning of the Checked Baggage Inspection System. The re-design effort was completed in late June and the documents dated June 26th 2007 were issued to the Authority for procurement. Per recent changes to TSA requirements for In-Line EDS, indicate that the June 26, 2007 IFP submittal will need to be re-evaluated for revisions.

At the Authority's request the design team studied the feasibility of accommodating the future "High-Volume" EDS machines, within the existing SBB footprint based on the proposed In-Line EDS design as it was presented in the June 26, 2007 IFP submittal.

Executive Summary

The SBB In-Line EDS layout, which was brought up to 100% detail design level under the Authority's Main Terminal Security Alterations Program in late 2005, recently went through a re-design effort (earlier this year) to include the following additions and changes, which are described in detail in the following paragraphs of this document:

- Updated EDS machine manufacturer equipment, such as the new 1-Meter Wide Entrance Tunnel System.
- The exclusion of the proposed Directional Input Device (DID), which was considered in the last design submittal due to the unavailability of the current L3 1-Meter-Wide Entrance Tunnel System.
- The addition of a new Automatic Tag Reader (ATR), with associated conveyor feeds back to the ETD area, for EDS faulted baggage that need to automatically re-circulate.
- Additional system demonstrations for the TSA have mandated certification testing, which basically increased the estimated construction schedule as it relates to the commissioning of the BHS and CBIS.
  - The 2005 SBB In-Line EDS design and above referenced revisions was based on a list of design objectives and attributes that were established during the 2002 – 2005 design periods, which per recent changes to TSA requirements for In-Line EDS, indicate that the June 26, 2007 IFP submittal will need to be re-evaluated for revisions. The following is an outline of the latest TSA CBIS Performance Design Standards that influence the SBB In-Line EDS design, as illustrated in the IFP submittal:
- The addition of new conveyor lines to segregate Level 1 EDS screened "Cleared Bags" and "Non-Cleared Bags".
- The addition of new conveyor lines to provide EDS "Out-of-Gauge" by-pass capability. EDS Out-of Gauge bags are bags that can be accommodated by the BHS conveyor equipment, but exceed the EDS machine's scanner gantry limits and therefore would be automatically directed to the Threat Resolution Room (ETD area), instead of processed through the existing Kiosk 3 oversize line as it was intended by the 2005 SBB In-line EDS design.
- BHS and CBIS design to be optimized for the current EDS Technology (E.g.., Roughly 500 bags per hour / EDS machine), without constraining maximum potential capacity of the EDS equipment (assumed to be 600 bags per hour / EDS machine).
- The BHS and CBIS design to be able to accept and be optimized for upgrades or replacement with future "High-Volume" EDS machines (e.g., also referred to as Type 1 machines by the TSA) with minimal re-engineering or modifications to previously installed CBIS or current design considerations. Additionally, the design of the system shall not constrain the maximum potential capacity of the future "High-Volume" EDS machines.
  - With respect to the future "High-Volume" EDS machines (item 4 above), at the Authority's request, the design team studied the feasibility of accommodating the referenced requirement within the existing SBB footprint and consistent with the proposed In-Line EDS design as it was presented in the June 26, 2007 IFP submittal. The results of the study indicated that the future "High-Volume" EDS machines can be accommodated within the same envelope as that proposed in the IFP, based on the following optional scenarios, which would be dependent on the approach that the final procurement package will proceed with as well as the EDS equipment type that would be selected. The Design Team's study for the "High-Volume" EDS machines was based on the type that is currently being considered by the TSA for future certification, such as the Analogic Extra Large Bore 1100, referred to as the XLB1100, that claims to be able to scan up to 1100 bags per hour per machine.

[redacted]

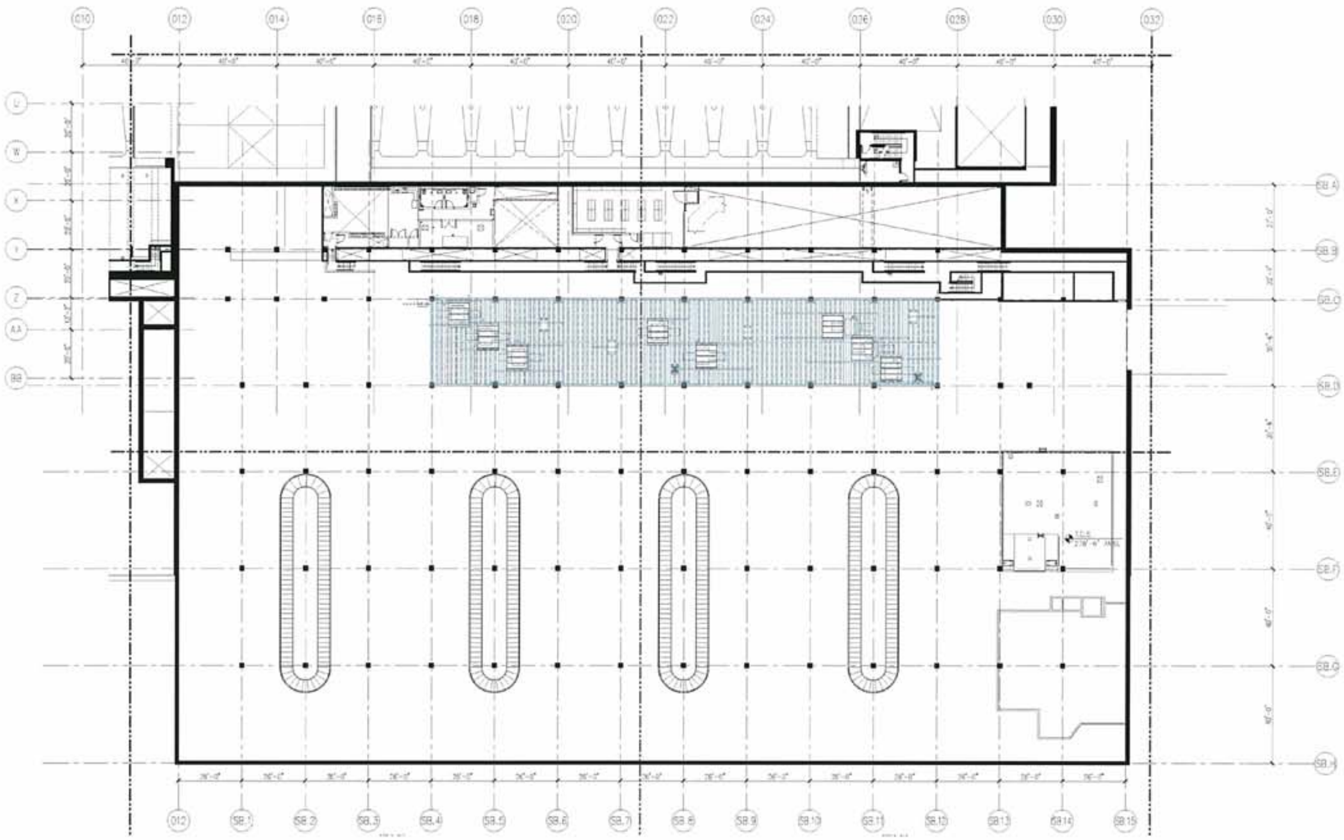


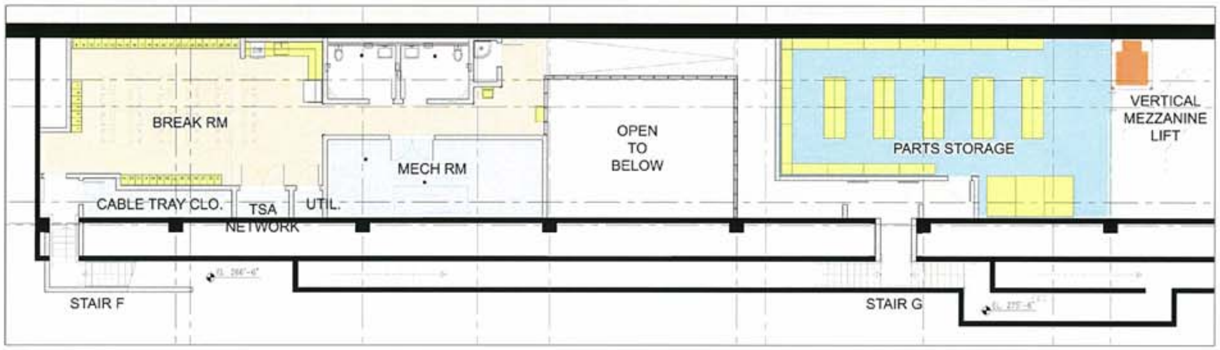
Figure 6.0 - Overall Plan South Baggage Basement Steel Mezzanine Deck

Design Objectives

The Current design that was issued for procurement on July of 2007 for the [redacted] was accomplished in light of the following design objectives.

- Compliance with latest TSA protocols for
- 100% CBS of all originating bags out of the SBB (ticketing kiosks 2 & 3)
- 100% CBS of all international to domestic rechecked bags out of the IAB FIS (reserved ROWs)
- Use of current & forecasted flight schedules
- Use of existing facility space/footprints
- To accommodate the proposed in-line EDS designs
- To minimize expansions to the main terminal
- Coordinate in-line EDS design with on-going airport construction projects (e.g., [redacted] Package 6 - APM)
- Coordinate in-line EDS design w/future airport construction projects (E.g.., APM tunnels, Tier 2, etc.)
- Construction consideration for on-going airline operation
- Eliminate existing “stand-alone” EDS security screening process from concourse level and bag room spaces.
- Provision of new L3 (3DX 6000 series) machines for in-line EDS with 1-meter-wide entrance tunnel
- Oddsize bags screened at concourse level (no changes)
- A minimum 400 bph screening throughput rate, per level-1 EDS machine (6.7bpm)
- Planning of 2 (min) level-2 workstations, per level-1 EDS machine
- A 45-second decision time (min) for the level-2 remote operator
- A means (based on approved TSA procedures and/ or equipment) to track selected bags, as identified by the CAPPS II program through the level-1 and 2 screening processes to the ETD area

[redacted]



Design Highlights of Mezzanine level

- A staff break room with kitchenette and rest rooms at mezzanine level
- Newly added stairs (F and G) for code-compliant egress.
- Air-conditioning in all TSA occupied spaces
- Additional Lockers & Breakroom
- A spacious BHS Parts Storage created at mezzanine level
- A Cantilevered Material Lift (for parts only) and ample shelving

Design Highlights of Basement level

- Provision of ancillary TSA monitoring space (EDS screening) and modification to existing BHS control office to facilitate West basement BHS control
- A new ADA-compliant, air-conditioned, enclosed working area in the southeast corner of basement for Level 3 ETD operation
- Improvised Explosive Device (IED) Resolution – Threat Containment Unit (TCU) trailer at the west corner of the ETD room to convey IED outside of immediate ETD operation area

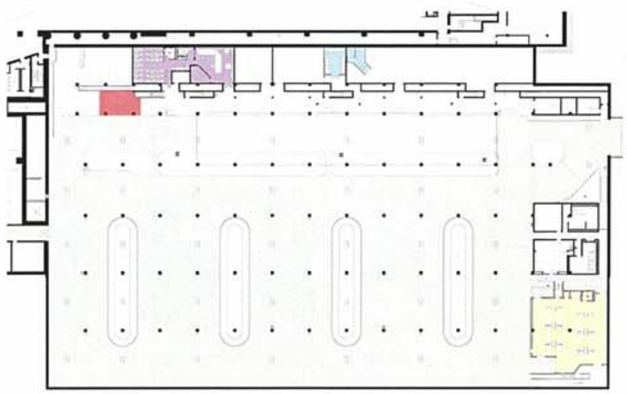


Figure 7.0 - [redacted] Basement Level Current Design w/future Oversize Location

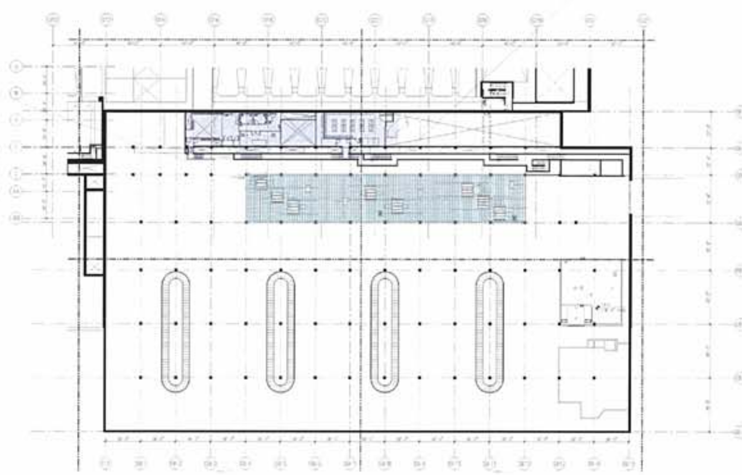


Figure 7a.0 - [redacted] Mezzanine Level Current Design

[redacted]

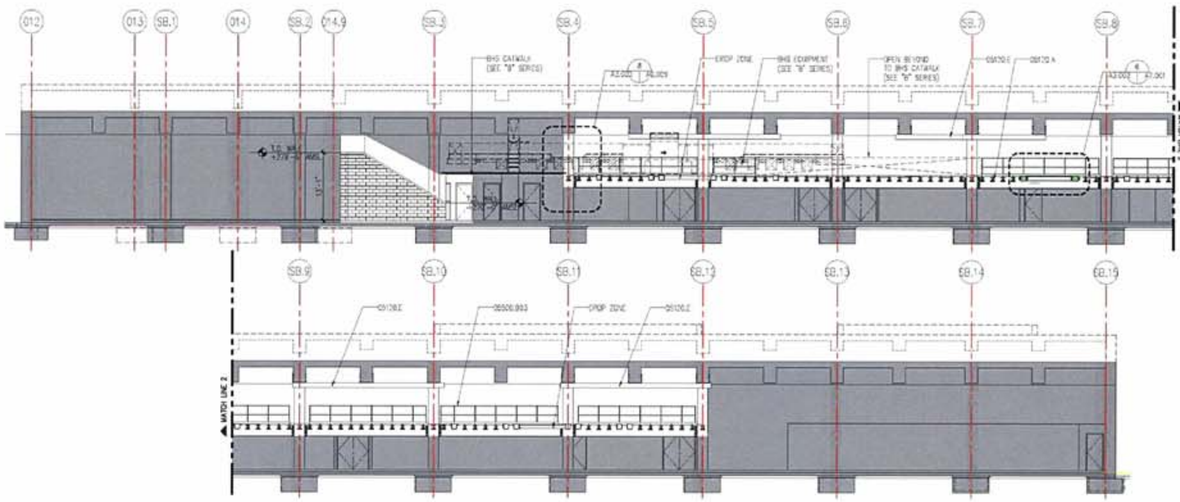


figure 8.0 - Sections thru Steel Mezzanine deck

Current IFP Proposal

Proposed [redacted] in-line EDS layout includes the following:

- The Redevelopment of the Existing [redacted] Bagroom Space
- Construction of a New Mezzanine to accommodate the EDS
- Alterations to Existing Baggage Handling Systems to Accommodate the In-Line EDS
- Outbound BHS – Reconfigure the 2 Main Outbound Transport Lines
- Inbound BHS – Reconfigured to Accommodate Proposed New Right-of-Ways
- Oddsize Line – Reconfigured to Accommodate Proposed New Right-of-Ways
- Installation of New In-Line EDS Equipment, Level-2 Workstations & ETD Stations
- Installation of eight (8) In-Line EDS Machines
- EDS Equipment (i.e., L3 eXaminer 3DX 6000 series) will be provided by the TSA
- Authority's G.C. will provide rigging/installation of EDS Equipment
- EDS Internal System Wiring, Networking and Controls will be provided by TSA.
- Authority's BHS Contractor will integrate the BHS with the EDS

Design Team's study for the "High-Volume" EDS machines was based on the type XLB1100, that is currently being considered by the TSA. The optional scenarios that were studied to incorporate the Type 1 machines to the SBB In-Line EDS design are all mentioned below.

All these options satisfy only 8 of the 10 TSA requested CBIS Performance Design Standards, as these are based on prior design objectives/planning premise and TSA guidelines.

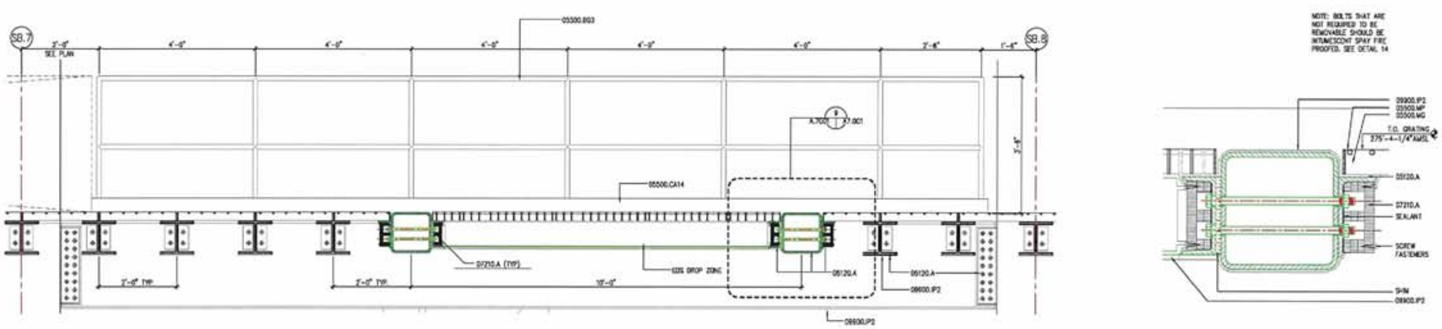
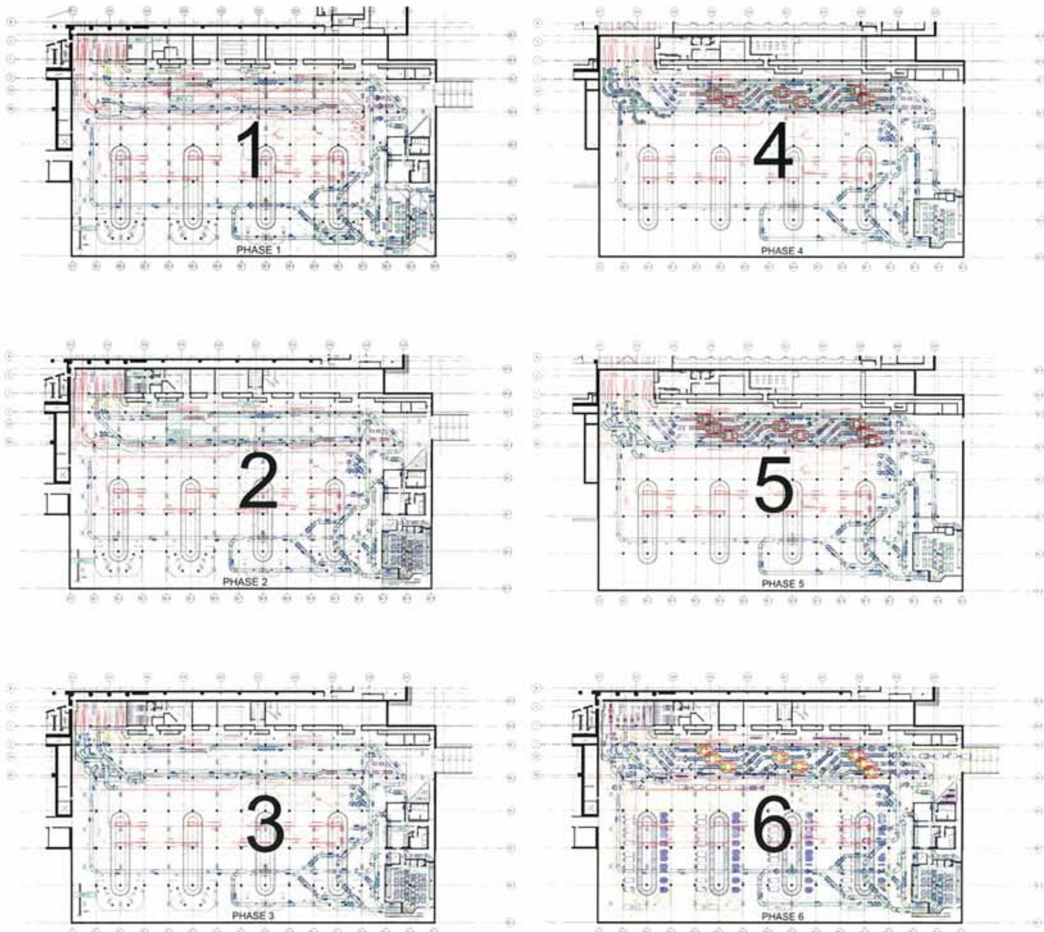


Figure 8a.0 - Details of Steel Mezzanine deck

[redacted]



Basement Figure 9.0 - [redacted] Phasing Sequence Diagram

Current Project Phasing

Proposed [redacted] Security Alterations Program will be constructed in a Phased-in Implementation Process

- 6 Project Phases & **6 BHS Activities**
  - Architectural Design Phasing Sequence
  - HVAC Design Phasing Sequence
  - Structural Design Phasing Sequence

BHS Design Phasing Sequence

[redacted] Summary of Phased-in BHS Implementation involves 6 major BHS Activities

BHS contractor to locate drives, install removable side guards, etc., to accommodate future high speed diverters, merges, etc. Should high-speed diverters not be available, provide slider bed inserts at those locations.

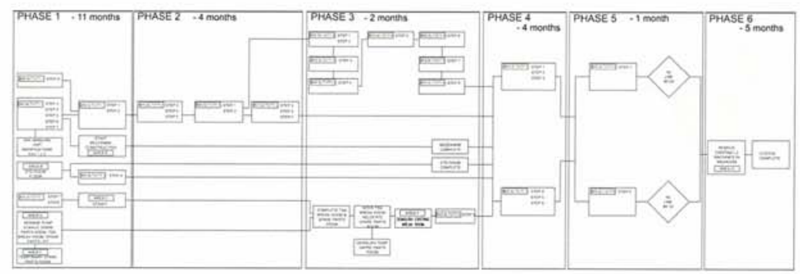
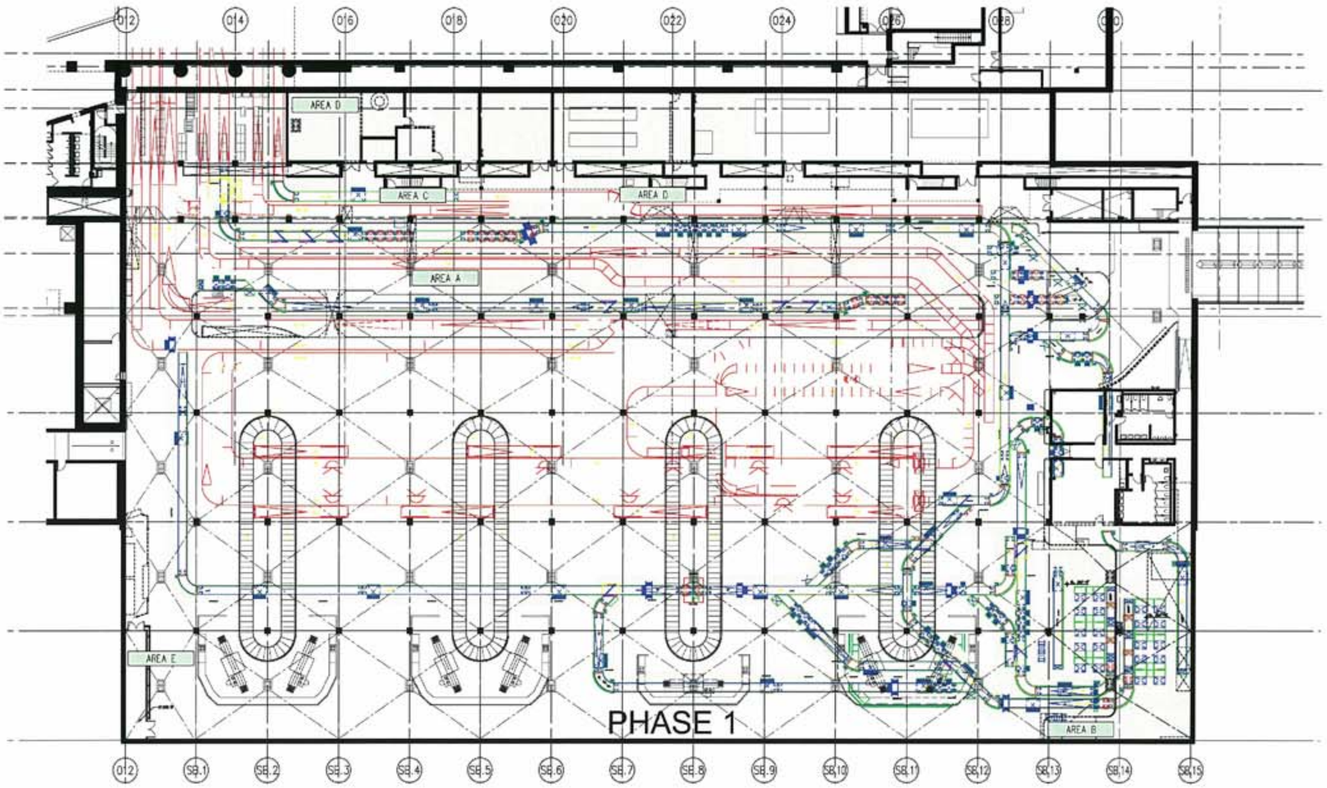
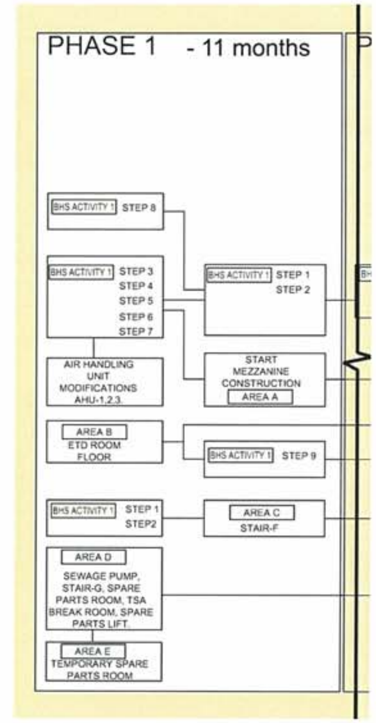


Figure 9a.0 - [redacted] Basement Phasing Chart

For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents Specification Section 01325 - Project sequencing Program, June 26, 2007.

[redacted]





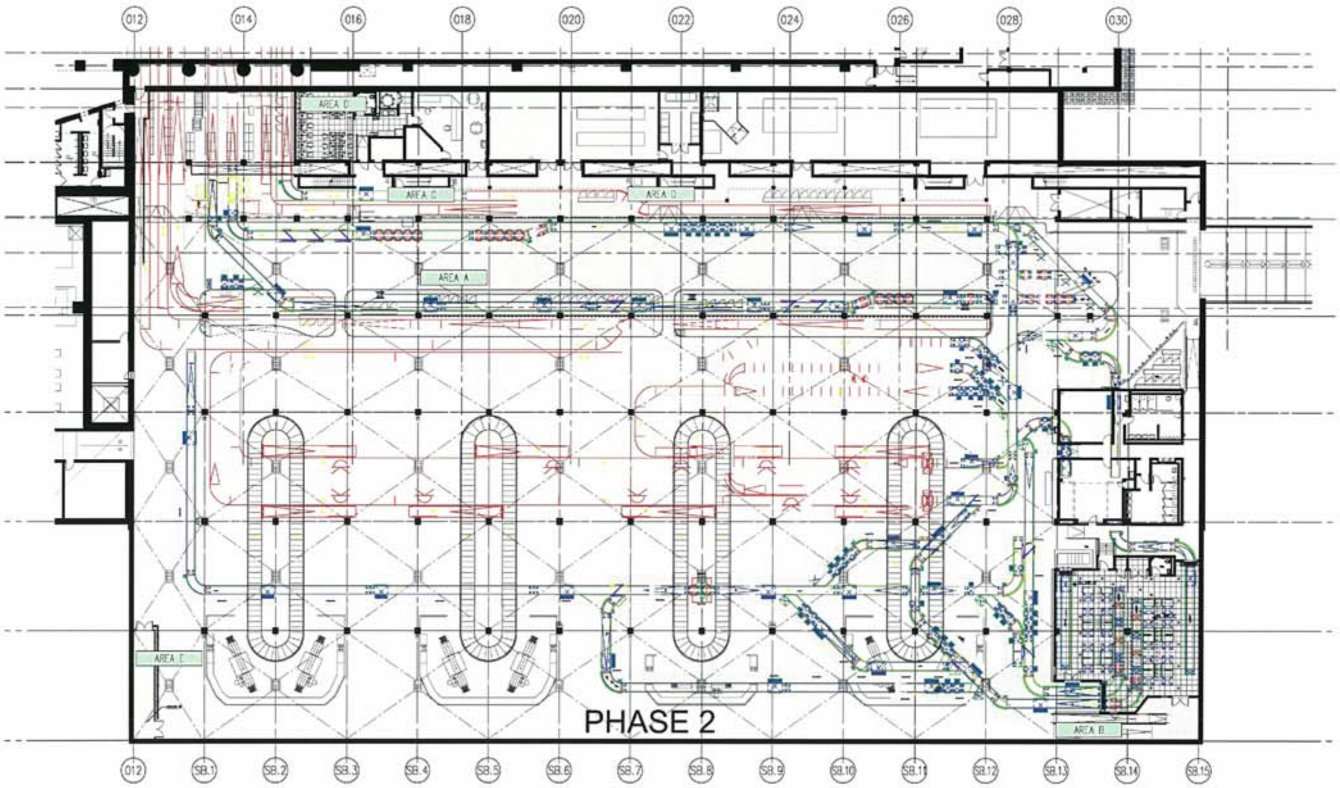
For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

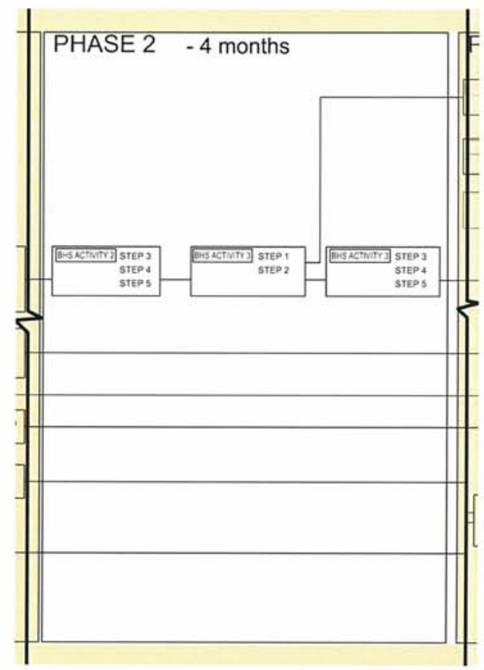
Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure10.0 - Phase 1 - Diagram

Figure 10a..0 - Phase 1 -Phasing Chart

[redacted]





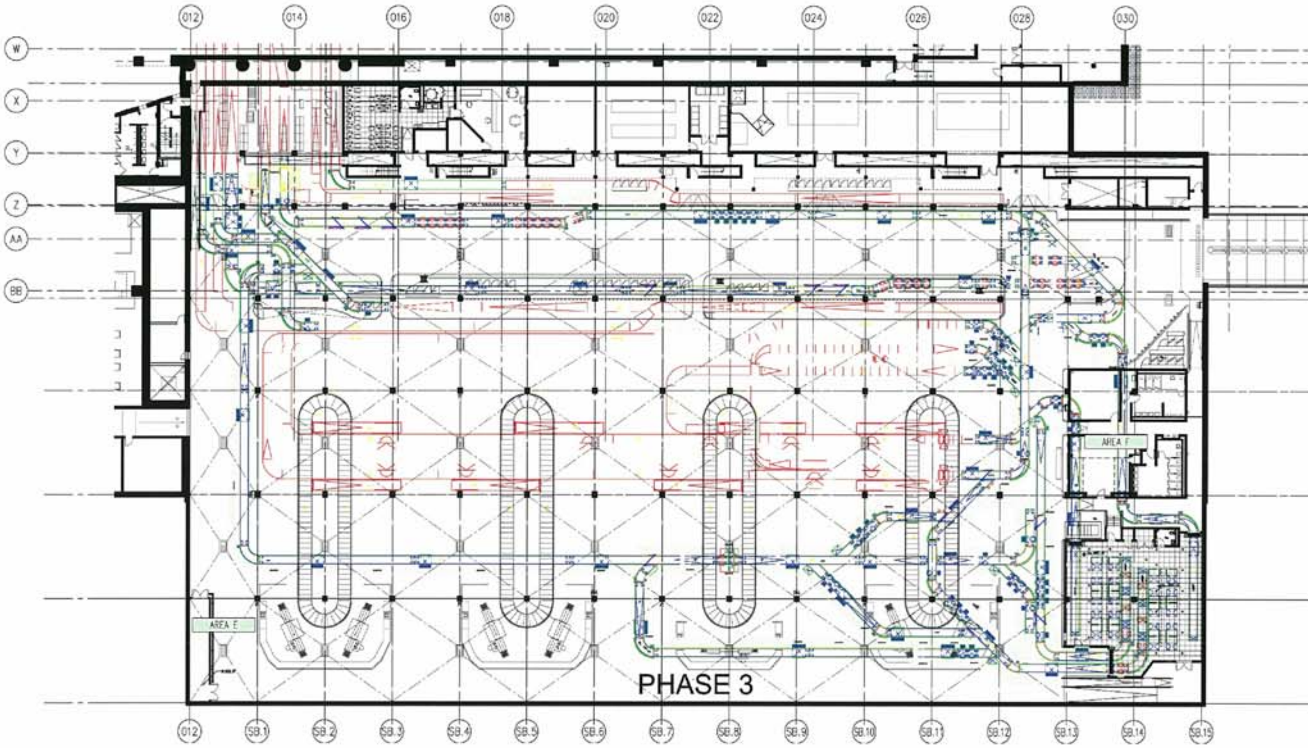
For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure 11.0 - Phase 2 Design Diagram

figure 11a.0 - Phase 2 Phasing Chart

[redacted]



For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure 12.0 - Phase 3 Design Diagram

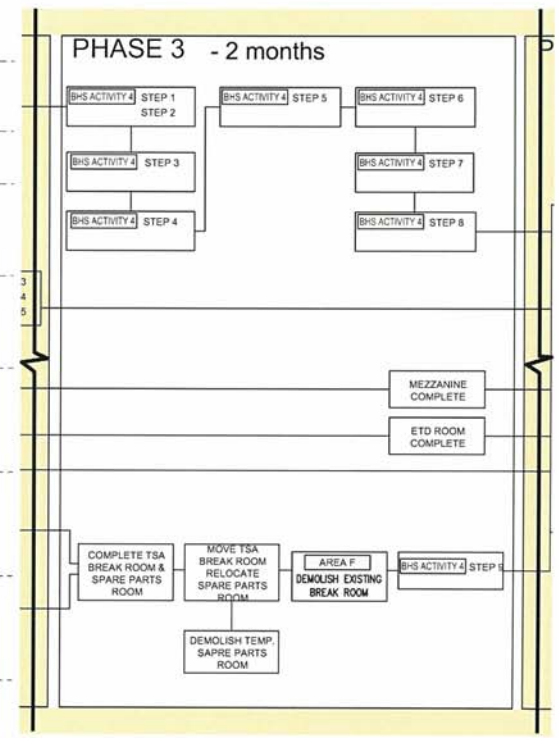
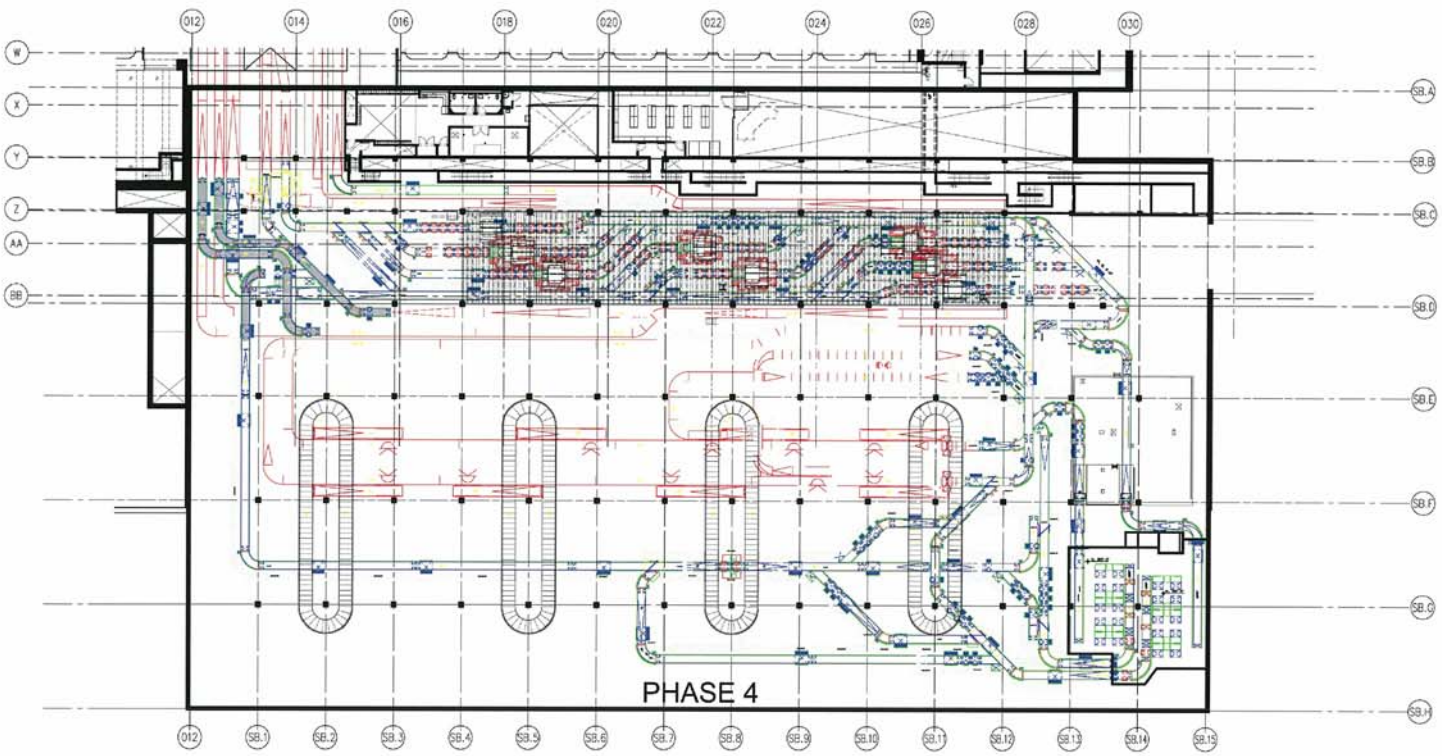
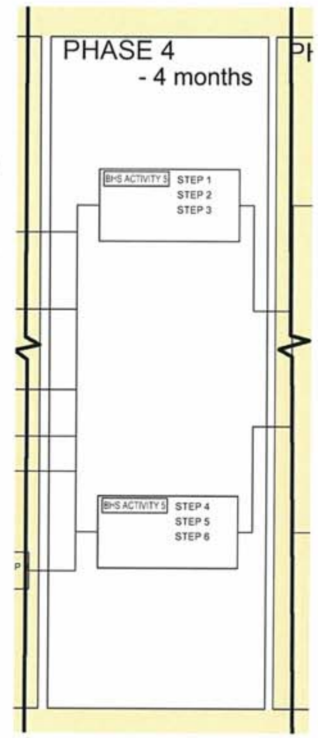


figure 12a.0 - Phase 3 Phasing Chart

[redacted]





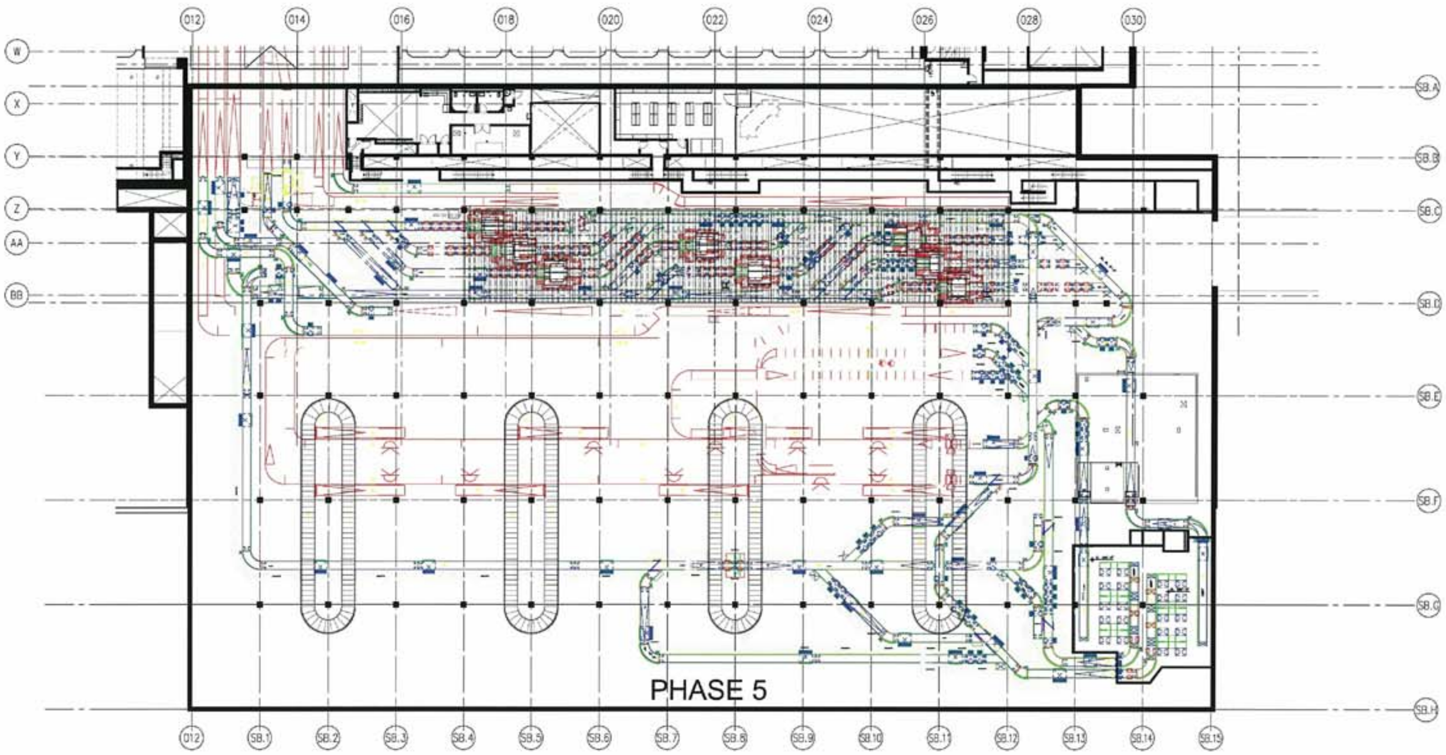
For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

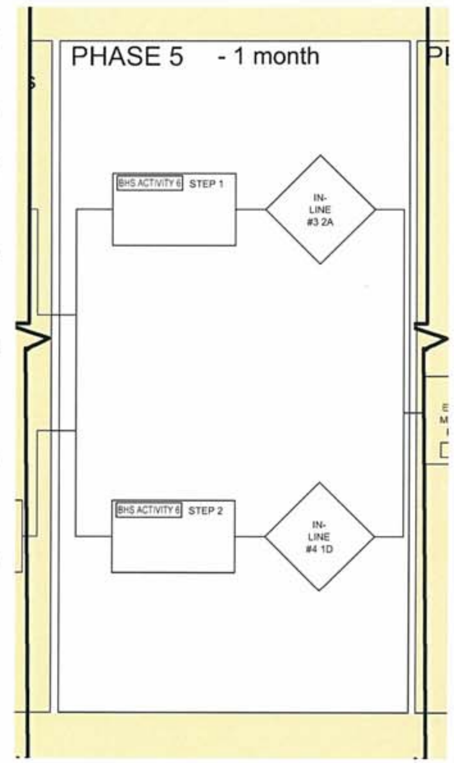
Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure 13.0 - Phase 4 Design Diagram

Figure 13a.0 - Phase 4 Phasing Chart

[redacted]





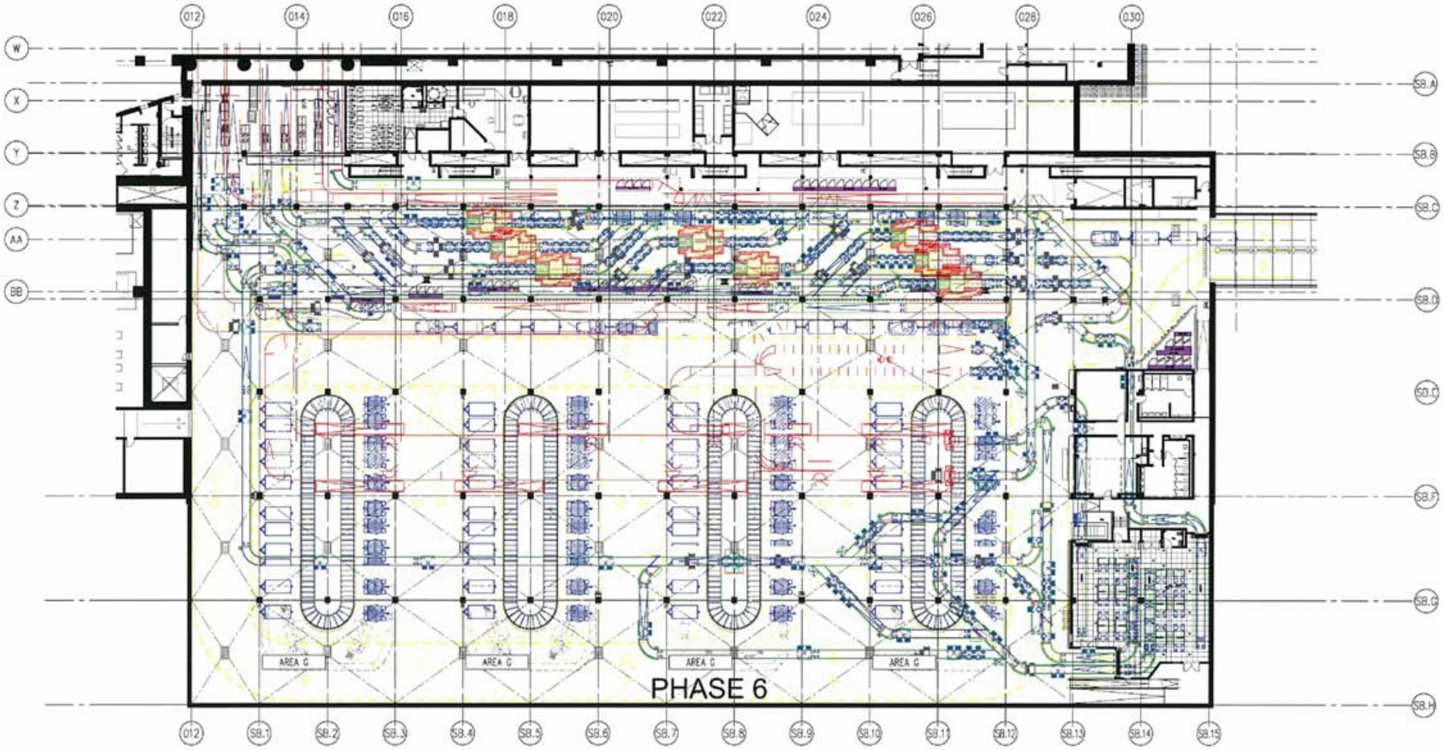
For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

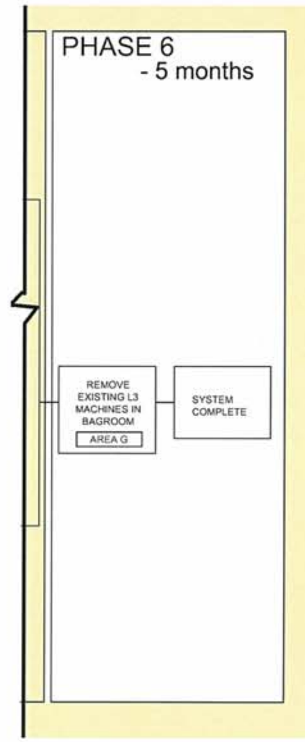
Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure 14.0 - Phase 5 Diagram

Figure 14a.0 - Phase 5 Chart

[redacted]





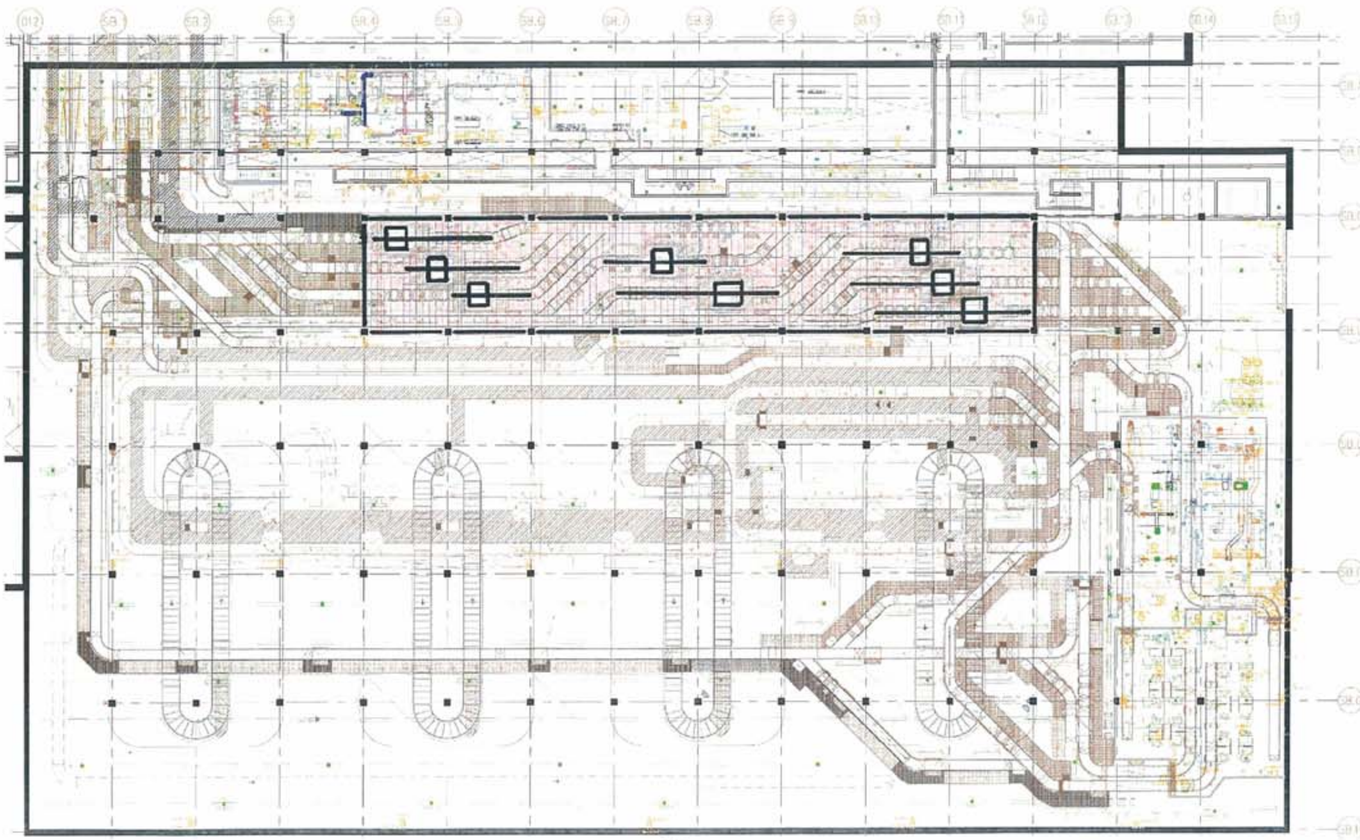
For Descriptions and additional details listed in the Phasing sequence, please refer to IFP Documents

Specification Section 01325 - Project sequencing Program, June 26, 2007.

Figure15.0 - Phase 6 Design Diagram

figure 15a.0 - Phase 6 Phasing Chart

[redacted]



Structural Design Highlights

* 7400 SF structural steel & bar grating platform
* Attached to existing columns
* Supports conveyers and EDS machines including CTX 9000
* Clearance for tug traffic below
* Removable panels for equipment installation or removal
* Permanent overhead trolley beams to lift EDS machines

HVAC Design Highlights

* Add cooling coils and chilled water connections to SBB Main Air Handling Units to provide cooled supply air in lieu of ventilated outside air.
* Modify Building Automation Control System setpoints to improve Main AHU normal heating and ventilation performance by increased air flow.
* Repair and commission heating system components to prevent operating conflicts with cooling system.
* Remove TSA UPS branch power connections for when stand-alone screening units and UPS units can be removed.

HVAC Phasing Sequence

Advance [redacted] Mechanical Work to include:

* 1) provide the cooling coils for the AHU-1 and 2.
* 2) provide the CHW piping and connections to the AHU cooling coils.
* 3) complete other welded pipe modifications to existing glycol HW and CHW piping.
* 4) perform BAS reprogramming to increase the air flow setpoints for extreme hot and cold outside air conditions.
* 5) perform commissioning and repair to the hot water source unit heaters.
* 6) install exhaust above mezzanine area to promote reducing higher temperature air at ceiling of basement.

Figure16.0 - [redacted]tructural Design - IFP Documents

[redacted]

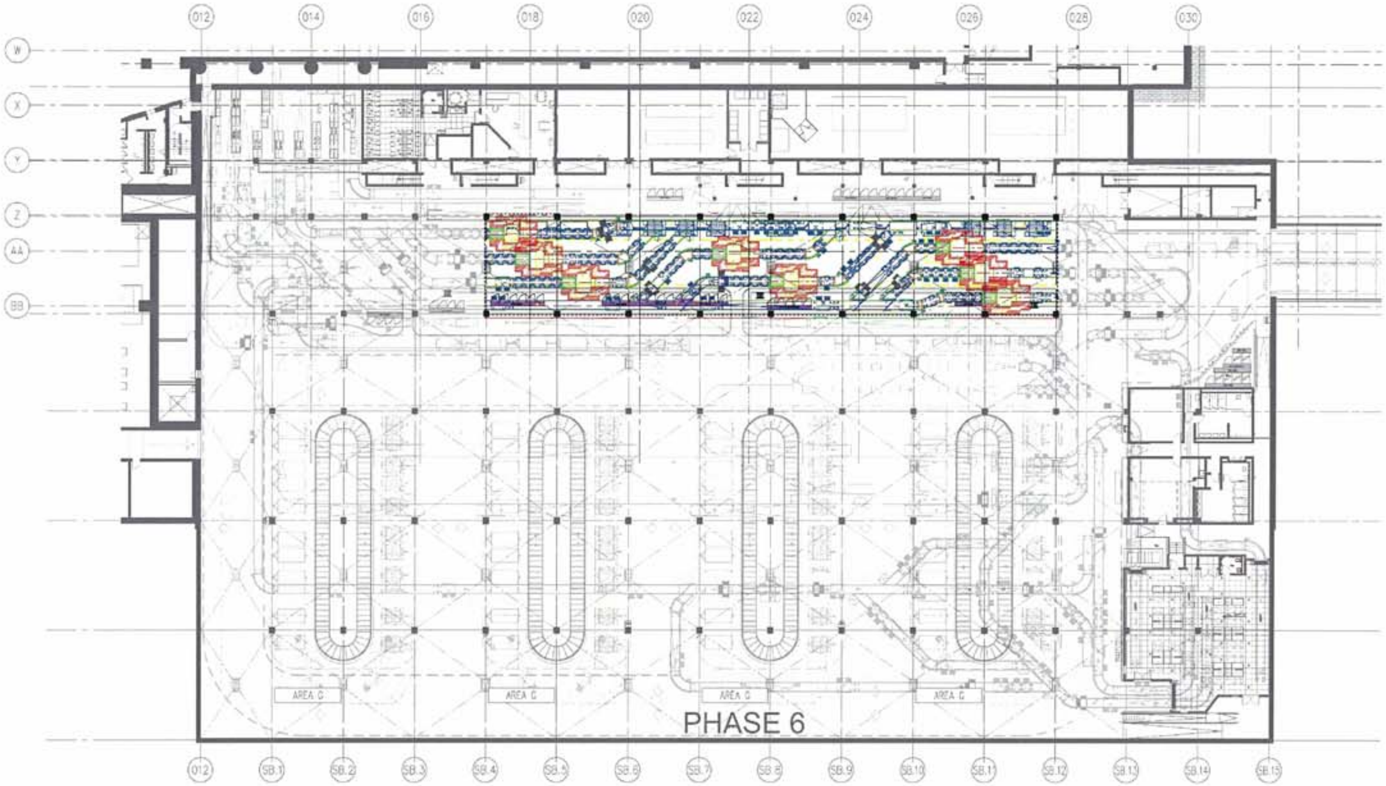


Figure17.0-Key plan for Hi speed Options

[redacted]

Hi-Speed study option Overview

During the first quarter of 2007, MWAA resumed coordination with the TSA in an effort to obtain funding associated with Dulles International Airport Main Terminal EDS In-Line Projects (ie. [redacted]
As a result of the MWAA/TSA meeting on March 15th 2007, MWAA directed the design team to proceed with the following MTBB EDS In Line SBB - Issue for proposal documents that is based upon 7/25/07 - IFP 100% documents.

Early this year the 100% Design Submittal documents dated July 25th 2005 were taken off the shelf for a re-design effort, between March and June, to include changes/updates to EDS equipment and TSA requirements on the commissioning of the Checked Baggage Inspection System. The re-design effort was completed in late June and the documents dated June 26th 2007 were issued to the Authority for procurement.

Recent changes to TSA requirements for In-Line EDS, indicate that the June 26, 2007 IFP submittal will need to be re-evaluated for revisions.

At the Authority's request the design team studied the feasibility of accommodating the future "High-Volume" EDS machines, within the existing SBB footprint based on the proposed In-Line EDS design proposal.

Design Team's study for the "High-Volume" EDS machines was based on the type XLB1100, that is currently being considered by the TSA. The optional scenarios that were studied to incorporate the Type 1 machines to the [redacted] In-Line EDS design are as follows:

[redacted]

Options	Description	Cost	Schedule	Impact/Issues
OPTION - 1 **Installation of (8) L3 EDS Machines, Re-Design includes BHS / Structural modifications to accommodate future High Speed Equipment. Assumes Future High Speed Implementation** PRIOR TO CONSTRUCTION Modify Current (IFP) Documents (ie. High Speed Friendly) including: (4) BHS / (4) Mezzanine Openings Complies with Mandatory TSA Design Standards (not Preferred)	Revise the current IFP layout, which considers the installation of 8 L3-6000 series EDS machines, to be Type 1 (High-Volume EDS) friendly. This option assumes that the SBB In-Line EDS design will proceed with the installation of 8 L3-6000 series EDS machines, but the overall CBIS layout will be designed in a way that would allow the future implementation of the 4 Type 1 machines with minimal re-engineering and modifications.	$138,045 In addition to IFP cost of $30,062,331	IFP - 32 months	1. Minor revisions to the current IFP documents 2.This option requires minimum revisions to current documents, estimated cost and construction schedule. 3. This structural opening system allows for minimal re-engineering and modifications to implement Type 1 4. to accommodate potential future suppliers, we provided the maximum access openings possible without increasing the depth of the platform structure. **5. This Option satisfies 8 Mandatory TSA requested design standards. Preferred TSA design standards including: No. 3 BHS & EDS Capacity requirement (Optimized for upgrades), No. 9 Divert and Merge requirements (ie. no mixing clear / non-clear bags) and No. 10 Reinsertion and Purge requirements cannot be satisfied, due to space limitations.**
OPTION - 2 **Installation of (8) L3 EDS Machines, Minimal Re-Design includes Structural modifications to accommodate future implementation of High Speed Equipment. Assumes Future High Speed Implementation** PRIOR TO CONSTRUCTION Modify Current (IFP) Documents (ie. High Speed Friendly) Including: (4) Mezzanine Openings POST CONSTRUCTION Future Project (not part of initial construction) Re-Design to accommodate (4) High Speed EDS Complies with Mandatory TSA Design Standards (not Preferred)	This option considers re-engineering and re-testing of the In-Line EDS, due to the phased in implementation of the Type 1 (HSS) machines in future to replace the L3 units that would be installed under Option 1. This option requires minimum revisions to current documents.	$4,843,996 (FUTURE COSTS) in addition to IFPcost of $30,062,331	60 WEEKS in addition to 32 months= 47 months	1. Minor revisions to the current IFP documents 2. This structural opening system allows for minimal re-engineering and modifications to implement Type 1 3. Assumes Option 1 is complete with 8 L3 machines installed. 4. Phased in implementation of Type 1 (High-Volume EDS). 5.Minimum changes upfront to estimated cost and construction schedule. It does have additional cost to re-engineer the mezzanine at a later date when the L3 machines are replaced by Type 1 (HSS) machines. **6. This Option satisfies 8 Mandatory TSA requested design standards. Preferred TSA design standards including: No. 3 BHS & EDS Capacity requirement (Optimized for upgrades), No. 9 Divert and Merge requirements (ie. no mixing clear / non-clear bags) and No. 10 Reinsertion and Purge requirements cannot be satisfied, due to space limitations.**
OPTION - 3 **Re-Design / Installation of (4) High Speed EDS Machines. Complies with 8 of 10 TSA Design Standards (ie. Mandatory only)** PRIOR TO CONSTRUCTION Modify Current Documents to accommodate (4) High Speed EDS Machines Including: All Disciplines Complies with Mandatory TSA Design Standards (not Preferred) Note: High Speed Equipment not currently certified	This option is based on the initial installation of the 4 Type 1 EDS machines, as opposed to the 8 L3-6000 series (i.e., above referenced Option 1).	$803,231 in addition to IFP cost of $30,062,331	32 months Schedule Impacts associated with Type 1 (HHS) Certification	1. Installation of the 4 Type 1 (High-Volume EDS) only 2. Savings of approx. $750,000 in BHS work 3. Only 4 large openings in the steel at mezzanine for the Type 1 machines. **4.This Option satisfies 8 Mandatory TSA requested design standards. Preferred TSA design standards including: No. 3 BHS & EDS Capacity requirement (Optimized for upgrades), No. 9 Divert and Merge requirements (ie. no mixing clear / non-clear bags) and No. 10 Reinsertion and Purge requirements cannot be satisfied, due to space limitations.**

Figure18.0-Comparison Table of all High Speed options

Main Terminal Baggage Basement EDS In-Line – South (SBB)

The following items from the TSA's latest performance design standards cannot be accommodated due to existing facility space limitations. Items such as,

The addition of new conveyor lines to segregate Level 1 EDS screened "Cleared Bags" and "Non-Cleared Bags".

The addition of new conveyor lines to provide EDS "Out-of-Gauge" by-pass capability. EDS Out-of Gauge bags are bags that can be accommodated by the BHS conveyor equipment, but exceed the EDS machine's scanner gantry limits and therefore would be automatically directed to the Threat Resolution Room (ETD area), instead of processed through the existing Kiosk 3 oversize line as it was intended by the 2005 [redacted]In-line EDS design.

EDS Re-insert conveyor line from the ETD area for mis-tracked/unknown baggage.

Design Team's study for the "High-Volume" EDS machines was based on the type XLB1100, that is currently being considered by the TSA. The optional scenarios that were studied to incorporate the Type 1 machines to the [redacted]n-Line EDS design are all mentioned below. All these options satisfy only 8 of the 10 TSA requested CBIS Performance Design Standards, as these are based on prior design objectives/planning premise and TSA guidelines.

[redacted]

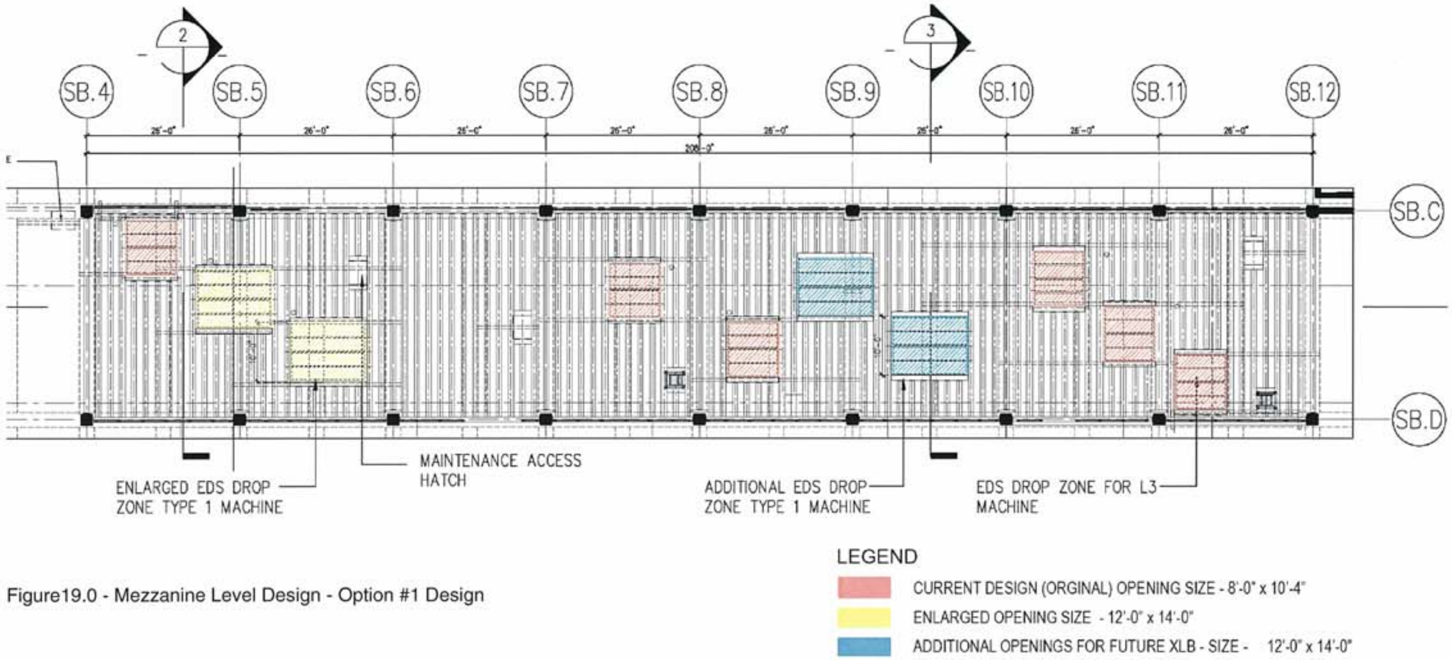


Figure19.0 - Mezzanine Level Design - Option #1 Design

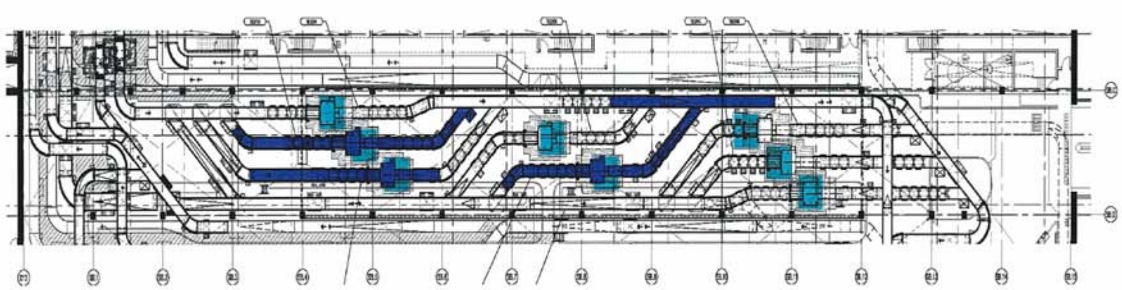


Figure19a.0 - Mezzanine Level Design - Option #1 with BHS layout

Hi- Speed study options

Option 1 (The Type 1 friendly Option):

Revise the current IFP layout, which considers the installation of 8 L3-6000 series EDS machines, to be Type 1 (High-Volume EDS) friendly.

This option assumes that the [redacted]In-Line EDS design will proceed with the installation of 8 L3-6000 series EDS machines, but the overall CBIS layout will be designed in a way that would allow the future implementation of the 4 Type 1 machines with minimal re-engineering and modifications. This option requires minor revisions to the current IFP documents to include the necessary changes. The BHS changes to the IFP submission should not influence the June 26, 2007 estimated cost and construction schedule submittal.

Summary

- Revise current layout of 8 L3-6000 series EDS machines to accommodate future 4 Type 1 (High-Volume EDS) machines.
- 6 openings structurally (SIZE) designed for L3 Machine, 2 openings (SIZE)for future Type 1 (High-Volume EDS) that coincide with the L3 locations and 2 additional openings (SIZE) for Type 1 (High-Volume EDS) making it a total of 10 openings.
- There is sufficient headroom to install the future Type 1 (High-Volume EDS) machine and these machines have no impact on the mezzanine elevations. This design is in keeping the tug traffic below as the original concept.
- This structural opening system allows for minimal re-engineering and modifications to implement Type 1 (High-Volume EDS) See structural plans and sections.
- This option requires minimum revisions to current documents, estimated cost and construction schedule.
- This option assumes the construction of the 8 - Hi speed L3 machines on the mezzanine level according to IFP documents but with slight enlargement to four of the structural openings.

[redacted]

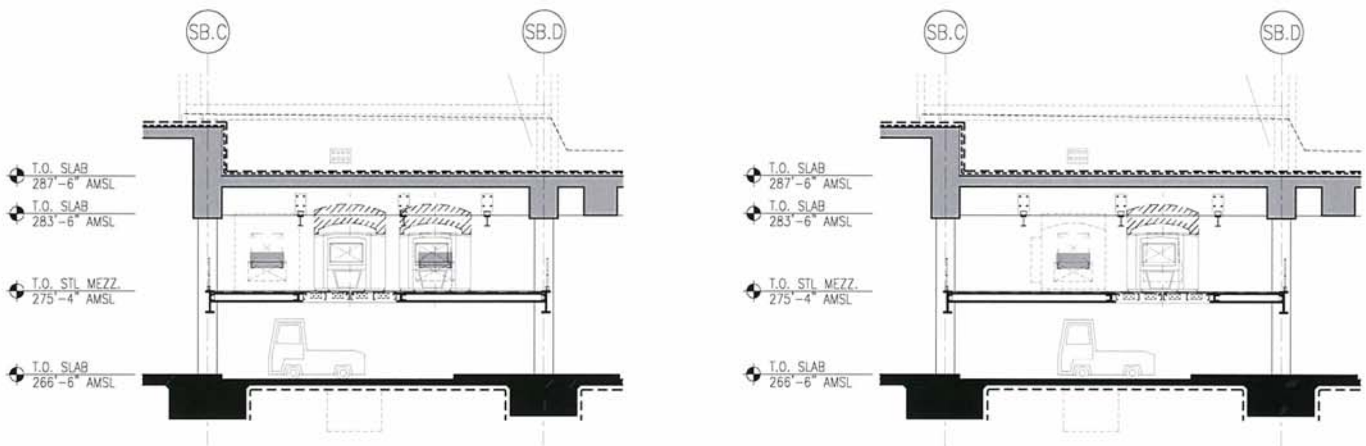


Figure20.0 - Sections thru mezzanine level

High speed Friendly Options Section and details

- There is sufficient headroom to install the future Type 1 (High-Volume EDS) machine and these machines have no impact on the mezzanine elevations. See Figure 15. This design is in keeping the tug traffic below as the original concept
- This structural opening system allows for minimal re-engineering and modifications to implement Type 1 (High-Volume EDS) See structural plans and Figures.
- Current Design or IFP documents are based on the 6500 D L3 machines shown in Figure 20a.0
- The Future design of the High speed studies is based on accommodating Type 1 High Volume EDS machines which is the XLB 1100 shown on Figure 20b.0

Figure20a.0 - 6500 D L3 machine

Figure20b.0 - Type 1 - XLB 1100 machine

[redacted]

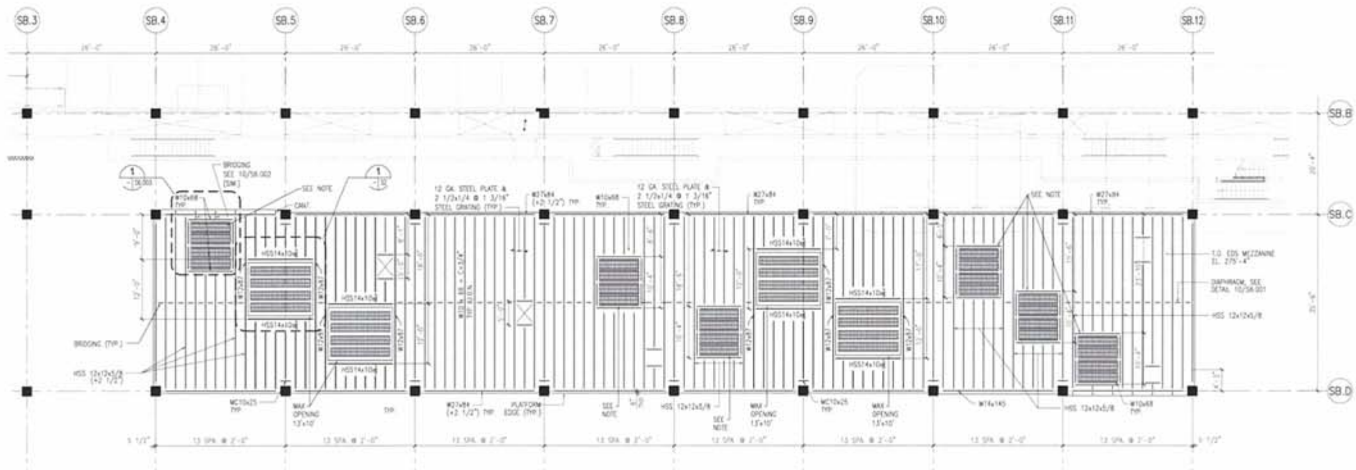


Figure21.0-Structural Mezzanine level Plan

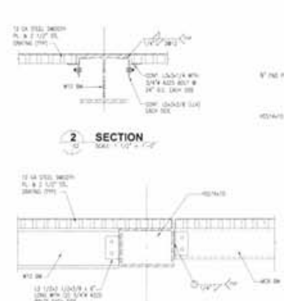


Figure21a.0 - Structural sections

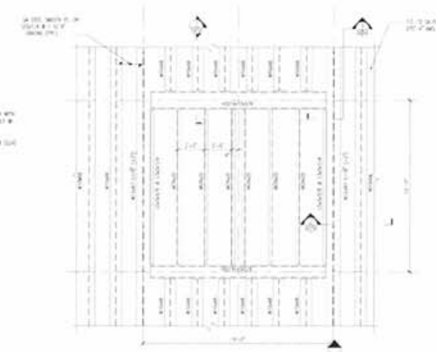


Figure 21b.0 - Typical drop down panel Detail

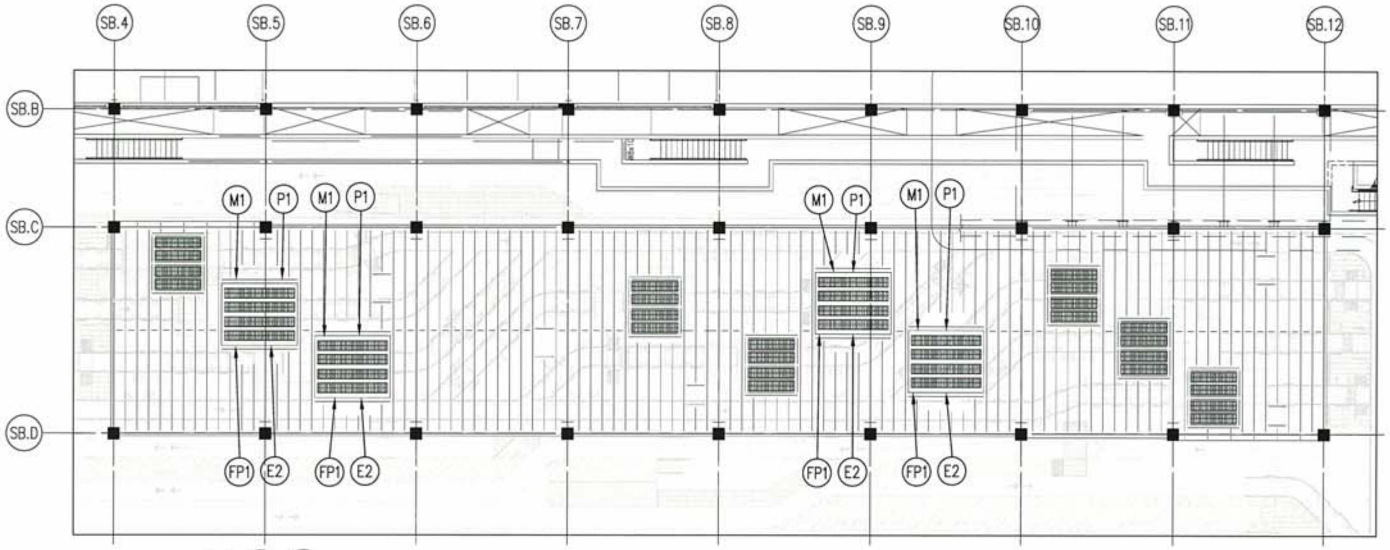
Structural Design

Summary & Brief overview (All options)

The following is a summary of the modifications that Ammann & Whitney proposes for the [redacted] Mezzanine in order to provide the flexibility to incorporate the use of hi-speed, Type 1 machines in the In-Line EDS system.

- The current design for the In-Line EDS at the [redacted] (issued 06/26/07) utilizes an elevated steel-framed mezzanine platform. Each of the 8 machines requires an opening through the platform for access. The structural depth was limited to approximately 12" to maximize clearance in the drivel aisle below and headroom above the platform. The typical framing consists of W10 beams spanning north-south to girders attached to the existing concrete columns on grids SB.C and SB.D. The platform is made up of a 2 ½" bar grating sitting on top of the W10s.
- Options 1 and 2 provide the flexibility to incorporate the use of hi-speed, Type 1 machines into the current design. The In-Line EDS design that utilizes the hi-speed, Type 1 machines requires 4 larger openings. To adapt the current design to accommodate the potential implementation of the Type 1 machines, the machines were laid out such that 2 of the openings were coincident with the current locations, and 2 new openings were added. To accommodate multiple suppliers, the access openings were made as large as possible without increasing the depth of the platform structure. This was accomplished by using heavier beams and maintaining a minimum of (2) beams between each opening.

[redacted]



GENERAL NOTES: M2 E1 P2

M1. DUCTWORK WILL NEED TO BE EXTENDED TO HIGH SPEED EQUIPMENT

M2. FAN AND DUCTWORK SIZE WILL BE AFFECTED DEPENDING ON EQUIPMENT LOAD

E1. LIGHTING LAYOUT COULD BE AFFECTED BOTH ABOVE AND BELOW MEZZANINE STRUCTURE

E2. POWER CONNECTIONS TO EDS MACHINES WILL BE AFFECTED

P1. CONDENSATE DRAINAGE ROUTING WILL BE AFFECTED

P2. CONDENSATE DRAINAGE LINE SIZE COULD BE AFFECTED

FP1. PROPOSED SPRINKLER BRANCHLINES UNDER MEZZANINE ARE IN CONFLICT WITH REVISED MEZZANINE STRUCTURE.

REDESIGN SPRINKLER BRANCHLINES UNDER MEZZANINE TO COORDINATE WITH REVISED MEZZANINE STRUCTURE.

Figure 22.0 - Mechanical, Electrical, Plumbing & Fire Protection Plan w/Comments

Mechanical, Electrical, Plumbing & Fire Protection

Summary & Brief Overview

Mechanical

- Mechanical revisions to the dedicated mezzanine exhaust duct takeoffs are necessary to coordinate with the relocated high-speed machine positions

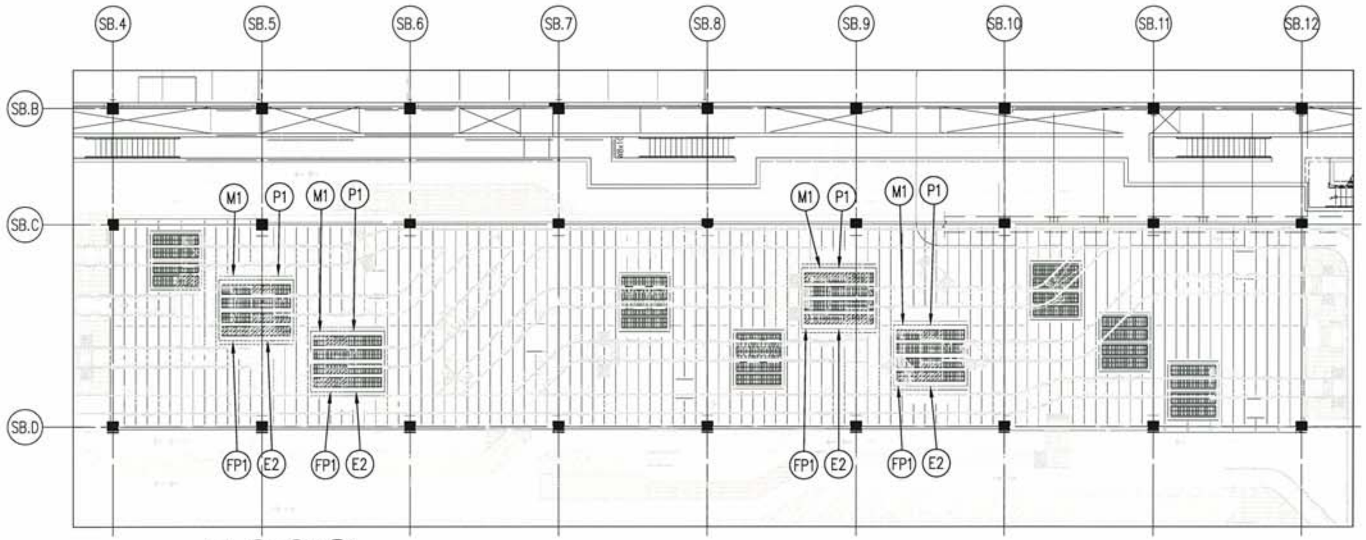
Electrical and Special Systems

- Electrical connections designed for the present technology machines would require change for any of the high-speed scenarios.
- The number of machine connections will be reduced, but the rating of each connection is expected to be higher. Larger conduit can be provided to accommodate future larger cable sizes, but it is not advised to provide the cable at this time if the particular machine electrical requirements are unknown.
- Pull boxes can be located along run to original machines such that conduit can be rerouted to new machine locations with minimal rework below the mezzanine.
- Lights designed for installation to the bottom of the mezzanine will require relocation to coordinate with the additional removable mezzanine sections designed for the high-speed scenarios.
- The telecommunications conduit and cable reconnections will be on a lesser scale than the power connections, and can be benefited by pull box locations so that connections can be rerouted from former machine locations to new locations with minimal rework.

Plumbing

- Plumbing work will be re-coordination of existing roof drain piping with the proposed machine relocations for all options

[redacted]



GENERAL NOTES: (M2) (E1) (E3) (P2)

E1. LIGHTING LAYOUT WOULD BE AFFECTED BOTH ABOVE AND BELOW MEZZANINE STRUCTURE.

E2. POWER CONNECTIONS TO EDS MACHINES WILL BE AFFECTED.

E3. OVERALL POWER REQUIREMENTS WOULD LIKELY INCREASE.

M1. DUCTWORK WILL NEED TO BE EXTENDED TO HIGH SPEED EQUIPMENT

M2. FAN AND DUCTWORK SIZE WILL BE AFFECTED DEPENDING ON EQUIPMENT COOLING LOAD.

P1. CONDENSATE DRAINAGE ROUTING WILL BE AFFECTED.

P2. CONDENSATE DRAINAGE LINE SIZE COULD BE AFFECTED.

FP1. PROPOSED SPRINKLER BRANCHLINES UNDER MEZZANINE ARE IN CONFLICT WITH REVISED MEZZANINE STRUCTURE.

REDESIGN SPRINKLER BRANCHLINES UNDER MEZZANINE TO COORDINATE WITH REVISED.

Figure 23.0 - Mechanical, Electrical, Plumbing & Fire Protection Comments

Fire Protection

- The sprinkler distribution below the mezzanine structure will need to be coordinated with the addition of structural openings for options 1 and 2
- Sprinkler distribution can be redesigned to address machine locations in option 3 XLB only design as there are fewer structural openings.
- Sprinkler head locations above the mezzanine will be coordinated with the high-speed machine and associated exhaust ductwork locations for options 1 and 2
- New sprinkler layout will be developed for option 3 as fewer machines will be installed.

Fire Alarm

- The smoke detector locations below the mezzanine structure will need to be coordinated with the addition of structural openings for options 1 and 2.
- Smoke detector distribution can be redesigned to address machine locations in option 3 XLB Only design as there are fewer structural openings.
- Smoke detector head locations above the mezzanine will be coordinated with the high-speed machine and associated exhaust ductwork locations for options 1 and 2.
- New smoke detector layout will be developed for option 3 as fewer machines will be installed.

[redacted]

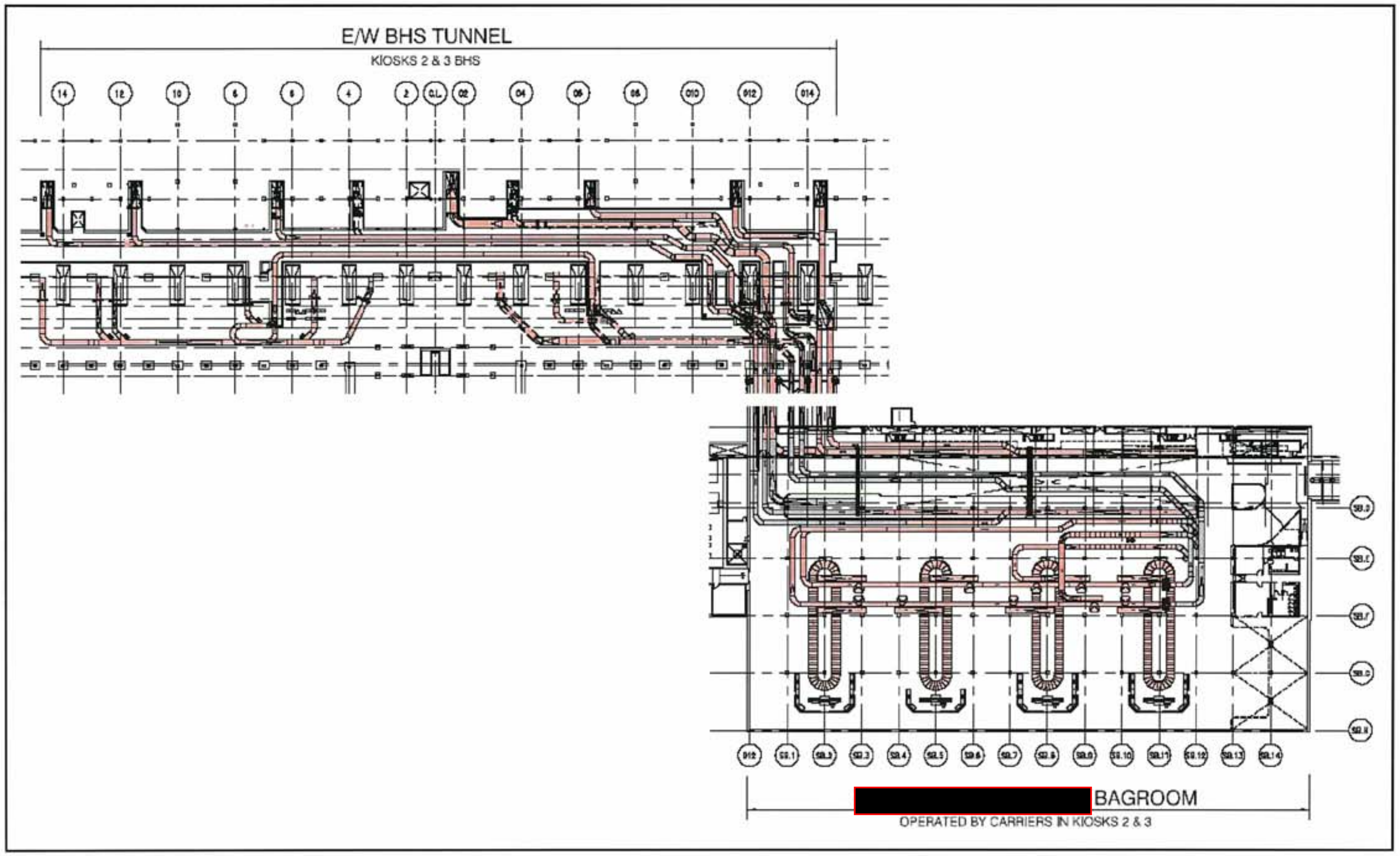


Figure 24.0 [redacted] Basement BHS layout plans

Baggage Handling Services

The basis of this document is to give a synopsis of the study that was performed by the design team to compare the [redacted] In-Line EDS design, to the recent developments that have taken place, since the design documents were issued for procurement (IFP) on June 26, 2007; developments, which have (or will have) an effect on what was originally considered for the [redacted] re-design effort.

Executive Summary

The [redacted] In-Line EDS layout, which was brought up to 100% detail design level under the Authority's Main Terminal Security Alterations Program in late 2005, recently went through a re-design effort (earlier this year) to include the following additions and changes, which are described in detail in the following paragraphs of this document:

- Updated EDS machine manufacturer equipment, such as the new 1-Meter Wide Entrance Tunnel System.
- The exclusion of the proposed Directional Input Device (DID), which was considered in the last design submittal due to the unavailability of the current L3 1-Meter-Wide Entrance Tunnel System.
- The addition of a new Automatic Tag Reader (ATR), with associated conveyor feeds back to the ETD area, for EDS faulted baggage that need to automatically re-circulate.
- Additional system demonstrations for the TSA have mandated certification testing, which basically increased the estimated construction schedule as it relates to the commissioning of the BHS and CBIS.
    - The 2005 [redacted] In-Line EDS design and above referenced revisions was based on a list of design objectives and attributes that were established during the 2002 – 2005 design periods, which per recent changes to TSA requirements for In-Line EDS, indicate that the June 26, 2007 IFP submittal will need to be re-evaluated for revisions. The following is an outline of the latest TSA CBIS

[redacted]

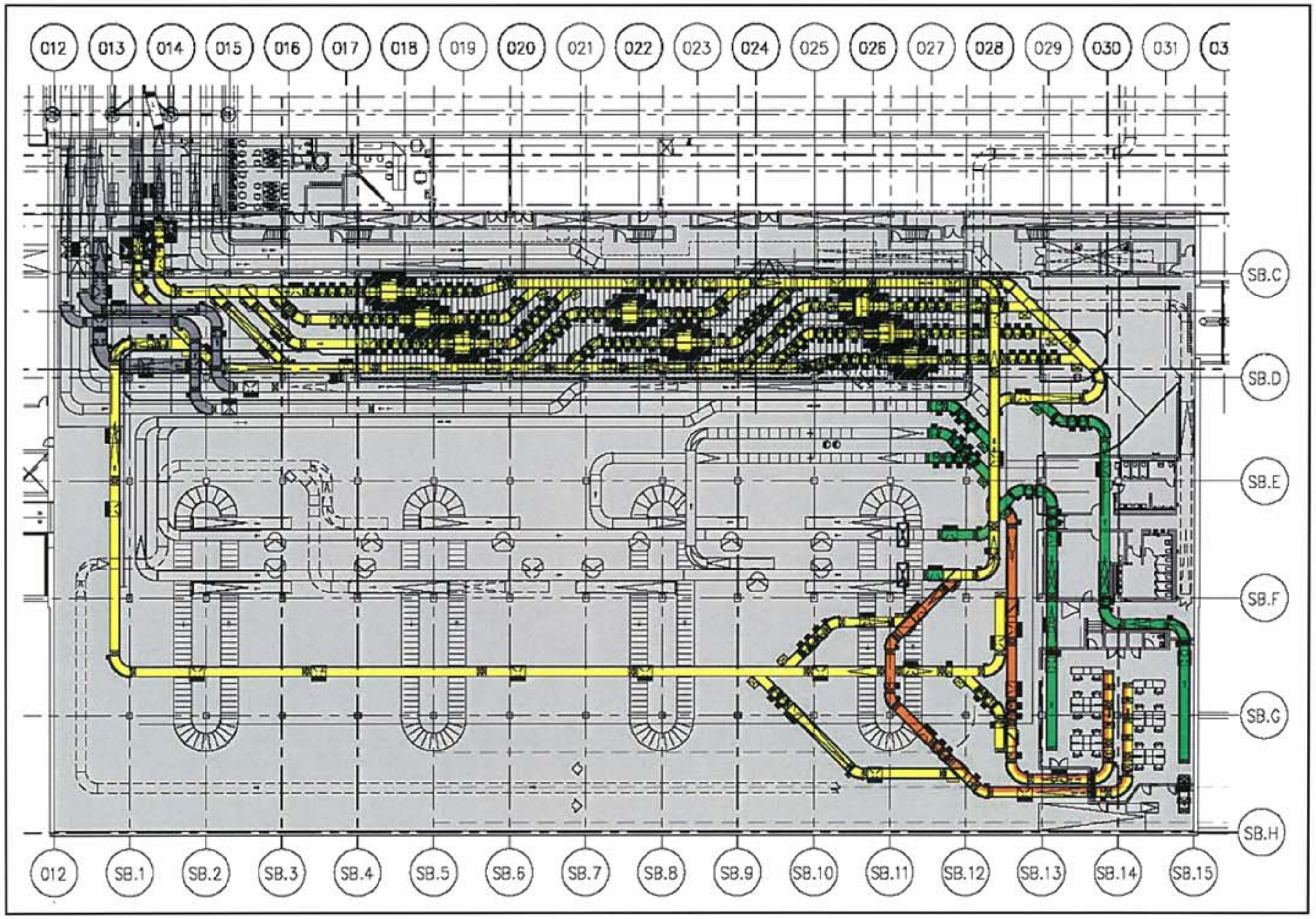


Figure 25.0 - [redacted] Basement BHS layout plans

* Performance Design Standards that influence the [redacted] In-Line EDS design, as illustrated in the IFP submittal:

- The addition of new conveyor lines to segregate Level 1 EDS screened "Cleared Bags" and "Non-Cleared Bags".
- The addition of new conveyor lines to provide EDS "Out-of-Gauge" by-pass capability. EDS Out-of Gauge bags are bags that can be accommodated by the BHS conveyor equipment, but exceed the EDS machine's scanner gantry limits and therefore would be automatically directed to the Threat Resolution Room (ETD area), instead of processed through the existing Kiosk 3 oversize line as it was intended by the 2005 SBB In-line EDS design.
- BHS and CBIS design to be optimized for the current EDS Technology (e.g., roughly 500 bags per hour / EDS machine), without constraining maximum potential capacity of the EDS equipment (assumed to be 600 bags per hour / EDS machine).
- The BHS and CBIS design to be able to accept and be optimized for upgrades or replacement with future "High-Volume" EDS machines (e.g., also referred to as Type 1 machines by the TSA) with minimal re-engineering or modifications to previously installed CBIS or current design considerations. Additionally, the design of the system shall not constrain the maximum potential capacity of the future "High-Volume" EDS machines.

* With respect to the future "High-Volume" EDS machines (item 4 above), at the Authority's request, the design team studied the feasibility of accommodating the referenced requirement within the existing SBB footprint and consistent with the proposed In-Line EDS design as it was presented in the June 26, 2007 IFP submittal. The results of the study indicated that the future "High-Volume" EDS machines can be accommodated within the same envelope as that proposed in the IFP, based on the following optional scenarios, which would be dependent on the approach that the final procurement package will proceed with as well as

[redacted]

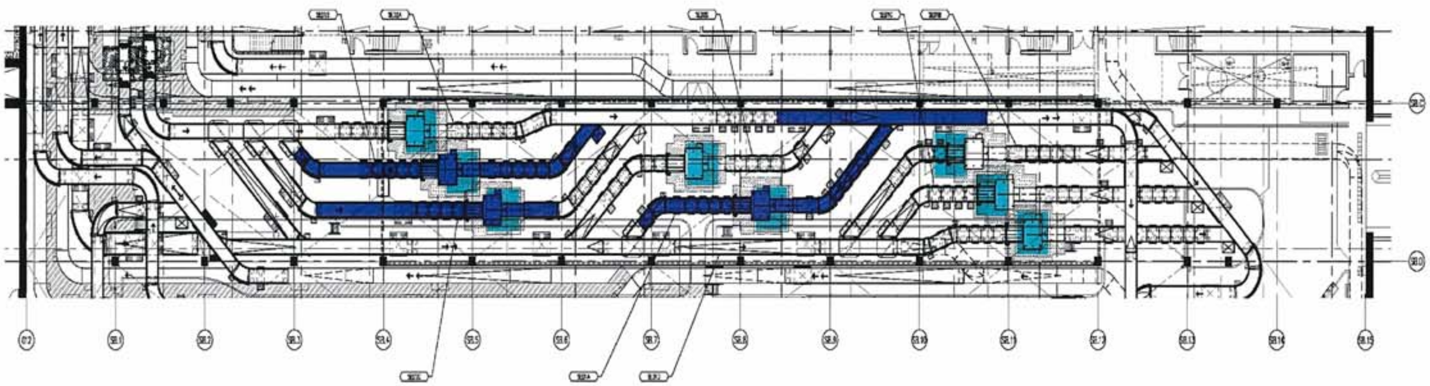


Figure26- BHS layout Plans for Options 1 (Friendly)

BNP Drawing Reference Nos[redacted]_High Speed_Option 1_2

* the EDS equipment type that would be selected. The Design Team's study for the "High-Volume" EDS machines was based on the type that is currently being considered by the TSA for future certification, such as the Analogic Extra Large Bore 1100, referred to as the XLB1100, that claims to be able to scan up to 1100 bags per hour per machine.
* The optional scenarios that were studied to incorporate the Type 1 machines to the SBB In-Line EDS design are as follows:

- Option 1 (ref. drawing [redacted] Option 1_2) –Revise the current IFP layout, which considers the installation of L3-6000 series EDS machines, to be Type 1 (High-Volume EDS) friendly. This option assumes that the SBB In-Line EDS design will proceed with the installation of L3-6000 series EDS machines, but the overall CBIS layout will be designed in a way that would allow the future implementation of the Type 1 machines with minimal re-engineering and modifications. This option requires minor revisions to the current IFP documents to include the necessary changes. The BHS changes to the IFP submission should not influence the June 26, 2007 estimated cost and construction schedule submittal.

[redacted]

KSI - Hi-Speed Study - Option 1

[redacted]

ROM ESTIMATE SUMMARY

Item		Labor		Material		Equip / Sub	Sub OH & Fee		Total
DIV 01 - GENERAL REQUIREMENTS		0		0		0	0		0
DIV 02 - SITE CONSTRUCTION		0		0		0	0		0
DIV 03 - CONCRETE		0		0		0	0		0
DIV 04 - MASONRY		0		0		0	0		0
DIV 05 - METALS		15,884		45,218		4,131	13,699		78,932
DIV 06 - WOOD & PLASTICS		0		0		0	0		0
DIV 07 -THERMAL & MOISTURE PROT.		0		0		0	0		0
DIV 08 - DOORS & WINDOWS		0		0		0	0		0
DIV 09 - FINISHES		0		0		0	0		0
DIV 10 - SPECIALTIES		0		0		0	0		0
DIV 11 - EQUIPMENT		0		0		0	0		0
DIV 12 - FURNISHINGS		0		0		0	0		0
DIV 13 - SPECIAL CONSTRUCTION		0		0		0	0		0
DIV 14 - CONVEYING SYSTEMS		0		0		0	0		0
DIV 15 - MECHANICAL		0		0		5,200	1,092		6,292
DIV 16 - ELECTRICAL		1,760		2,000		0	790		4,550
Subtotal		**17,644**		**47,218**		**9,331**	**15,581**		**89,774**
Sales Tax			5%	**2361**					**2,361**
Shift Work Premium	10%	**1764**							**1,764**
Subtotal		**19,408**		**49,579**		**9,331**	**15,581**		**93,899**
Sub P&P Bonds								0.0%	**0**
Subtotal									**93,899**
General Conditions								10%	**9,390**
Subtotal									**103,289**
Prime Contractor's Insurance								1.25%	**1,291**
Subtotal									**104,580**
Prime Contractor's OH & Fee								10%	**10,458**
Subtotal									**115,038**
Contingency								20%	**23,008**
Subtotal									**138,045**
Authority Provided Equipment Total									**0**
TOTAL									**138,045**

Figure 27.0 - Hi Speed Study Option 1 - Cost Estimate - Summary

Assumptions and Clarifications

The following Assumptions and Clarifications are provided to convey the basis of the estimate and general approach taken by Kohnen-Starkey, Inc. in the preparation of this estimate. The detailed estimate backup provided for each area of the project shall serve as a reference for all scope of work (work activity, assumed quantity and level of quality) which has been taken into account in this estimate. Work not specifically indicated in this detailed backup should be considered Not Included (NIC).

1. This estimate is a "Rough Order of Magnitude" estimate.
2. Line items in the estimate that are not included as having subcontractor OH & Fee are unit prices, and the markups are included in the unit price.
3. A 20% design contingency has been included in the estimate.
4. Critical outage work will occur off hours between 10:00 PM and 6:00 AM.
5. A shift work premium has been included, as this work is assumed to be performed between the hours of 10:00 PM and 6:00 AM.
6. The material, equipment and labor cost in this estimate is subject to escalation.
7. The preferred option is assumed to be selected prior to the start of the EDS In-Line – [redacted] project. With this in mind, the mezzanine structural modifications in each option will be incorporated prior to fabrication of the mezzanine. Therefore, the work will be performed within the established EDS In-Line – [redacted]roject schedule.
8. The same assumption as identified in number eight (8) above would also apply to the MEP. Any re-route work would be identified prior to the start of construction, so it is not anticipated that there will be additional cost or schedule required. Additional MEP cost is related to additional scope above and beyond that accounted for in the EDS In-Line – [redacted] estimate.
9. BHS Option 1: There is no change from the Issued for Procurement submission of the EDS In-Line – [redacted].
10. BHS Option 2: The work in this option is considered additional scope that will occur sometime in the future after the implementation of the L3 based CBIS. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines. This additional work is expected to take approximately 60 weeks to perform.
11. BHS Option 3: This option is based on the Type 1 (HSS) units being installed initially as opposed to the L3-6000 series. The cost to perform this work is anticipated to be less expensive than the L3-6000 series, and is expected to take approximately 15 fewer weeks to install. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines.
12. The construction schedule for these options is not expected to change from that provided with the EDS In-Line - [redacted] Issue for Procurement (enclosed), with the exception of the noted increase or decrease related to each BHS option.
13. Consultant exercises no control over fluctuating market conditions. Consultant shall employ their best judgment in analyzing the subject project and assignments, however, Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from the opinions provided by Consultant from this or subsequent estimates.

[redacted]

KSI - Hi-Speed Study - Option 1

[redacted]

ROM Pricing

Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 01 - GENERAL REQUIREMENTS												21%	
With EDS In-Line - South (SBB)													
Subtotal Division 01					0		0		0		0	0	0
DIV 02 - SITE WORK													
With EDS In-Line - South (SBB)													
Subtotal Division 02					0		0		0		0	0	0
DIV 03 - CONCRETE													
With EDS In-Line - South (SBB)													
Subtotal Division 03					0		0		0		0	0	0
DIV 04 - MASONRY													
With EDS In-Line - South (SBB)													
Subtotal Division 04					0		0		0		0	0	0
DIV 05 - METALS													
Credit EDS In-Line - South (SBB) Openings	2.00 ea												
- Deduct opening steel	(10.57) tons	S	50.00	16.00	(169.12)	800.00	(8456.00)	2400.00	(25368.00)	300.00	(3171.00)	(7768.95)	(44764)
Add Option 1 Larger Openings	4.00 ea												
- Add larger opening steel	24.34 tons	S	50.00	20.00	486.80	1000.00	24340.00	2900.00	70586.00	300.00	7302.00	21467.88	123696
Subtotal Division 05					318		15,884		45,218		4,131	13,699	78,932
DIV 06 - WOOD & PLASTICS													
With EDS In-Line - South (SBB)													
Subtotal Division 06					0		0		0		0	0	0
DIV 07 - THERMAL & MOIST PROTECTION													
With EDS In-Line - South (SBB)													
Subtotal Division 07					0		0		0		0	0	0
DIV 08 - DOORS & WINDOWS													
With EDS In-Line - South (SBB)													
Subtotal Division 08					0		0		0		0	0	0
DIV 09 - FINISHES													
With EDS In-Line - South (SBB)													
Subtotal Division 09					0		0		0		0	0	0

Figure 28.0 - Hi Speed Study Option 1 - Cost Estimate - Details - Page 1

KSI - Hi-Speed Study - Option 1

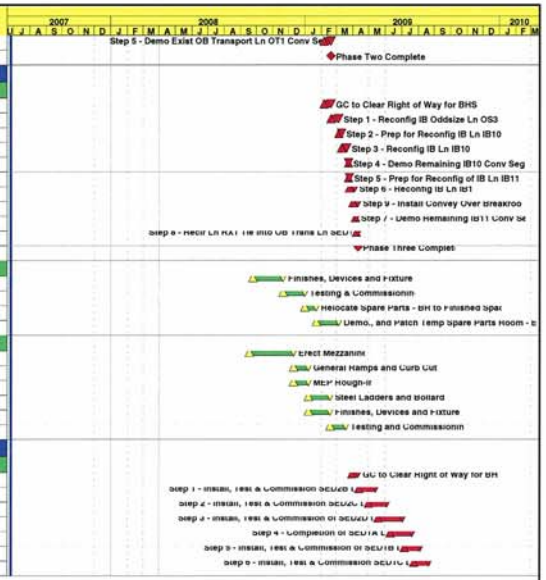
[redacted]

ROM Pricing

Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 10 - SPECIALTIES													
With EDS In-Line - South (SBB)													
Subtotal Division 10					0		0		0		0	0	0
DIV 11 - EQUIPMENT													
With EDS In-Line - South (SBB)													
Subtotal Division 11					0		0		0		0	0	0
DIV 12 - FURNISHINGS													
With EDS In-Line - South (SBB)													
Subtotal Division 12					0		0		0		0	0	0
DIV 13 - SPECIAL CONSTRUCTION													
With EDS In-Line - South (SBB)													
Subtotal Division 13					0		0		0		0	0	0
DIV 14 - CONVEYING SYSTEMS													
Type 1 "Friendly" L3 Layout (same as SBB)													
Subtotal Division 14					0		0		0		0	0	0
DIV 15 - MECHANICAL													
Plumbing													
- Re-Route condensate drainage (w/SBB)													
- Increase condensate drain line size	100 lf	P	$55.00		0	0	0		0	5.00	500	105	605
HVAC													
Increase fan and ductwork size													
- Extend ductwork to high speed equipment	400 lbs	P	$55.00		0	0	0		0	6.50	2600	546	3146
- Extend ductwork insulation	320 sf	P	$55.00		0	0	0		0	5.00	1600	336	1936
- Increase fan size	1 ls	P	$55.00		0	0	0		0	500.00	500	105	605
Fire Protection													
- Redesign layout under mezzanine (w/SBB)													
Subtotal Division 15					0		0		0		5,200	1,092	6,292
DIV 16 - ELECTRICAL													
- Modify lighting layout (w/SBB)													
- Modify power connections to EDS machines	4 ea	E	$55.00	8	32	440	1760	500.00	2000		0	790	4550
Subtotal Division 16					32		1,760		2,000		0	790	4,550
Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total

[redacted]

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
BHS2305	Step 5 - Demo Exist OB Transport	9	06FEB09	18FEB09
BHS2315	Phase Two Complete	0		18FEB09
Phase 3				
BHS Activity 4				
BHS3411	GC to Clear Right of Way for BHS	10	05FEB09	18FEB09
BHS3401	Step 1 - Reconfig IB Oddsize Ln	11	19FEB09	05MAR09
BHS3402	Step 2 - Prep for Reconfig IB Ln	2	06MAR09	09MAR09
BHS3403	Step 3 - Reconfig IB Ln IB10	9	10MAR09	20MAR09
BHS3404	Step 4 - Demo Remaining IB10	1	23MAR09	23MAR09
BHS3405	Step 5 - Prep for Reconfig of IB	2	24MAR09	25MAR09
BHS3406	Step 6 - Reconfig IB Ln IB11	7	26MAR09	03APR09
BHS3409	Step 9 - Install Convey Over	9	31MAR09	10APR09
BHS3407	Step 7 - Demo Remaining IB11	1	06APR09	06APR09
BHS3408	Step 8 - Recir Ln RX1 Tie Into OB	4	07APR09	10APR09
BHS3410	Phase Three Complete	0		10APR09
Spare Room, Storage, Break Room, Sewage, Sp Part				
SPR2004	Finishes, Devices and Fixtures	40	25SEP08	19NOV08
SPR2006	Testing & Commissioning	30	20NOV08	31DEC08
SPR2007	Relocate Spare Parts - BR to	15	01JAN09	21JAN09
SPR2008	Demo., and Patch Temp Spare	30	22JAN09	04MAR09
Mezzanine				
MEZZ1003	Erect Mezzanine	60	17SEP08	09DEC08
MEZZ2001	General Ramps and Curb Cuts	20	10DEC08	06JAN09
MEZZ2003	MEP Rough-In	20	10DEC08	06JAN09
MEZZ2002	Steel Ladders and Bollards	30	07JAN09	17FEB09
MEZZ3001	Finishes, Devices and Fixtures	30	07JAN09	17FEB09
MEZZ3002	Testing and Commissioning	20	18FEB09	17MAR09
Phase 4				
BHS Activity 5				
BHS4511	GC to Clear Right of Way for BHS	10	30MAR09	10APR09
BHS4501	Step 1 - Install, Test &	22	13APR09	12MAY09
BHS4502	Step 2 - Install, Test &	25	30APR09	03JUN09
BHS4503	Step 3 - Install, Test &	33	19MAY09	02JUL09
BHS4504	Step 4 - Completion of SED1A Ln	29	11JUN09	21JUL09
BHS4505	Step 5 - Install, Test &	21	07JUL09	04AUG09
BHS4506	Step 6 - Install, Test &	21	24JUL09	21AUG09



Start Date 26JUN07 · Finish Date 24FEB10 · Data Date 26JUN07 · Run Date 30JUL07 19:31

Early Bar · Progress Bar · Critical Activity

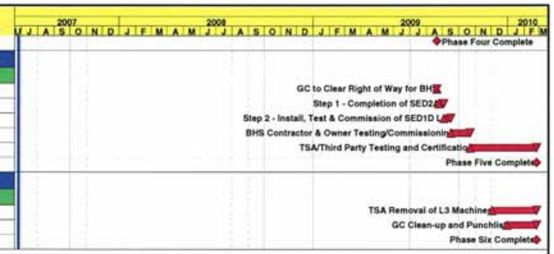
SBB1 · Sheet 3 of 4

SOM

Main Terminal EDS In-Line South(SBB)

Date	Revision	Checked	Approved
22JUN07	Version 1		
11JUL07	Version 2		

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
BHS4516	Phase Four Complete	0		21AUG09
Phase 5				
BHS Activity 6				
BHS5611	GC to Clear Right of Way for BHS	1	21AUG09	21AUG09
BHS5601	Step 1 - Completion of SED2A	9	24AUG09	03SEP09
BHS5602	Step 2 - Install, Test &	9	04SEP09	16SEP09
BHS5604	BHS Contractor & Owner	25	17SEP09	21OCT09
BHS5605	TSA/Third Party Testing and	90	22OCT09	24FEB10
BHS5603	Phase Five Complete	0		24FEB10
Phase 6				
FIN1031	TSA Removal of L3 Machines	60	03DEC09	24FEB10
FIN1041	GC Clean-up and Punchlist	40	31DEC09	24FEB10
FIN1021	Phase Six Complete	0		24FEB10



Start Date 26JUN07 · Finish Date 24FEB10 · Data Date 26JUN07 · Run Date 30JUL07 19:31

Early Bar · Progress Bar · Critical Activity

SBB1 · Sheet 4 of 4

SOM

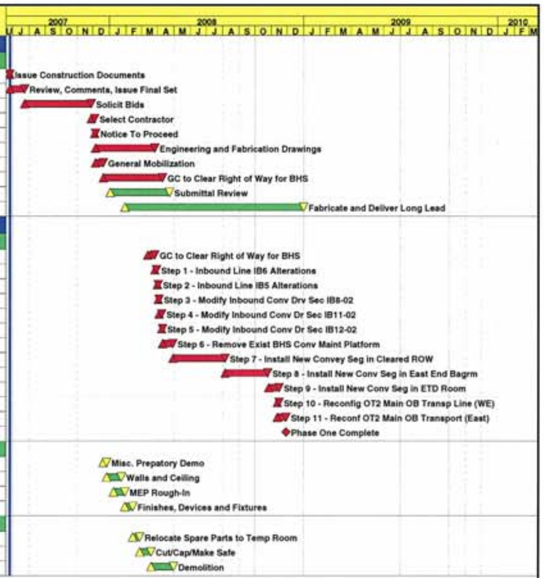
Main Terminal EDS In-Line South(SBB)

Date	Revision	Checked	Approved
22JUN07	Version 1		
11JUL07	Version 2		

Figure 29.0 - Construction Schedule - Current IFP Document schedule - Page 1

[redacted]

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
Pre-Construction				
PRECON000	Issue Construction Documents	1	26JUN07	26JUN07
PRECON020	Review, Comments, Issue Final	20	27JUN07	24JUL07
PRECON010	Solicit Bids	90	25JUL07	27NOV07
PRECON030	Select Contractor	5	28NOV07	04DEC07
PRECON040	Notice To Proceed	1	05DEC07	05DEC07
PRECON050	Engineering and Fabrication	80	06DEC07	26MAR08
PRECON060	General Mobilization	10	06DEC07	19DEC07
PRECON061	GC to Clear Right of Way for BHS	80	20DEC07	09APR08
PRECON051	Submittal Review	80	03JAN08	23APR08
PRECON070	Fabricate and Deliver Long Lead	240	31JAN08	31DEC08
Phase 1				
BHS Activity 1				
BHS1111	GC to Clear Right of Way for BHS	10	13MAR08	26MAR08
BHS1101	Step 1 - Inbound Line IB6	2	27MAR08	28MAR08
BHS1102	Step 2 - Inbound Line IB5	2	31MAR08	01APR08
BHS1103	Step 3 - Modify Inbound Conv Drv	2	02APR08	03APR08
BHS1104	Step 4 - Modify Inbound Conv Dr	2	04APR08	07APR08
BHS1105	Step 5 - Modify Inbound Conv Dr	2	08APR08	09APR08
BHS1106	Step 6 - Remove Exist BHS Conv	14	10APR08	29APR08
BHS1107	Step 7 - Install New Convey Seg	70	30APR08	05AUG08
BHS1108	Step 8 - Install New Conv Seg in	58	06AUG08	24OCT08
BHS1109	Step 9 - Install New Conv Seg in	15	27OCT08	14NOV08
BHS1201	Step 10 - Reconfig OT2 Main OB	3	12NOV08	14NOV08
BHS1202	Step 11 - Reconf OT2 Main OB	13	12NOV08	28NOV08
BHS1212	Phase One Complete	0		28NOV08
Temporary Spare Parts				
TEMP1001	Misc. Prepatory Demo	5	20DEC07	26DEC07
TEMP1002	Walls and Ceiling	20	27DEC07	23JAN08
TEMP1003	MEP Rough-In	15	10JAN08	30JAN08
TEMP1004	Finishes, Devices and Fixtures	10	31JAN08	13FEB08
Spare Room, Storage, Break Room, Sewage, Sp Part				
SPR1001	Relocate Spare Parts to Temp	10	14FEB08	27FEB08
SPR1002	Cut/Cap/Make Safe	15	28FEB08	19MAR08
SPR1003	Demolition	30	20MAR08	30APR08



Start Date 26JUN07
Finish Date 24FEB10
Data Date 26JUN07
Run Date 30JUL07 19:31

Early Bar
Progress Bar
Critical Activity

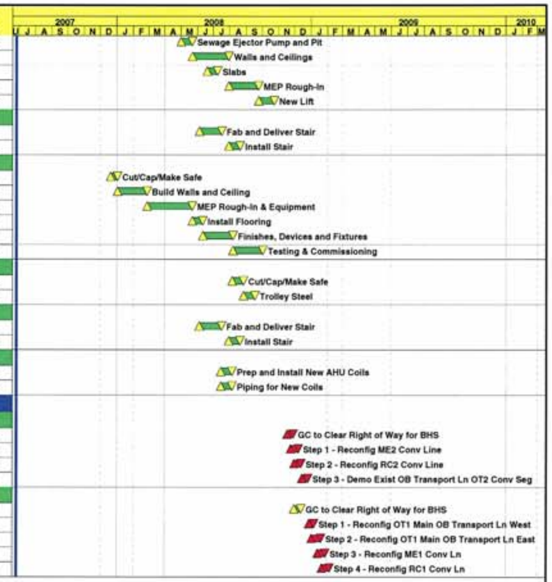
SBB1

Sheet 1 of 4

SOM

Main Terminal EDS In-Line South(SBB)

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
SPR1005	Sewage Ejector Pump and Pit	15	01MAY08	21MAY08
SPR1004	Walls and Ceilings	50	22MAY08	30JUL08
SPR1006	Slabs	15	19JUN08	09JUL08
SPR2001	MEP Rough-In	40	31JUL08	24SEP08
SPR2005	New Lift	20	25SEP08	22OCT08
Stair G				
STAIR1001	Fab and Deliver Stair	30	05JUN08	16JUL08
STAIR1002	Install Stair	15	31JUL08	20AUG08
ETD Room				
ETD1001	Cut/Cap/Make Safe	10	20DEC07	02JAN08
ETD1002	Build Walls and Ceiling	40	03JAN08	27FEB08
ETD1003	MEP Rough-In & Equipment	60	28FEB08	21MAY08
ETD1004	Install Flooring	15	22MAY08	11JUN08
ETD2001	Finishes, Devices and Fixtures	40	12JUN08	06AUG08
ETD3001	Testing & Commissioning	40	07AUG08	01OCT08
Mezzanine				
MEZZ1001	Cut/Cap/Make Safe	15	06AUG08	26AUG08
MEZZ1002	Trolley Steel	15	27AUG08	16SEP08
Stair F				
STAIR1003	Fab and Deliver Stair	30	05JUN08	16JUL08
STAIR1004	Install Stair	15	31JUL08	20AUG08
AHU Modifications				
SPR2002	Prep and Install New AHU Coils	15	16JUL08	05AUG08
SPR2003	Piping for New Coils	15	16JUL08	05AUG08
Phase 2				
BHS Activity 2				
BHS2211	GC to Clear Right of Way for BHS	10	17NOV08	28NOV08
BHS2201	Step 1 - Reconfig ME2 Conv Line	11	24NOV08	08DEC08
BHS2202	Step 2 - Reconfig RC2 Conv Line	10	01DEC08	12DEC08
BHS2203	Step 3 - Demo Exist OB Transport	10	15DEC08	26DEC08
BHS Activity 3				
BHS2311	GC to Clear Right of Way for BHS	10	01DEC08	12DEC08
BHS2301	Step 1 - Reconfig OT1 Main OB	7	29DEC08	06JAN09
BHS2302	Step 2 - Reconfig OT1 Main OB	12	02JAN09	19JAN09
BHS2303	Step 3 - Reconfig ME1 Conv Ln	12	13JAN09	28JAN09
BHS2304	Step 4 - Reconfig RC1 Conv Ln	11	22JAN09	05FEB09



Start Date 26JUN07
Finish Date 24FEB10
Data Date 26JUN07
Run Date 30JUL07 19:31

Early Bar
Progress Bar
Critical Activity

SBB1

Sheet 2 of 4

SOM

Main Terminal EDS In-Line South(SBB)

Figure 30.0 - Construction Schedule - Current IFP Document schedule - page 3

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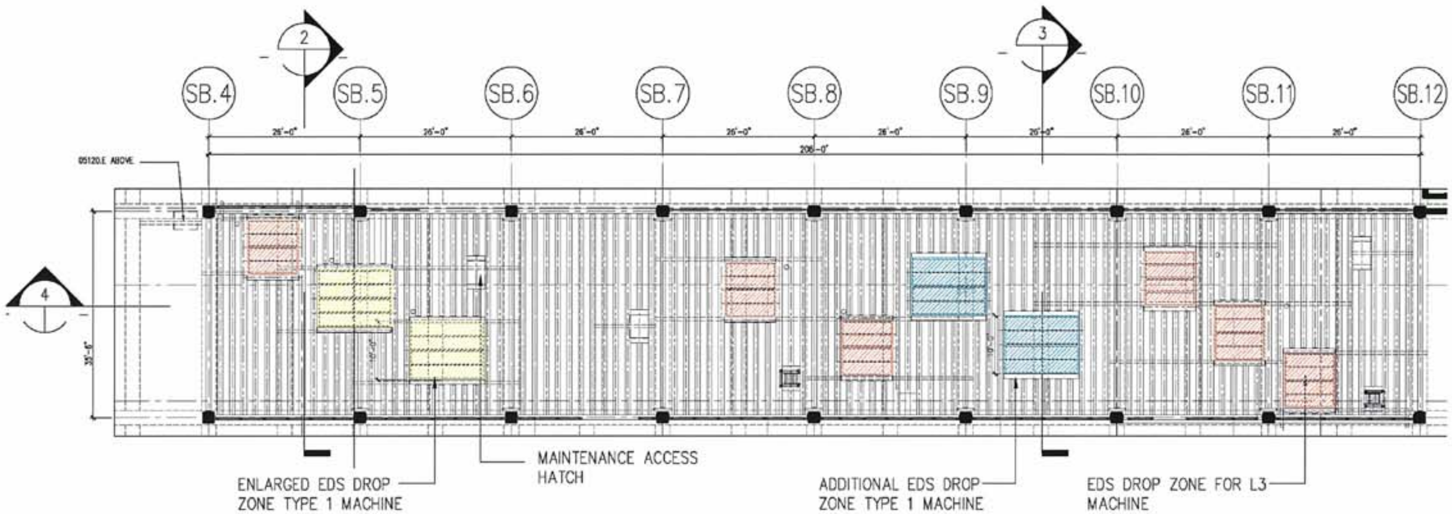


LEGEND

- CURRENT DESIGN (ORGINAL) OPENING SIZE - 8'-0" x 10'-4"
- ENLARGED OPENING SIZE - 12'-0" x 14'-0"
- ADDITIONAL OPENINGS FOR FUTURE XLB - SIZE - 12'-0" x 14'-

Figure31.0 - Mezzanine Level Design - Option #2

Option 2 (Type 1 option phase-in)

This option examined the phased-in implementation requirements for the new Type 1 EDS machine, configuration.

It assumes TSA to pass the recommendation to implement new Type 1 machines to a built environment.

This option determines the additional scope that would be required in the future, assuming Option 1 was already in place.

While the design recommendation is similar to Option 1, they differ in execution.

Summary:

- Assumes Option 1 is complete with 8 L3 machines installed.
- Phased in implementation of Type 1 (High-Volume EDS)
- Minimum impact on operation
- Minimum revision on current IFP design drawings
- Depending on current scope change total impact on construction schedule and cost estimate.

Architectural Section

Same as Option 1. Please refer to Page 20.

Structural Design

Same as Option 1. Refer to Page 21.

Mechanical, Electrical, Plumbing & Fire Protection Design

Same as Option 1. Refer to Pages 22 & 23

[redacted]

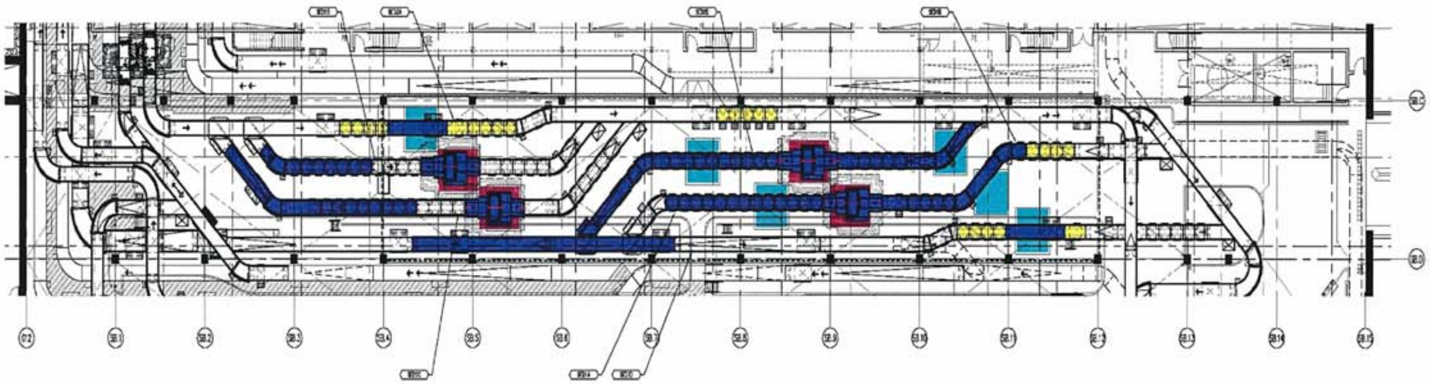


Figure 32- BHS layout Plans for Option 2

[redacted]

- Option 2 (ref. drawing [redacted] Option 1_2) – This option examined the phased-in implementation requirements for the Type 1, configuration to determine the additional scope that would be required in the future, assuming Option 1 was already in place.

[redacted]

ROM ESTIMATE SUMMARY

KSI - Hi-Speed Study - Option 2

[redacted]

Item		Labor		Material		Equip / Sub	Sub OH & Fee		Total
DIV 01 - GENERAL REQUIREMENTS		0		0		0	0		0
DIV 02 - SITE CONSTRUCTION		0		0		0	0		0
DIV 03 - CONCRETE		0		0		0	0		0
DIV 04 - MASONRY		0		0		0	0		0
DIV 05 - METALS		15,884		45,218		4,131	13,699		78,932
DIV 06 - WOOD & PLASTICS		0		0		0	0		0
DIV 07 -THERMAL & MOISTURE PROT.		0		0		0	0		0
DIV 08 - DOORS & WINDOWS		0		0		0	0		0
DIV 09 - FINISHES		0		0		0	0		0
DIV 10 - SPECIALTIES		0		0		0	0		0
DIV 11 - EQUIPMENT		0		0		0	0		0
DIV 12 - FURNISHINGS		0		0		0	0		0
DIV 13 - SPECIAL CONSTRUCTION		0		0		0	0		0
DIV 14 - CONVEYING SYSTEMS		0		0		3,080,000	0		3,080,000
DIV 15 - MECHANICAL		0		0		5,200	1,092		6,292
DIV 16 - ELECTRICAL		1,760		2,000		100,000	21,790		125,550
Subtotal		**17,644**		**47,218**		**3,189,331**	**36,581**		**3,290,774**
Sales Tax			5%	**2361**					**2,361**
Shift Work Premium	10%	**1764**							**1,764**
Subtotal		**19,408**		**49,579**		**3,189,331**	**36,581**		**3,294,899**
Sub P&P Bonds								0.0%	**0**
Subtotal									**3,294,899**
General Conditions								10%	**329,490**
Subtotal									**3,624,389**
Prime Contractor's Insurance								1.25%	**45,305**
Subtotal									**3,669,694**
Prime Contractor's OH & Fee								10%	**366,969**
Subtotal									**4,036,663**
Contingency								20%	**807,333**
Subtotal									**4,843,996**
Authority Provided Equipment Total									**0**
TOTAL									**4,843,996**

Figure 33.0 - Hi-Speed Study Option 2 - Cost Estimate Summary

Assumptions and Clarifications

The following Assumptions and Clarifications are provided to convey the basis of the estimate and general approach taken by Kohnen-Starkey, Inc. in the preparation of this estimate. The detailed estimate backup provided for each area of the project shall serve as a reference for all scope of work (work activity, assumed quantity and level of quality) which has been taken into account in this estimate. Work not specifically indicated in this detailed backup should be considered Not Included (NIC).

1. This estimate is a "Rough Order of Magnitude" estimate.
2. Line items in the estimate that are not included as having subcontractor OH & Fee are unit prices, and the markups are included in the unit price.
3. A 20% design contingency has been included in the estimate.
4. Critical outage work will occur off hours between 10:00 PM and 6:00 AM.
5. A shift work premium has been included, as this work is assumed to be performed between the hours of 10:00 PM and 6:00 AM.
6. The material, equipment and labor cost in this estimate is subject to escalation.
7. The preferred option is assumed to be selected prior to the start of the EDS In-Line – South (SBB) project. With this in mind, the mezzanine structural modifications in each option will be incorporated prior to fabrication of the mezzanine. Therefore, the work will be performed within the established EDS In-Line – [redacted]roject schedule.
8. The same assumption as identified in number eight (8) above would also apply to the MEP. Any re-route work would be identified prior to the start of construction, so it is not anticipated that there will be additional cost or schedule required. Additional MEP cost is related to additional scope above and beyond that accounted for in the EDS In-Line – [redacted] estimate.
9. BHS Option 1: There is no change from the Issued for Procurement submission of the EDS In-Line – [redacted].
10. BHS Option 2: The work in this option is considered additional scope that will occur sometime in the future after the implementation of the L3 based CBIS. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines. This additional work is expected to take approximately 60 weeks to perform.
11. BHS Option 3: This option is based on the Type 1 (HSS) units being installed initially as opposed to the L3-6000 series. The cost to perform this work is anticipated to be less expensive than the L3-6000 series, and is expected to take approximately 15 fewer weeks to install. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines.
12. The construction schedule for these options is not expected to change from that provided with the EDS In-Line - [redacted]) Issue for Procurement (enclosed), with the exception of the noted increase or decrease related to each BHS option.
13. Consultant exercises no control over fluctuating market conditions. Consultant shall employ their best judgment in analyzing the subject project and assignments, however, Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from the opinions provided by Consultant from this or subsequent estimates.

[redacted]

KSI - Hi-Speed Study - Option 2

[redacted]

ROM Pricing

Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 01 - GENERAL REQUIREMENTS												21%	
With EDS In-Line - South (SBB)													
Subtotal Division 01					0		0		0		0	0	0
DIV 02 - SITE WORK													
With EDS In-Line - South (SBB)													
Subtotal Division 02					0		0		0		0	0	0
DIV 03 - CONCRETE													
With EDS In-Line - South (SBB)													
Subtotal Division 03					0		0		0		0	0	0
DIV 04 - MASONRY													
With EDS In-Line - South (SBB)													
Subtotal Division 04					0		0		0		0	0	0
DIV 05 - METALS													
Credit EDS In-Line - South (SBB) Openings	2.00 ea												
- Deduct opening steel	(10.57) tons	S	50.00	16.00	(169.12)	800.00	(8456.00)	2400.00	(25368.00)	300.00	(3171.00)	(7768.95)	(44764)
Add Option 2 Larger Openings	4.00 ea												
- Add larger opening steel	24.34 tons	S	50.00	20.00	486.80	1000.00	24340.00	2900.00	70586.00	300.00	7302.00	21467.88	123696
Subtotal Division 05					318		15,884		45,218		4,131	13,699	78,932
DIV 06 - WOOD & PLASTICS													
With EDS In-Line - South (SBB)													
Subtotal Division 06					0		0		0		0	0	0
DIV 07 - THERMAL & MOIST PROTECTION													
With EDS In-Line - South (SBB)													
Subtotal Division 07					0		0		0		0	0	0
DIV 08 - DOORS & WINDOWS													
With EDS In-Line - South (SBB)													
Subtotal Division 08					0		0		0		0	0	0
DIV 09 - FINISHES													
With EDS In-Line - South (SBB)													
Subtotal Division 09					0		0		0		0	0	0

KSI - Hi-Speed Study - Option 2

[redacted]

ROM Pricing

Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 10 - SPECIALTIES													
With EDS In-Line - South (SBB)													
Subtotal Division 10					0		0		0		0	0	0
DIV 11 - EQUIPMENT													
With EDS In-Line - South (SBB)													
Subtotal Division 11					0		0		0		0	0	0
DIV 12 - FURNISHINGS													
With EDS In-Line - South (SBB)													
Subtotal Division 12					0		0		0		0	0	0
DIV 13 - SPECIAL CONSTRUCTION													
With EDS In-Line - South (SBB)													
Subtotal Division 13					0		0		0		0	0	0
DIV 14 - CONVEYING SYSTEMS													
Type 1 phased in implementation	1 ls		$0.00		0	0	0		0	2800000.00	2800000	0	2800000
- Interface contingency between BHS & new	1 ls		$0.00		0	0	0		0	280000.00	280000	0	280000
High Speed Throughput machines (10% of base)													
Subtotal Division 14					0		0		0		3,080,000	0	3,080,000
DIV 15 - MECHANCIAL													
Plumbing													
- Re-Route condensate drainage (w/SBB)													
- Increase condensate drain line size	100 lf	P	$55.00		0	0	0		0	5.00	500	105	605
HVAC													
Increase fan and ductwork size													
- Extend ductwork to high speed equipment	400 lbs	P	$55.00		0	0	0		0	6.50	2600	546	3146
- Extend ductwork insulation	320 sf	P	$55.00		0	0	0		0	5.00	1600	336	1936
- Increase fan size	1 ls	P	$55.00		0	0	0		0	500.00	500	105	605
Fire Protection													
- Redesign layout under mezzanine (w/SBB)													
Subtotal Division 15					0		0		0		5,200	1,092	6,292
DIV 16 - ELECTRICAL													
- Modify lighting layout (w/SBB)													
- Modify power connections to EDS machines	4 ea	E	$55.00	8	32	440	1760	500.00	2000		0	790	4550
- Overall power requirement increase (10%)	1 ls	E	$55.00		0	0	0		0	100000.00	100000	21000	121000
Subtotal Division 16					32		1,760		2,000		100,000	21,790	125,550
Item	Quantity	Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total

Figure 34.0 - Hi-Speed study Option 2 - Cost Estimates - Details

[redacted]

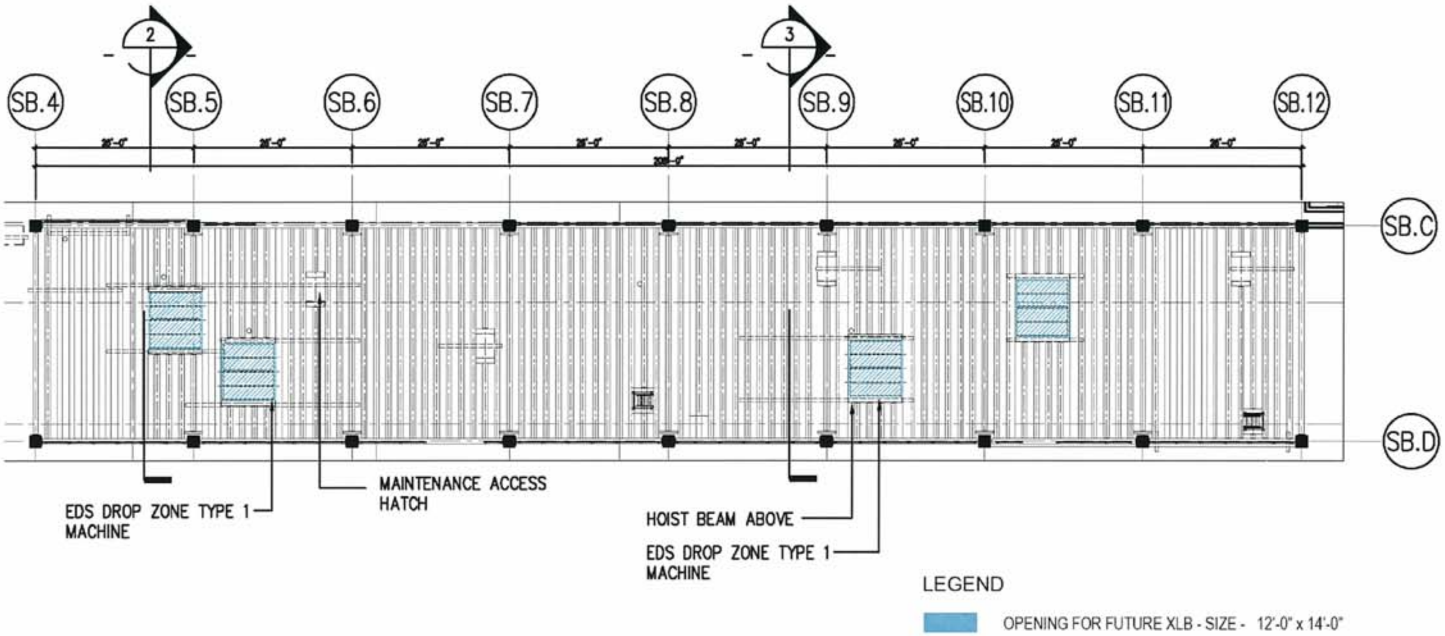


Figure 35.0 - Mezzanine Level Design - Option 3

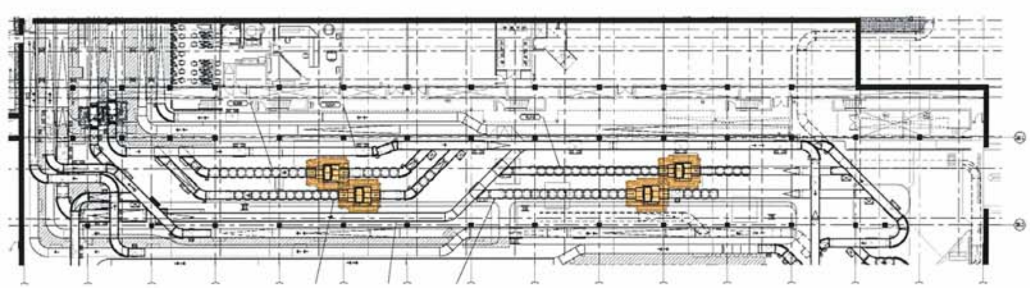


Figure 35a.0 - Mezzanine Level Design - Option #3 - with BHS layout

Option 3 (Complete re-design)

This option is based on the initial installation of the 4 Type 1 EDS machines, as opposed to the 8 L3-6000 series (i.e., above referenced Option 1).

Summary

Installation of the 4 Type 1 (High-Volume EDS) only.

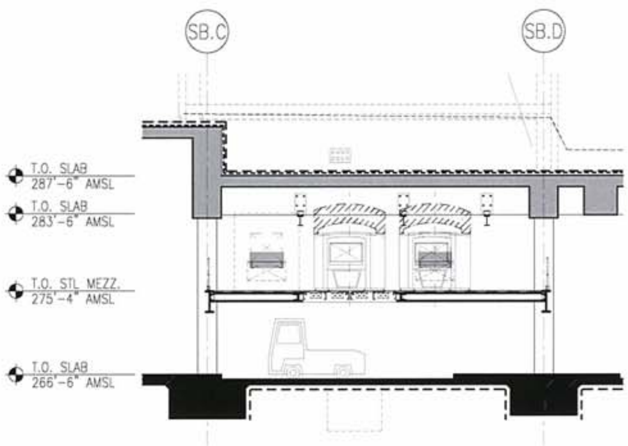
Install 4 openings in the mezzanine level instead of 10 openings as shown in Options 1 & 2

It will require total redesign of the Baggage Handling System

Total impact on construction schedule and cost estimates.

- The current design for the In-Line EDS at the [redacted] (issued 06/26/07) utilizes an elevated steel-framed mezzanine platform.
- Each of the 8 machines in the current design requires an opening through the platform for access.
- For Option 1 and 2 the In-Line EDS design that utilizes the hi-speed, type 1 machines requires 4 larger openings. To adapt the current design to accommodate the potential implementation of the Type 1 machines, the machines were laid out such that 2 of the openings were coincident with the current locations, and 2 new openings were added.
- Option 3 would require only 4 openings
- At this date, there is only 1 supplier of the Type 1 machines; however, to accommodate potential future suppliers, we provided the maximum access openings possible without increasing the depth of the platform structure.

[redacted]



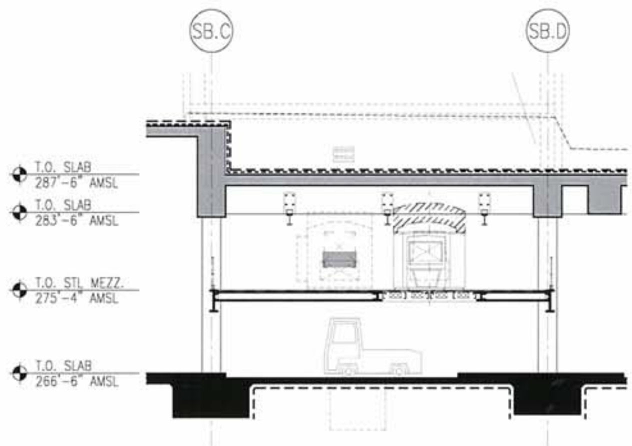


Figure36.0 - Sections thru mezzanine level

High speed Friendly Options Section and details

- There is sufficient headroom to install the future Type 1 (High-Volume EDS) machine and these machines have no impact on the mezzanine elevations. See Figure 15. This design is in keeping the tug traffic below as the original concept
- This structural opening system allows for minimal re-engineering and modifications to implement Type 1 (High-Volume EDS) See structural plans and Figures.
- Current Design or IFP documents are based on the 6500 D L3 machines shown in Figure 36a.0
- The Future design of the High speed studies is based on accommodating Type 1 High Volume EDS machines which is the XLB 1100 shown on Figure 36b.0

Figure36a.0 - 6500 D L3 machine

Figure36b.0 - Type 1 - XLB 1100 machine

[redacted]

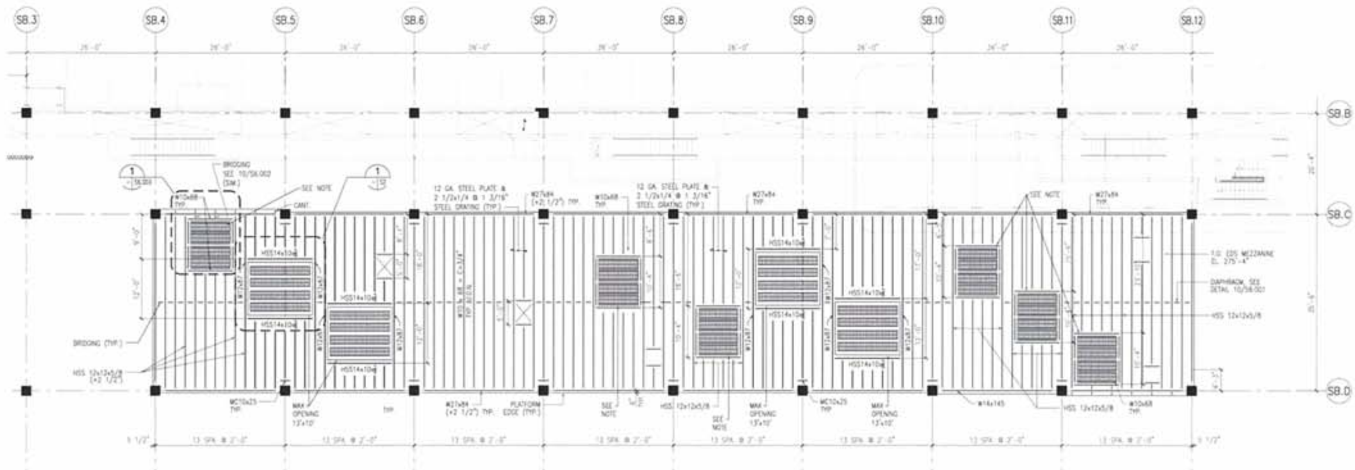


Figure37.0-Structural Mezzanine level Plan

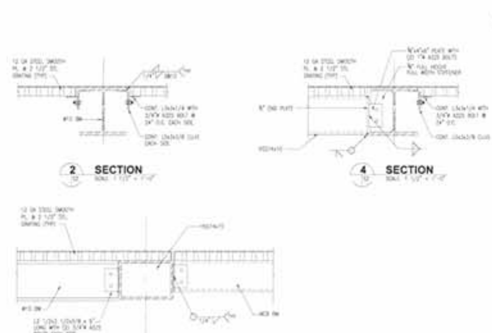


Figure37a.0 - Structural sections

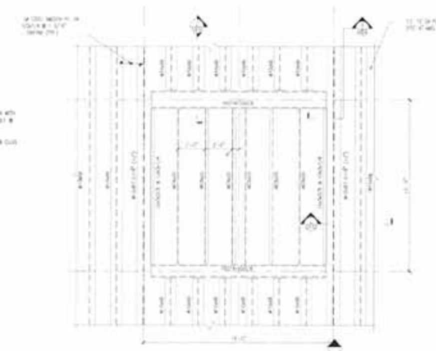


Figure 37b.0 - Typical drop down panel Detail

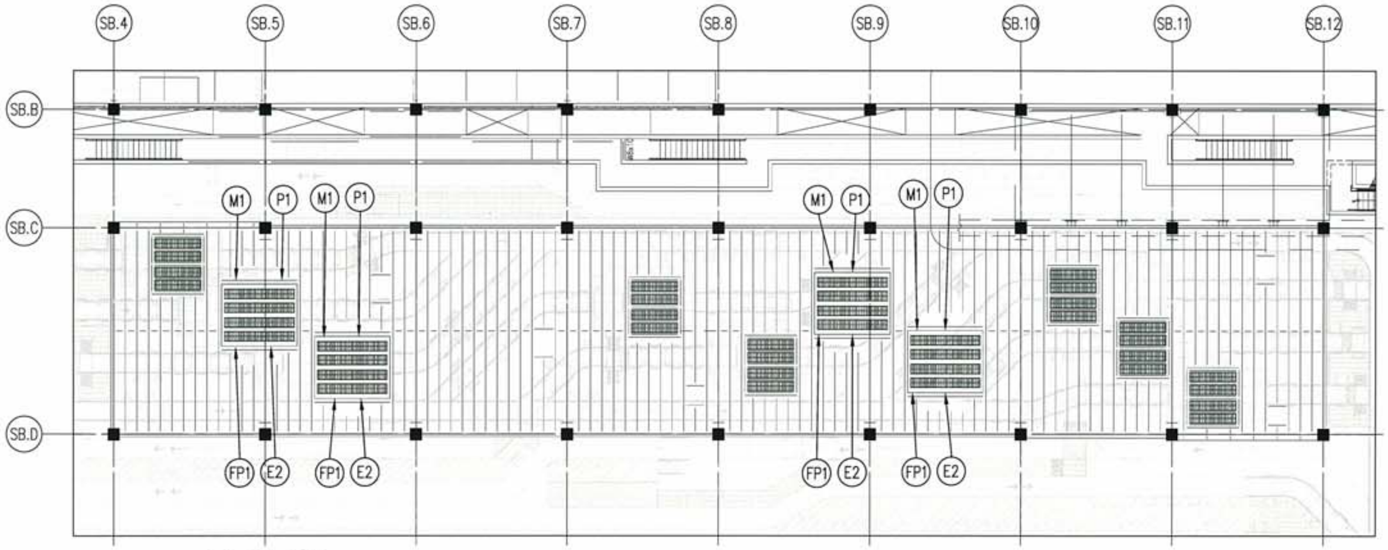
Structural Design

Summary & Brief overview (All options)

The following is a summary of the modifications that Ammann & Whitney proposes for the SBB Mezzanine in order to provide the flexibility to incorporate the use of hi-speed, Type 1 machines in the In-Line EDS system.

- The current design for the In-Line EDS at the [redacted] (issued 06/26/07) utilizes an elevated steel-framed mezzanine platform. Each of the 8 machines requires an opening through the platform for access. The structural depth was limited to approximately 12" to maximize clearance in the drivel aisle below and headroom above the platform. The typical framing consists of W10 beams spanning north-south to girders attached to the existing concrete columns on grids SB.C and SB.D. The platform is made up of a 2 ½" bar grating sitting on top of the W10s.
- Option 3 would involve redesigning the mezzanine to provide only 4 access openings for the high speed, Type 1 machines. The smaller openings shown in the current design and Options 1 and 2 would be eliminated.

[redacted]



GENERAL NOTES: (M2) (E1) (P2)

M1. DUCTWORK WILL NEED TO BE EXTENDED TO HIGH SPEED EQUIPMENT

M2. FAN AND DUCTWORK SIZE WILL BE AFFECTED DEPENDING ON EQUIPMENT LOAD

E1. LIGHTING LAYOUT COULD BE AFFECTED BOTH ABOVE AND BELOW MEZZANINE STRUCTURE

E2. POWER CONNECTIONS TO EDS MACHINES WILL BE AFFECTED

P1. CONDENSATE DRAINAGE ROUTING WILL BE AFFECTED

P2. CONDENSATE DRAINAGE LINE SIZE COULD BE AFFECTED

FP1. PROPOSED SPRINKLER BRANCHLINES UNDER MEZZANINE ARE IN CONFLICT WITH REVISED MEZZANINE STRUCTURE.

REDESIGN SPRINKLER BRANCHLINES UNDER MEZZANINE TO COORDINATE WITH REVISED MEZZANINE STRUCTURE.

Figure 38.0 - Mechanical, Electrical, Plumbing & Fire Protection Comments

Mechanical, Electrical, Plumbing & Fire Protection

Summary & Brief Overview

Mechanical

- Mechanical revisions to the dedicated mezzanine exhaust duct takeoffs are necessary to coordinate with the relocated high-speed machine positions

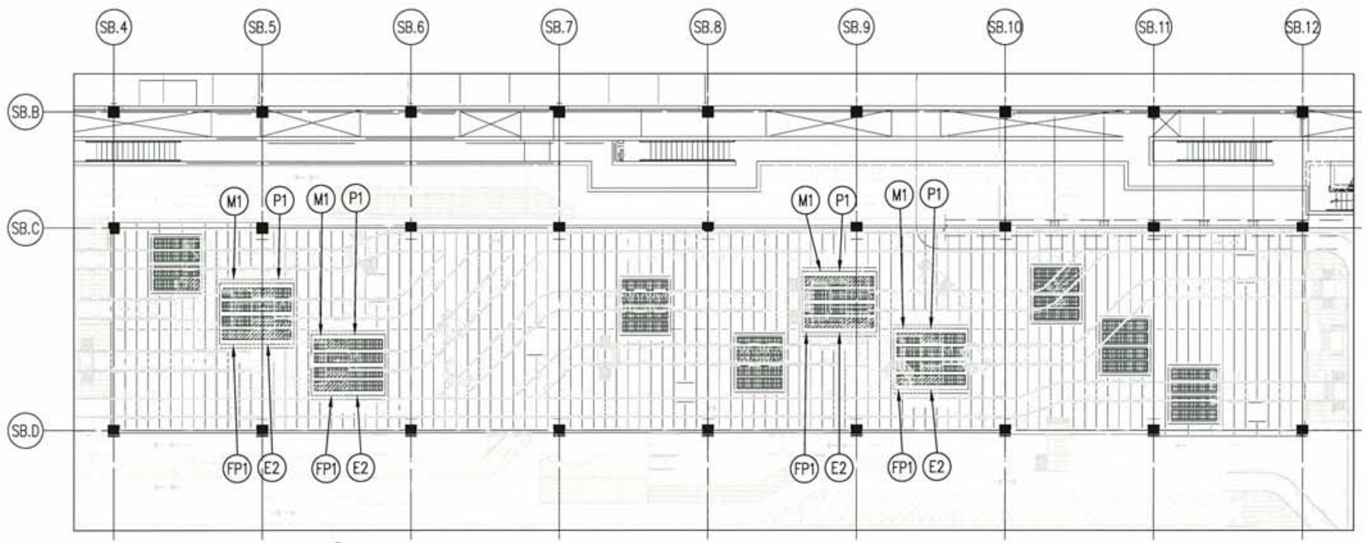
Electrical and Special Systems

- Electrical connections designed for the present technology machines would require change for any of the high-speed scenarios.
- The number of machine connections will be reduced, but the rating of each connection is expected to be higher. Larger conduit can be provided to accommodate future larger cable sizes, but it is not advised to provide the cable at this time if the particular machine electrical requirements are unknown.
- Pull boxes can be located along run to original machines such that conduit can be rerouted to new machine locations with minimal rework below the mezzanine.
- Lights designed for installation to the bottom of the mezzanine will require relocation to coordinate with the additional removable mezzanine sections designed for the high-speed scenarios.
- The telecommunications conduit and cable reconnections will be on a lesser scale than the power connections, and can be benefited by pull box locations so that connections can be rerouted from former machine locations to new locations with minimal rework.

Plumbing

- Plumbing work will be re-coordination of existing roof drain piping with the proposed machine relocations for all options

[redacted]



GENERAL NOTES: (M2) (E1) (E3) (P2)

E1. LIGHTING LAYOUT WOULD BE AFFECTED BOTH ABOVE AND BELOW MEZZANINE STRUCTURE.

E2. POWER CONNECTIONS TO EDS MACHINES WILL BE AFFECTED.

E3. OVERALL POWER REQUIREMENTS WOULD LIKELY INCREASE.

M1. DUCTWORK WILL NEED TO BE EXTENDED TO HIGH SPEED EQUIPMENT

M2. FAN AND DUCTWORK SIZE WILL BE AFFECTED DEPENDING ON EQUIPMENT COOLING LOAD.

P1. CONDENSATE DRAINAGE ROUTING WILL BE AFFECTED.

P2. CONDENSATE DRAINAGE LINE SIZE COULD BE AFFECTED.

FP1. PROPOSED SPRINKLER BRANCHLINES UNDER MEZZANINE ARE IN CONFLICT WITH REVISED MEZZANINE STRUCTURE.

REDESIGN SPRINKLER BRANCHLINES UNDER MEZZANINE TO COORDINATE WITH REVISED.

Figure 39.0 - Mechanical, Electrical, Plumbing & Fire Protection Comments

Fire Protection

- The sprinkler distribution below the mezzanine structure will need to be coordinated with the addition of structural openings for options 1 and 2
- Sprinkler distribution can be redesigned to address machine locations in option 3 XLB only design as there are fewer structural openings.
- Sprinkler head locations above the mezzanine will be coordinated with the high-speed machine and associated exhaust ductwork locations for options 1 and 2
- New sprinkler layout will be developed for option 3 as fewer machines will be installed.

Fire Alarm

- The smoke detector locations below the mezzanine structure will need to be coordinated with the addition of structural openings for options 1 and 2
- Smoke detector distribution can be redesigned to address machine locations in option 3 XLB Only design as there are fewer structural openings
- Smoke detector head locations above the mezzanine will be coordinated with the high-speed machine and associated exhaust ductwork locations for options 1 and 2
- New smoke detector layout will be developed for option 3 as fewer machines will be installed

[redacted]

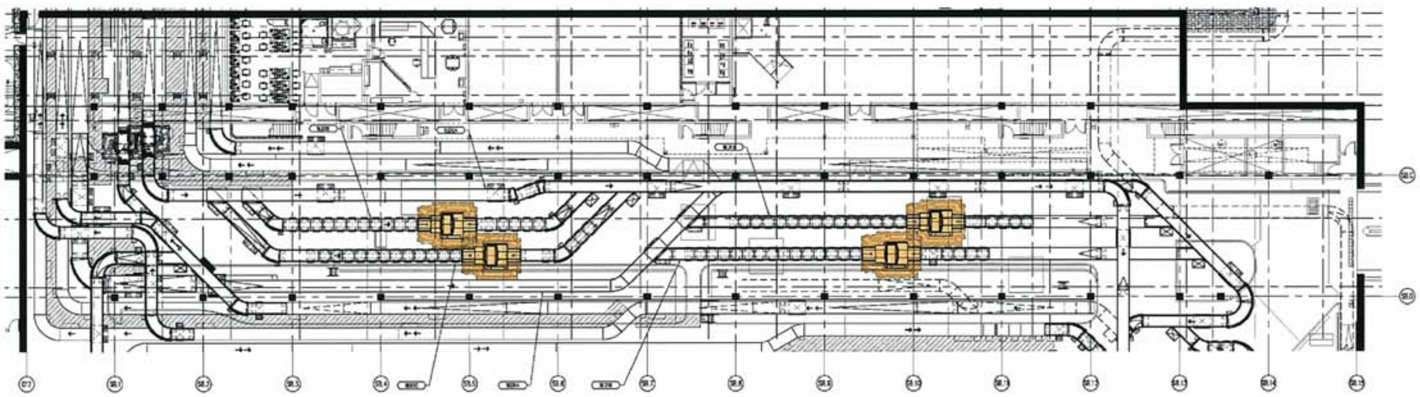


Figure40- BHS layout Plans

(BNP_[redacted]_High Speed_Option 3)

- Option 3 (ref. drawing BNP[redacted]-High Speed_ Option 3) – This option is based on the initial installation of the Type 1 EDS machines, as opposed to the L3-6000 series (i.e., above referenced Option 1).
  - Per the current [redacted]In-Line EDS design objectives and planning premise, as presented in the IFP submittal and summarized below, Items 1 and 2 above cannot be accommodated due to existing space limitations. The current design was based on the Future 2 Aviation Activity Forecast for IAD, which assumed the eventual build-out for the Main Terminal that will more than likely include an expansion to the [redacted] for additional baggage make-up and balancing of facilities between the basement level operational space and Concourse level Ticketing. The design intent for the [redacted] In-Line EDS was to install the required number of EDS machines, per the Future 2 forecast, to ensure that the proposed design had the necessary EDS equipment in place for the forecasted period. Per the design review comments that were received from Carter Burgess (TSA's Chief Technology Officer), on the SBB 100% In-Line EDS design submittal, it was suggested that the project planning premise should be consistent with the TSA's guidelines, which typically take into account the current airport/airline flight schedules with a projected growth of approximately a 5-year look ahead period. If the Authority were to reconsider the project planning premise, so that the SBB In-Line EDS was designed to meet the current originating demand, plus a coordinated projected annual growth for the next 5 to 7 years, the overall [redacted] In-Line EDS design can be re-evaluated to consider less EDS equipment and potentially facilitate the addition of new conveyor lines for item 1 above and/or item 2. This option, coupled with the assumption that new Type 1 EDS machines with higher throughput rates would become available in the future, ay permit the [redacted]In-Line EDS design to provide a CBIS within the same original envelope that was anticipated through the IFP submittal, without compromising future expansion programs for the Main Terminal build-out considerations.
  - For a summary of the[redacted] In-Line EDS project history, please reference the following two reports that were prepared for the Authority:
- The "Main Terminal Baggage Basements Security Alterations Program Concept Re-evaluation", dated April 27, 2004. This report recaps the results of the initial coordination process with the TSA, relating to the requested revisions for reduced EDS machine throughput considerations (from 480 bph/EDS to 400 bph/EDS), changes to protocol requirements for In-Line EDS equipment (from a 4-Level to 3-Level Screening Process) and the resultant security alteration requirements that were developed by the A/E design team for the Main Terminal SBB.
- The[redacted]BHS Design Narrative for the 100% Design Submittal, dated July 25, 2005. This report recaps the last design effort prior to the project being put on-hold in December 2005 and delineates the basis of design and planning premise for the current project, along with the TSA's protocol requirements for In-Line EDS equipment during the 2004 – 205 design period and the defined security alterations that resulted from the coordination meetings between all concerned (the Authority, PMC, the Airlines, TSA and the A/E Design Team).

[redacted]

- Current [redacted] In-Line EDS Design – Issued For Procurement
  - The [redacted] in-line EDS design went through three different design periods; the first was in 2002/2003, where the design was brought up to 75% completion and was put on-hold in early 2003. The second was in 2004/2005 where the design was taken off the shelf and revised to address the TSA's changes in baggage screening protocols (i.e., revised from a 4-Level to a 3-Level Screening Process) and EDS throughput requirements (i.e., reduced from 480 bags per hour / EDS machine to 400 bags per hour / EDS machine). The [redacted] In-Line EDS design was brought up to 100% detail design level and the project was again put on-hold in late 2005. Early this year the documents were taken off the shelf for a re-design effort, between March and June, to include changes/updates to EDS equipment and TSA requirements on the commissioning of the CBIS. The re-design effort was completed in late June and the documents were issued to the Authority for procurement:
  - The redesign effort for the IFP submittal was based on the following main design attributes, which are described in detail in the SBB 100% BHS Design Submittal Narrative, dated July 25, 2005, and the above referenced changes/ additional requirements (ref. paragraphs 10.3.1.1 through 4):
- The [redacted] will continue to serve Ticketing Kiosks 2 and 3.
- The existing [redacted] bag room will continue to operate during the construction of the SBB In-Line EDS and related mezzanine, with minimum disruption to their operation.
- The proposed In-Line EDS would be accommodated within the existing SBB footprint with no expansions to the facility space.
- Compliance with the TSA requirements, as established during the two separate design periods between 2002 and 2005, for 100% Checked Baggage Screening of all originating outbound bags out of the Main Terminal, including International to Domestic Rechecked bags out of the [redacted]
- Use of HNTB's Future 1 and Future 2 Aviation Activity Forecasts for the anticipated future BHS operational needs of the Main Terminal and to determine the obsolescence of the proposed In-Line EDS configurations for originating as well as FIS Recheck.

[redacted] intent to reduce (if not eliminate) the existing manual Stand-Alone EDS security screening process from the Concourse Level and Bag room spaces. It should be noted that removal of the existing "Stand-Alone" EDS machines, within the Main Terminal Concourse Level (i.e., Kiosks 2 & 3) and [redacted] room was assumed to be performed by the TSA's supplier/contractor. This work was not considered as part of the In-Line EDS package and was therefore not included in the related budgetary capital cost estimates.

- The following is a summary that outlines the 100% Checked Baggage Screening requirements, based on the "worse-case" scenario that was developed in 2004 – 2005 detail design period, for the Main Terminal South Bag Basement In-Line EDS configuration.

Main Terminal Bag Basement	BHS Originating Bag Rate (bags / min)	In-Line EDS & ETD Assumptions		
		Level 1 Machines (6.7 bpm / machine)	Level 2 Workstations (2.0 stations / EDS)	Level 3 ETD Stations (3.5 min Aver. Review Time)*
South	54.6	8	17	20

- The development of future BHS right-of-ways within the [redacted] bagroom area was also taken into consideration during the last design submittal's conceptual design period and was again revisited during this re-design period, for flexibility considerations and potential future [redacted] connections, but was determined to be unworkable, without adding additional space. It is recommended, however, that should future expansions be considered for the [redacted] facility, this option should be revisited in parallel with the EBB In-Line EDS design and the Main Terminal east end future build-out considerations, so as not to preclude any future options.
- The SBB In-line EDS layout that is illustrated in the June 26, 2007 IFP documents proposed the redevelopment of the existing bagroom space and the addition of a new mezzanine over the existing inbound stripping area, to accommodate the new security screening systems. The revisions to the original (2003) layout and subsequent 2004 – 2005 detail design effort included the reconfiguration of the EDS units and related conveyor lines that are associated with the various security-screening levels to accommodate the TSA's protocol requirements that were coordinated during the referenced design periods. The overall layout of the [redacted] In-Line EDS design is similar to the one that was brought up to 100% detail design completion, under the Main Terminal Security Alterations Program in late 2005, with the exception that it was revised to include the following additional requirements:
  - Updated EDS machine manufacturer equipment, such as the new 1-Meter Wide Entrance Tunnel System (ref. Figure. 1) to feed bags into EDS machine's scanner. The 1-Meter Wide Tunnel is compatible with the proposed L3 eXaminer 3DX 6000 (the EDS machine that is planned to be used for the [redacted] In-Line EDS) and the BHS industry standards for conveyor segments. The 1-Meter Wide Entrance Tunnel System, which is equal to the in-feed conveyor width (i.e., 39" wide between side-guard) will permit a better conveyance of baggage between the BHS and the EDS machine's CT scanner, which is 0.8 meters wide (i.e., 31.5"); an area of the screening process where baggage positioning is critical to the operation. The 1-Meter Wide Tunnel System uses specially designed conveyor belts that automatically position bags by centering them on the belt prior to feeding them into the CT scanner and/or turn bags that are oriented in a position too wide for passing through the CT scanner.

Figure 41- The 1 meter wide Tunnel System

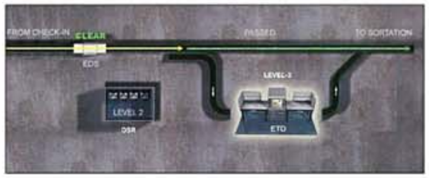
- The exclusion of the proposed Directional Input Device (DID), which was considered in the last design submittal due to the unavailability of the current L3 1-Meter-Wide Entrance Tunnel System. The function of the proposed DID was to position and rotate baggage so as to present the bag in the correct orientation into the center of the conveyor prior to the entrance of the L3 eXaminer 3DX 6000 EDS device.
- The addition of a new Automatic Tag Reader (ATR), with associated conveyor feeds back to the ETD area, for EDS faulted baggage that need to automatically recirculate.
- Additional system demonstrations for the TSA's mandated certification testing, which will be based on Site Specific Test Plans (SSTP) that will be prepared by the TSA's representative (Battelle) and will be followed by the BHS contractor in order to pass the Integrated Site Acceptance Test (ISAT). Additional system demonstrations such as,

[redacted]

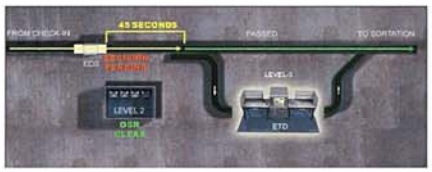
* The Pre-Test Readiness Review (TRR), which will need to be performed by the BHS contractor in conjunction and in coordination with the TSA's Chief Technology Office (CTO) - Carter-Burgess - and the local TSA representatives.
* The formal TRR; upon successful completion of the above referenced local acceptance testing and Pre-TRR, the TSA's CTO representative (Carter-Burgess) will be invited to witness a formal TRR, which shall be demonstrated by the BHS contractor. The tests that will be performed during this period will be selected (from previous SSTPs that were performed during the Pre-TRR) by the TSA's CTO representative and those tests shall be demonstrated by the BHS contractor, under the direction of the TSA's CTO representative (Carter-Burgess).

- ISAT - Upon successful completion of the formal TRR to the TSA's CTO representative (Carter-Burgess), a TRR report will be issued by the TSA's CTO (Carter Burgess) to the TSA or their representative (Battelle) and the Airport will need to submit a letter of concurrence to the TSA regarding successful Pre-ISAT demonstration, to schedule the TSA or their representative (Battelle's) on-site visit for the ISAT. It is anticipated that the TSA or their representative (Battelle) will provide all test personnel and testing material for the ISAT. However, the contract document will indicate that the BHS Contractor will also need to provide the necessary manpower/labor and material, as necessary, similar to previous tests performed with the COTR and local TSA, to support the TSA or their representative (Battelle) in performing the mandated Integrated System Acceptance Test (ISAT) for the CBIS.
- The proposed [redacted]n-line EDS design that was presented in the December 2005 Design Submittal and was pursued as part of the June 26, 2007 IFP re-design effort, was based on a "three (3) level" screening process, as defined below, which is consistent with the latest TSA requirements:

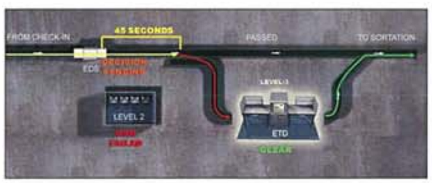
* Level 1 – An EDS device, such as the L3 Communications "eXaminer 3DX 6000", planned



to be operating in a fully automated mode (i.e., system automatically pass / fails the bag).
* Level 2 – Remote operator screening; Operator(s)



review/perform an "On Screen Resolution (OSR)" of the Level 1 image alarms.
* Level 3 – The use of Explosive Trace Detection (ETD) machines – screening basically is handled



by way of directed manual search, utilizing the ETD equipment (i.e., Trace operators screening Level 3 Alarms).

* The configuration of the In-Line EDS, three-level screening process, relies on the EDS Level 2 function, similar to the original concept. Level 2 screening automatically focuses the operator's attention on specific objects that have been rejected by the Level 1 EDS. Alarmed objects or areas of a bag are highlighted by the system so that the operator can more quickly determine whether or not a threat exists. This means that if a bag processed at the Level 1 EDS automated mode fails, the Level 1 image would be sent to a remote operator station that would pass or fail the image. The Level 2 remote operator workstations can either be dedicated to the S[redacted]or be centralized in one common location for all three Main Terminal Bag Basements. Due to the limited floor space within the existing Main Terminal facility, the 2005 designs for all three bag basements considered the use of dedicated Level 2 workstation areas (i.e., one per bag basement), instead of a centralized operation. This concept however can be revisited (if necessary) to determine other options/locations.

Description of Operation

- The Main Terminal [redacted]n-Line EDS design will provide an automated Checked Baggage Inspection System (CBIS) for the existing baggage Make-up operation. Both of the existing main outbound transport lines (i.e., OT1 and OT2) are proposed to be reconfigured to direct bags through the new Level-1 EDS machines. These two reconfigured conveyor lines will transport all originating bags to the In-Line EDS machines, balancing the baggage flow between their respective Level 1 EDS machines, via their high-speed diverters (i.e., the 2005 design and the 2007 IFP package considered eight (8) EDS machines).
- Originating outbound bags transported on the reconfigured OT1 and OT2 conveyor lines shall be assigned a discrete bag tracking identification code, upstream of each EDS machine by the BHS at the respective bag present photocell. As the bags enter the EDS screening machine, the discrete bag tracking identification code will be passed over to the EDS for fail-safe bag tracking functionality between the two systems (BHS & EDS). As the bags exit the EDS screening machine, the discrete bag tracking identification code will be assigned a security status as "Clear", "Suspect", "Fault" or "Unknown". Clear means the Level 1 EDS machine completed the screening process; the bag is not suspect and shall be automatically routed to the existing sortation system (per the latest TSA Design Performance Standards, this means as soon as possible, but no sooner than 15 feet outside of the EDS Machine). Suspect means the Level 1 EDS machine completed the screening process, the bag alarmed and the image scanned by the EDS machine has been sent to the remote Level 2 operator(s) for review, in which case the decision can be reversed up and until the Level 3 decision point. Fault means the PLC/computer lost communication with the EDS or Level 1 screening is not complete due to an EDS fault, in which case the bag(s) will re-circulate and be re-introduced back into an active EDS device off the OT2 outbound transport line. Unknown means bags which cannot be screened by the Level 1 EDS machines or the distinct bag tracking identification code does not have an EDS screening status assigned to it, in which case the bag(s) will be directed to re-circulate and be re-introduced back into an active EDS device off the OT2 outbound transport line; the system design currently allows this process to occur automatically, within the system's conveyor lines.
- The system is designed and specified to operate in a "fail-safe" manner, per appropriate controls / software, as required by the TSA, in that bags must be diverted om the EDS line to the outbound transport lines and subsequent make-up device(s).

[redacted]

KSI - Hi-Speed Study - Option 3

[redacted]

ROM ESTIMATE SUMMARY

Item		Labor		Material		Equip / Sub	Sub OH & Fee		Total
DIV 01 - GENERAL REQUIREMENTS		0		0		0	0		0
DIV 02 - SITE CONSTRUCTION		0		0		0	0		0
DIV 03 - CONCRETE		0		0		0	0		0
DIV 04 - MASONRY		0		0		0	0		0
DIV 05 - METALS		13,436		35,582		1,494	10,608		61,120
DIV 06 - WOOD & PLASTICS		0		0		0	0		0
DIV 07 -THERMAL & MOISTURE PROT.		0		0		0	0		0
DIV 08 - DOORS & WINDOWS		0		0		0	0		0
DIV 09 - FINISHES		0		0		0	0		0
DIV 10 - SPECIALTIES		0		0		0	0		0
DIV 11 - EQUIPMENT		0		0		0	0		0
DIV 12 - FURNISHINGS		0		0		0	0		0
DIV 13 - SPECIAL CONSTRUCTION		0		0		0	0		0
DIV 14 - CONVEYING SYSTEMS		0		0		350,000	0		350,000
DIV 15 - MECHANICAL		0		0		5,200	1,092		6,292
DIV 16 - ELECTRICAL		1,760		2,000		100,000	21,790		125,550
Subtotal		**15,196**		**37,582**		**456,694**	**33,489**		**542,961**
Sales Tax			5%	**1879**					**1,879**
Shift Work Premium	10%	**1520**							**1,520**
Subtotal		**16,716**		**39,461**		**456,694**	**33,489**		**546,360**
Sub P&P Bonds								0.0%	**0**
Subtotal									**546,360**
General Conditions								10%	**54,636**
Subtotal									**600,996**
Prime Contractor's Insurance								1.25%	**7,512**
Subtotal									**608,508**
Prime Contractor's OH & Fee								10%	**60,851**
Subtotal									**669,359**
Contingency								20%	**133,872**
Subtotal									**803,231**
Authority Provided Equipment Total									**0**
TOTAL									**803,231**

Figure 43.0 - Hi Speed Option 3 - Cost Estimate Summary

Assumptions and Clarifications

The following Assumptions and Clarifications are provided to convey the basis of the estimate and general approach taken by Kohnen-Starkey, Inc. in the preparation of this estimate. The detailed estimate backup provided for each area of the project shall serve as a reference for all scope of work (work activity, assumed quantity and level of quality) which has been taken into account in this estimate. Work not specifically indicated in this detailed backup should be considered Not Included (NIC).

1. This estimate is a "Rough Order of Magnitude" estimate.
2. Line items in the estimate that are not included as having subcontractor OH & Fee are unit prices, and the markups are included in the unit price.
3. A 20% design contingency has been included in the estimate.
4. Critical outage work will occur off hours between 10:00 PM and 6:00 AM.
5. A shift work premium has been included, as this work is assumed to be performed between the hours of 10:00 PM and 6:00 AM.
6. The material, equipment and labor cost in this estimate is subject to escalation.
7. The preferred option is assumed to be selected prior to the start of the EDS In-Line – [redacted]roject. With this in mind, the mezzanine structural modifications in each option will be incorporated prior to fabrication of the mezzanine. Therefore, the work will be performed within the established EDS In-Line – South (SBB) project schedule.
8. The same assumption as identified in number eight (8) above would also apply to the MEP. Any re-route work would be identified prior to the start of construction, so it is not anticipated that there will be additional cost or schedule required. Additional MEP cost is related to additional scope above and beyond that accounted for in the EDS In-Line – [redacted] estimate.
9. BHS Option 1: There is no change from the Issued for Procurement submission of the EDS In-Line – [redacted]
10. BHS Option 2: The work in this option is considered additional scope that will occur sometime in the future after the implementation of the L3 based CBIS. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines. This additional work is expected to take approximately 60 weeks to perform.
11. BHS Option 3: This option is based on the Type 1 (HSS) units being installed initially as opposed to the L3-6000 series. The cost to perform this work is anticipated to be less expensive than the L3-6000 series, and is expected to take approximately 15 fewer weeks to install. A 10% contingency has been added for the interface between BHS and the new High Speed Throughput machines.
12. The construction schedule for these options is not expected to change from that provided with the EDS In-Line - [redacted]Issue for Procurement (enclosed), with the exception of the noted increase or decrease related to each BHS option.
13. Consultant exercises no control over fluctuating market conditions. Consultant shall employ their best judgment in analyzing the subject project and assignments, however, Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from the opinions provided by Consultant from this or subsequent estimates.

[redacted]

KSI - Hi-Speed Study - Option 3

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 01 - GENERAL REQUIREMENTS													21%	
With EDS In-Line - South (SBB)														
Subtotal Division 01						0		0		0		0	0	0
DIV 02 - SITE WORK														
With EDS In-Line - South (SBB)														
Subtotal Division 02						0		0		0		0	0	0
DIV 03 - CONCRETE														
With EDS In-Line - South (SBB)														
Subtotal Division 03						0		0		0		0	0	0
DIV 04 - MASONRY														
With EDS In-Line - South (SBB)														
Subtotal Division 04						0		0		0		0	0	0
DIV 05 - METALS														
Credit EDS In-Line - South (SBB) Openings	8.00	ea												
- Deduct opening steel	(42.28)	tons	S	50.00	16.00	(676.48)	800.00	(33824.00)	2400.00	(101472.00)	300.00	(12684.00)	(31075.80)	(179056)
Add Option 2 Larger Openings	4.00	ea												
- Add larger opening steel	24.34	tons	S	50.00	20.00	486.80	1000.00	24340.00	2900.00	70586.00	300.00	7302.00	21467.88	123696
Steel Infill @ Removed Openings	6.00	ea												
- Infill steel	22.92	tons	S	50.00	20.00	458.40	1000.00	22920.00	2900.00	66468.00	300.00	6876.00	20215.44	116479
Subtotal Division 05						269		13,436		35,582		1,494	10,608	61,120
DIV 06 - WOOD & PLASTICS														
With EDS In-Line - South (SBB)														
Subtotal Division 06						0		0		0		0	0	0
DIV 07 - THERMAL & MOIST PROTECTION														
With EDS In-Line - South (SBB)														
Subtotal Division 07						0		0		0		0	0	0
DIV 08 - DOORS & WINDOWS														
With EDS In-Line - South (SBB)														
Subtotal Division 08						0		0		0		0	0	0
DIV 09 - FINISHES														
With EDS In-Line - South (SBB)														

Figure 44.0 - Hi speed Study Option 3 - Cost Estimates - Details

KSI - Hi-Speed Study - Option 3

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
Subtotal Division 09						0		0		0		0	0	0
DIV 10 - SPECIALTIES														
With EDS In-Line - South (SBB)														
Subtotal Division 10						0		0		0		0	0	0
DIV 11 - EQUIPMENT														
With EDS In-Line - South (SBB)														
Subtotal Division 11						0		0		0		0	0	0
DIV 12 - FURNISHINGS														
With EDS In-Line - South (SBB)														
Subtotal Division 12						0		0		0		0	0	0
DIV 13 - SPECIAL CONSTRUCTION														
With EDS In-Line - South (SBB)														
Subtotal Division 13						0		0		0		0	0	0
DIV 14 - CONVEYING SYSTEMS														
Type 1 Base Design	1	ls		0		0	0	0		0	17250000	17250000	0	17250000
- Interface contingency between BHS & new	1	ls		0		0	0	0		0	1380000	1380000	0	1380000
High Speed Throughput machines (10% of base)														
EDS In-Line - South SBB credit	(1)	ls		0		0	0	0		0	18280000	(18280000)	0	(18280000)
Subtotal Division 14						0		0		0		350,000	0	350,000
DIV 15 - MECHANICAL														
Plumbing														
- Re-Route condensate drainage (w/SBB)														
- Increase condensate drain line size	100	lf	P	$55.00		0	0	0		0	5.00	500	105	605
HVAC														
Increase fan and ductwork size														
- Extend ductwork to high speed equipment	400	lbs	P	$55.00		0	0	0		0	6.50	2600	546	3146
- Extend ductwork insulation	320	sf	P	$55.00		0	0	0		0	5.00	1600	336	1936
- Increase fan size	1	ls	P	$55.00		0	0	0		0	500.00	500	105	605
Fire Protection														
- Redesign layout under mezzanine (w/SBB)														
Subtotal Division 15						0		0		0		5,200	1,092	6,292
DIV 16 - ELECTRICAL														

KSI - Hi-Speed Study - Option 3

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
- Modify lighting layout (w/SBB)														
- Modify power connections to EDS machines	4	ea	E	$55.00	8	32	440	1760	500.00	2000		0	790	4550
- Overall power requirement increase (10%)	1	ls	E	$55.00		0	0	0		0	100000.00	100000	21000	121000
Subtotal Division 16						32		1,760		2,000		100,000	21,790	125,550

[redacted]

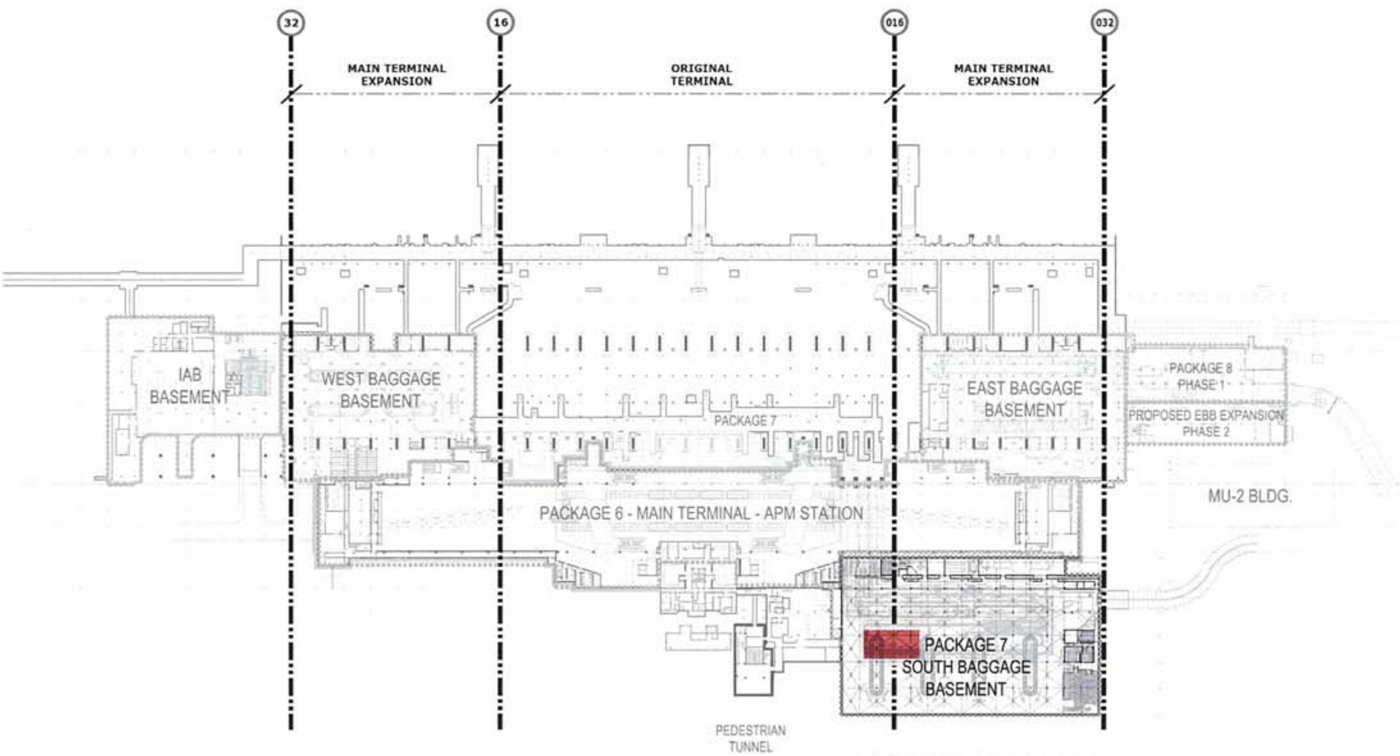


Figure 45.0 Oversize Baggage key plan

South Baggage Basement Oversize Baggage Study

Brief Overview

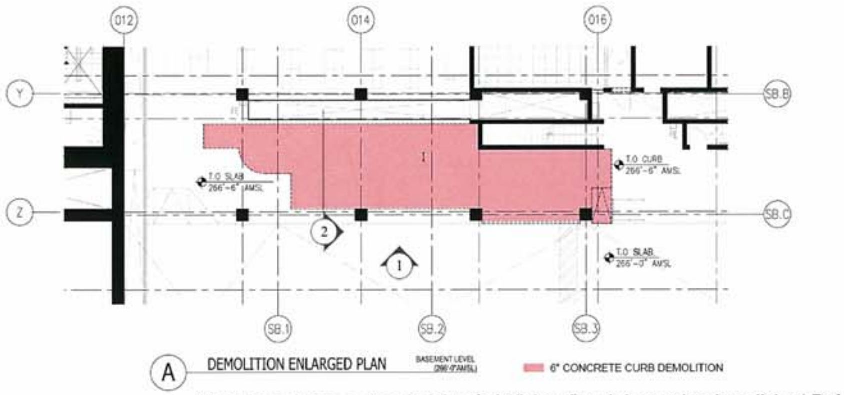
[redacted] as part of the Main Terminal Security Alterations Program and the design objective to eliminate the existing CBS operation (i.e., Stand-Alone EDS machines and related ETD stations) from the Concourse Level, requested that the A/E design team investigates the relocation of the oversize baggage screening process from the Concourse Level to the [redacted]oom.

Assuming it can be accommodated in the SBB, the study was initiated as a possible addition to the Main [redacted] In-Line EDS project, which is currently under a re-design program to accommodate recent changes in EDS equipment and TSA requirements for standard originating CBS.

The results of the study concluded that the Kiosk 2 & 3 oversize CBS operation can be relocated from the Concourse Level to the northwest area of the SBB Bag room. See Figures 41-43.

The relocated ETD stations and related operator's room, which would be referred as the new Outbound Oversize Baggage Threat Resolution Room.

[redacted]



Note: To achieve a clear height of 7'-6" the 6" curb has to be demolished Ref. Sketch Refer to pictures below.

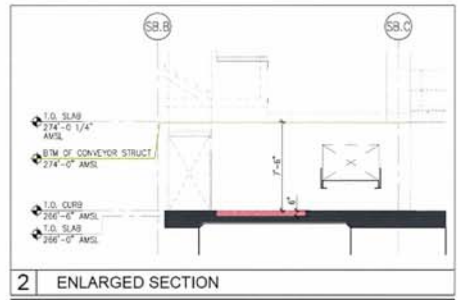


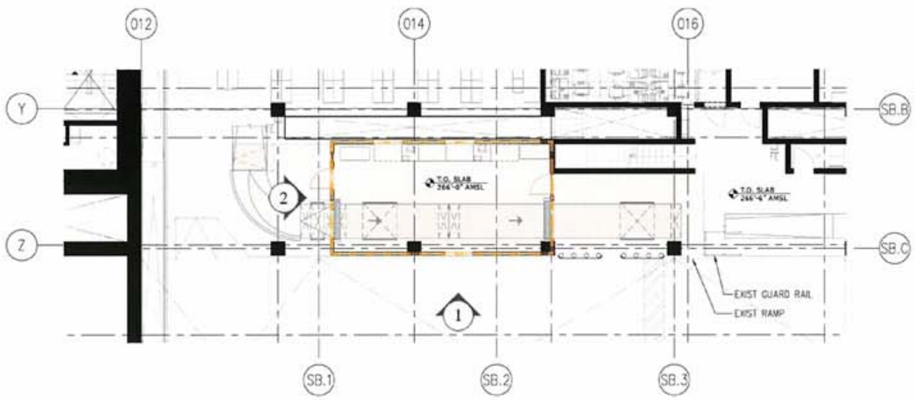
Figure 46.0 Oversize Luggage Enlarged Plan, Section & Photos

Architectural Design

This Oversize luggage basement room has the following features:

- To achieve a clear height of 7'-6" the 6" curb has to be demolished. Refer to Figure 41below.
- The room is 2hr rated, fully sprinkled room, size is approximately (aft x bft)
- It has a concrete deck ceiling Ref. Structural shown in Figure 43 which will also be used as a maintenance platform for the conveyors above.
- A staging area for hand carts has also been considered, adjacent to the ETD stations, to assist in the handling of bags (if necessary) between the runout conveyor and the ETD stations.
- Adding the Outbound Baggage Threat Resolution Room in the South Baggage Basement will not affect the EDS In Line [redacted] IFP package (dated June 26th 2007) construction schedule and is therefore recommended that the Authority issues the Notice to proceed on this project to complete the construction documents so they can be issued before the actual start of construction of the EDS In Line SBB project. The A/E design team looked investigated the option of building this Outbound Oversize Baggage Threat Resolution Room before the In Line EDS South Bag Basement project went into construction but the option was negated based on the following.
- No space to put the stand alone Fan Coil Unit,
- Extra demolition work involved to cut the concrete floor and embed the drain pipe for the FCU.
- Increase in cost by $3, 489.00
- It adds on clutter to the already overcrowded space in this area of SBB.

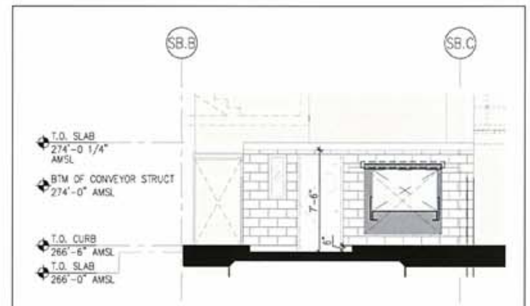
[redacted]



B FLOOR PLAN AREA N1 BASEMENT LEVEL (266'-0"AMSL)

2HR FIRE-RATED

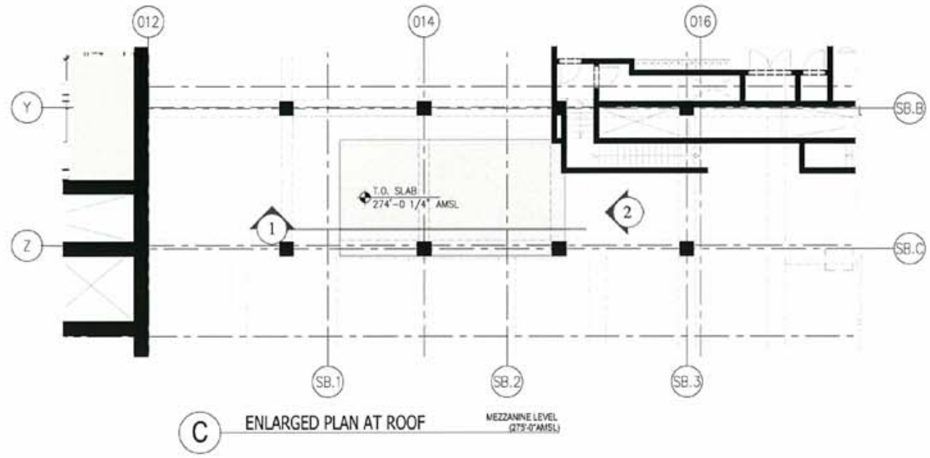
Note: The room is 2hr rated, fully sprinkled room, size is approximately (aft x bft)



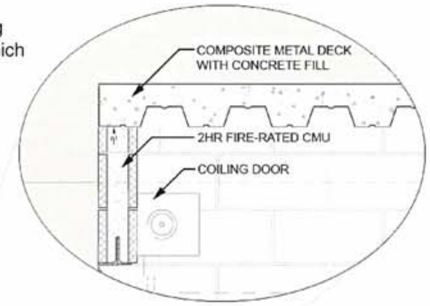
2 ENLARGED SECTION

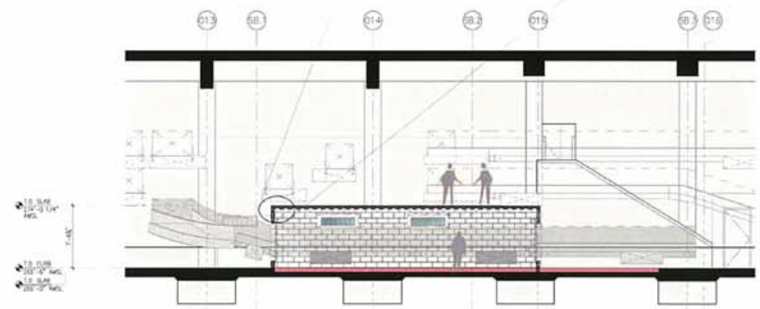
Figure 47.0 Oversize Luggage Enlarged Plan, Elevation & Photos

[redacted]



Note: It has a concrete deck ceiling as shown in the Structural detail which will also be used as a maintenance platform for the conveyors above.



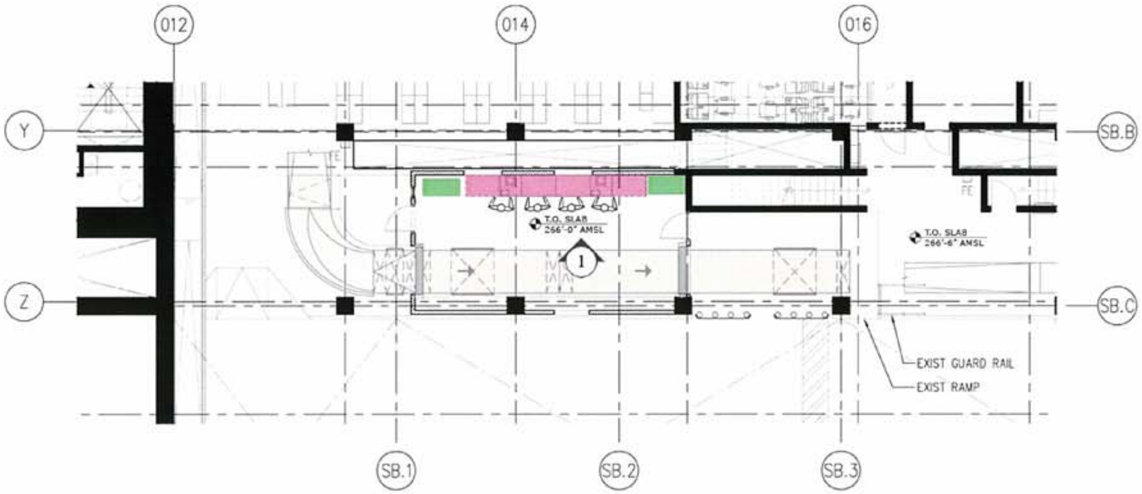


1 ENLARGED SECTION

Figure 48.0 Oversize Luggage area, Enlarged sections & Details

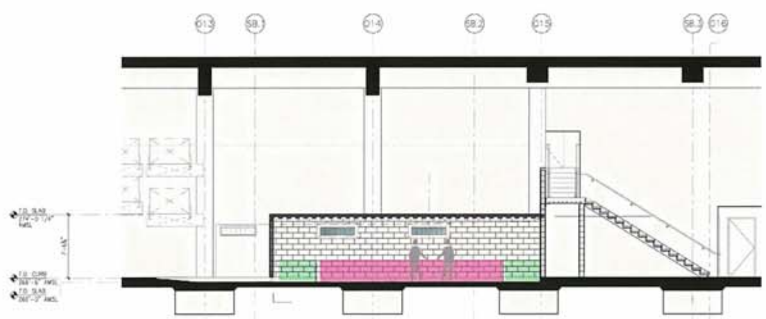
[redacted]

Note: A staging area for hand carts has also been considered, adjacent to the ETD stations, to assist in the handling of bags (if necessary) between the runout conveyor and the ETD stations



D FLOOR PLAN AREA N1 BASEMENT LEVEL (266'-0"AMSL)

STAND ALONE ETD MACHINE
STAGING AREA FOR HAND CART



1 ENLARGED SECTION

Figure 49.0 Over size are staging Area Plans & Elevations

[redacted]

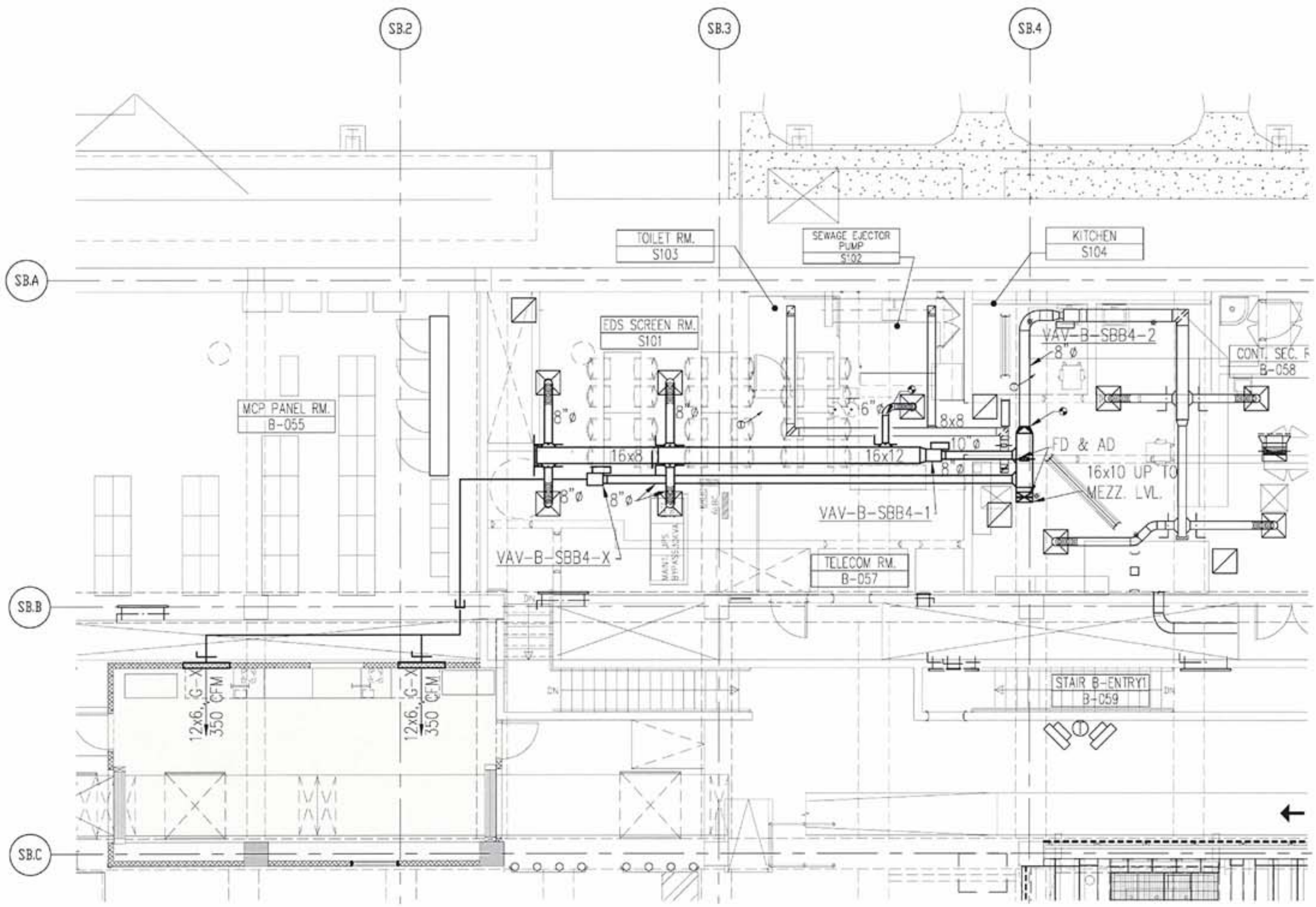


Figure 50.0 HVAC Design Recommendation for new Baggage room

Mechanical / Electrical Plumbing & Fire Protection

Mechanical

- The Odd size Screening Room (OSR) is situated adjacent to a supply air plenum for the basement level. The supply air drum louver that becomes obstructed by the room's north wall will be removed and the duct opening closed. The remaining drum louver for the area and located just west of the proposed room will be balanced to provide twice the previous airflow as part of the re-commissioning and BAS system adjustments included with the [redacted] Security Alterations project.
- Heating and cooling for the OSR will be provided by sidewall diffusers installed through the north wall of the room. These diffusers will be ducted to a variable air volume box located in the ceiling of the adjacent EDS Screening Room. The duct will be routed through the ESR's east wall and turn immediately south to avoid passing over the existing conveyor motor control panels.

Structural Design

Ammann & Whitney proposes for the following structure for the [redacted] for the odd-sized baggage screening.

- Structure consists of four 6" masonry walls with 3 ¼" Light-weight concrete 3" metal deck roof spanning 16'-0" north-south in a single span.
- Restricted clearance beneath the existing overhead conveyors, in conjunction with the minimum headroom within the room, preclude the use of any intermediate support beams and require the removal of the existing 6" curb at the slab-on-grade level.
- Grouted and reinforced masonry walls are doweled into the foundation slab. The various opening through the walls require either precast concrete or steel beam lintels.
- Roof slab provides a 2-hour fire rating and will serve as a maintenance platform for the overhead conveyors.
- Overhead conveyors would be temporarily removed to construct the room, especially placing and finishing the concrete for the roof deck.

[redacted]

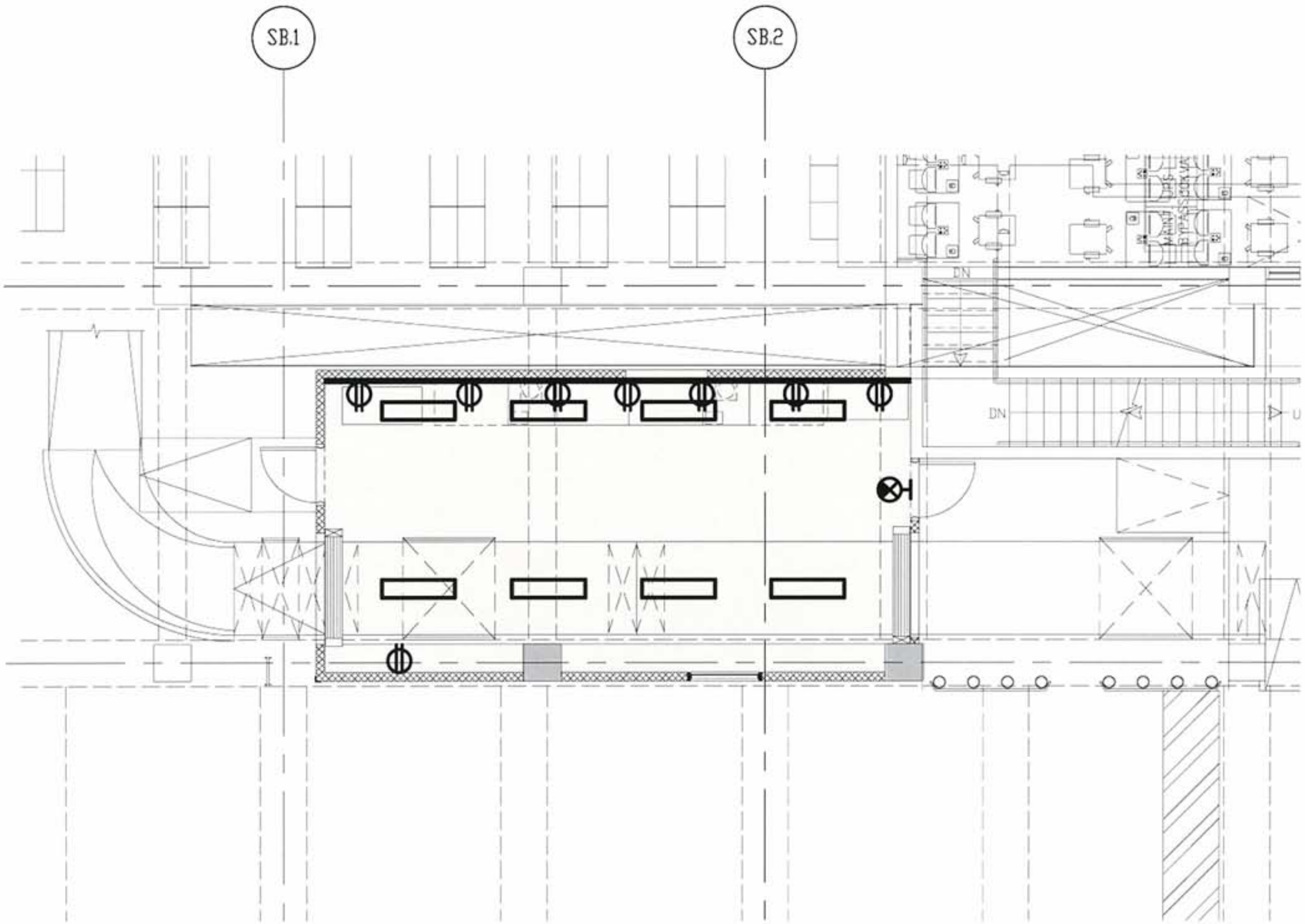


Figure 51.0 Electrical & Special Design Systems for New Baggage room

Electrical and Special Systems

Lighting for the OSR will be supplied by eight 2-lamp, 4' fluorescent strip lights surface-mounted to the underside of the room's ceiling structure (height of 7'-6" above finished floor). The lights will be oriented in two rows of four lights, one row above the workstations and one row above the conveyor belt. The lights will be controlled by a three-way toggle switch located adjacent to each door.

- Workstation power will be provided by duplex 120V receptacles mounted 12" on center in metal raceway along the top of the work counter.
- The conveyor power will be provided by the baggage contractor via remotely located motor control panels.
- Teledata connections for the workstations will be provided as required via a separate wiring compartment in the workstation's metal raceway.

Plumbing

There will be no plumbing requirements for the OSR

Fire Protection

The SBB sprinkler system distribution will be extended into the room and provide connection to sidewall sprinkler heads that run along the ceiling at the north and south walls.

Fire Alarm

The fire alarm devices for the OSR will include a ceiling mounted smoke detector, a manual pull station at the east door, and an audible-visual strobe above the pull station.

[redacted]

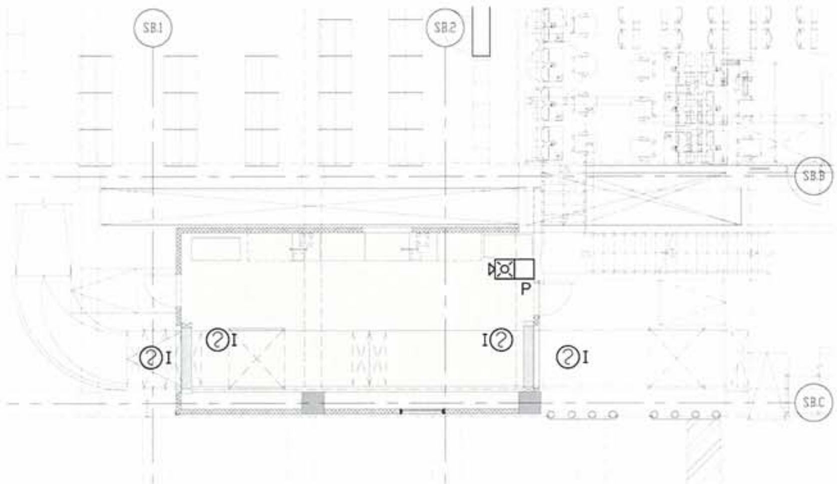


Figure 52.0 Electrical & Special Design Systems for New Baggage room

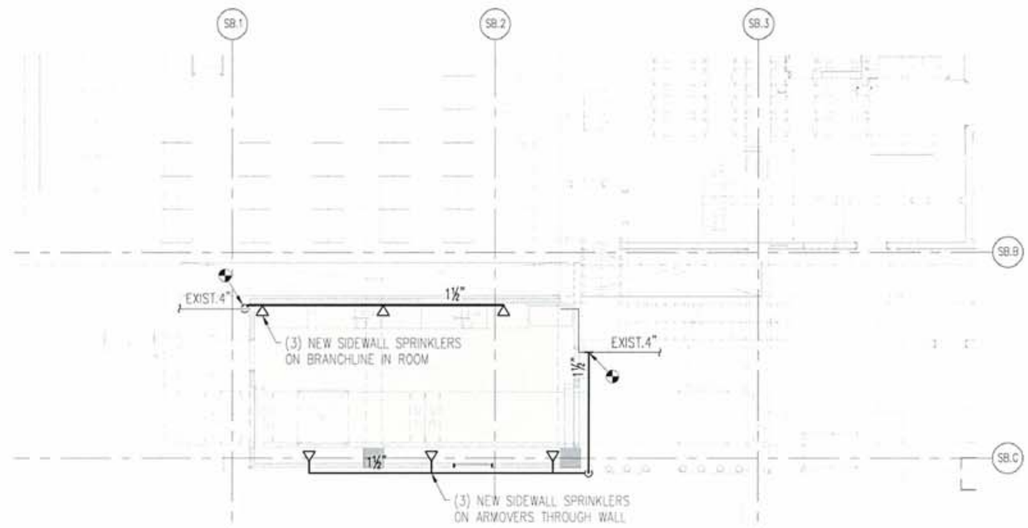


Figure 47a.0 Electrical & Special Design Systems for New Baggage room

[redacted]

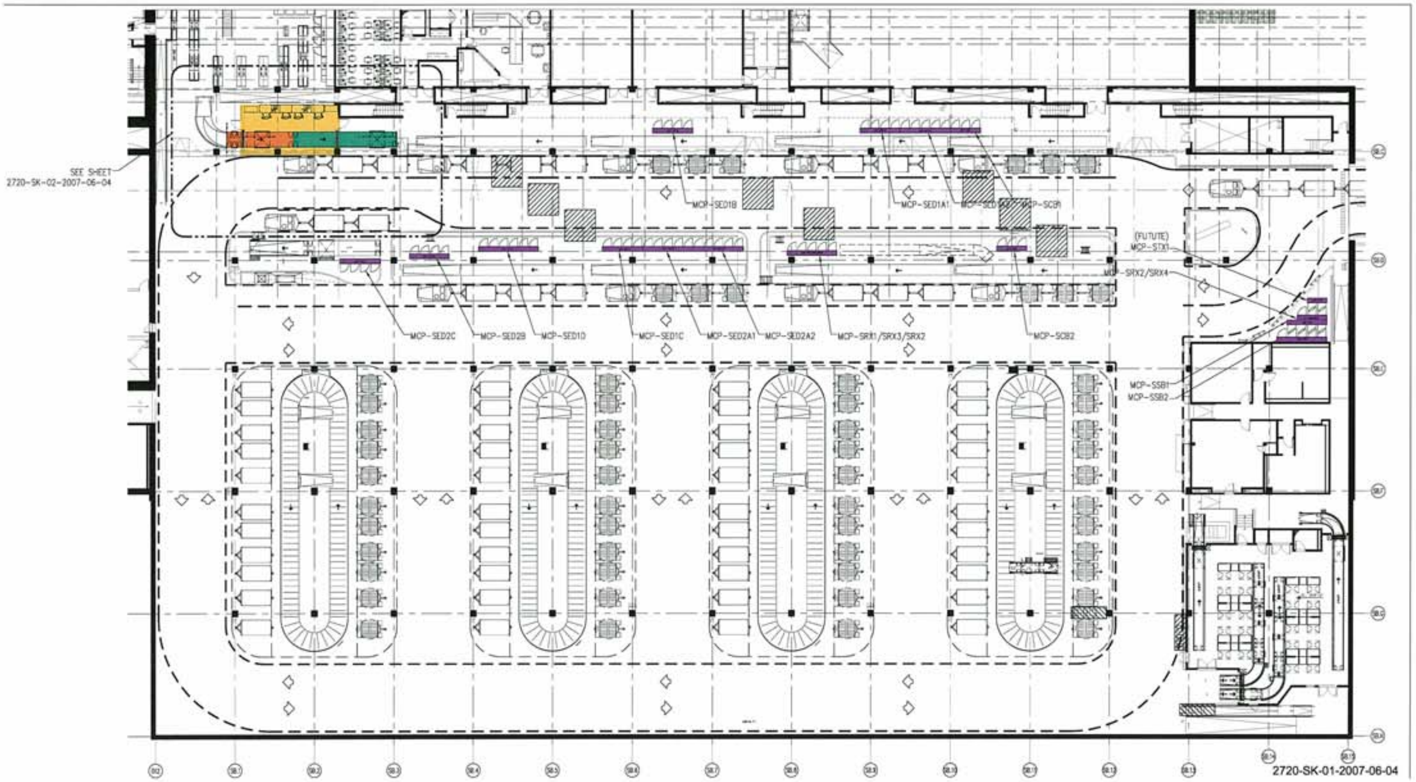


Figure 53.0 [redacted] - Baggage Handling Services - BHS Location Plan

Baggage Handling Services

The basis of this document is to give a synopsis of the study that was performed by the design team for the proposed relocation of the Checked Baggage Screening (CBS) operation for oversized bags, relating to the Kiosk 2 & 3 ticketing and the [redacted] Oversize Baggage Conveyor Line.

Kiosk 2 & 3 and [redacted] Oversize Baggage Security Screening Relocation

Oversize Baggage for originating outbound flights that are processed out of the Kiosk 2 & 3 Ticket Counters, and associated SBB bag room, are checked-in through the OS2 Oversize conveyor line, which is located at the west end of Kiosk 3 and is shared between the airlines operating out of the two Ticketing Kiosks. The OS2 Odd size conveyor line runs between the Concourse Level and the [redacted] bag room. The input belt (i.e., OS2-1) declines through the Concourse Level floor and the conveyor line runs across the building through the Arrivals Hall ceiling space and north/south connector bridge to terminate at the northwest area of the [redacted] bag room. Checked Baggage Screening for the oversized bags is currently being performed by the TSA with Explosive Trace Detection equipment at the Concourse Level, in the general vicinity of the OS2-1 input conveyor, which are also shared with the Stand-Alone EDS machine screening process. The screening equipment (Stand-Alone EDS and ETD) is currently located within a partitioned area, as illustrated in the attached photos below. Only clear bags are inducted onto the oversize conveyor line for transport to the bag room level. At the bag room level airlines are required to monitor the Odd size conveyor line's run out conveyor every so often for baggage (e.g., periodic visits to the run out during their operating period) and pick-up their respective oversize bags for processing/ baggage make-up to their outbound flights.

[redacted] as part of the MT Security Alterations Program and the design objective to eliminate the

[redacted]

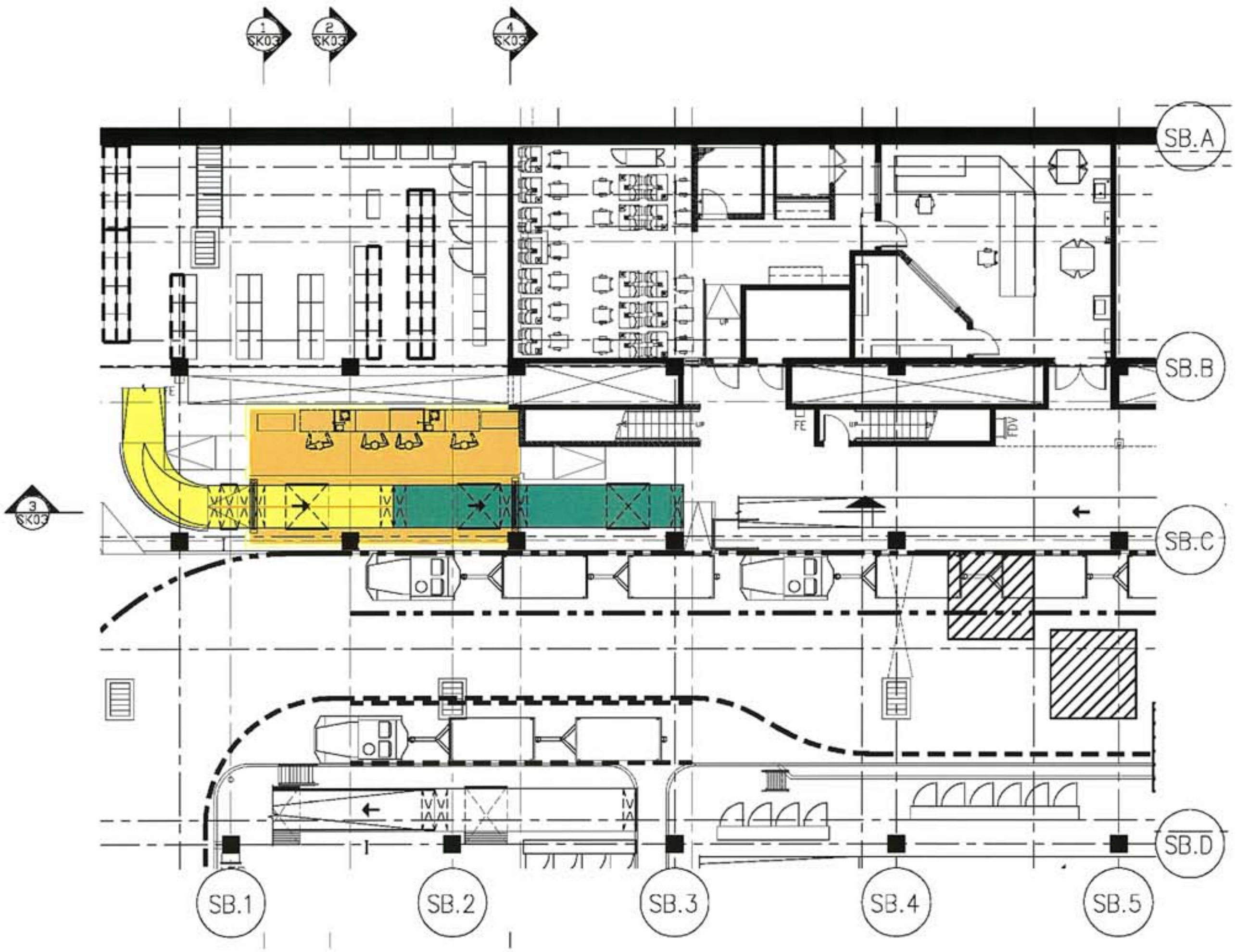


Figure 54.0 [redacted] - Baggage Handling Services - BHS conveyor route

existing CBS operation (i.e., Stand-Alone EDS machines and related ETD stations) from the Concourse Level, requested that the A/E design team investigates the relocation of the oversize baggage screening process from the Concourse Level to the [redacted] Bag room.

Assuming it can be accommodated in the SBB, the study was initiated as a possible addition to the MT [redacted] In-Line EDS project, which is currently under a re-design program to accommodate recent changes in EDS equipment and TSA requirements for standard originating CBS.

The results of the study concluded that the Kiosk 2 & 3 oversize CBS operation can be relocated from the Concourse Level to the northwest area of the SBB Bag room, as illustrated in the accompanying drawings (BNP_[redacted]-HIGH SPEED_ODDSIZE-1 & 2). The relocation of the oversize CBS operation will require modifications to the existing OS2-20 decline and OS2-21 run out conveyor (i.e., conveyor line's baggage output collection belt), to accommodate the proposed screening process, the relocated ETD stations and related operator's room, which would be referred to as the new Outbound Oversize Baggage Threat Resolution Room. Upon completion of these alterations, the Kiosk 2 & 3 oversize bags will be checked-in at the Concourse Level, similar to the existing conditions, and transported on the OS2 conveyor line to the bag room level for TSA screening and processing. Baggage transported on the OS2 line will end up on the reconfigured run out conveyor (illustrated in yellow), which will operate on an inch-and store mode. Once the bags are screened and cleared by the TSA they will be placed on the "Clear Bag" exit conveyor (illustrated in green) for airline pick-up and processing/baggage make-up to their outbound flights. A staging area for hand carts has also been considered, adjacent to the ETD stations, to assist in the handling of bags (if necessary) between the run out conveyor and the ETD stations.

[redacted]

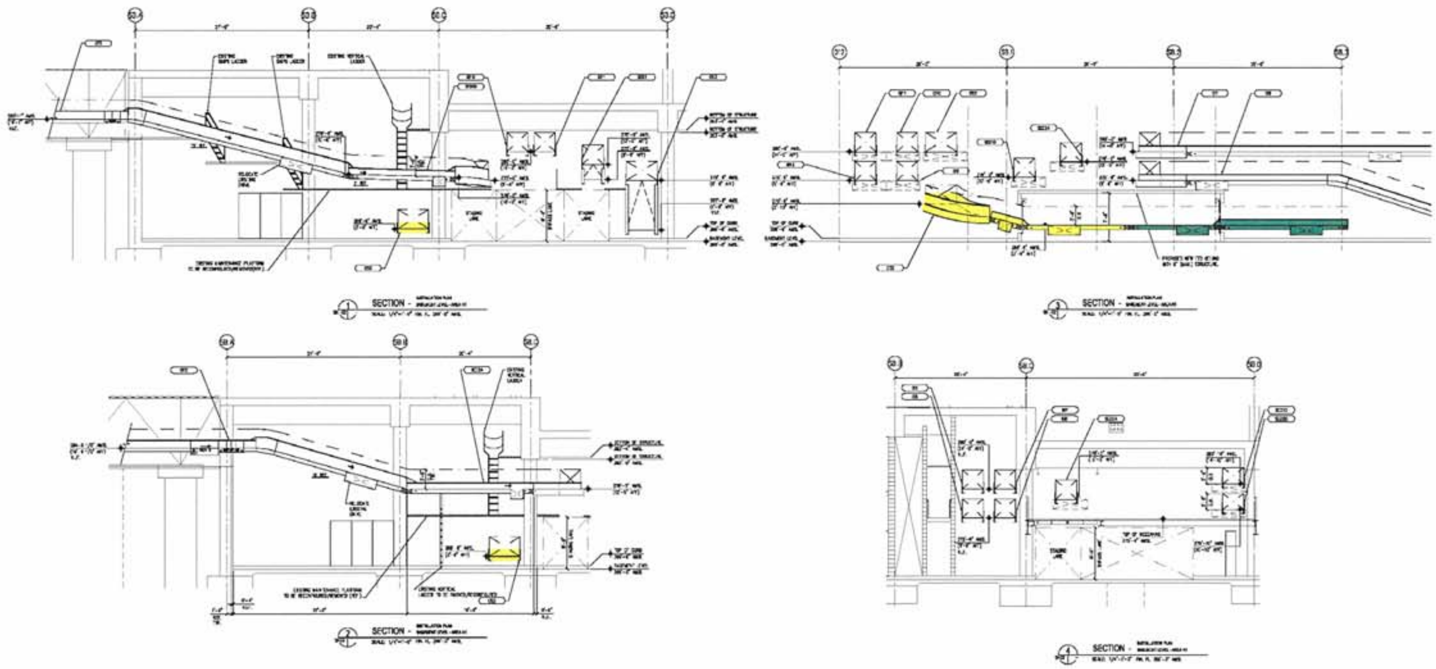


Figure 55.[redacted] - Baggage Handling Services - BHS Sections

Should this option proceed towards detail design, the overall operation (i.e., TSA baggage screening process and related "Clear Bag" pick-up by the carriers) should also consider the following control features as part of the proposed [redacted] In-Line EDS design, which would also serve as an enhancement to the existing bag room operation for oversize baggage processing:

The use of a hand-held scanner, adjacent to the "Clear Bag" exit conveyor (illustrated in green) and new baggage information displays at each make-up device, to inform the airlines that a "Cleared" bag for their outbound flight is ready for pick-up. This feature, which would be accomplished via the manual hand-scanning of bag tags (e.g., 10-digit IATA or special operations bag tags) and an interface between the Baggage Handling Computer (BHC) system and the Flight Information Display System (FIDS), will permit the display of the "Cleared" bag's respective carrier code at the allocated make-up device.

The interface of the proposed new hand-held scanner with the [redacted] BHC system will also permit the updating of the BHC system database with the screening status of the bags (i.e., suspect or clear).

[redacted]

KSI - Oversize Baggage Study

[redacted]

ROM ESTIMATE SUMMARY

Item		Labor		Material		Equip / Sub	Sub OH & Fee		Total
DIV 01 - GENERAL REQUIREMENTS		0		0		0	0		0
DIV 02 - SITE CONSTRUCTION		830		0		750	332		1,912
DIV 03 - CONCRETE		0		0		11,019	2,314		13,333
DIV 04 - MASONRY		945		875		14,890	3,509		20,219
DIV 05 - METALS		510		2,101		6,682	1,952		11,245
DIV 06 - WOOD & PLASTICS		0		0		250	53		303
DIV 07 -THERMAL & MOISTURE PROT.		0		0		0	0		0
DIV 08 - DOORS & WINDOWS		3,780		13,560		200	3,683		21,223
DIV 09 - FINISHES		3,766		2,585		0	1,334		7,684
DIV 10 - SPECIALTIES		0		0		420	88		508
DIV 11 - EQUIPMENT		0		0		0	0		0
DIV 12 - FURNISHINGS		0		0		0	0		0
DIV 13 - SPECIAL CONSTRUCTION		0		0		157,100	0		157,100
DIV 14 - CONVEYING SYSTEMS		0		0		280,000	0		280,000
DIV 15 - MECHANICAL		6,964		4,193		1,800	2,721		15,677
DIV 16 - ELECTRICAL		13,480		5,417		0	3,968		22,865
Subtotal		**30,275**		**28,730**		**473,111**	**19,953**		**552,069**
Sales Tax			5%	**1436**					**1,436**
Shift Work Premium	10%	**3027**							**3,027**
Subtotal		**33,302**		**30,166**		**473,111**	**19,953**		**556,533**
Sub P&P Bonds								0.0%	**0**
Subtotal									**556,533**
General Conditions								10%	**55,653**
Subtotal									**612,186**
Prime Contractor's Insurance								1.25%	**7,652**
Subtotal									**619,838**
Prime Contractor's OH & Fee								10%	**61,984**
Subtotal									**681,822**
Contingency								20%	**136,364**
Subtotal									**818,187**
"Below the Line" Cost Allowance for Spec Syst									**1,800**
TOTAL									**819,987**

Figure 56.[redacted] - Oversize Baggage Cost Estimate Summary

Assumptions and Clarifications

The following Assumptions and Clarifications are provided to convey the basis of the estimate and general approach taken by Kohnen-Starkey, Inc. in the preparation of this estimate. The detailed estimate backup provided for each area of the project shall serve as a reference for all scope of work (work activity, assumed quantity and level of quality) which has been taken into account in this estimate. Work not specifically indicated in this detailed backup should be considered Not Included (NIC).

* This estimate is a "Rough Order of Magnitude" estimate.
* Line items in the estimate that are not included as having subcontractor OH & Fee are unit prices, and the markups are included in the unit price.
* A 20% design contingency has been included in the estimate, as we are in the Pre-design phase.
* Critical outage work will occur off hours between 10:00 PM and 6:00 AM.
* A shift work premium has been included, as this work is assumed to be performed between the hours of 10:00 PM and 6:00 AM.
* The material, equipment and labor cost in this estimate is subject to escalation.
* Security is included as estimated by the security consultant. Security rough-in (conduit and cable) is for CCTV equipment only.
* The preferred option is assumed to be selected prior to the start of the EDS In-Line – [redacted] project. With this in mind, the work will be performed within the established (SBB) project schedule. The included schedule is a fragnet of the Oddsize Luggage Room, and should be rolled into the [redacted] IFP Submission without increase to the overall duration. The BHS and security revisions will also be incorporated into the overall [redacted] IFP Submission without increase to the overall duration.
* The BHS work is inclusive of removing approximately 50 LF of OS2, install 56 LF of OS2, and the installation of the fire/security doors.
* Consultant exercises no control over fluctuating market conditions. Consultant shall employ their best judgment in analyzing the subject project and assignments, however, Consultant cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from the opinions provided by Consultant from this or subsequent estimates.

[redacted]

KSI - Oversize Baggage Study

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
DIV 01 - GENERAL REQUIREMENTS													21%	
With EDS In-Line - South(SBB) Procurement Sub.				0.00		0.00	0.00	0.00		0.00		0.00	0.00	0
Subtotal Division 01						0		0		0		0	0	0
DIV 02 - SITE WORK														
Demolition														
- Remove and salvage ladder	1.00	ls	L	27.00	8.00	8.00	216.00	216.00		0.00	100.00	100.00	66.36	382
- Demo concrete curb	20.00	lf	L	27.00	1.00	20.00	27.00	540.00		0.00	25.00	500.00	218.40	1258
- Remove and dispose of debris	1.00	cy	O	37.00	2.00	2.00	74.00	74.00		0.00	150.00	150.00	47.04	271
Subtotal Division 02						30		830		0		750	332	1,912
DIV 03 - CONCRETE														
Concrete														
- Concrete lintel	70.00	lf		0.00		0.00	0.00	0.00		0.00	20.00	1400.00	294.00	1694
- Concrete slab on deck	530.00	sf		0.00		0.00	0.00	0.00		0.00	18.00	9540.00	2003.40	11543
- Concrete curb	4.50	lf		0.00		0.00	0.00	0.00		0.00	17.50	78.75	16.54	95
Subtotal Division 03						0		0		0		11,019	2,314	13,333
DIV 04 - MASONRY														
CMU														
- Masonry dowels	35.00	ea	L	27.00	1.00	35.00	27.00	945.00	25.00	875.00	10.00	350.00	455.70	2626
- 6" CMU wall (incl bars, grout & bond beam)	89.00	lf		0.00		0.00	0.00	0.00		0.00	160.00	14240.00	2990.40	17230
- Steel lintels	6.00	ea		0.00		0.00	0.00	0.00		0.00	50.00	300.00	63.00	363
Subtotal Division 04						35		945		875		14,890	3,509	20,219
DIV 05 - METALS														
Steel														
- Metal deck	530.00	sf	S	50.00	0.02	7.95	0.75	397.50	3.20	1696.00	0.10	53.00	450.77	2597
- Structure (column and beam)	0.20	tons		0.00		0.00	0.00	0.00		0.00	5500.00	1100.00	231.00	1331
- Shelf angle (4 x 4 x 1/4)	22.00	lf		0.00		0.00	0.00	0.00		0.00	17.00	374.00	78.54	453
- Continuous wall cap plate (3" x 1/4")	74.00	lf		0.00		0.00	0.00	0.00		0.00	15.00	1110.00	233.10	1343
- Lt gauge pour stop	90.00	lf	S	50.00	0.03	2.25	1.25	112.50	4.50	405.00	0.50	45.00	118.13	681
- 4'-0" Bollards	8.00	ea		0.00		0.00	0.00	0.00		0.00	500.00	4000.00	840.00	4840
Subtotal Division 05						10		510		2,101		6,682	1,952	11,245
DIV 06 - WOOD & PLASTICS														
Blocking														
- Misc. blocking	1.00	ls		0.00		0.00	0.00	0.00		0.00	250.00	250.00	52.50	303
Subtotal Division 06						0		0		0		250	53	303
DIV 07 - THERMAL & MOIST PROTECTION														
None														

KSI - Oversize Baggage Study

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
Subtotal Division 07						0		0		0		0	0	0
DIV 08 - DOORS & WINDOWS														
Doors and Windows														
- Rated door/frame/hardware	2.00	ea	C	35.00	12.00	24.00	420.00	840.00	1500.00	3000.00		0.00	806.40	4646
- Grout door frames	4.00	ea	C	35.00	1.00	4.00	35.00	140.00	15.00	60.00	50.00	200.00	84.00	484
- Rated windows (4'-0 3/8 x 3'-4 3/8)(10 ea)	135.00	sf	S	50.00	0.40	54.00	20.00	2700.00	75.00	10125.00		0.00	2693.25	15518
- Rated windows (1'-4 3/8 x 3'-4 3/8)	5.00	sf	S	50.00	0.40	2.00	20.00	100.00	75.00	375.00		0.00	99.75	575
Subtotal Division 08						84		3,780		13,560		200	3,683	21,223
DIV 09 - FINISHES														
Floor														
- VCT	530.00	sf	C	35.00	0.02	10.60	0.70	371.00	1.35	715.50		0.00	228.17	1315
- Drywall ceiling	530.00	sf	C	35.00	0.10	53.00	3.50	1855.00	1.50	795.00		0.00	556.50	3207
- Paint walls and ceiling	1800.00	sf	C	35.00	0.02	27.00	0.53	945.00	0.50	900.00		0.00	387.45	2232
- Paint doors	4.00	ea	C	35.00	1.50	6.00	52.50	210.00	16.00	64.00		0.00	57.54	332
- Paint windows	11.00	ea	C	35.00	1.00	11.00	35.00	385.00	10.00	110.00		0.00	103.95	599
Subtotal Division 09						108		3,766		2,585		0	1,334	7,684
DIV 10 - SPECIALTIES														
Signage														
- Door signage	2.00	ea		0.00		0.00	0.00	0.00		0.00	210.00	420.00	88.20	508
Subtotal Division 10						0		0		0		420	88	508
DIV 11 - EQUIPMENT														
None														
Subtotal Division 11						0		0		0		0	0	0
DIV 12 - FURNISHINGS														
By Owner														
Subtotal Division 12						0		0		0		0	0	0
DIV 13 - SPECIAL CONSTRUCTION														
Security rough-in and cable (ref. Big Sky est)	1.00	ls		0.00		0.00	0.00	0.00		0.00	12800.00	12800.00	0.00	12800
Mufids System(ref. Big Sky est)	1.00	ls		0.00		0.00	0.00	0.00		0.00	144300.00	144300.00	0.00	144300
Subtotal Division 13						0		0		0		157,100	0	157,100
DIV 14 - CONVEYING SYSTEMS														
BHS														
- Security fire doors (w/BHS)														
- BHS order of magnitude	1.00	ls		0.00		0.00	0.00	0.00		0.00	280000.00	280000.00	0.00	280000

Figure 57.0[redacted]- Oversize Luggage Cost Estimate Details

[redacted]

KSI - Oversize Baggage Study

[redacted]

ROM Pricing

Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total
Subtotal Division 14						0		0		0		280,000	0	280,000
DIV 15 - MECHANICAL														
Option #1 - Added VAV and associated duct														
HVAC														
- VAV-B-SBB-4-2	1	EA	P	$55.00	4.000	4	220	220	1200.00	1200		0	298	1718
- 3/4" HW VAV coil Hook Up	1	EA	P	$55.00	6.000	6	330	330	375.00	375		0	148	853
- Galv. Sheet Metal	575	Lbs	P	$55.00	0.110	63	6	3479	0.90	518		0	839	4835
- Supply diffusers, side wall	2	EA	P	$55.00	0.923	2	51	102	65.00	130		0	49	280
- Spin in w/ volume damper	2	EA	P	$55.00	0.400	1	22	44	25.00	50		0	20	114
- Duct Insulation	450	SF	P	$55.00	0.050	23	3	1238	0.95	428		0	350	2015
- AHU modification	1	EA	P	$55.00		0	0	0		0	500.00	500	105	605
- T-Stat	1	EA	P	$55.00	1.000	1	55	55	125.00	125		0	38	218
- Temperature controls	1	EA	P	$55.00		0	0	0		0	900.00	900	189	1089
- Test and Balance	1	EA	P	$55.00		0	0	0		0	400.00	400	84	484
Fire Protection				$0.00		0	0	0		0		0	0	0
- Connect to Existing	2	EA	P	$55.00	4.000	8	220	440		0		0	92	532
- 1 1/2" Sch. 40, Thd. Pipe	62	LF	P	$55.00	0.110	7	6	375	2.32	144		0	109	628
- 1 1/2" 90	7	EA	P	$55.00	0.300	2	17	116	4.75	33		0	31	180
- 1 1/2" Tee	4	EA	P	$55.00	0.390	2	21	86	7.50	30		0	24	140
- New Sprinkler Heads	6	EA	P	$55.00	0.123	1	7	41	26.78	161		0	42	244
- Tie into existing	2	ea	P	$55.00	4.000	8	220	440	500.00	1000		0	302	1742
Subtotal Division 15						127		6,964		4,193		1,800	2,721	15,677
DIV 16 - ELECTRICAL														
Misc. Demo - Cut/Cap/Make safe	1	ls	E	$55.00	16	16	880	880	200.00	200		0	227	1307
Lights and Power														
- Light Fixtures surf mtd	8.00	ea	E	55.00	4.95	39.60	272.25	2178.00	130.00	1040.00		0.00	675.78	3894
- Light Fixtures exit	1.00	ea	E	55.00	1.00	1.00	55.00	55.00	125.00	125.00		0.00	37.80	218
- Conduit/wire/box (assume conn. < 100 lf)	305.00	lf	E	55.00	0.23	69.24	12.49	3807.93	1.41	430.05		0.00	889.97	5128
- Fuses	3.00	ea	E	55.00	1.21	3.63	66.55	199.65	10.00	30.00		0.00	48.23	278
- Circuit breakers	5.00	ea	E	55.00	0.80	4.00	44.00	220.00	36.00	180.00		0.00	84.00	484
- Switches/receptacles	10.00	ea	E	55.00	0.57	5.70	31.35	313.50	3.80	38.00		0.00	73.82	425
- Wiremold (4000 series)	55.00	lf	E	55.00	0.45	24.75	24.75	1361.25	8.60	473.00		0.00	385.19	2219
Fire Alarm														
- conduit/wire/box	145.00	lf	E	55.00	0.32	46.40	17.60	2552.00	7.37	1068.65		0.00	760.34	4381
- Wiremold (#500 & #700)	11.00	lf	E	55.00	0.23	2.53	12.65	139.15	3.80	41.80		0.00	38.00	219
- Pull station	1.00	ea	E	55.00	0.80	0.80	44.00	44.00	250.00	250.00		0.00	61.74	356
- 24VDC Beam smoke detector	4.00	ea	E	55.00	1.30	5.20	71.50	286.00	250.00	1000.00		0.00	270.06	1556
- 24VDC horn/strobe	1.00	ea	E	55.00	1.25	1.25	68.75	68.75	250.00	250.00		0.00	66.94	386
- Recertification of panel (w/SBB)				0.00		0.00	0.00	0.00		0.00		0.00	0.00	0
VAV				0.00		0.00	0.00	0.00		0.00		0.00	0.00	0
- VAV Hook-up	1.00	ls	E	55.00	25.00	25.00	1375.00	1375.00	290.00	290.00		0.00	349.65	2015
Subtotal Division 16						245		13,480		5,417		0	3,968	22,865
Item	Quantity		Crew	Rate	MH/Unit	Tot MH's	U.P.	Labor	U.P.	Material	U.P.	Equip / Sub	Sub OH & Fee	Total

Figure 58.0 [redacted] - Oversize Baggage Cost Estimate Details

[redacted]

Activity ID	Activity Description	Orig Dur
Oddsize Options 1 & 2		
C010001	NTP	0
C010011	Submittals / Fab&Deliver (w/start of SBB)	60
C010003	Mobilize	0
C020001	Demo / Cut / Cap / Make Safe	5
C020041	MEP Rough-In	10
C020031	Construct New Walls	20
C020051	Install Doors / Windows / Frames	10
C020011	Install Steel & Metal Deck	10
C020061	Install Doors & Windows	10
C020021	Slab on Deck	5
C020101	Install Finishes	10
C020251	Install Equip. / Devices	10
C020071	Clean-Up / Punchlist	5
C020091	Project Completion	0

Start Date	JAN 01 08	Early Bar
Finish Date	JUN 09 08	Progress Bar
Data Date	JAN 01 08	Critical Activity
Run Date	SEP 11 07 09:59	

Option & Area (print) SBB0

Sheet 1 of 1

[redacted] *High Speed*

Oddsize Options 1 & 2

Kohnen-Starkey Higher Standards, Superior Results. Inc.

Date	Revision	Checked	Approved

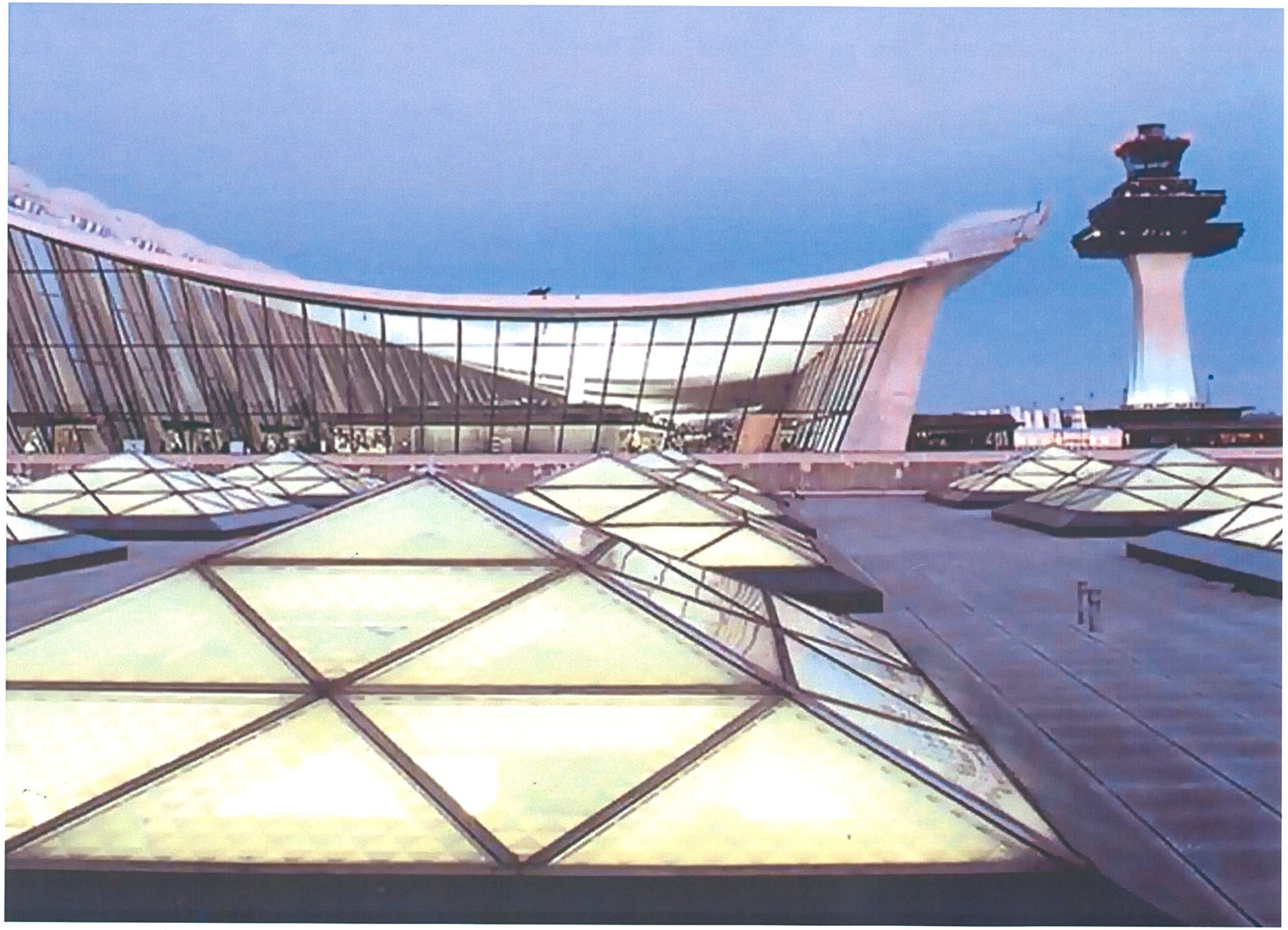
Figure 59.0 SBB - Oversize baggage Construction Schedule

[redacted]

End of Report

Attachment G

Example Preferred Alternative Report



[redacted]

High-speed - Option 4

[redacted]

[redacted]

FINAL - September 25, 2007

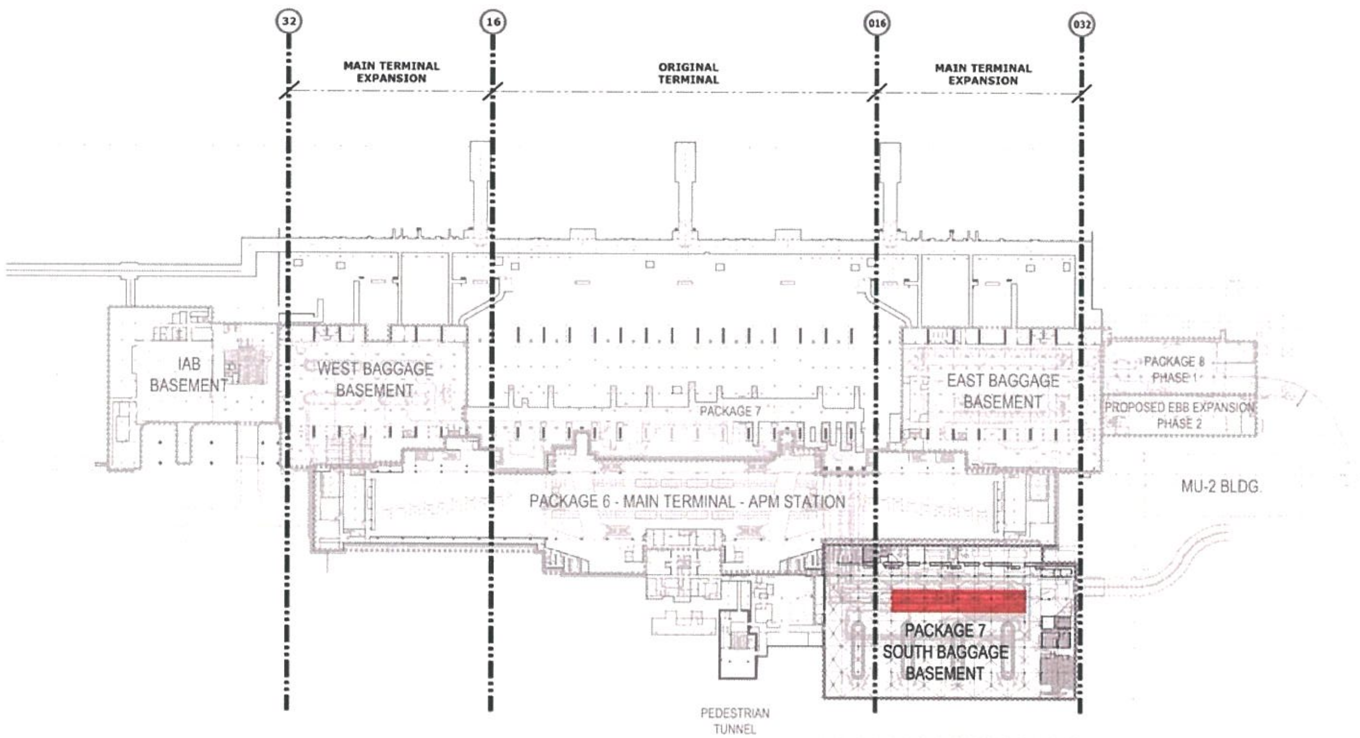


figure 1.0 -High Speed Key Plan Mezzanine Level

[redacted]

Overview

During the first quarter of 2007, [redacted] resumed coordination with the TSA in an effort to obtain funding associated with [redacted] Terminal EDS In-Line Projects [redacted] As a result of the [redacted] meeting on March 15th 2007, [redacted] directed the design team to proceed with the following

[redacted] - Issue for proposal documents (Based upon 7/25/05. 100% documents)

Early this year the 100% Design Submittal documents dated July 25th 2005 were taken off the shelf for a re-design effort, between March and June, to include changes/updates to EDS equipment and TSA requirements on the commissioning of the Checked Baggage Inspection System. The re-design effort was completed in late June and the documents dated June 26th 2007 were issued to the Authority for procurement.

Per recent changes to TSA requirements for In-Line EDS, the June 26, 2007 IFP submittal will need to be re-evaluated for revisions.

At the [redacted] request the design team studied four (4) alternate options to facilitate the future "High-Volume" EDS machines, within the existing SBB footprint.

The first three options were based on the proposed In-Line EDS design, as it was presented in the June 26, 2007 IFP submittal, which indicated that only 8 of the 10 TSA requested CBIS Performance Design Standards can be satisfied, because the proposed layout was based on prior design objectives/planning premise and TSA guidelines. The results of the initial study, which included the first three alternate options for the [redacted] High-Speed consideration is summarized in the September 25, 2007 Design Narrative.

The fourth alternate option is based on a revised planning premise that considers the current originating demand for Ticketing Kiosks 2 and 3, plus a coordinated projected annual growth for the next 5 to 7 years, which is consistent with the TSA's CBIS planning guidelines. This new design, referred to as Option 4, satisfies all 10 TSA design standards, as illustrated in this document and can accommodate current EDS technology, such as the L3 6000 series, as well as future EDS technology, such as the Analogic XLB1100 units.

Option 4 - Baggage Handling System

Executive Summary

As indicated in the [redacted] High-Speed Options Design Narrative, dated 25th September 2007, if the [redacted] In-Line EDS design is based on the current planning forecast, as that presented in the June 26, 2007 IFP submittal (i.e., Future 2 Aviation Activity Forecast for IAD, which indicates a requirement for 8 EDS units), the following items from the TSA's latest performance design standards cannot be accommodated due to existing facility space limitations. Items such as,

- The addition of new conveyor lines to segregate Level 1 EDS screened "Cleared Bags" and "Non-Cleared Bags".
- The addition of new conveyor lines to provide EDS "Out-of-Gauge" by-pass capability. EDS Out-of Gauge bags are bags that can be accommodated by the BHS conveyor equipment, but exceed the EDS machine's scanner gantry limits and therefore would be automatically directed to the Threat Resolution Room (ETD area), instead of processed through the existing Kiosk 3 oversize line as it was intended by the 2005 [redacted] In-line EDS design.
- EDS Re-insert conveyor line from the ETD area for mis-tracked/unknown baggage.

The current design (i.e., IFP submittal dated June 26, 2007) was based on the Future 2 Aviation Activity Forecast for [redacted] which assumed the eventual build-out for the Main Terminal that will more than likely include an expansion to the [redacted] for additional baggage make-up and balancing of facilities between the basement level operational space and Concourse level Ticketing. The design intent for the SBB In-Line EDS was to install the required number of [redacted] machines, per the Future 2 forecast, to ensure that the proposed design had the necessary [redacted] equipment in place for the forecasted period.

Per the design review comments that were received from Carter Burgess (TSA's Chief Technology Office), on the [redacted] 100% In-Line EDS design submittal, and subsequent meetings with the TSA, it was suggested that the project planning forecast should be consistent with the TSA's guidelines, which typically take into account the current airport/airline flight schedules with a projected growth of approximately 5-year look ahead period. With that in mind, and with the understanding that current flight schedule data was not readily available for an analysis, at the Authority's request, BNP performed a fast-track study to evaluate a fourth High-Speed Option for the [redacted]; the feasibility of accommodating the latest TSA Checked Baggage Inspection System (CBIS) Performance Design Standards with a revised planning premise that considers the following:

- Meet the current originating demand for Ticketing Kiosks 2 and 3 based on baggage flow volumes, as recorded by the existing [redacted] Automated BHS computer system.
- Assume the hours of 14:00 to 19:00 as the [redacted] Bagroom daily peak operating period.
- Apply an estimated growth rate of 3% per year, for approximately 12 to 13 years.

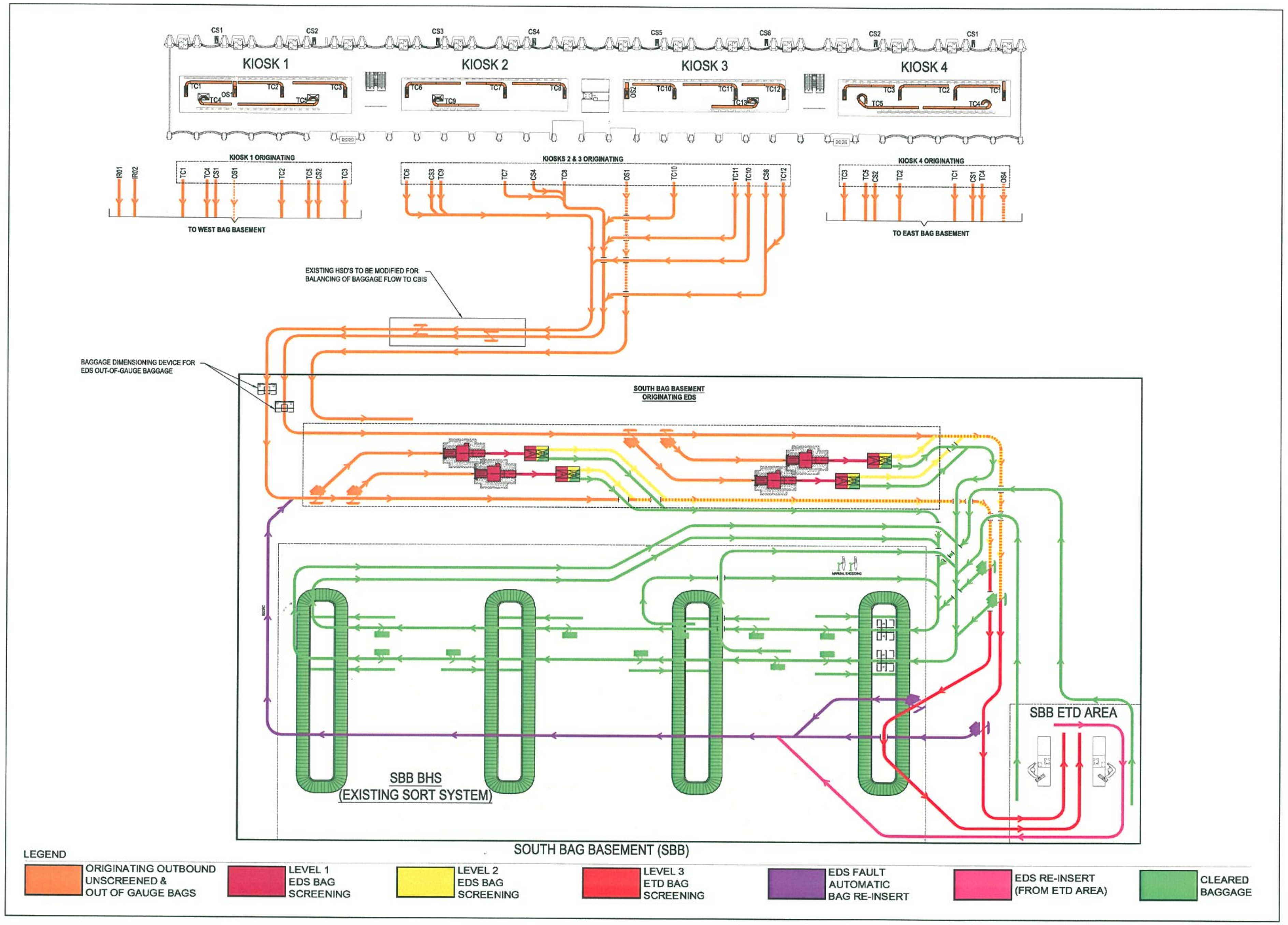


Figure 2.0 -Main Terminal Outbound BHS Security Alterations Program Option 4

It should be noted that for the purposes of this study, bag counts for the month of August 2007 were utilized that were roughly 1200 bags per hour during the peak period. This information does of course need to be analyzed against current flight schedules, various holiday and/or high-volume periods, and validated through simulations to confirm these initial preliminary figures.

Based on the above referenced revised planning premise considerations and assuming a minimum of 400 bags-per-hour per EDS machine, it appears that the CBIS can be designed with four (4) In-Line EDS machines that will accommodate:

- The current [redacted] bagroom (i.e., Ticketing Kiosks 2 & 3) baggage volume,
- A projected growth for the next 5 to 7 years, after the commissioning of the CBIS (assumed to be roughly by late 2009),
- And the TSA's latest 10 CBIS Performance Design Standards

[redacted] Option 4 (Figure 2 and 3)

The attached preliminary concept, which needs to be reviewed and coordinated with the Architecture and MEP disciplines illustrates that the TSA's ten (10) Performance Design Standards, for the proposed CBIS in the [redacted] can be satisfied with the above referenced revised planning premise. This additional option, which is referred to as Option 4 of the study for the [redacted] High-Speed Options, coupled with the assumption that new Type 1 EDS machines with higher throughput rates would become available in the future, allows the [redacted] In-Line EDS design to provide a CBIS within the same original envelope that was anticipated through the IFP submittal, without compromising future expansion programs for the Main Terminal build-out considerations.

As an example, referencing the table 1, if we were to assume 400 bags-per-hour (BPH) per EDS machine, the CBIS would reach maximum capacity around the year 2016. Assuming current EDS technology may potentially provide higher throughput rates than 400 bph (say up to 600 bph) or other new more efficient EDS equipment become available in the future, with higher throughput rates, such as the Analogic XLB1100 or the like, the proposed CBIS design may potentially stay with four (4) EDS units without constraining the [redacted] future build-out requirements such as the Future 2 Aviation Activity Forecast that was considered in the original and the IFP In-Line EDS designs. Therefore with this option a more universal approach would be considered for the [redacted] In-Line EDS design; one that would be optimized for the current EDS technology, without constraining the maximum potential capacity of the EDS equipment, while also providing the ability to accept and be optimized for future upgrades or replacements with "High-Volume" EDS machines and minimal re-engineering or modifications to the proposed CBIS.

BPH / EDS	CBIS CAPACITY (BPH) (Based on 4 EDS Machines)	DESIGN YEAR	BHS& CBIS THROUGHPUT (BPH) Per Aug. 2007 Bag Counts & 3% Growth Factor
400	1600	2007	1200
500	2000	2008	1236
600	2400	2009	1274
700	2800	2010	1313
800	3200	2011	1353
		2012	1394
		2013	1436
		2014	1480
		2015	1525
		2016	**1571**
		2017	1619
		2018	1668
		2019	1719
Note: Existing BHS Capacity = 3300 BPH		2020	1771

Table 1 BHS and CBIS Projected Throughput

The following table 2 illustrates the differences between the June 26, 2007 IFP Submittal and the enclosed drawings for Option 4

#1 - In-line Screening Lines

- Verti-sorters were added to the design to accommodate Item 9 of TSA's CBIS Performance Design Standards (i.e., Level 1 Screening Divert and Merge Requirements)
- Baggage Dimmensioners were added to the design to accommodate the TSA requirement for out-of-gauge bag processing
- One (1) Screening Line per loop (2 lines total) were eliminated due to updated requirements
- One (1) Line per loop (2 lines total) maintained from IFP as an out-of-gauge easement

#2 - In-line Screening Re-Insert Lines

- Two (2) Re-circulation lines have been eliminated due to redesign of system functionality

#3 - EDS Clear Bag Lines

- Additional Linear footage added due to the redesign to accommodate Item 10 of TSA's CBIS Performance Design Standards (i.e., Reinsertion and Purge Requirements), both automatic for EDS faults and Manual from ETD area for mis-tracked / unknown bags.

#4 - Sortation MODS

- Additional Linear footage added to accommodate the redesign for #3 above

#5 - Inbound Line Modifications

- Additional Linear footage added to accommodate the redesign for #3 above

DESCRIPTION	*Difference between Option 4 & IFP*						
	New Conveyor (LF)	Modified Conveyor (LF)	Queue Conveyor	Vertical Sorter Units	Baggage Dimens. Device	45° Merge Conveyor	High Speed Diverters
In-line Screening Lines	-218	-30	-6	4	2	-6	-4
In-line Screening Re-Insert Belts	-49	0	-2	0	-1	-3	-3
EDS Clear Bag Lines	573	0	14	0	0	6	2
Sortation MODS (RC1, RC2, OS3 & OT/ML MODS)	405	108	-4	0	0	-4	0
Inbound Line Modifications (4 lines - IB10, IB11, IB5, IB6)	172	-130	0	0	0	0	0
TOTAL: Option 4 vs. IFP	**883**	**-52**	**2**	**4**	**1**	**-7**	**-5**
Existing Conveyor Equipment Removal	**543**		**-9**	**0**	**0**	**-4**	**0**

Table 2 - Differences between IFP submittal and Option 4

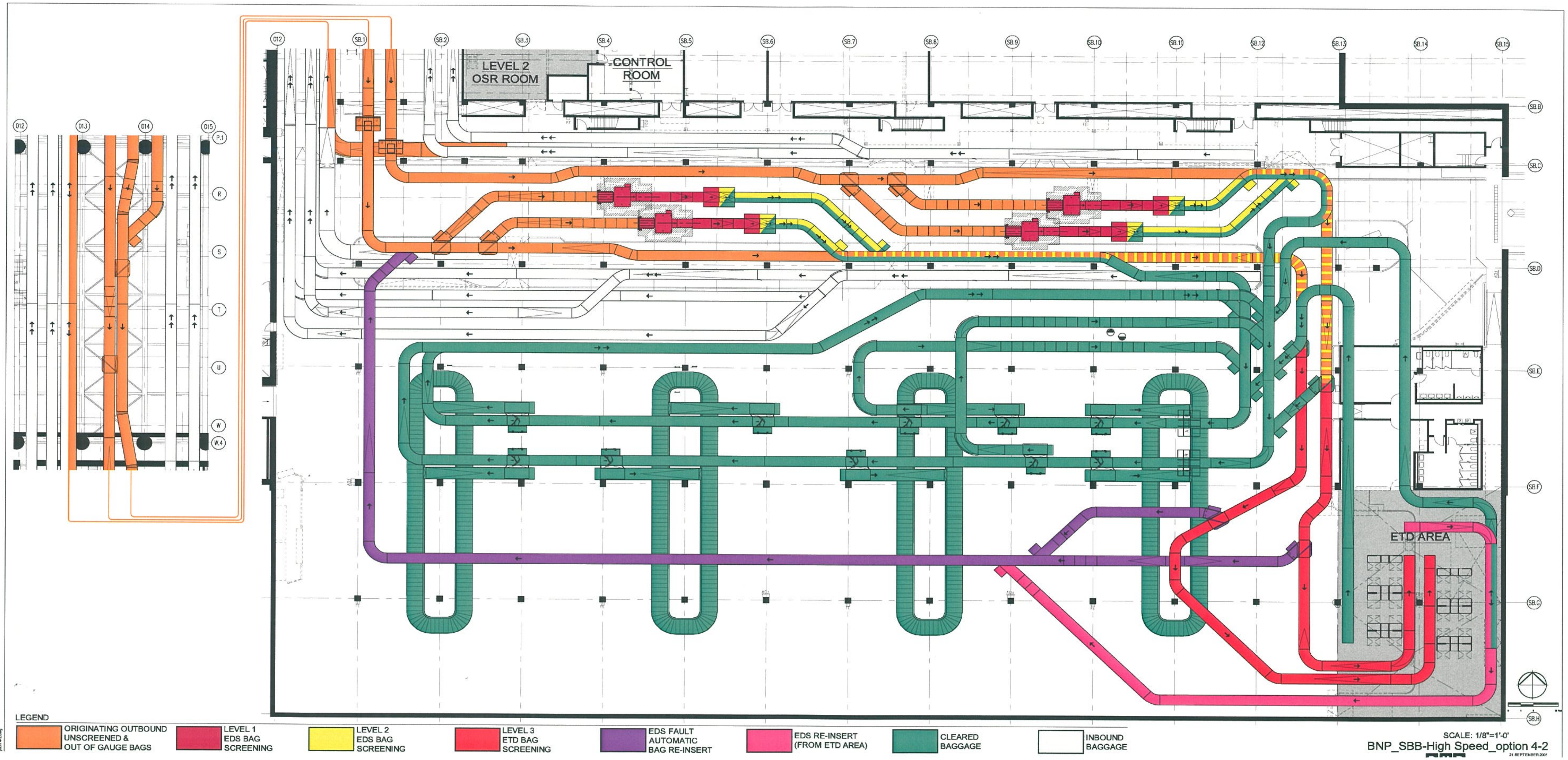
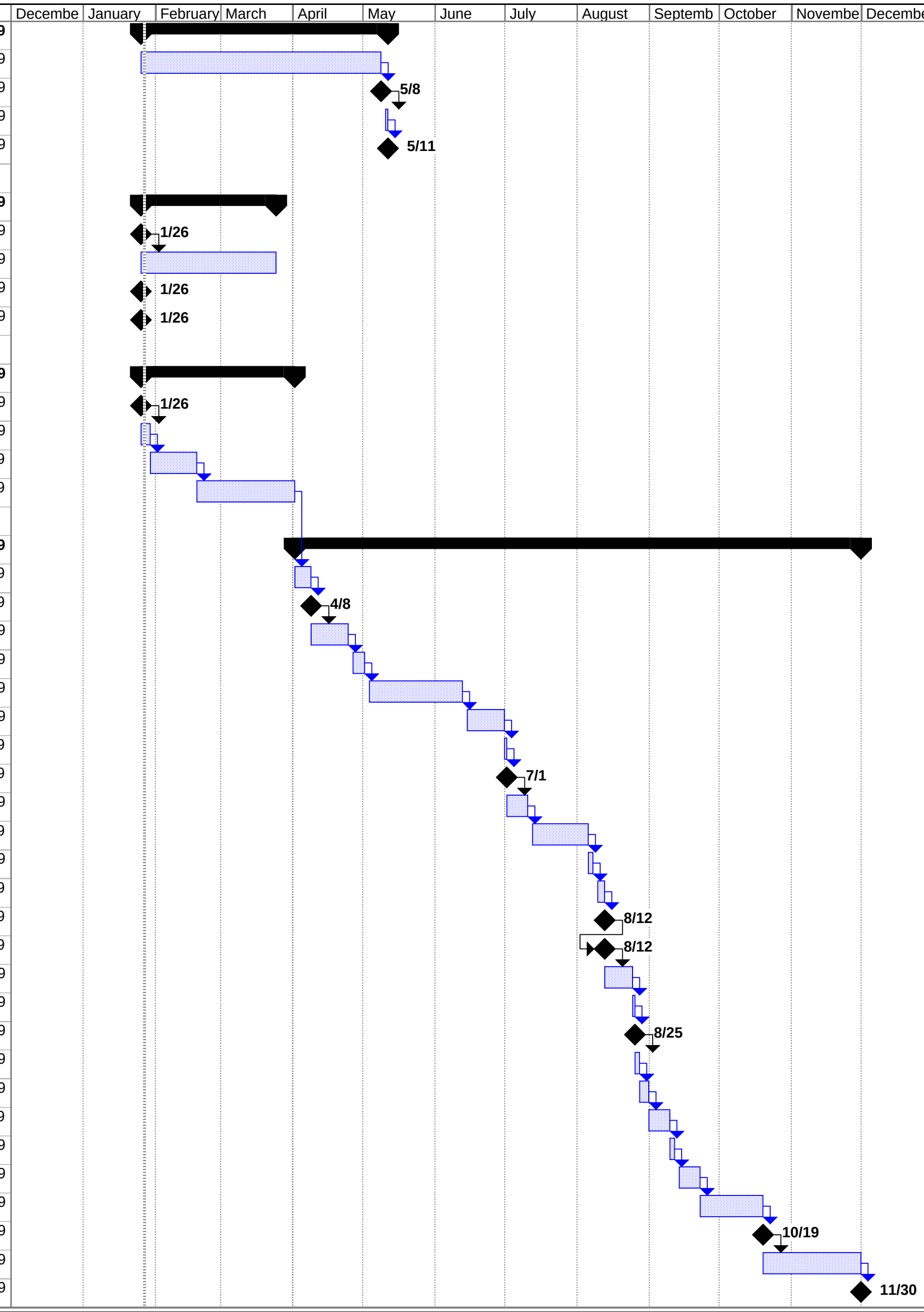


figure 3.0 -Main Terminal Outbound BHS Security Alterations Program Option 4

Attachment H

Example Milestone Project Schedule

ID	Task Name	Duration	Start	Finish
1	**construction**	**76 days?**	**Mon 1/26/09**	**Mon 5/11/09**
2	Construction	75 days	Mon 1/26/09	Fri 5/8/09
3	Permanent Power Available	0 days	Fri 5/8/09	Fri 5/8/09
4	Contractor System Power Up and Diagnostic Testing	1 day?	Mon 5/11/09	Mon 5/11/09
5	BHSC Ready for Integration	0 days	Mon 5/11/09	Mon 5/11/09
6				
7	**Contract for Sercvices EDS Delivery and Installation**	**42 days**	**Mon 1/26/09**	**Tue 3/24/09**
8	Equipment SOW	0 days	Mon 1/26/09	Mon 1/26/09
9	Equipment DO Process	42 days	Mon 1/26/09	Tue 3/24/09
10	Installaton SOW	0 days	Mon 1/26/09	Mon 1/26/09
11	Installation PR	0 days	Mon 1/26/09	Mon 1/26/09
12				
13	**Installation and Integration**	**48 days**	**Mon 1/26/09**	**Wed 4/1/09**
14	EDS Delivery	0 days	Mon 1/26/09	Mon 1/26/09
15	EDS Installation	4 days	Mon 1/26/09	Thu 1/29/09
16	EDS BHS Integration	14 days	Fri 1/30/09	Wed 2/18/09
17	Networking (MUX and NEDS)	30 days	Thu 2/19/09	Wed 4/1/09
18				
19	**IV&V/Commissioning**	**173 days**	**Thu 4/2/09**	**Mon 11/30/09**
20	Site Lead Detemines iSAT date	5 days	Thu 4/2/09	Wed 4/8/09
21	Deliver SSTP Questionair to Project Sponsor	0 days	Wed 4/8/09	Wed 4/8/09
22	Collect Testing Data	12 days	Thu 4/9/09	Fri 4/24/09
23	OnSite SSTP Preparation Meeting	5 days	Mon 4/27/09	Fri 5/1/09
24	IV&V Develops SSTP	30 days	Mon 5/4/09	Fri 6/12/09
25	Review SSTP	12 days	Mon 6/15/09	Tue 6/30/09
26	Approve SSTP	1 day	Wed 7/1/09	Wed 7/1/09
27	Deliver SSPT to Project Sponsor	0 days	Wed 7/1/09	Wed 7/1/09
28	Test Coordination Meeting	7 days	Thu 7/2/09	Fri 7/10/09
29	Constracting Test (Pre-iSAT)	18 days	Mon 7/13/09	Wed 8/5/09
30	Deliver Internal Pre-iSAT Test Results	2 days	Thu 8/6/09	Fri 8/7/09
31	Testing Readiness Review (TRR)	3 days	Mon 8/10/09	Wed 8/12/09
32	Issue TRN	0 days	Wed 8/12/09	Wed 8/12/09
33	Approve TRN	0 days	Wed 8/12/09	Wed 8/12/09
34	Integrated Site Acceptance Testing (iSAT)	8 days	Thu 8/13/09	Mon 8/24/09
35	Issue QLR	1 day	Tue 8/25/09	Tue 8/25/09
36	Approve QLR	0 days	Tue 8/25/09	Tue 8/25/09
37	Systems Data and Operations Review	2 days	Wed 8/26/09	Thu 8/27/09
38	Issue TSR	2 days	Fri 8/28/09	Mon 8/31/09
39	Approve TSR	7 days	Tue 9/1/09	Wed 9/9/09
40	Issue SSTR	2 days	Thu 9/10/09	Fri 9/11/09
41	Approave SSTR	7 days	Mon 9/14/09	Tue 9/22/09
42	Site Acceptance Test (SAT) /Operational Readiness Test (ORT)	19 days	Wed 9/23/09	Mon 10/19/09
43	Live Bag Screening	0 days	Mon 10/19/09	Mon 10/19/09
44	30 day Run in Period	30 days	Tue 10/20/09	Mon 11/30/09
45	Operation	0 days	Mon 11/30/09	Mon 11/30/09



Project: Example Schedule
Date: Tue 1/27/09

Task		Progress		Summary		External Tasks	
Split		Milestone		Project Summary		External Milestone	

Deadline