Transportation
Security
Administration

CHECKPOINT DESIGN GUIDE (CDG)

Revision 6.1

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Prepared for the

Transportation Security Administration (TSA)

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DISCLAIMER

The Transportation Security Administration (TSA) Checkpoint Design Guide (CDG) is prepared to help TSA Headquarters (TSA HQ), local TSA, airport stakeholders, and architectural and engineering (A&E) firms produce a consistent design product.

The CDG is intended to be used as a design guide. Not all answers to questions in the design process are addressed in this document and deviations are sometimes warranted. Seek guidance from the local Federal Security Director (FSD), TSA checkpoint designer, deployment coordinator, and TSA Occupational Safety, Health and Environment (OSHE) when the guidelines cannot be applied. As with any guide, previous experience, knowledge of local and national codes, and professional judgment are to be integrated with the direction provided herein to develop the optimum design.

This document is intended to be printed double-sided. Select flip short edge when printing.

All graphics/drawings contained in this document are not meant to be scaled.

HOW TO USE THIS GUIDE

This guide is organized into 4 parts, in which each are geared to a specific audience. There are many moving parts in designing TSA SSCPs and although all the information in this guide is important, some may not need to have as much specific information for certain aspects of a checkpoint. Following is summary of each part of this document to help direct to specific information as it applies to the required audience.

PART 1 – INTRODUCTION

1-1 - Introduction to Security Screening Checkpoints

Section 1-1 is designed to familiarize the reader of this document with the purpose of TSA Security Checkpoints. General information is provided to inform all audiences and is an aide to direct the reader to the specific information for designing a new SSCP.

PART 2 – SSCP ROLES, RESPONSIBILITIES, & PROJECT PHASING

2-1- Section 2-1 describes the roles, responsibilities, and project phasing of design, installation, and certification of TSA Equipment.

2-2 – Section 2-2 outlines the equipment installation, decommission, and closeout.

PART 3 – SSCP ELEMENTS, LAYOUTS, AND SPECIFICATIONS

3-1 - Standard SSCP Layouts

Section 3-1 identifies the requirements for a new or reconfigured SSCP design including queuing, pre-screening, passenger screening, carry-on screening, and risk based security. This section provides the requirements for equipment spacing and orientation of TSA standard layouts.

3-2 - Transportation Security Equipment (TSE)

Section 3-2 includes detailed specifications and graphics of all the standard TSE currently being deployed to airports for SSCP. The section is organized to introduce TSE as a passenger travels through a checkpoint. Each piece of equipment in a SSCP has specific dimensional and electrical requirements. Attention to specifications is crucial to ensure that the equipment is installed and operates as required.

3-3 - SSCP Electrical, Data, and Safety Requirements

Section 3-3 describes, in more detail, the power and data requirements for each piece of equipment as well as the power and data infrastructure required for a SSCP. Standard layouts and configurations of electrical/ data devices are depicted to improve checkpoint infrastructure consistency. This section also identifies the safety requirements for the checkpoint.

PART 4 – DESIGN AIDES

4-1 – Checklists and Lessons Learned

Section 4-1 is used to aide in SSCP design and TSE Installation by identifying common oversights. Guidance is provided for equipment placement and drawing production standards.

4-2 – Standard Equipment Dimensional Criteria

4-2 includes standard layouts for multiple manufacturers' AT X-rays with various configurations. When designing a new checkpoint, the designer should refer to a standard layout or a combination of multiple layouts.

4-3 – SSCP Terminology

Section 4-3 provides a list of common acronyms and their definitions which occur throughout this document.

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PART 2 – Roles, Responsibilities, and Project Phasing

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PART 4 – Design Aides

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CDG Revision Log			
Date	**Revision No.**	**Description**	**Section(s) Affected**
12/17/08	0	Original publication	All Sections: 1, 2, 3, 4, 5, & 6
02/11/09	1	Incorporated OIB feedback from the original publication.	All Sections: 1, 2, 3, 4, 5, & 6
02/19/10	2	Incorporated power/data requirements for all SSCP equipment.	Section 4 Only
03/10/11	3	Updated the SSCP equipment, the arrangements, and the electrical requirements.	All Sections: 1, 2, 3, 4, 5, & 6
08/29/12	4	Updated the SSCP equipment, the arrangements, and the electrical requirements.	All Sections: 1, 2, 3, 4, 5, & 6
11/09/12	4.1	Quarterly update - AIT power location, AWT language, x-ray brand, ETD procurement	Sections 2, 8 (pages 17, 40-41, and 110-117)
09/23/13	5.0	Updated the SSCP equipment, removed Rapiscan AIT reference, removed AWT language, updated the arrangements, and the electrical requirements.	All Sections: 1, 2, 3, 4, 5, 6, 7, 8 & 9
05/07/14	5.1	Updated language in section 1.5, updated Figure 1.4, updates to Section 7.1 Checklist.	Sections 1 & 7
12/30/15	6.0	Reformat document, included Construction, Deployment, and Installation Section, removed references to legacy equipment, update several figures, add L3 Provision2 AIT.	All Sections
06/01/16	6.1	Added requirement for a mirror in the Private Screening Room. Updated all standard layouts with the AIT2. Provided dimensional and weight information for structural analysis guidelines.	Sections 3 & 4

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1-1 INTRODUCTION TO SECURITY SCREENING CHECKPOINTS (SSCPS)

The Transportation Security Administration (TSA) is mandated by law to screen air travelers and their carry-on bags in order to intercept prohibited items at the Security Screening Checkpoints (SSCP) at approximately 450 airports across the United States. Since each checkpoint represents a point of entry into the aviation system, each must meet security criteria. SSCPs were less complex pre-9/11. SSCPs have evolved considerably since the formation of TSA in 2002, and continue to evolve with improved technology and increased experience. Because the threat environment is constantly changing, this Checkpoint Design Guide (CDG) was created to communicate the most current accepted guidelines for checkpoint design.

The intent of this document is to provide a description of the SSCP equipment that is used today. Also included is information that can be used to locate equipment within the checkpoint to provide the highest level of security screening and efficiency beginning at the queue and continuing through the composure area. The information in this guide should be used when designing new checkpoints or reconfiguring existing checkpoints. All designs and reconfigurations must be coordinated with TSA checkpoint designer and deployment coordinator, local FSD and staff, and local airport stakeholders so that the recommended guidelines can be site-adapted for each checkpoint. This document is a "living" document that is updated when new technologies or processes are adopted by TSA.

There are multiple layers of security in place at airports today to facilitate the safe movement of people and commerce throughout the airport transportation system. These layers are roadblocks to potential terrorist paths because they are equipped to detect and minimize threats that could occur. Refer to **Figure 1-1.1.**

Every airport and airport terminal building is unique in physical design and operational requirements. A single SSCP solution will not work for every checkpoint, nor will it work for every checkpoint at the same airport. Every SSCP location must be reviewed as an entity of the overall airport security system. The CDG provides direction and recommendations on how to construct, deploy equipment, install equipment, and locate and size a new SSCP based on the following conditions.

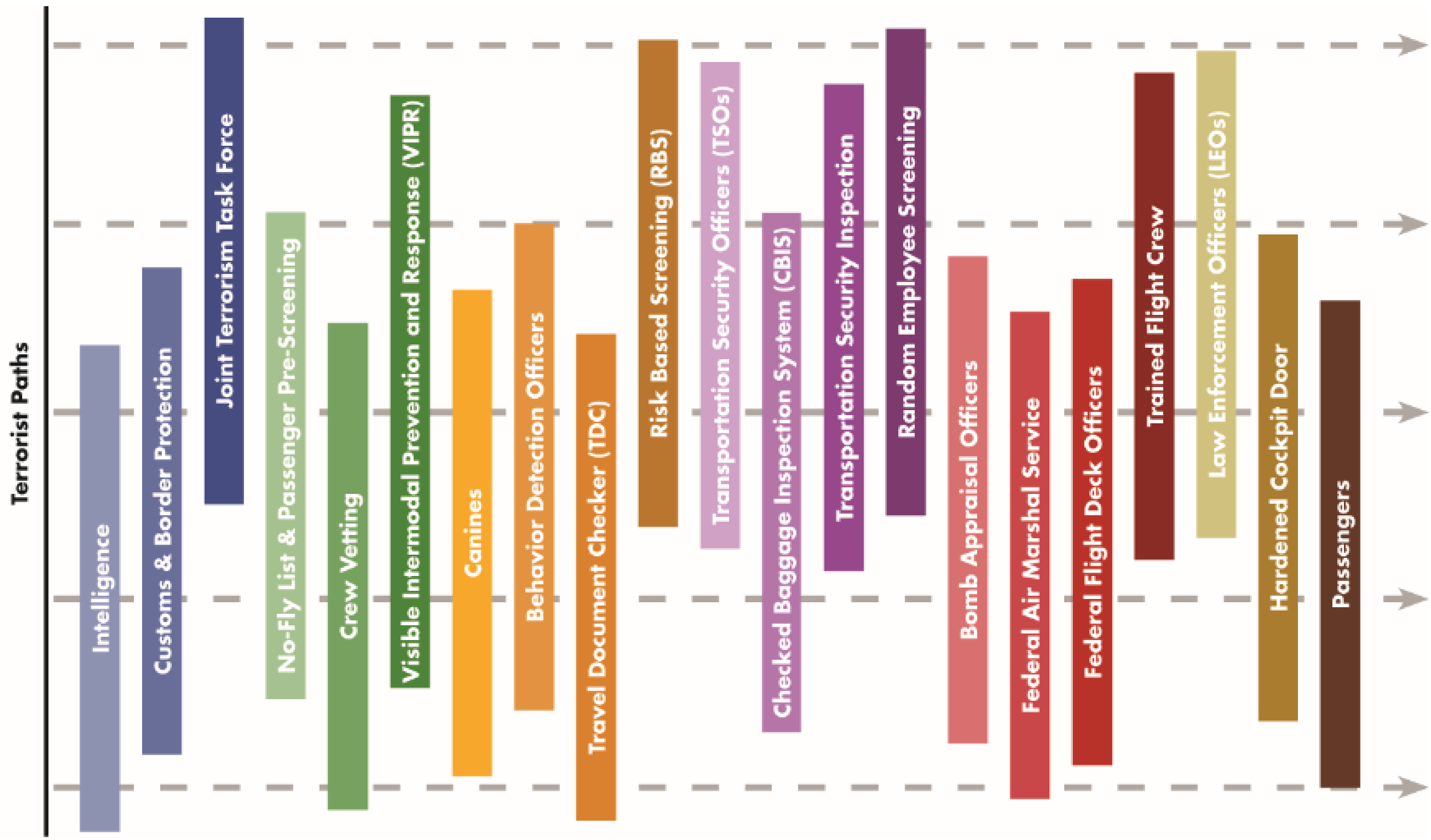
- Facility Infrastructure & Operations
- Current Screening Technology/Equipment
- Type of Risk that is Present or Anticipated
- Passenger Loads/Number of Enplanements

Improper SSCP design can result in terminal and checkpoint queue congestion, decreased efficiencies, flight delays, missed flights, and unnecessary security risks. Proper SSCP design helps avoid costly problems for the airport, airlines, and TSA. It also provides a smoother and safer experience for the passenger while increasing the efficiency of the screening process.

Once the checkpoint is laid out per the design there should be no adjustments or deviations from its design unless it is reviewed and approved by the design team.

This document is divided so that each section is directed to a specific audience. When using this guide, each part and/or section may be more directed to the scope of work one may be involved in when installing a new SSCP. Part 1 is included to identify each section and which information is specific to the reader of this guide. Part 1 also covers different airport classifications and their importance to security. It is recommended that an audience who is new to TSA SSCP design and implantation read through this section to get an understanding of general TSA screening information.

Figure 1-1.1 Twenty One Layers of Security



1-1.1 GENERAL INFORMATION

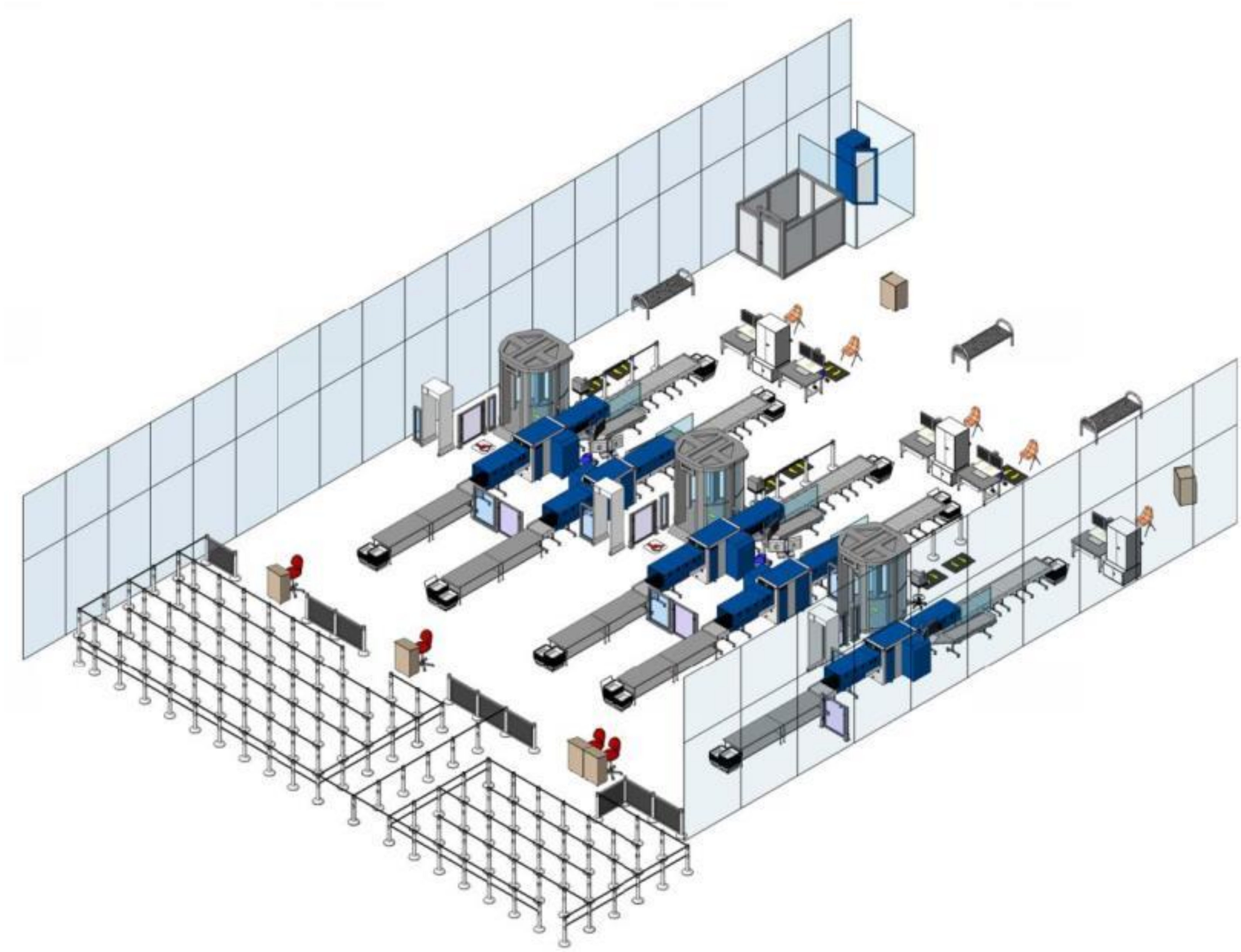
SSCPs are a critical element to an airport's overall terminal design and must be considered in the early stages of planning and conceptual layout.

Security screening is intended to deter and prevent hijackings and the transport of explosives, incendiary, or dangerous weapons aboard commercial aircraft. Sterile areas are defined as those areas where aircraft access is possible only for persons that have undergone security screening. Non-sterile areas are accessible to the general public and are generally located near the ticketing counters and areas before the airport concourse(s).

When designing a new terminal or checkpoint, or reconfiguring an existing terminal or checkpoint, the following should be considered during design:

- Sufficient square footage to support current TSA technology and screening processes
- Ability to secure exit lanes during operational and non-operational hours of the SSCP with locking doors and/or continuous staffed law enforcement officers
- Wheelchair accessibility and allowances for persons with disabilities and/or assistive devices
- Minimal interruption or delay to the flow of passengers and others being screened
- Effective and secure handling of goods that are transported from the non-sterile area to the sterile area
- Protection of SSCP equipment during non-operational hours
- Equipment maintenance clearances
- Operational flexibility in response to changes in passenger loads, equipment, technology, processes, and security levels
- Efficient and effective use of terminal space
- Acceptable and comfortable environmental factors, such as air temperature, humidity, air quality, lighting, and noise
- Safe and ergonomic design
- Coordination of power, data, fiber optics, CCTV, and lighting at the SSCP
- Contingency plans for power outages and system challenges (good practice for the airport, but not required by TSA for the checkpoint)
- Allowance for TSA office / support space which needs to be negotiated through the TSA Office of Real Estate
- Staffing efficiency for TSA and other security personnel

Figure 1-1.2 Example SSCP



1-1.2 AIRPORT OPERATIONAL TYPES

Airports are typically categorized by the number of enplanements per year. This defines the airport's category as "X, I, II, III, and IV." Category X or CAT X airports are the busiest of the Federal Airports, Category IV or CAT IV airports may have only a few flights arriving/ departing each week.

Airports are also classified as a hub, spoke of a hub, or stand-alone. Airports can be characterized as Transfer/Hub, Origin and Destination (O&D), or a combination of the two, with regional and commuter traffic included in all three.

In Transfer/Hub airports, transfer passengers frequently move from gate to gate without passing through an airport SSCP. If concessions are located in the non-sterile area, there is incentive for passengers to exit the sterile area and subsequently re-enter the sterile area through the SSCP, thus increasing the passenger load that might otherwise be unnecessary. In this arrangement, concessions are suggested to be located in the sterile area to allow passengers to move among gates along multiple concourses without needing to be re-screened..

Each airport category may have different SSCP layout requirements and when constructing a new checkpoint, a designer should take into consideration the particular category of that airport. Throughout this guide requirements for different categorized airports are discussed.

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2-1 ROLES, RESPONSIBILITIES, AND PROJECT PHASING

If an airport is constructing a new or modifying an existing TSA security screening checkpoint, close coordination with many stakeholders is required. The responsibilities may vary depending on the conditions of the checkpoint modifications. The following describes typical roles and responsibilities for primary project stakeholders interested in modifying or constructing a new checkpoint.

1. Airport Authority - Local representative of overall airport operations
   - Consult on basic engineering, operations, IT, maintenance, master planning, project management, and other appropriate design functions
   - Coordinate with project sponsor and TSA Headquarters for specific procedural and funding responsibilities
2. Project Sponsor – Airport owner/operator or airline funding and initiating checkpoint improvements
   - Initiation and execution of planning and design
   - Initiation and execution of construction
   - Provide technical recommendations
   - Provide structural, electrical/data, duress alarm and architectural designs
   - Produce checkpoint layout design, phasing, and electrical/data design drawings to issue for construction drawings in accordance with the latest CDG
3. TSA Headquarters – Representative from TSA responsible for review and approval of all design submittals, funding of modifications, and prioritization of equipment deployments.
   - Operations and maintenance of checkpoint
   - Determine the number of lanes required or permitted at a checkpoint based on Airport Category, Unique Security Requirements, and Passenger Volume.
   - Provide regular correspondence of lessons learned and regularly update stakeholders of design and process changes
   - Perform technical and operational review of designs
   - Review impact of screening protocol changes
   - Brainstorm operational and policy issues
   - Determine the specific equipment type to be used
   - Determine the scheduling of deploying new equipment
   - Consult with TSA OSHE Specialists as needed
   - Ensure optimal design to mitigate unnecessary stress to passengers and TSOs
4. Design/Integration Team – Formed to plan, design, ship/install, and modify checkpoint
   - Consult directly with TSA Design Team
   - Coordinate shipping, storing, transporting, and installing equipment at the checkpoint
   - Coordinate with contractors as required for checkpoint infrastructure improvements
   - Consult with project stakeholders

Figure 2-1.1 describes the process and stakeholder coordination when designing and constructing an SSCP.

Figure 2-1.1 Project Stakeholder RACI Chart

Project Phase	Project Sponsor	TSA	Applicable CDG Section
Prepare Construction Documents	Responsible		2-1.1
SSCP Design Optimization Review	Advise	Responsible/Advise	2-1.1
Equipment Layout	Responsible	Advise	Part 3
Electrical Layout	Responsible	Advise	Section 3-3
Selection of Electrical/Data Device Type	Responsible	Advise	Section 3-3
Designation of IT Cabinet Location	Responsible	Advise	Section 3-3
Design of Fiber optic Connections	Responsible	Advise	Section 3-3
Design of CCTV	Responsible	Inform/ Advise	Section 3-3
Phasing Plans (Equipment Installation)	Responsible	Inform/Advise	Part 2
Phasing Plans (Bldg/Construction)	Responsible		Part 2
Queue Design	Responsible	Advise	3-1.2, 3-2.2
Private Screening Room Location	Responsible	Advise	3-2.11
Airport Modifications	Responsible		Part 2
Structural Engineering	Responsible		Part 2
Seismic Engineering	Responsible		Part 2
Equipment Installation	Inform	Responsible	Part 2 / Section 3.2
Equipment Decommission	Inform	Responsible	Part 2
Rigging	Advise/Inform	Responsible	Part 2
Shipping	Inform	Responsible	Part 2
Warehousing	Inform	Responsible	Part 2

Figure 2-1.1 Project Stakeholder RACI Chart (cont.)

Project Phase	Project Sponsor	TSA	Applicable CDG Section
Electrical & Data Infrastructure Installation/Relocation	Responsible		Section 3-3
Electrical Outlets	Responsible		Section 3-3
Electrical Cabling	Responsible		Section 3-3
Electrical Panel (If Required)	Responsible		Section 3-3
Data Outlet and Cablings	Responsible		Section 3-3
Duress Alarm	Responsible		Section 3-3
IT Cabinet	Responsible	Inform	Section 3-3
Patch Panel(s)	Responsible	Inform	Section 3-3
Data Switch	Advise	Responsible	Section 3-3
Airport Modifications - Construction	Responsible		Part 2
Permitting	Responsible		Part 2
Wall Relocation or Demolition	Responsible		Part 2
Ceiling Height Adjustment	Responsible	Advise	Part 2
Private Screening Room Installation	Responsible	Advise	3-2.11
CCTV	Responsible	Advise	3-3.6
Floor Repair	Responsible		Part 2
Cleanup	Responsible		Part 2

Responsible - Those who do the work and achieve the task

Advise - Those who recommend subject matter to the responsible party to complete a task

Consult - Those whose opinions are sought, typically subject matter experts; and which there is two-way communication

Inform - Those who are kept up-to-date on progress, often only on completion of the task or deliverable; and which there is just one-way communication

2-1.1 PROJECT PHASING

New construction and checkpoint reconfigurations to the SSCP must be closely coordinated with TSA Checkpoint Designer, Deployment Coordinator, Federal Security Director & Staff, government agencies, and airport/ airline operations. The multiple stakeholders' involvement is crucial to the ensure proper equipment and resources are deployed to support the changes that heightens security, increases throughput, reduces on-the-job injuries, makes staffing more dynamic, improves passenger experience, and is consistent with this design guide.

Funding for SSCP modifications or reconfigurations will depend on the scope of work. TSA Checkpoint Designer and Deployment Coordinator may approve the work, but may not provide all or any of the funding for it.

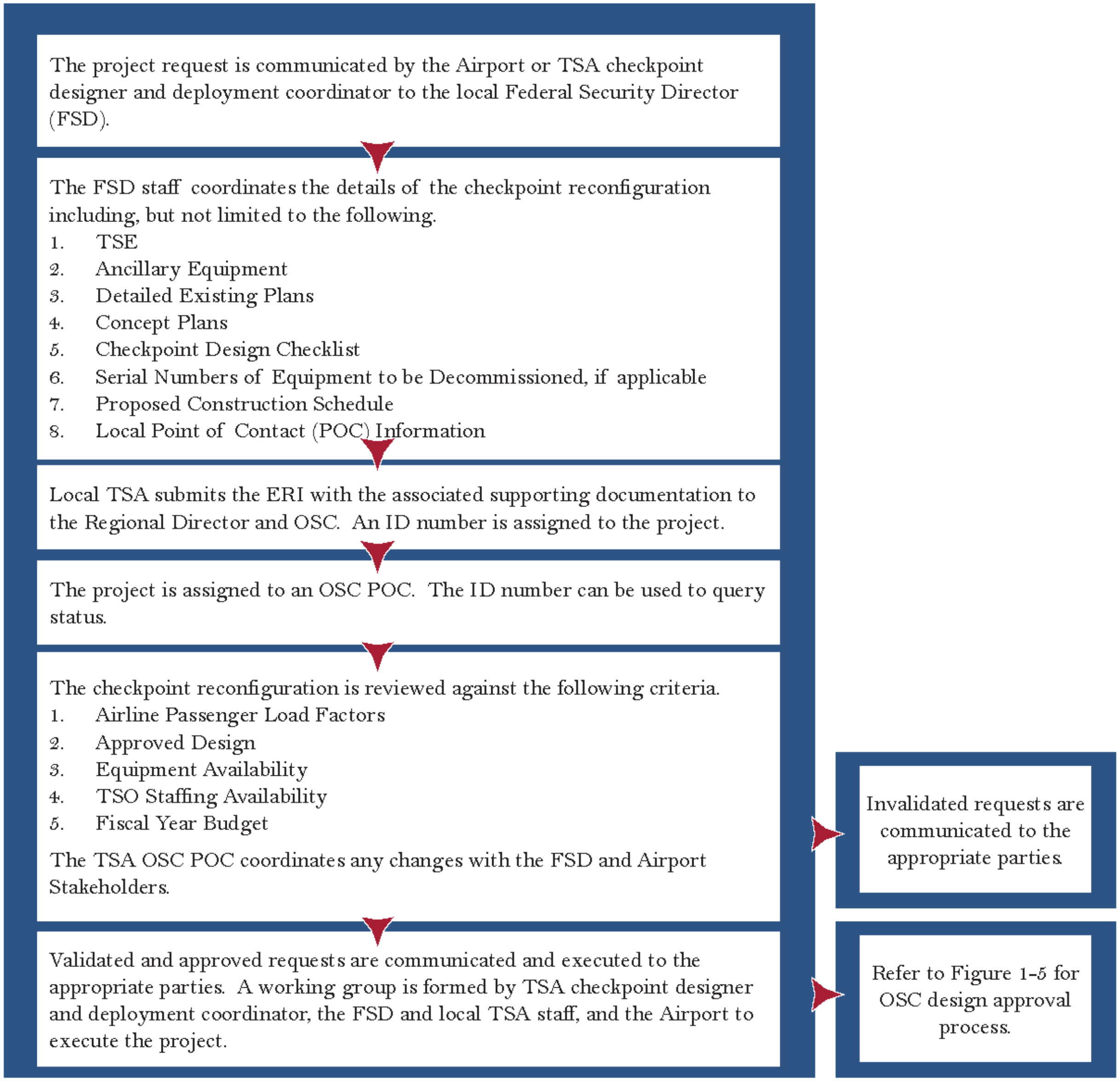
It is the Airport Authority's responsibility to fund and hire the A&E firms that create the designs for airport-initiated projects and that will follow the TSA Checkpoint Design Guide. When an airport adds screening lanes due to new terminal construction, or when approved as the result of increased passenger throughput, TSA HQ will provide Transportation Security Equipment (TSE) and fund its installation. When an Airport Authority builds a new terminal that will replace an existing one, the Airport Authority is responsible for funding the required infrastructure and construction, and TSA HQ will provide Transportation Security Equipment (TSE) and fund its installation. When Airport Authority-initiated TSE moves become necessary for other needs (e.g. temp screening location, remodeling, carpet cleaning, floor tile replacement, etc.), the Airport Authority will fund the removal and reinstallation of the TSE. The Airport Authority is responsible to fund all construction and infrastructure costs associated with the relocation or installation of TSE, and will do so following the standards identified in the TSA Checkpoint Design Guide. Depending on scope of work, funding may vary. However, all designs must be approved by TSA Headquarters

To document a request for movement of TSE in a construction project, a request must be submitted to TSA HQ. The request must include language that states the responsibility for funding of airport-initiated projects by the Airport Authority, and their acceptance of project funding responsibility. The request language must also include the acceptance of funding responsibility by the Airport Authority for any airport-initiated equipment moves related to other actions (e.g. remodeling, carpet cleaning, floor tile replacement, etc.).

There may be circumstances when shared cost solutions will be considered by TSA. TSA checkpoint designer, deployment coordinator, local TSA, airport stakeholders, and the SSCP designer should determine funding responsibilities in the early planning stages of the project before design begins.

An outline of the checkpoint modification process is shown in **Figure 2-1.2** starting with project inception all the way to project approval. Local TSA and airport stakeholders should follow this process when modifications to an existing SSCP are needed. Once the project is approved, the appropriate department within TSA HQ helps local TSA and the airport stakeholders execute the project. Tasks vary from shipping equipment to putting the project out for bid.

Figure 2-1.2 Checkpoint Modification Process



2-1.1.1 PLANNING CONSIDERATIONS

SSCPs are created by combining standard 1- and 2-lane module sets. A typical 1-lane module set consists of a Travel Document Checker (TDC), X-ray, Manual Diverter Roller (MDR), Walk Through Metal Detector (WTMD) and/or Advanced Imaging Technology (AIT), Alternate Viewing Station (AVS), Explosive Trace Detection (ETD), Bottle Liquid Scanner (BLS), Passenger Inspection, and Bag Inspection. A 2-lane module set is the same as a 1-lane module set with the addition of another X-ray. These module sets are discussed in more detail in **Part 3**. The module sets are created based on the recommended TSA spacing for passenger ingress/egress, clearance for maintenance activities, and prevention of passenger breaches. Separation of sterile and non-sterile areas provides a controlled and contained screening environment.

A modular design enables TSA to determine the depth and width needed for a set number of lanes. The number of lanes is based on the passenger load and the physical space provided by the airport. Contact TSA Headquarters to assist with determining the number of lanes needed to meet the passenger load in the space allotted for the SSCP. As the number of enplanements per year increases and the equipment and technology evolve, the SSCP needs to have the flexibility to change and expand. Allowances for modifications must be included in the Airport Master Plan.

Vulnerabilities specific to a particular airport will dictate where the checkpoint is situated within the terminal. Some airports may locate the SSCP at or near the entrance of the terminal, making all spaces beyond the SSCP sterile. Thoughtful consideration must be given to passenger queuing if the SSCP is placed near the terminal entrance. Massing people in public areas should be avoided. The more common choice is to position the SSCP deep in the terminal. During periods of elevated threat or special events, temporary SSCPs may need to be installed. If this is a potential option, floor space and temporary utilities should be planned into the terminal design by the airport.

Airports with international flights require a dedicated Federal Inspection Service (FIS) checkpoint, specifically for arriving international passengers transferring to a domestic flight. Arriving international passengers are required to undergo U.S. screening before transferring to a domestic flight because the U.S. screening process has different requirements and provisions than screening processes at non- U.S. origins.

The screening requirements for a FIS checkpoint are the same as other checkpoints, but the volume varies based on the frequency of inbound international flights.

Care should be taken to preserve the paths and clearances required by the local and national building codes to provide for barrier-free movement in the checkpoint and life safety requirements for exiting. Observing exiting for airport and TSA staff as well as passengers is gaining closer scrutiny from the reviewing agencies. Some locations may require emergency exiting through a checkpoint. Many sites require exit studies showing how the checkpoint affects the emergency exiting of the terminal as a whole. This could require modifications or additions to the checkpoint beyond guidelines set herein.

Airport security technology is a dynamic and rapidly changing field. No matter how carefully an airport is designed to take maximum advantage of the current technology, designs must be sufficiently adaptable to meet the changing threats and support future technology. Security screening equipment dimensions and/ or processes may change, requiring the entire airport security managerial infrastructure to make important decisions regarding modifications, which the designer must then accommodate. The designer's task will be easier if the original design has anticipated the need for change and has provisions for expansion. Electrical and data infrastructure should also be flexible. Planning ahead for adaptable electrical/data devices will best support future changes.

Key TSA individuals (including checkpoint designer, deployment coordinator, and local FSD /staff), government agencies, and airport/ airline operations should be involved during the SSCP deployment process. These groups will be able to facilitate dialogue regarding local building codes, mutual aid agreements with local law enforcement/emergency responders, and joint commercial/military entities.

Permitting and approvals may be factors in design and final deliverables. Depending on site location and project complexity, permits and approvals may or may not be required. This should be determined early in the project. Some sites require airport authority approval only. Permitting or approvals may require additional information in the deliverable that is beyond the information given in this guideline. Early determination of approval requirements will avoid inconvenient and costly changes later in the process.

2-1.1.2 PROJECT DESIGN PROCESS

The design for improving existing TSA security screening checkpoints is ongoing while new technology is being developed and deployed to U.S. Federalized airports across the country. The process for designing a new checkpoint generally includes an initial 30% design, TSA and airport authority review, final design, construction/ installation, and record drawing completion. **Figure 2-1.3** illustrates the TSA design review sub-process. This critical sub-process ensures designs meet the requirements of the CDG, allows for TSA review and concurrence with deviations from the CDG, and allows opportunities to understand the impact to building infrastructure. The following describes the basic design procedures for designing a new security screening checkpoint.

When a new checkpoint layout is required, TSA requires the Architect and Engineering (A&E) designer to begin a design using the criteria as described in this Checkpoint Design Guide. This design is based upon the deployment of new equipment and/or relocation of existing equipment which is typically outlined in a deployment schedule produced by TSA. Equipment layout and dimensional requirement checklists are provided in **Sections 4-1 and 4-2** to provide quality assurance/quality control that the layout meets general guidelines for a security checkpoint.

All designs are currently to be produced in AutoCAD 2007 format. The AutoCAD files should contain a background floor plan of one or more TSA security screening checkpoints for the airport. All TSA equipment is represented by dynamic AutoCAD blocks which are standard for all checkpoint designs and should be obtained from TSA. The standard equipment dynamic blocks allow the A&E designer to manipulate and locate the TSA equipment within the checkpoint while allowing only the available configurations as specified by the manufacturer for each piece of equipment. When the A&E designer completes an initial checkpoint layout, existing and final conditions are plotted to PDF and the 30% design is submitted by email to TSA for review and approval/rejection. TSA reviews the layout and replies with approval or rejection for the planned checkpoint configuration. If the 30% design is not approved, comments are provided for an improved design.

A telephone conference, including an invite to share the screen of the AutoCAD format layout, is scheduled/coordinated by the A&E designer to modify the 30% design. The A&E designer manages the conference while taking input from all stakeholders and modifies the layout live to ensure the recommendations are fulfilled. Then the A&E designer re-submits the 30% design to TSA for approval/rejection.

Upon approval of the 30% design, the A&E designer completes the final drawings. The final drawings include equipment delivery paths, layout modifications, and a schedule for provided and relocated equipment. Electrical designs should be included to install new or modify existing electrical/data devices. The final drawings including electrical/data layout should be submitted to TSA for review before construction. The A&E firm should coordinate with local airport authority for approval and/or permitting for construction. During construction of the checkpoint, changes may occur either initiated by local TSA, on- site conflicts, airport authority request, or other instances unforeseen in design. The A&E designer should coordinate with TSA for solutions of any conflicts.

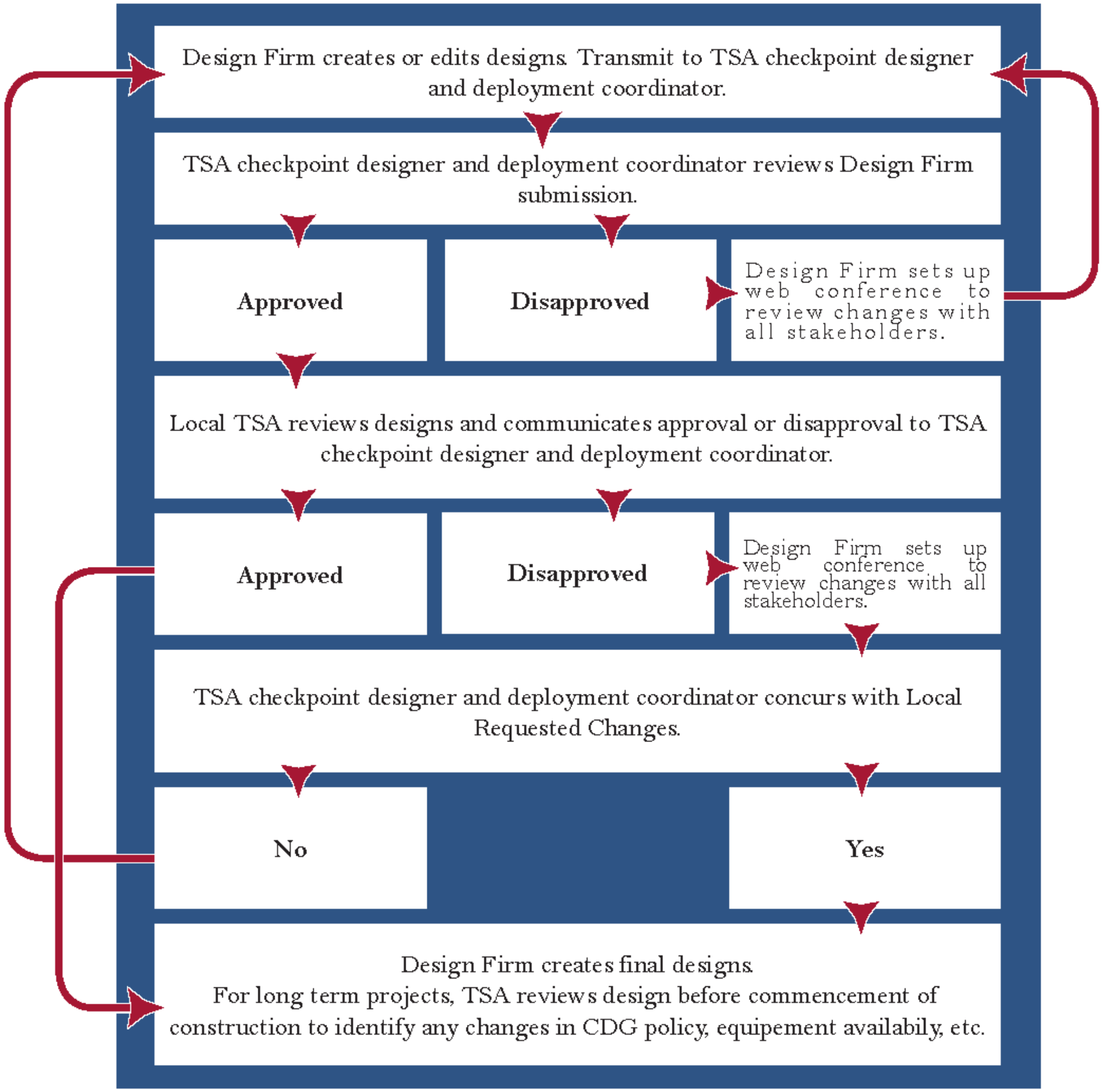
After completion of the checkpoint installation the A&E designer is to create Record Drawings from contractor's red-lines and post-construction photographs. Following completion of the Record Drawings, the A&E designer provides both a PDF and AutoCAD 2007 file to the TSA designer.

2-1.1.3 DESIGN PHASES AND DELIVERABLE MILESTONES

The drawings are produced and submitted to TSA for review in multiple phases to ensure the design of each checkpoint meets the requirement of this guide. The project milestones are listed as follows:

- 30% Design - During this phase the designer determines the modification scope of the checkpoint including additional equipment to be deployed and/or relocation of existing equipment. Once a new layout is created, the existing and proposed layouts are submitted to TSA and local TSA for review and approval or requested changes.
- 100% Design - Upon completion of requested changes, 100% design of the existing and proposed designs including electrical/ data layout are submitted to TSA for final approval. Refer to Section 4-1 for drawing checklists and lessons learned for expected 100% design drawing submittals.
- Issue for Construction - Drawings are issued for construction including:
  - ➢ Equipment Description Sheet
  - ➢ Equipment Delivery Paths
  - ➢ Existing and Proposed Layouts
  - ➢ Electrical/Data Details
  - ➢ Electrical/Data Layouts/ Modifications
  - ➢ Updated Electrical Panel Schedule
  - ➢ Seismic Structural Details

Figure 2-1.3 TSA Design Approval Sub-Process



2-1.2 DEPLOYMENT

2-1.2.1 CONSTRUCTION PHASE

Deployment projects may require modifications to the facility to provide utilities (heating, ventilating, air-conditioning, power, and IT), as well as space for the TSE installation (including wall relocation/demolition, ceiling height adjustments, etc.). These modifications must occur in accordance with local codes/ regulations, performed by contractors familiar with the processes/ requirements of working within an operational airport environment and must be completed prior to the installation of the TSE. The project sponsor is responsible to ensure all construction and supporting infrastructure work is complete and to coordinate the construction schedule with TSA HQ in order to schedule the installation of the equipment. The project sponsor ensures that any floor repairs are complete and the area is cleaned up and ready for operations.

2-1.2.2 EQUIPMENT INSTALLATION PHASE

Equipment is provided by TSA based on passenger volume, aircraft type, and passenger load factor. When equipment is needed for a checkpoint reconfiguration, local TSA should request equipment from the TSA deployment coordinator via the Equipment Request Interface (ERI) at the following URL.

https://team.ishare.tsa.dhs.gov/sites/OST/ERI/default.aspx

TSA is responsible for submitting the equipment request via the ERI. Equipment that is available for the checkpoint can be found in the TSA Passenger Screening Program (PSP) Ancillary Equipment Guide. This most current version of this is available at the ERI Interface. This document includes the following:

- Available Equipment
- Equipment Ordering Information
- Equipment Description
- Technical Product Data

Once the request is approved, TSA HQ will coordinate the required contracts to ship, rig and install/remove the equipment. TSA HQ will provide equipment cut sheets upon request.

Once the equipment is installed at its location, it is tested by OEM certified technicians and witnessed by independent test team as required. In some cases, the local TSA will witness the tests.

2-1.2.3 EQUIPMENT DECOMMISSION

All equipment being removed from an airport checkpoint will be decommissioned by OEM certified technicians and witnessed by local TSA as required. The decommissioned equipment will be removed from the airport and shipped to the specified location as documented.

2-1.2.4 SHIPPING, RIGGING AND WAREHOUSING

All equipment being installed in the airport checkpoint will be delivered to the airport at the location and time approved by local TSA and the airport authority. The equipment is unloaded and moved to the install location in accordance with the agreed and documented rigging path. The rigging contractor is responsible to ensure the required equipment and flooring protection is utilized during this process. The equipment is usually stored at a warehouse local to the airport during the deployment process.

2-1.2.5 PROJECT CLOSEOUT PHASE

At the completion of an installation, a complete, accurate, and validated set of installation drawings, which reflect the as-built configuration is required to be submitted to TSA, in both AutoCAD 2007 and PDF digital file formats.

3-1 STANDARD SSCP LAYOUTS

With approximately 730 checkpoints in existence today, it is easy to understand how there are various equipment arrangements based on the approved approach at the time of implementation at the checkpoint. Site conditions and local input also impact the look of a checkpoint. TSA intends for each arrangement to meet baseline standards based on the current threat; however, these standards change often due to the development of new technology intended to detect possible future threats. The following pages illustrate the currently approved arrangements of checkpoint equipment at the time of this guide's printing that will be common across the approximately 450 federalized airports. It is necessary that designers coordinate with TSA when designing layouts.

Checkpoints consist of standard module sets or combinations of standard module sets based on a particular arrangement of a given type and quantity of screening equipment that has been previously tested by TSA. A module set is either one or two lanes. A 1-lane module set will typically have an AT X-ray, a Walk Through Metal Detector (WTMD) and/or an Advanced Imaging Technology (AIT) unit, passenger containment, and a secondary screening area that includes Explosive Trace Detection (ETD), Bottle Liquid Scanner (BLS), Alternate Viewing Station (AVS), and passenger and carry-on bag inspection. A 2-lane module set is the same as a 1-lane module set with the addition of another AT X-ray opposite the first X-ray with the other equipment being located between the two lanes. The equipment between the lanes is known as the "infield" equipment. A 2-lane module set or a combination of 2-lane module sets is the best approach for configuring a checkpoint because it efficiently utilizes screening equipment and TSA personnel. However, a 1-lane module set should be used if the peak passenger load only supports 1-lane, the checkpoint has an odd number of lanes, or there is an obstruction, such as a column, electrical closet, or chase that prevents adding a 2-lane module set.

Module sets are sometimes categorized by the quantity of X-rays in the module set compared to the quantity of equipment used to screen passengers. For example, a 1-to-1 configuration is considered as one X-ray per one WTMD and/or AIT. A 2-to-1 configuration is considered as two X-rays per one or two WTMD(s) or two X-rays per one WTMD and one AIT.

The purpose of this section is to illustrate the approved arrangements and corresponding module set. Refer to the following pages for an overview of the arrangements.

All designs going forward for new checkpoints or reconfigured existing checkpoints should be based on the module sets of an arrangement prescribed by the TSA checkpoint designer and deployment coordinator in the early stages of planning. A graphic representation of the arrangement is presented in **Figure 3-1.1**. Note that the secondary screening area is not included with the module sets in order to maximize the scale of the graphics. Generic ATs and AITs were used in the module sets and arrangements, but any manufacturer included in this guide can be applied using the same recommended spacing. Note that some adjustments to the layout may be required to account for different equipment dimensions which can be found in the equipment plan views in Section 3-2.

3-1.1 STANDARD SSCP ARRANGEMENT

The Standard SSCP Arrangement consists of TDC Podiums, AT equipment, a MDR, a WTMD, an AIT, passenger containment, and a secondary screening area that includes an ETD, BLS, AVS, and passenger/ carry-on baggage inspection. Refer to Section 3-2.6 for additional AT equipment information and specifications.

The designer must evaluate the structural floor prior to placement of the AT and the AIT, as the live load a floor system can support varies. With a standard checkpoint arrangement, the equipment will impact a maximum uniform area load of approximately 85 psf dead load on the floor.

Designers are reminded to consult applicable codes within the airport's region of the country to determine the applicability and countermeasures to address seismic events for all brands. Brand manufacturers have brackets available for purchase.

An 8'-0" high or full height wall shall form the exterior perimeter of the TDC podium(s) in order to deter passengers from bypassing this function. Strap stanchions can be detached too quickly and easily, where barrier stanchions have to be disassembled, alerting TSA personnel and allowing time for a TSO to respond. When an airport is installing a space for future lanes, the area between proposed and future space shall be separated by an 8'-0" high or full height temporary wall.

The following pages represent the Standard SSCP Arrangement. **Figure 3-1.1** is an isometric view of five lanes in an optimized layout. **Figure 3-1.2** is a plan view of the same 5-lane layout, but the recommended spacing between the screening and ancillary equipment is shown. These dimensions are guidelines to use when laying out a checkpoint. Adjustments to these dimensions may need to be made due to site conditions. This is acceptable as long the as the spacing is within the desired range. Deviations from the minimum and maximum spacing must receive TSA Headquarters approval before implementation. Every attempt to achieve the dimensions listed in **Figure 3-1.2** should be made when designing a checkpoint with Standard SSCP Arrangement equipment. The spacing requirements are the same regardless of the make and model of the screening equipment used.

Travel distance between the AIT and WTMD should be minimized while preserving maintenance clearance, egress, & CDG requirements.

It is required for the floor to be reinforced or replaced when an AIT or WTMD is placed on wood floor joists, certain raised floors, floors over a roadway, floors adjacent to a column, or other scenarios where electrical conductivity or vibration interference will affect the operation of the equipment. Careful consideration should be taken to include this in the design of the checkpoint. When interference is recognized due to these issues, it is required to provide additional reinforcement or relocation of utilities, contact TSA HQ for options to possible solutions.

Figure 3-1.1 SSCP Standard Arrangement Five-Lane Layout

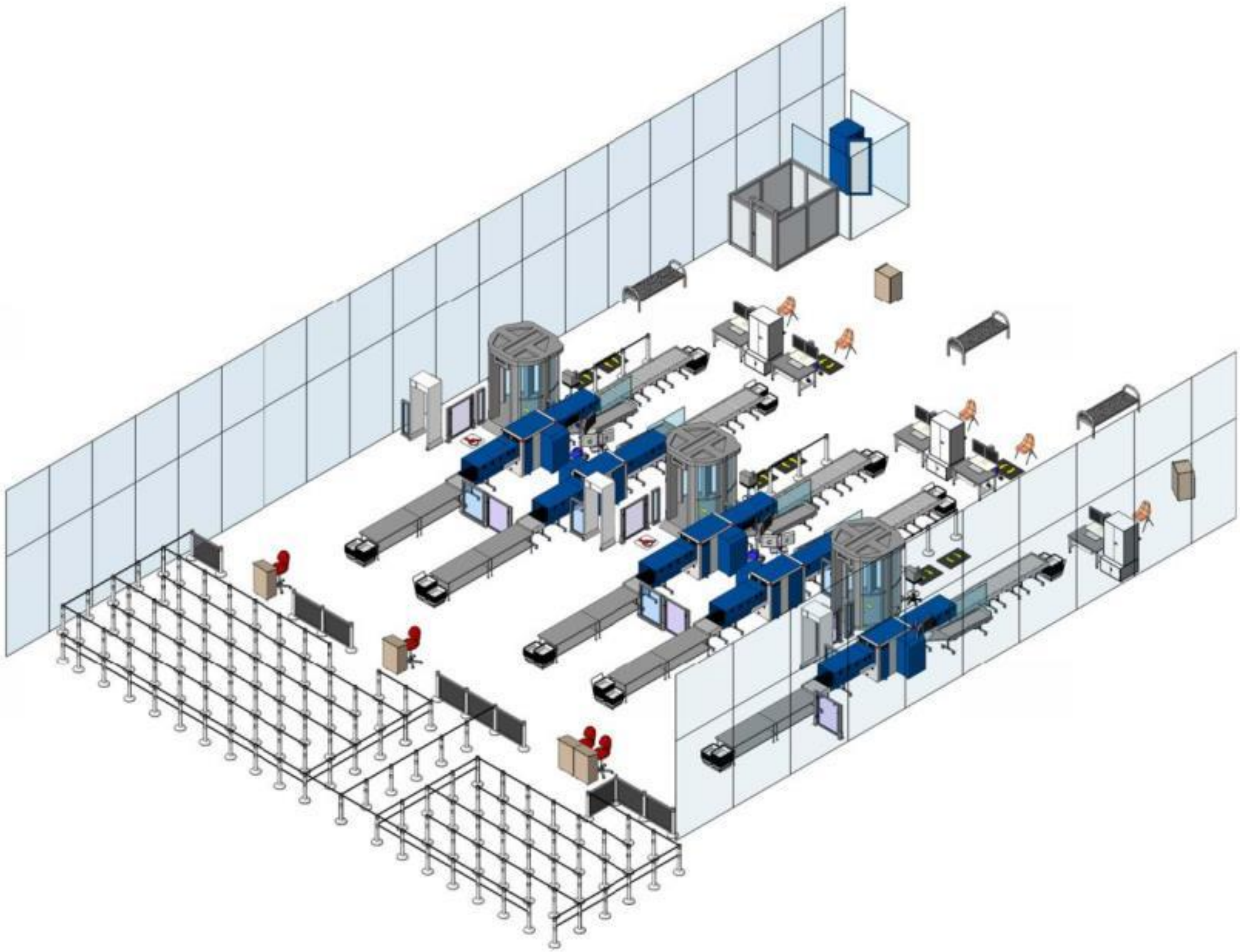
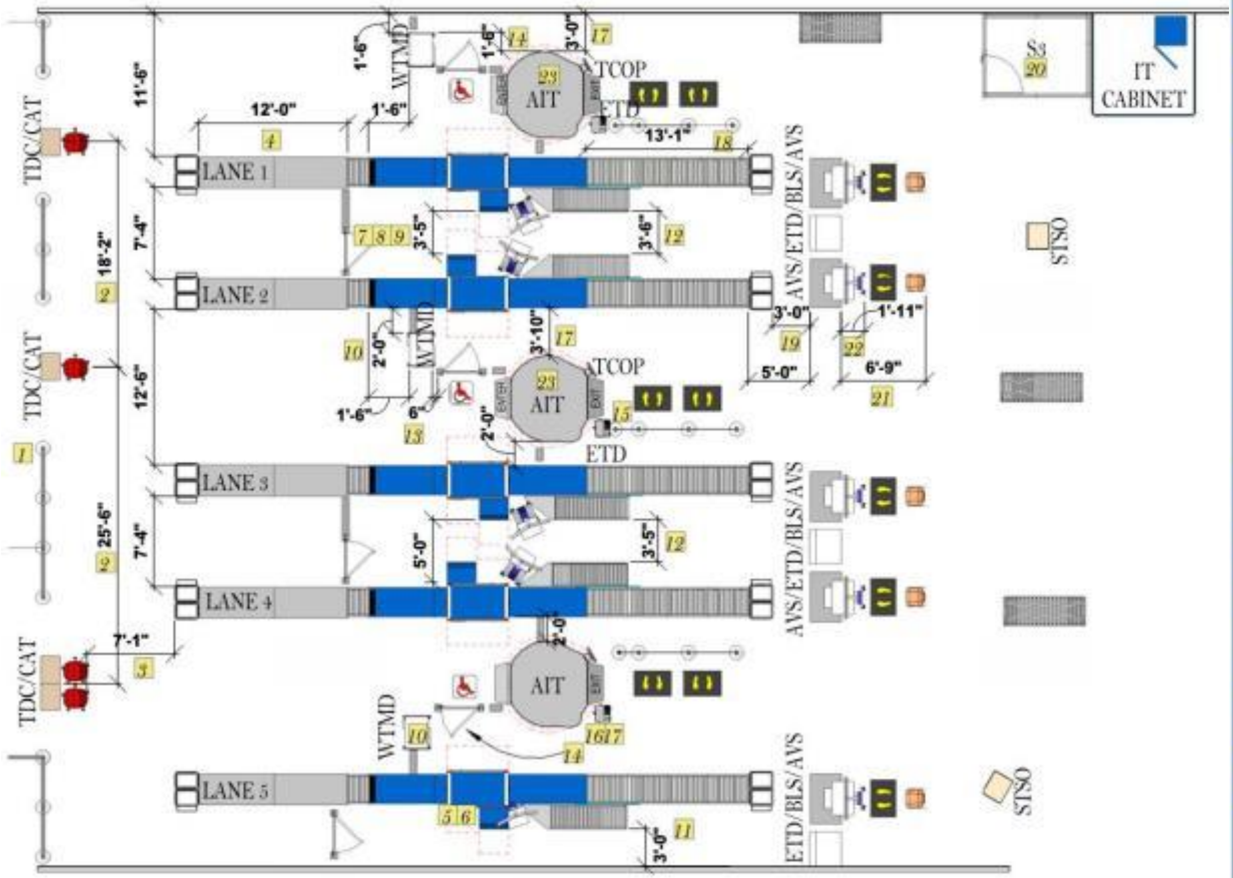


Figure 3-1.2 SSCP Arrangement Recommended Spacing



PLAN VIEW

LEGEND

- - - - - Service Area

1. 3'-0" minimum queue lane width (not shown)
2. Equally space TDC podium per lane width
3. 4'-0"-15'-0" from the TDC podium chair to nearest bin cart
4. 12'-0" preferred 18'-0" maximum divest tables
5. 2'-10" minimum from bump-out to wall when bump-out is towards the operator (not shown)
6. 4'-6" minimum from dome to wall when bump-out is towards the passengers
7. 4'-0" minimum between back-to-back bump-outs when both bump-outs are towards the operators and the domes are aligned or staggered
8. 6'-8" minimum between back-to-back dome and bump-out when one bump-out is towards the passengers, one bump-out is towards the operators, and the domes are aligned or staggered (not shown)
9. 6'-8" minimum between back-to-back domes when both bump-outs are towards the passengers and the domes are aligned or staggered (not shown)
10. 2'-0" minimum from WTMD to conveyor or dome
11. 3'-0" from MDR to wall
12. 3'-2" minimum from MDR to MDR for back-to-back lanes
13. 12" maximum between ancillary or screening equipment separating the non-sterile area from the sterile area (not every location shown))
14. Minimum 5" in, 11" out, and 2'-6" diagonally from WTMD to AIT
15. 3'-0" from AIT exit to passenger inspection mats
16. 3'-0" minimum for passenger egress
17. 3'-0" minimum for ADA passenger path of travel
18. 12'-0" minimum 18'-0" maximum composure rollers
19. 3'-0" minimum from bin cart to the secondary screening area to allow for TSO bypass or 5'-0" minimum from last composure roller to secondary screening area to allow for TSO bypass
20. 6'-0" x 8'-0" Private Screening Room (minimum)
21. 6'-0" x 6'-0" minimum for passenger search at secondary screening area
22. 18" - 22" from AVS to search table
23. 9'-0" minimum height clearance for L3 AIT
24. 1'-6" minimum WTMD to entry conveyor hood

3-1.2 RISK BASED SECURITY (RBS)

Risk-Based Security uses information gained during pre-screening and through observation and interaction with passengers to determine the proper level of screening that matches the passenger's risk assessment

3-1.2.1 TSAPre✓®

TSAPre✓® is an expedited screening initiative that is expanding to airports across the country as volumes continue to grow through new Risk Based Security (RBS) initiatives. There is a need to determine how to absorb volume growth across existing TSAPre✓® checkpoints through optimal lane utilization, as well as provide flexibility to open additional TSAPre✓® lanes at checkpoints which without would have insufficient throughput at peak times.

The purpose of this section is to provide guidance on how and when to expand TSAPre✓®airports, as well as introduce the concept of a "Dual Use" lane. A Dual Use Lane is a tool that will allow airports to "flex" TSAPre✓® to an additional adjacent lane during peak times as volumes dictate. As airports review their current design and layout for near term expansion, they should consider how to look at the checkpoints, terminals, and concourses holistically for a more long term expansion of TSAPre✓®. This will provide airports with the contextual framework in which to target such considerations.

Expanding TSAPre✓®

Requirements must be met in order to expand one or more lanes to TSAPre✓® at a given checkpoint. Requirements include:

- Sufficient predicted or realized volume for sustained periods to open a new lane or expand to an adjacent lane
- TSAPre✓® lane is operated with an AT X-ray
- Sufficient personnel are trained and available to run additional TSAPre✓® lanes as necessary
- Ability to restrict non-TSAPre✓® passengers from accessing the TSAPre✓® lane
- Maintain a minimum of one standard lane operating within the checkpoint
- If implementing a dual use lane, provide a visible indicator for TSOs to identify mode of operation (TSAPre✓® Standard.)

Depending on the airport configuration and which airlines are increasing in volume, there are three options which an airport may expand their TSAPre✓® lane:

Option 1: Move an existing TSAPre✓® lane to better accommodate traffic patterns and expansion

Option 2: Add a new TSAPre✓® lane at a new checkpoint that previously did not have sufficient volume

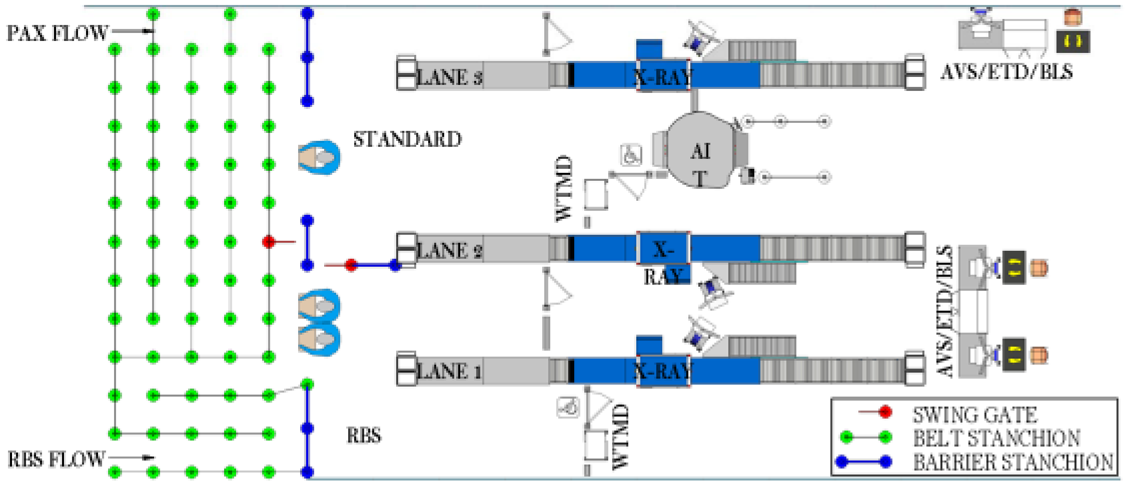
Option 3: Expand existing TSAPre✓® to an adjacent lane (either full-time or part-time as "Dual Use")

TSAPre✓® is growing in popularity and is expected to expand as more airports and airlines increase their screening volume. Due to a variation of TSAPre✓® demand at certain times, the checkpoint can be configured to allow for flexing screening lanes. If at least one TSAPre✓® lane is currently operational, the checkpoint is capable of expanding to additional lanes as needed. With equipment layout and queue planning, limited reconfiguration and time is required to "flex" from one TSAPre✓® lane to additional lanes.

The following examples provide the typical layouts for existing TSAPre✓® screening before and after flexing from one to two lanes.

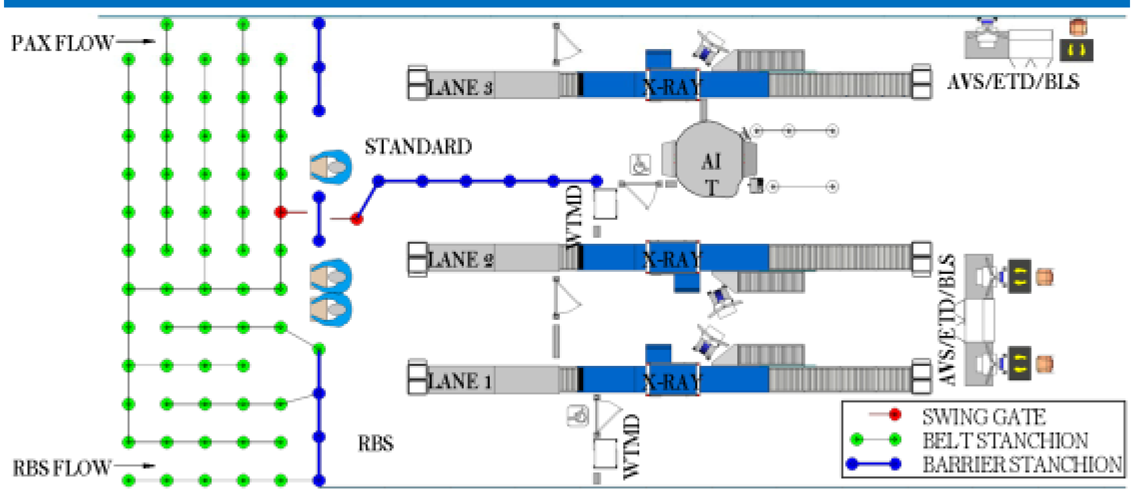
Figure 3-1.3 TSAPre✓® AT A SINGLE LANE WITH WTMD ONLY

BEFORE FLEXING



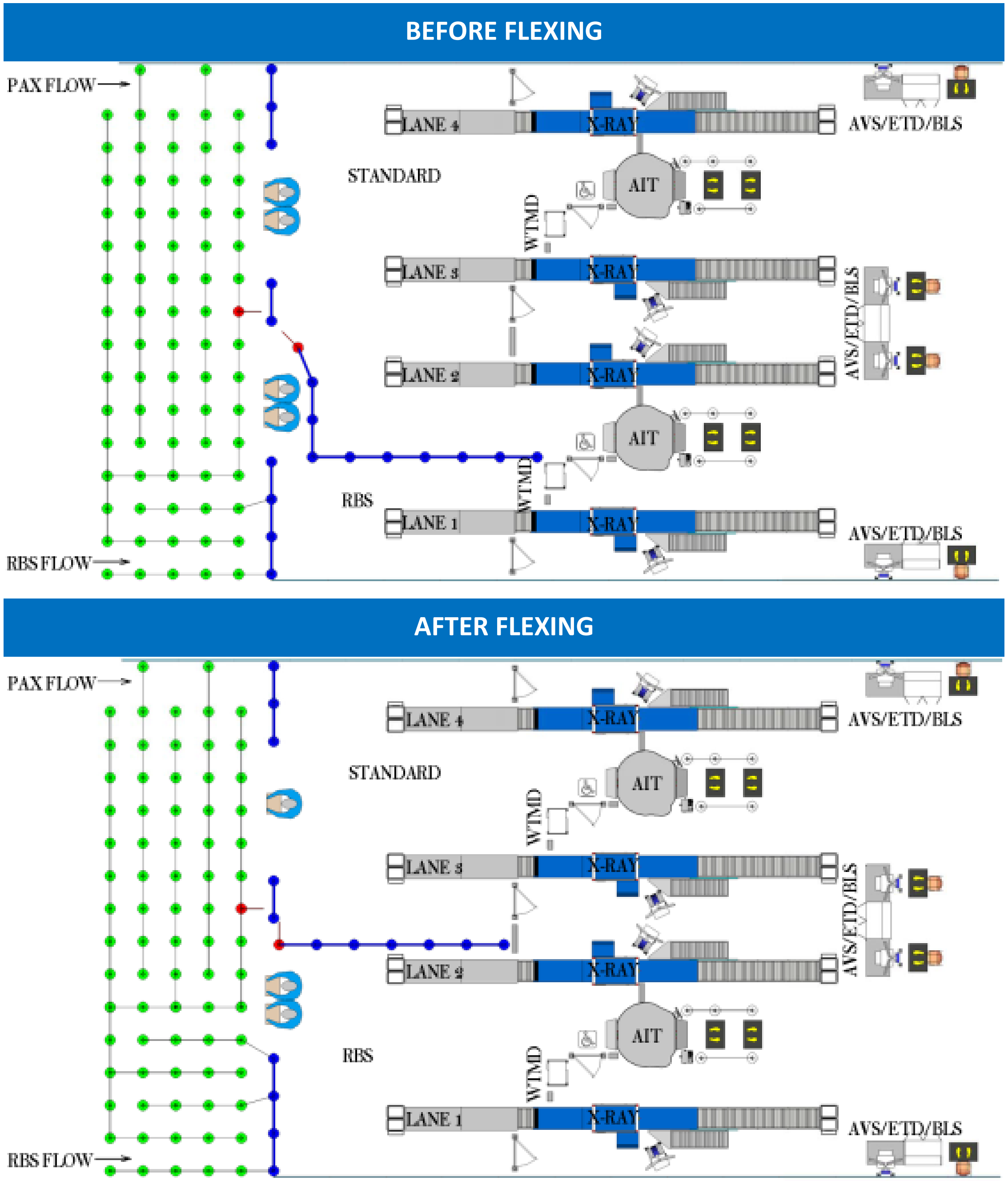
This scenario is for a single, outside TSA PreCheck lane with WTMD only. The RBS passengers flow only one lane before flexing. Standard passenger flow is limited to lanes 2 and 3, lane 2 is a dual use lane.

AFTER FLEXING



This scenario is for a two lane TSA PreCheck with flexing the additional TSA PreCheck lane to lane 2. Due to constraints of this configuration, flexing requires splitting an adjacent 2 to 1 module set to add the lane. In this scenario, the WTMD in adjacent lanes will need to be reconfigured to TSA PreCheck security settings.

Figure 3-1.4 TSAPre✓® AT THE WTMD SIDE OF A SPLIT MODULE SET



This scenario is for a single outside TSA PreCheck lane with a split module set with WTMD and AIT. The RBS passengers flow to only one lane before flexing. Standard passenger flow is limited to lanes 2, 3, and 4; lane 2 is a dual use lane.

This scenario is a two lane TSA PreCheck with flexing the additional TSA PreCheck lane to lane 2. Flexing TSA PreCheck lane requires only relocation of barrier stanchions from the center of the module set and allowing passengers from both lanes flow to the WTMD. In this case no reconfiguration is required for the WTMD.

3-1.2.2 QUEUE MANAGEMENT

Queue Management is a vital component to TSA Pre✓® screening. Not only does it ensure that populations are segregated appropriately to ensure only low risk individuals receive TSA Pre✓® screening, but it is also vital to Capacity Management of the Checkpoint. With the addition of Managed Inclusion and the resulting blending of TSA Pre✓® passengers with randomly selected passengers, increased wait times may result if the passenger queues are not managed correctly.

3-1.2.3 RBS PASSENGER QUEUE LAYOUT EXAMPLES

When designing a queue it is important to first determine what space is available for the passenger queue as a whole. The general rule is 400 SF of space available for each lane. If queue space is less than 400 SF per lane, consider tightening the space between stanchions to 3ft for all queue types except for ADA/Special Assistance queues. These need to maintain at least 3.5ft, and preferably have straight-line access to the TDC podium. For Unknown/High Risk Travelers, the TDC podium and the bin carts at the divestiture tables should provide a minimum distance as described in **Figure 3-2.7** enabling passengers to move freely toward their chosen lane. It is recommended that hard barrier stanchions are installed between TDC podiums to reduce the risk of passengers' ability to circumvent the TDC.

Sample design layouts are included on the following pages. It is not possible to show examples for every type of checkpoint configuration or size; however, examples for odd and even numbered checkpoint lanes are provided and convey the overall intention of the RBS queue design requirements. These designs can be scaled to encompass the design requirements of checkpoints with greater or fewer number of lanes.

Figure 3-1.5 TDC and Queue Layout

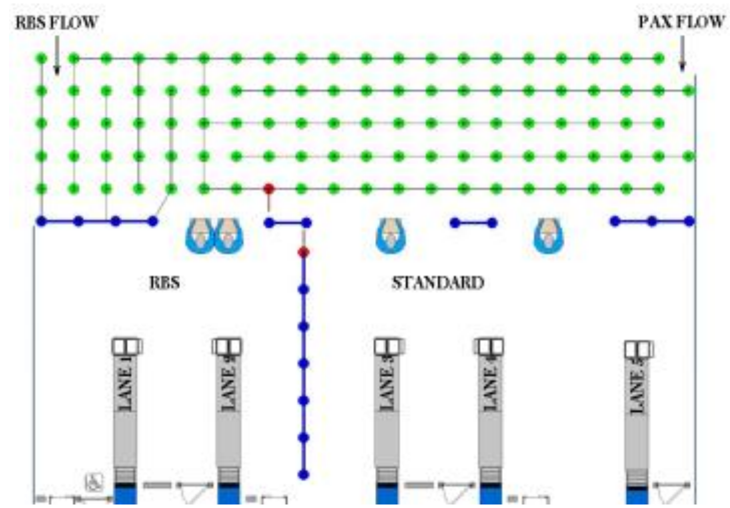


Figure 3-1.6 TSAPre✓® 5 LANE CHECKPOINT – GROWTH 3 RBS LANES

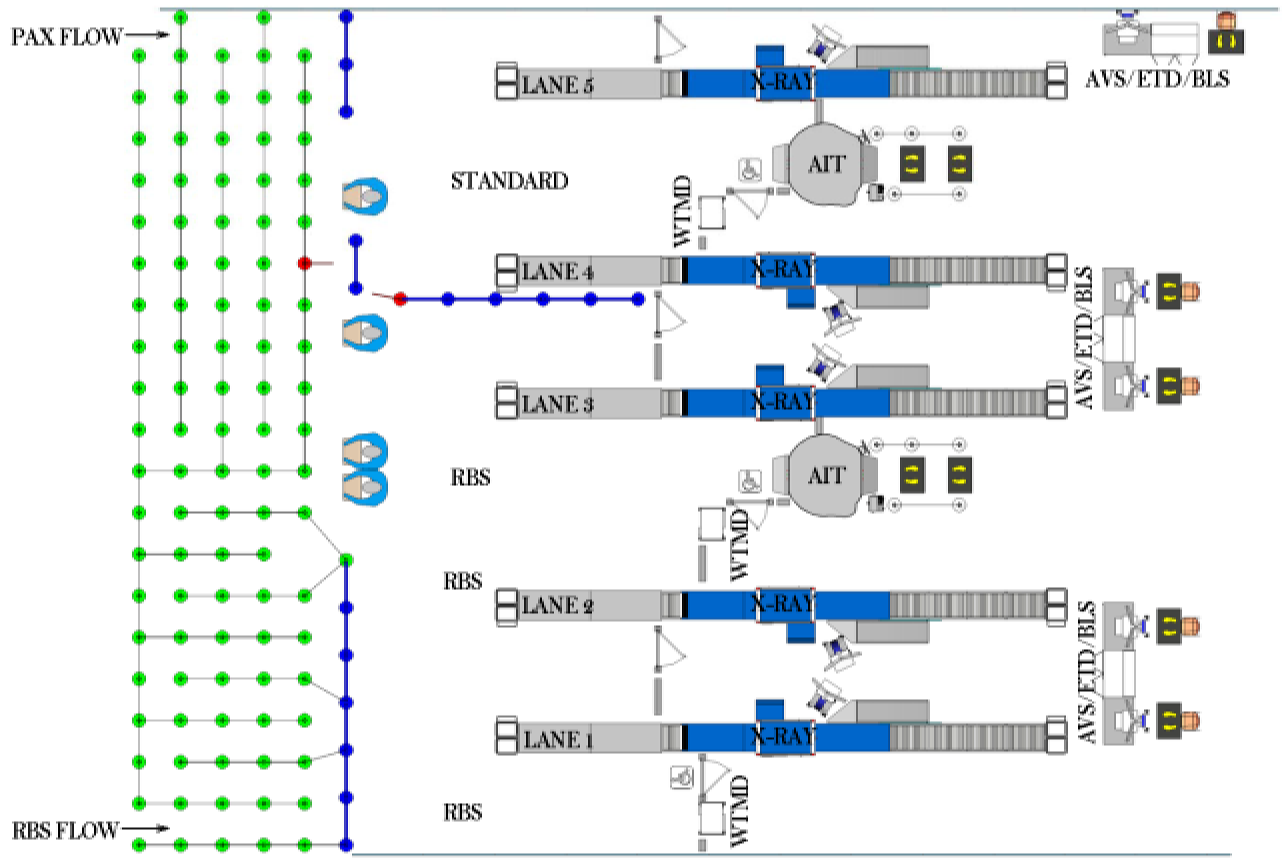
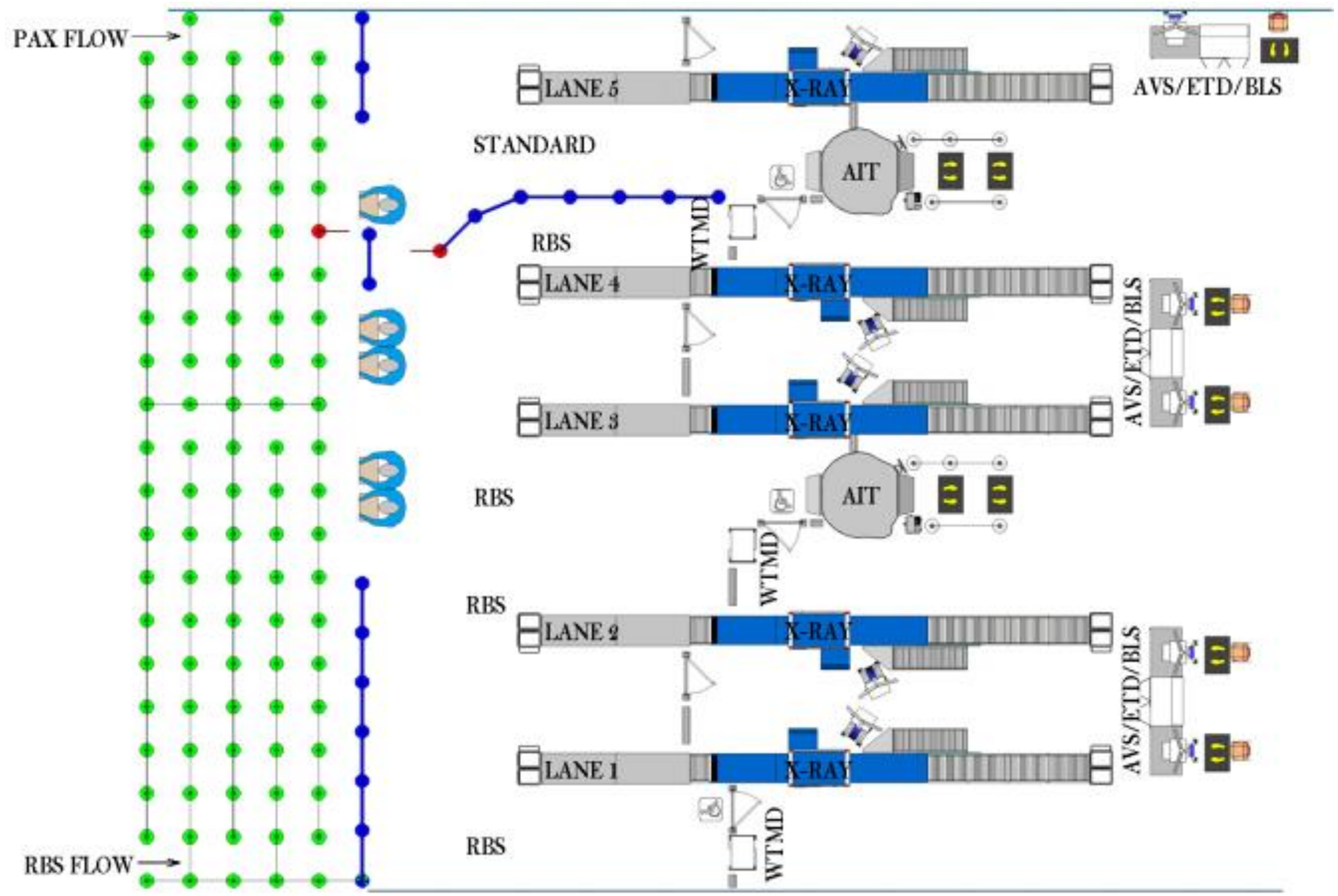


Figure 3-1.7 TSAPre✓® 5 LANE CHECKPOINT – GROWTH 4 RBS LANES



3-1.3 SSCP BOUNDARIES

There is no set boundary of an SSCP. Boundaries of a SSCP will vary by airport based on SSCP configuration and TSA requirements for a particular checkpoint. Typically, the SSCP length starts at the TDC podium(s), extends through the checkpoint elements discussed in this section, and ends at the checkpoint exit, which could be at or near the egress seating area or STSO podium. The SSCP width is the wall-to-wall width of the checkpoint, including all the screening lanes and a co-located exit lane (where applicable.) All walls adjacent to the non-sterile side need to be at least 8'-0" high to prevent the passage of prohibited items from the non-sterile area to the sterile area. An 8'-0" high or full height wall should be installed from the entrance of the TDC to the exit of the checkpoint beyond the screening equipment into the sterile area. Checkpoint boundaries are to be designed according to this document and are to be installed by the airport authority. When an airport is installing a space for future lanes, the area between proposed and future space shall be separated by an 8'-0" high or full height temporary wall.In the future, new technology may extend the current boundaries to include additional equipment and functions within the checkpoint or equipment and functions located remotely within the airport.

3-1.4 EXIT LANE

An exit lane can be co-located with a checkpoint, or it can be located independent of the checkpoint. This lane should be easily identifiable without adversely affecting security. It should also be adequately sized for deplaning passengers exiting the concourse. All building code egress path requirements must be met.

A minimum 8'-0" or full height wall is required to separate the checkpoint from the exit lane or separate the sterile area from the non-sterile area. This height impairs the ability for un-cleared passengers to pass prohibited items to a cleared passenger. This requirement should be coordinated with the airport authority when a new checkpoint is being discussed or an existing checkpoint is being reconfigured and the exit lane needs to be modified.

An exit lane is typically equipped with a table, chair, and podium for a person to monitor the area and deter those attempting to bypass the SSCP from the non-sterile area. The monitor should be located so that traffic attempting to enter the exit lane from the wrong direction can be intercepted. The exit shall also include a duress alarm system to covertly alarm of any threat to security; **Section 3-3.7** identifies duress alarm requirements. For long exit lanes, there is typically a monitor at both ends. TSA and the Airport may share operational responsibility of the exit lane with other parties such as the airport operator or an airline carrier. These parties contribute to the design of the exit lane and surrounding area to ensure that unauthorized entry does not occur.

Unique solutions have been deployed to secure exit lanes such as adding revolving doors or turnstiles, CCTV systems, and/or breach alarms. These solutions must allow sufficient space to accommodate the equipment as well as passengers with baggage and/or passengers with disabilities. Another simple solution is to provide clear glass panels when an exit lane is adjacent to the checkpoint. This often deters breaches since the exit lane would be highly visible by TSA and airport/airline personnel. These elements can also be combined to create an integrated system that utilizes video cameras, video monitors, sensors, and breach alarms concealed within the architectural elements and tied to a centralized system. This would further tighten security around this sensitive area without relying solely on manpower. In new facility planning and design, SSCP exit lanes should be a considerable distance from boarding gates to allow for sufficient time to resolve a breach if one should occur.

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3-2 TRANSPORTATION SECURITY EQUIPMENT (TSE)

The intent of this section is to introduce all of the elements of a standard TSA SSCP. These elements consist of Transportation Security Equipment (TSE) and non-powered ancillary equipment. The equipment in this section is listed in the order that a passenger encounters it, from the non-sterile area to the sterile area. It includes most but not all of the A&E technical data that a designer would need to configure a checkpoint. This guide is intended to be general and is not a replacement for manufacturer information or recommendations for clearances, power, etc. All SSCP equipment, including private screening rooms, must meet all local code requirements and standards for HVAC.

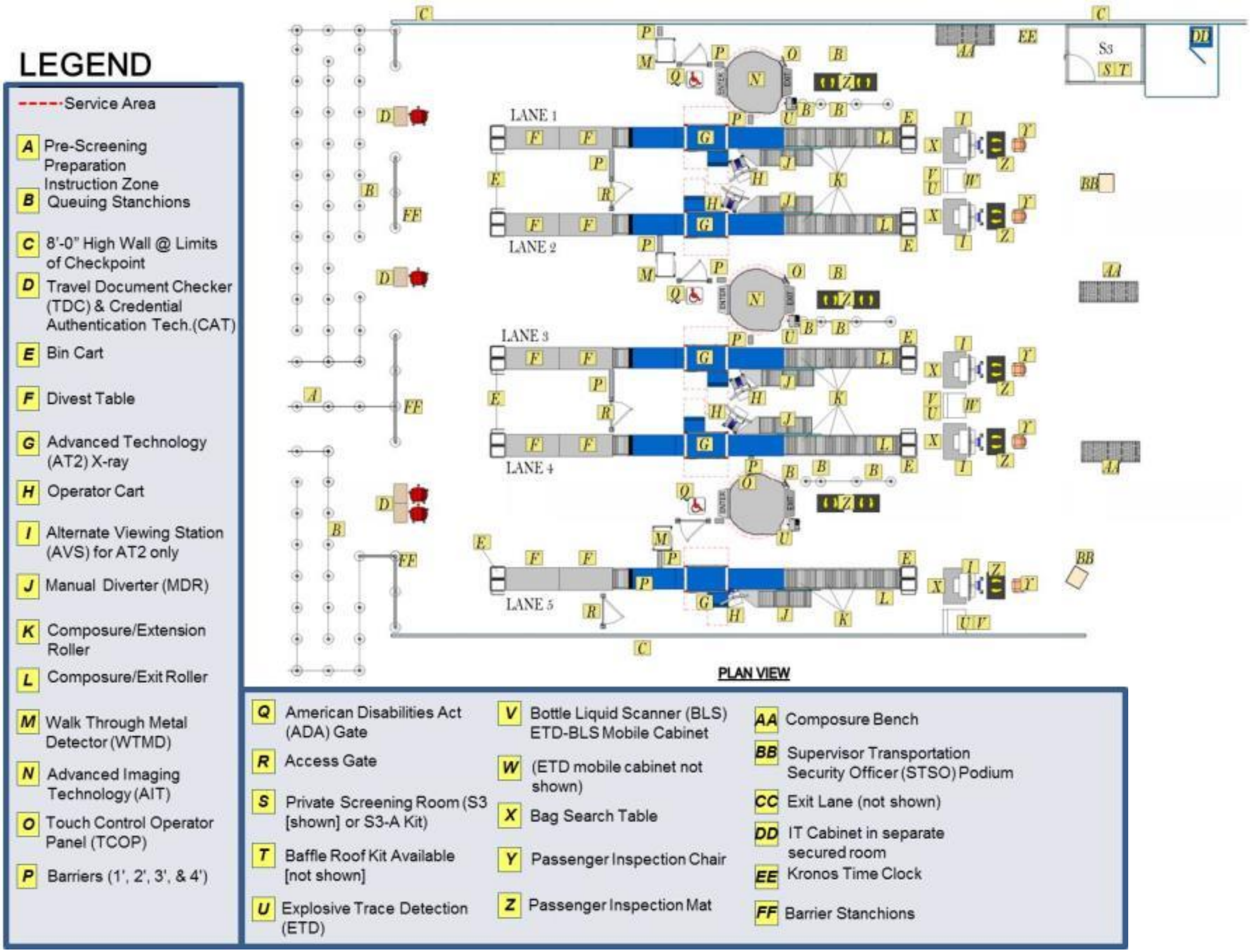
Every checkpoint has essentially the same elements which are site adapted to the existing conditions. While the queue and composure areas can vary significantly from checkpoint to checkpoint, the screening lanes are fairly consistent with the type of equipment deployed even though the equipment footprint can vary by manufacturer.

Manufacturers for a particular type of equipment are chosen by TSA HQ based on the following criteria:

- Manufacturers Deployed at the Hub Airport
- Width & Depth of Checkpoint
- Lane-to-Lane Spacing
- Structural Capacity of the Floor
- Floor Construction Type (slab on grade, etc.)
- Column Sizes, Quantities, & Locations
- Existing Maintenance Contracts
- Staff Familiarity with a Manufacturer
- Airline Passenger Load Factors
- Passengers per Hour
- Ceiling Height
- Floor Slope
- Expansion Joints

A layout of most but not all of the SSCP elements is represented in **Figure 3-2.1.** Passenger flow goes from left (non-sterile) to right (sterile). All equipment included in this section can be ordered from TSA HQ by following the process outlined in Section 2-2.

Figure 3-2.1 SSCP Elements



3-2.1 PRE-SCREENING PREPARATION INSTRUCTION ZONE

The Pre-Screening Preparation Instruction Zone begins as early as the curbside ticket counters and typically ends at the Travel Document Checker (TDC) deep in the queue. This zone should incorporate architectural features of the airport and be designed to provide an environment for the passenger with reduced noise, comfortable lighting, adequate spacing and other tranquil features. Signage, instructional videos, and "ambassador" staff or volunteers, when available, should be used to reduce passenger stress and ease movement through the SSCP.

Simple and effective checkpoint signage that has been created and approved in the TSA HQ Office of Public Affairs can be used to direct and instruct passengers on screening requirements and procedures. TSA signs are either 11" by 14" or 22" by 28" frames that can be mounted on top of a floor stanchion. Refer to **Figure 3-2.2**. The signs are divided into four categories: TSA Mandatory Signs, TSA Instructional Signs, TSA Directional Signs, and TSA Local Signs. Refer to the most current version of the TSA Airport Signage Guidelines, available on the TSA Intranet, for specific sign descriptions and where to locate these signs within the checkpoint. Signage is not typically part of a checkpoint design but space should be allocated for signage when designing a new checkpoint.

3-2.1.1 TSA MANDATORY SIGNS

TSA Mandatory Signs display critical information and TSA policies to the passenger such as listing prohibited items or the liquids, aerosols, and gels (LAGs) policy. These signs need to be visible from both sides, prominent, easy to read, and located along the path of departing passengers without obstructing queue lanes or being a safety hazard. These signs should not be clustered together in a way where larger signs block smaller signs or where multiple instructions create information overload for the passengers.

3-2.1.2 TSA INSTRUCTIONAL SIGNS

TSA Instructional Signs provide passengers with instructions on the screening process. These signs advise passengers on how to properly divest of their possessions and how to place those items in the bins. These signs can be mounted in the same way as the TSA Mandatory signs or displayed on walls near the divest tables.

3-2.1.3 TSA DIRECTIONAL SIGNS

TSA Directional Signs instruct passengers on where to go during the screening process, including providing direction to separate queue and screening lanes. The goal is to provide clear and concise directions so that passengers react quicker and overall time in the queue is minimized. Directional signs must be elevated so they are easily visible and not hidden by passengers standing in line.

3-2.1.4 TSA LOCAL SIGNS

TSA Local Signs are designed to meet specific local requirements, such as instructions regarding special equipment, local processing instructions, and any other signs deemed necessary by the local FSD. All local signs need to be cleared through the TSA HQ Office of Security Operations OSO RBS War Room osorbswarroom@tsa.dhs.gov

Figure 3-2.2 SSCP Signage

3-2.2 QUEUE

The queue is where passengers stand in line at the front of the checkpoint on the non-sterile side. It is recommended that the queue be bound by double strap stanchions (solid hard stanchions for larger areas) on the perimeter and single strap stanchions inside the perimeter to define the queuing lanes from the queue entrance(s) to the TDC(s)/CAT. Queue lanes are approximately 3'-0" to 5'-0" wide depending on the queue lane function and the queue space available. Refer to **Figure 3-2.3** for a graphic of the types of stanchions.

TSA recommends 400 square feet in the queue for every checkpoint lane, with 300 square feet minimum per lane. The queue should be big enough to meet the peak passenger demand without interfering with other functions in the terminal such as the ticket counter or checked bag processing. A queue entrance should remain open at all times. Queues should be able to be cordoned off and funneled down to one TDC during off- peak times.

The exclusive use of strap stanchions is inadequate to fully secure the checkpoint. Solid barrier stanchions as shown in **Figure 3-2.4,** are required along the boundary of TDC/CAT podium positions and the flanking side limits of the queue. The use of solid barrier stanchions is illustrated in **Figure 3-2.1.**

Figure 3-2.3 Strap Stanchion

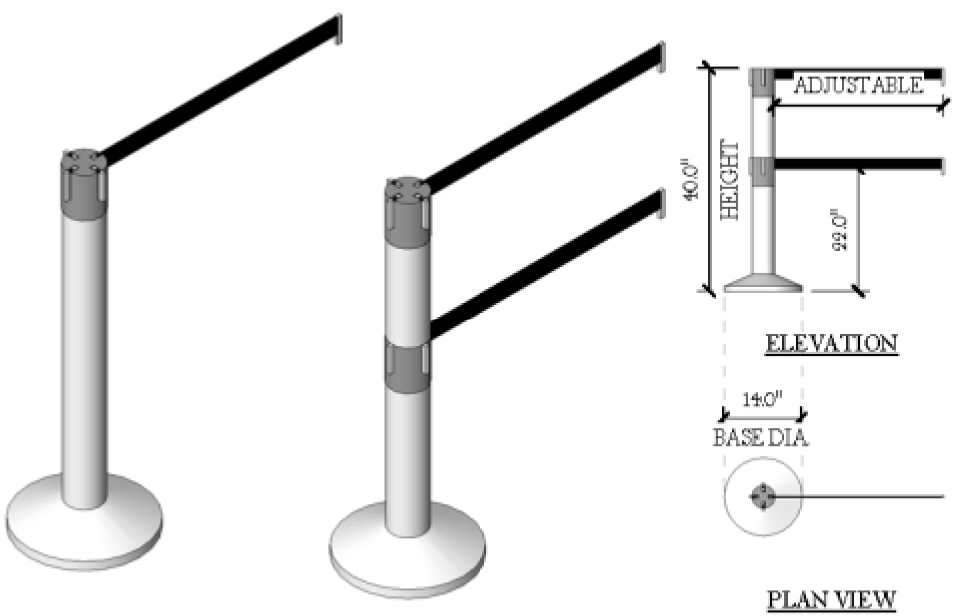
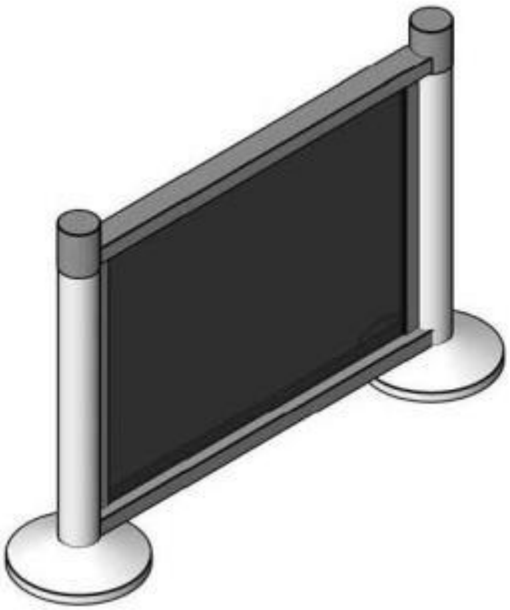


Figure 3-2.4 Solid Barrier Stanchion



3-2.2.1 TRAVEL DOCUMENT CHECKER (TDC) & CREDENTIAL AUTHENTICATION TECHNOLOGY (CAT)

CAT technology is currently being developed and has not been deployed to all airports. Please note that designers should still plan for the necessary infrastructure to be in place for checkpoints. TSA checks passenger identification and boarding passes at the end of the queue and is placed as to provide enough space for passage occurring between the exit of the podium and the screening lanes. The TDC officer stands or sits at the TDC or CAT podium and verifies that all the necessary documents are in order. The CAT integrates different technologies that independently verify travel documents such as a driver's license or passport. The CAT analyzes security features and barcodes on a passenger's ID to identify fraudulent documents. The CAT compares the independently verified ID to validate the passenger's identity and allow access to the screening checkpoint.

Refer to **Figure 3-2.5** and **Figure 3-2.8** for additional information. The TDC function is critical to the flow of passengers through the checkpoint as it can become the bottleneck or pinch point in the passenger screening process. The queue must be set up properly to feed the TDC, and the TDC must be set up properly to feed the checkpoint lanes.

The following guidelines should be considered when determining placement of the TDC:

- The TDC, hard building walls, and stanchions (strap and solid barrier) should be setup so that NO individual can circumvent or bypass the TDC.
- The TDC should be located as described in **Figure 3-2.7** with enough space from the screening lanes so that passengers can cross flow to a lane of their choosing.
- Lighting should be sufficient for reading documents. Refer to Section 3-3.8 for lighting guidelines at the SSCP.
- There should be one TDC for every two standard screening lanes.
- Additional TDC positions should be added for odd numbered lanes and TSAPre✓® and additional or revised queuing space should be considered.
- For checkpoints with more than three TDC positions, sufficient clearance should be provided between the queue stanchions and the TDC stanchions so that passengers can cross flow to a TDC of their choosing.
- Recommended queue widths and square footage of the queue based on the number of lanes should be followed to provide for an even distribution of passengers to the TDC. Refer to Section 3-2.2.

Figure 3-2.5 TDC Podium & CAT

- Power/data for the podium or CAT should be provided in a recessed poke-through flush to the floor and centered under the podium or CAT to allow for adjustment of the TDC position. Power/data devices should be spaced at 11'-6" center to center. When a poke-through is not possible, a power pole is acceptable, centered with the podium and between two lanes.
- Alternating "mini-queues" should be created on both sides of the TDC by providing at least 5'-0" of stanchions in front of the TDC along the centerline. This will force the passengers to form two separate lines for the same TDC. The TDC will process whichever "mini-queue" passenger is ready.
- "Mini-queue" stanchions should be used to close TDC podiums during non-peak periods of the day.
- Barrier stanchions shall form the exterior perimeter of the TDC podium in order to deter passengers from bypassing this function. Barrier or double strap stanchions shall also be used between TDC podiums. Strap stanchions can be detached too quickly and easily where barrier stanchions have to be disassembled, alerting TSA personnel and allowing time for a TSO to respond.

Figure 3-2.6 TDC Podium & CAT

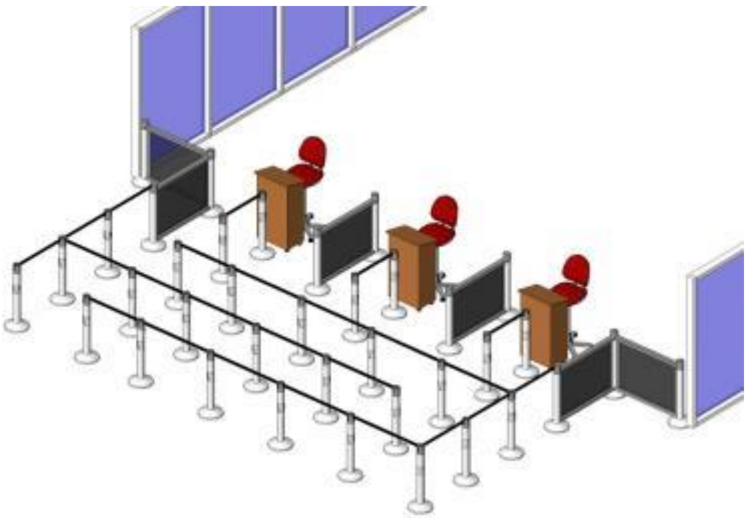
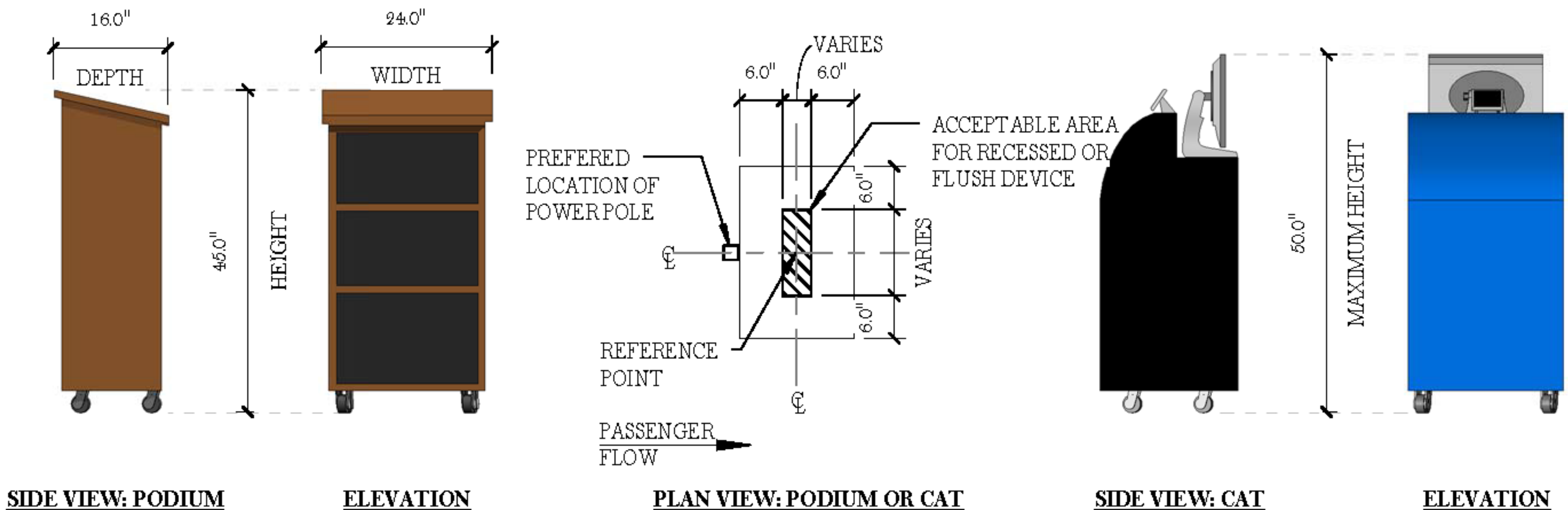


Figure 3-2.7 CAT X, I, and II TDC Podium Dimensioning

Number of Lanes	Minimum Distance from Bin Cart to Podium Chair (ft)	Number of Lanes	Minimum Distance from First Divest Table to Podium (ft)
1	4	9	15
2	6	10	15
3	7	11	15
4	9	12	15
5	10	13	15
6	12	14	15
7	13	15	15
8	15	16	15
*Measured as minimum suggested distance. Consult TSA Designer for guidance.			

Figure 3-2.8 TDC Podium & CAT

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
TDC Podium CAT (generic)	• 1 per 2 standard lanes • +1 for odd numbered lanes and TSA PreCheck lanes • +1 if checkpoint feeds international flights	• Dedicated circuit for TDC podiums ONLY, maximum of 5 per circuit • 20A, 125V, 180VA/podium • 2-Pole, 3-Wire Grounding • NEMA 5-20R Duplex Receptacle • Max amp: 0.86A, Steady state amp: 0.44A • Power cord length is unknown at the time of this printing	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	• The TDC function can be supported by either a TDC Podium or a CAT. • The CAT may be on wheels or it may sit on floor.

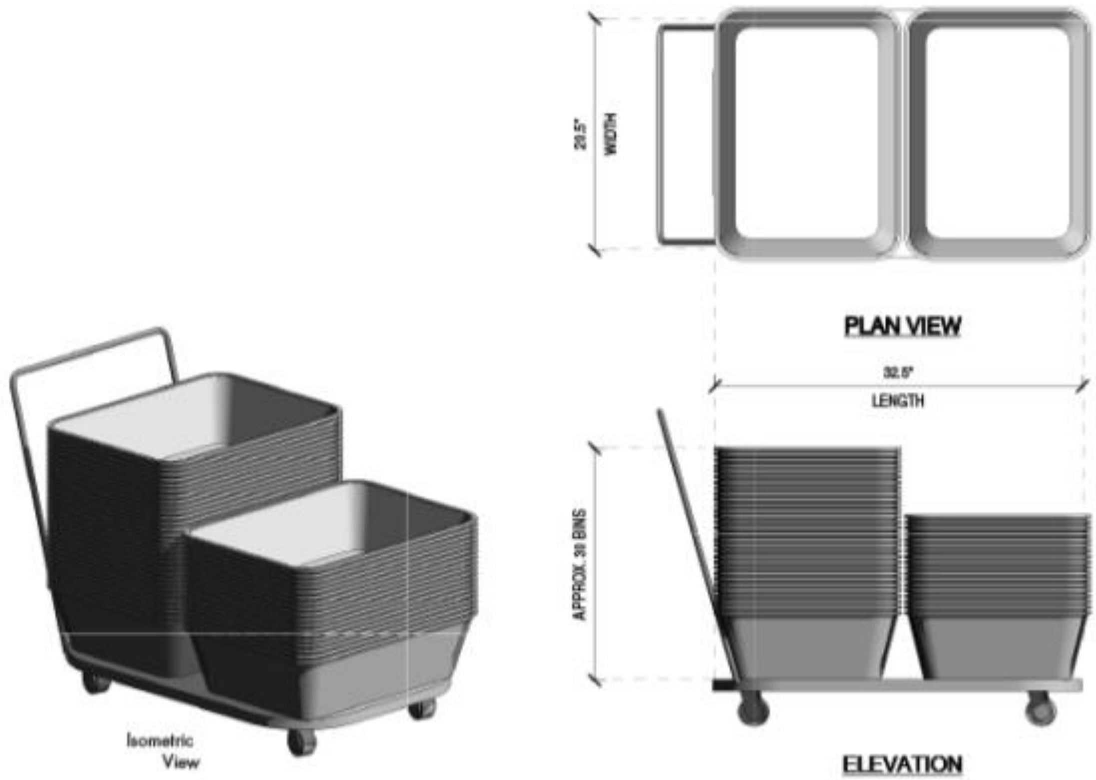


3-2.3 BIN CART

Bins are the gray containers located on a cart at the front and back of each checkpoint lane. Passengers use bins to divest themselves of their personal belongings such as purses, carry-on bags, backpacks, laptops, shoes, jackets, etc. Bin carts are similar to a hand cart or dolly that allows for the transport of a large number of bins without requiring excessive lifting or carrying by a TSA agent. In the past, bin transport by the TSOs was the primary cause of on-the-job injuries at checkpoints. Hand-carrying of bins is no longer endorsed by TSA. TSA recommends that bin carts be pushed upstream though an ADA or access gate. Ideally, an ADA or access gate should exist at every lane but this is not always possible. When there is insufficient space for an ADA or access gate, the bin cart should be pushed upstream against passenger flow through the WTMD. Bin carts can be one or two bins wide with bins stacked on top to slightly below the handle which equates to approximately 40 bins. Each lane requires a bin cart at each end. TSA recommends maintaining about 60 bins per lane divided across each end.

A fully- loaded bin cart should be located at the start of the divest tables on the non-sterile side of the lane for passenger pick-up. The other bin cart should be positioned at the end of the composure rollers on the sterile side so that the TSA agent can collect empty bins after passengers have picked up their belongings. Refer to **Figure 3-2.9** for bin cart dimensions. The bin cart width times two should be factored into the overall length of the checkpoint lane when designing a new checkpoint or reconfiguring an existing checkpoint.

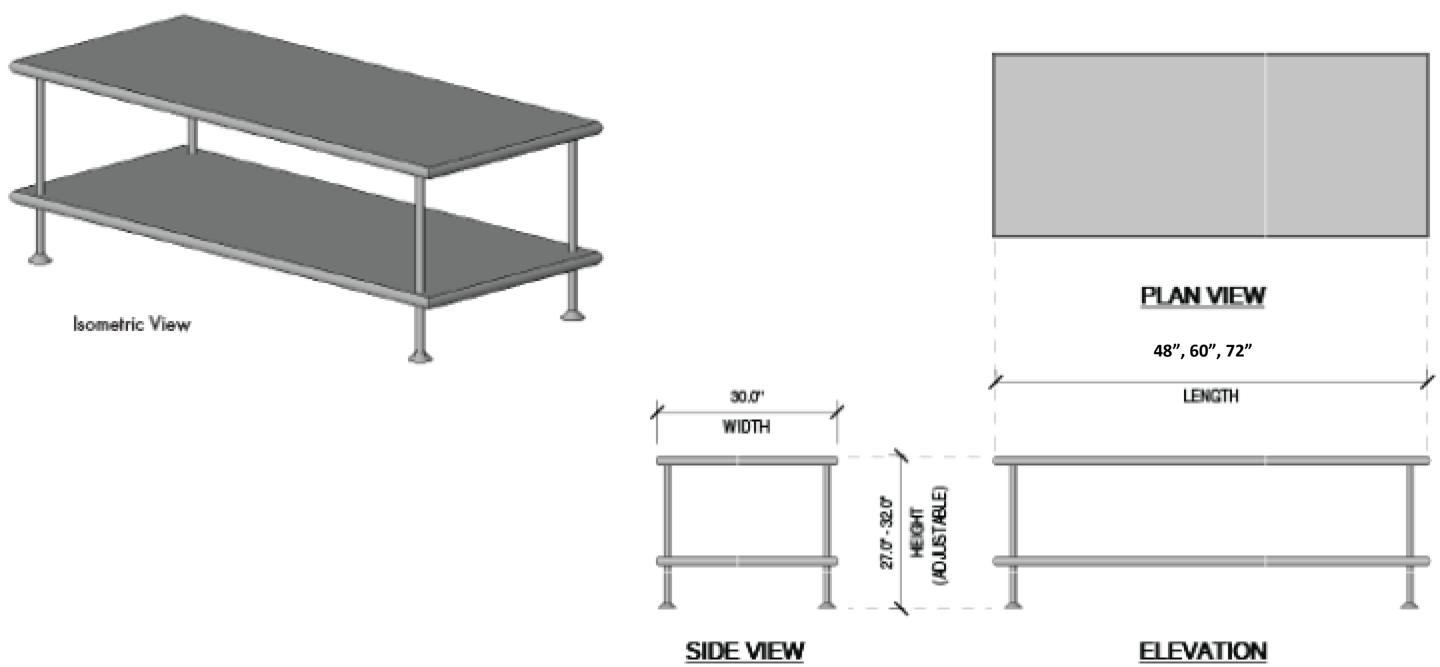
Figure 3-2.9 Bin Cart



3-2.4 DIVEST TABLE

Divest tables are provided for passengers to stage their bins side-by-side so they can deposit their personal items into the bins. The divest table allows passengers to slide their bins to the infeed of the X-ray. Current checkpoints utilize a variety of table sizes and types; however, for new checkpoints or checkpoints being reconfigured, the divest tables are 30" wide and 48", 60", or 72" long. See **Figure 3-2.10**. Two 72" tables abutted to the infeed roller or loading table of the X-ray is the preferred divest length, but limited checkpoint or obstructions may require shorter tables or only one table. Divest tables are stainless steel with height-adjustable legs from 27" to 32". Implementation of these tables will increase sequencing efficiency through the checkpoint. Lanes that do not have enough depth for 12'-0" of passenger divestiture will have a slower throughput.

Figure 3-2.10 Divest Table



3-2.5 CARRY-ON BAG SCREENING

Carry-on bag screening is mandatory at a SSCP and is accomplished by deploying AT equipment. Generally, this equipment has the following components:

- Loading Table/Entrance Roller
- Queuing Conveyor & Hood (Vendor Specific)
- Scanning Belt & Dome
- High Speed Conveyor (HSC) & Hood
- Extension Rollers
- Exit Roller with Bag Stop
- Manual Diverter Roller (MDR)
- Alternate Viewing Station (AVS)

TSOs are staffed dynamically at the carry-on bag screening units where one or two screeners can perform the functions listed:

- Review bag images on the monitors
- Remove alarmed bags from the alarm bag cutout or from the MDR
- Place empty bins on the bin carts

Interpreting the bag images on the monitor requires focused concentration by the TSO. The operator should have an ergonomic and distraction-free environment. The space should be designed to minimize glare on the X-ray workstation monitors from interior lighting, glass walls, or sunlight. The monitor height should be at an optimum viewing angle. The operator must also have a clear view of the machine's entrance and exit conveyor. Columns, power poles, signage, etc. should not prevent the TSO from seeing the bags going in and out of the X-ray unit.

Equipment determination for each lane at an SSCP will be based on the space available, the required number of lanes based on passenger load, and the floor structure. If the checkpoint is being reconfigured, additional consideration needs to be given to the location of the existing electrical outlets, TSO familiarity with a specific manufacturer, and existing maintenance contracts. The TSA HQ POC, local FSD staff, and the checkpoint designer will need to work together to determine the best solution based on the site conditions. The TSA HQ Point of Contact, local FSD staff, and the checkpoint designer should work together to determine the best solution based on the specific site conditions and normal operational procedures.

Carry-on bag screening equipment will have panic buttons/duress alarms installed by the airport directly on the equipment or near the equipment operator. These alarms are typically connected to the airport or local law enforcement. Checkpoint designers should refer to the Airport Security Plan if relocation of panic buttons is required. Duress alarm requirements are outlined in Section 3-3.7.

Equipment discussed in this section covers all primary carry-on bag screening. Alarmed bags may require secondary screening, which is discussed in Section 3-2.12.

3-2.6 ADVANCED TECHNOLOGY (AT) X-RAY

The AT X-ray is the next generation of X-ray equipment that replaces the TRX. The AT X-ray is wider, longer, heavier, and draws more power than its TRX counterpart. Refer to **Figure 3-2.11**. This larger size improves the screening capability by capturing a bottom and side view of carry-on bags inside the dome and producing two high resolution images for TSA to review. TSA currently classifies the baggage screening equipment as AT. AT represents the deployment of the AT X-ray units which consists of the Rapiscan 620DV, the Smiths 6040aTiX, and the L3 ACX 6.4-MV. AT includes an Alternate Viewing Station (AVS) and, in the case of Rapiscan and L3, a 48" queuing conveyor between the infeed roller and the scanning belt. **Figure 3-2.12, Figure 3-2.14, and Figure 3-2.16** depicts the Rapiscan, Smiths, and L3 AT product specifications. Standard layouts are reflected in Section 3-1.

The Rapiscan and Smiths AT come standard in a RH configuration but they can be modified into a LH configuration. The L3 AT comes standard in a LH configuration only. The standard configurations are shown on the plan views on the following pages. Unlike the TRX, the "hand" is dependent on the bump-out orientation rather than the operator. The bump-out is the side bonnet on the AT X-ray that juts out from the rectangular shape. This is where the side view camera is located. On a RH unit, the bump-out is on the right side of the AT dome when standing on the non-sterile side of the AT looking at the infeed tunnel. On a LH unit, the bump-out is on the left side of the AT dome when standing on the non-sterile side of the AT looking at the infeed tunnel. The RH and LH AT units are not symmetrical. The LH AT is a 180° rotation of the RH AT with the infeed and outfeed components interchanged. On the RH AT, the side view picture is taken last; whereas on the LH AT, the side view picture is taken first. The bump-out orientation should be specified prior to manufacture.

The operator workstation can be located on either the bump-out or the non-bump-out side. This is often referred to as bump-outs towards operators or bump-outs towards passengers, respectively. Even though the Rapiscan and L3 AT have a "tethered" independent operator workstation, the location still needs to be determined prior to manufacture. The Smiths AT operator workstation will be located on the AT unit.

In summary, there are four possible configurations of the Rapiscan and Smiths AT, and two possible configurations of the L3 AT. It is important to identify the orientation of the bump-out and the location of the operator early on so that it can be manufactured as designed as it is arduous and expensive to change in the field. The orientations are as follows.

Rapiscan 620DV AT and Smiths 6040aTiX AT Configurations:

- RH AT with bump-out towards operator
- RH AT with bump-out towards passengers
- LH AT with bump-out towards operator
- LH AT with bump-out towards passengers

L3 ACX 6.4-MV AT Configurations:

- LH AT with bump-out towards operator
- LH AT with bump-out towards passengers

The AT units are also unique in regard to the composure length. The Rapiscan 620DV and L3 ACX 6.4-MV have one 1-meter (3'-3") extension roller with a bag stop. The Smiths 6040aTiX has one 6'-8" exit roller with a bag stop. AT compatible TRX or AT extension rollers should be added to obtain the recommended composure length of 12'-0" and maximum composure length of 18'-0". Extension rollers are discussed further in Section 3-2.6.2.

The AVS is where a TSO can recall the image of an alarmed bag from the AT while performing a target bag search. For the Rapiscan and L3 AT, the AVS is a mobile operator cart that is located approximately 18" to 22" off the back side of a TSA-provided search table. The cart has one or two monitors, a keyboard, and a PC tower that can be plugged into the re-locatable power tap that is mounted to the TSA search table. The power tap is plugged into a device that feeds the ETD and BLS at the secondary screening area. The Smiths AVS has two monitors and a keyboard attached to an arm that is connected to the Smiths-provided search table. The search table also acts as a cabinet that houses the PC and UPS. **Figure 3-2.13, Figure 3-2.15, and Figure 3-2.17** depict the Rapiscan, Smiths, and L3 AVS product specifications.

Figure 3-2.11 AT Units

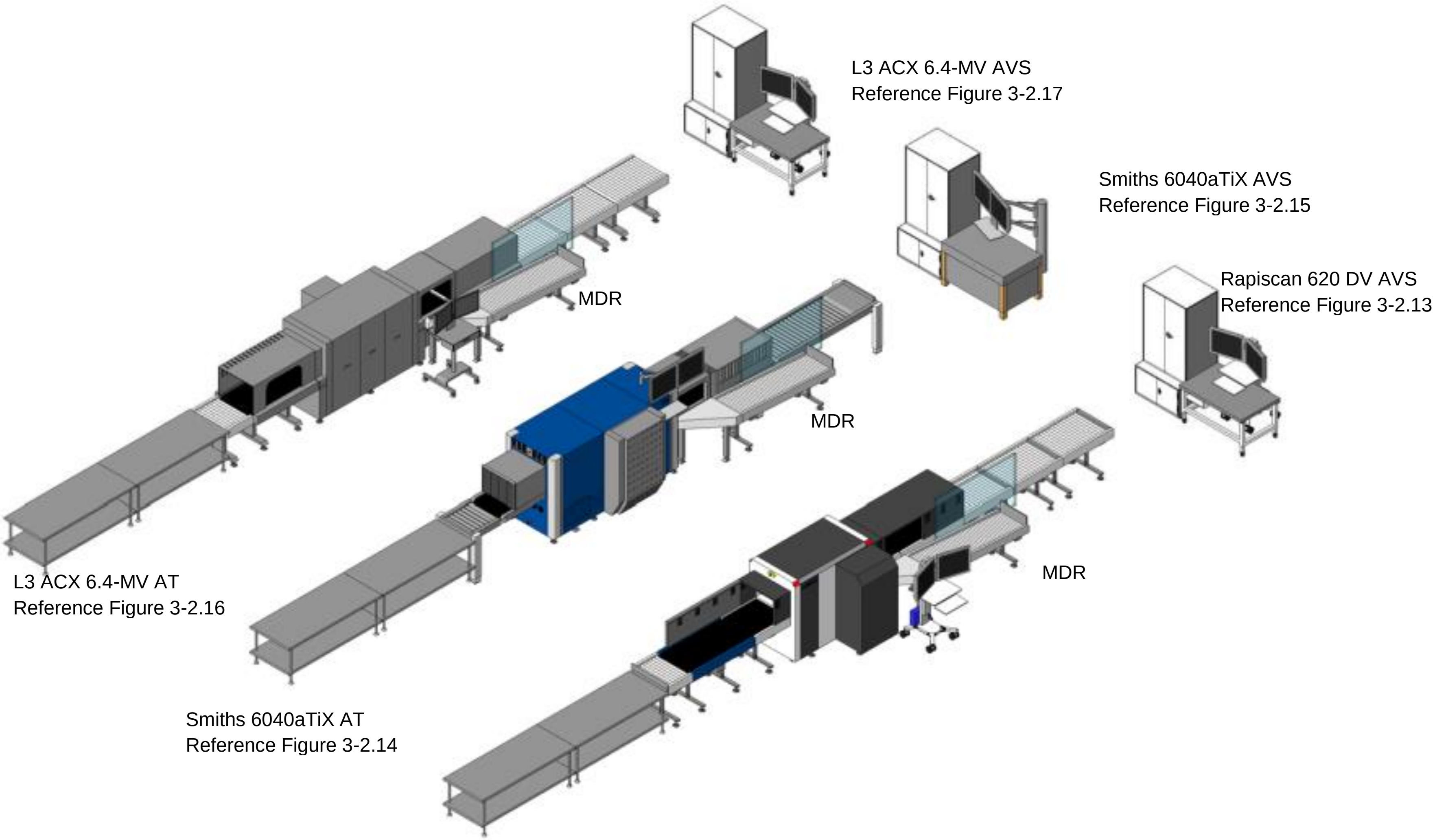


Figure 3-2.12 AT - Rapiscan

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
Rapiscan 620DV AT	1 per lane	• Dedicated • 20A, 125V, 1800VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Simplex Receptacle • 15' power cord from the AT to the • Receptacle • 20A, 125V, 360VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Simplex Receptacle • Queuing Conveyor • 15' power cord from the queuing conveyor to the receptacle • 20A, 125V, 360VA/unit (Queuing Conv.) • 2-Pole, 3-Wire Grounding • NEMA 5-20R Simplex Receptacle • 15' power cord from the queuing conveyor to the receptacle	• Data Drops = 4 Total: 2 from device to IT cabinet, 2 from device to respective AVS/ETD/BLS location • Cat5e / Cat6 cable • The cable length from the termination point in the IT • cabinet to the AT data outlet shall not exceed 295'. • All data cabling must be provided by others. Not • Supplied by vendor.	• Rapiscan 620DV comes in a RH (shown) or LH configuration. The LH unit is a 180 degree rotation of the RH unit. Power and data connections are reversed for a LH unit. • Rapiscan uses an Ergotron Dual Stand for the AT mobile operator cart and AVS. The operator cart is attached by a vendor provided data cable and can move freely around the unit. • Weight: 2,094 lbs., approx. 350 lbs per leg • The HSC can be sloped downwards no more than 12 degrees and upwards no more than 10 degrees. • The queuing conveyor and HSC can be sloped downwards no more than 12 degrees and upwards no more than 10 degrees. • Refer to manufacturer product information for more details.

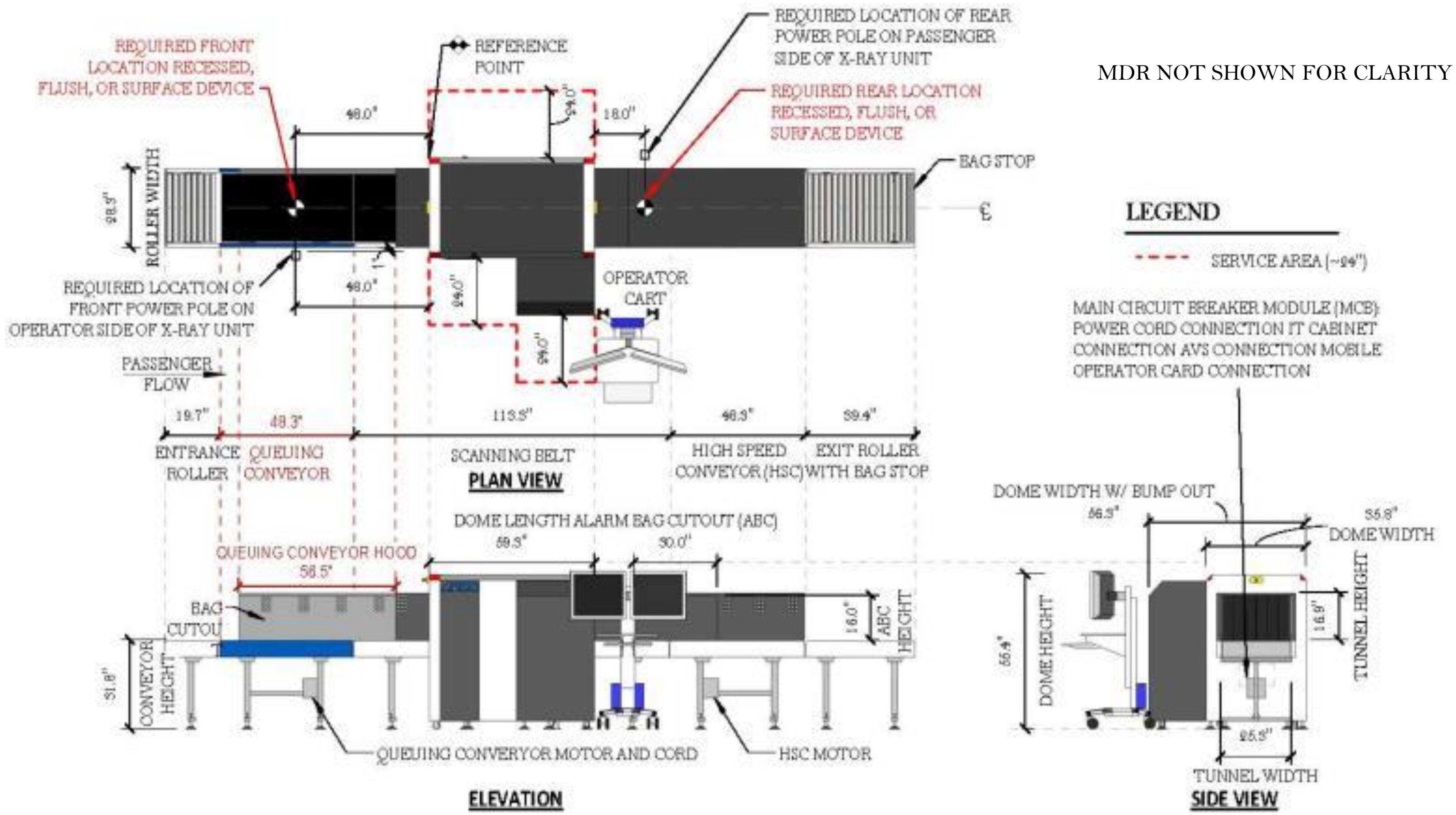


Figure 3-2.13 AVS - Rapiscan

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
Rapiscan 620DV AVS	1 per AT	• Non-Dedicated, shared with ETD and BLS circuit at the same search area • 15A, 125V, 252VA/unit, 504VA/2 units • 2-Pole, 2-Wire Grounding • NEMA 5-20R Receptacle • 5’ power cord for two monitors and one PC tower of the AVS to the relocatable power tap mounted to the TSA search table. • 6’ power cord from the relocatable power tap to the receptacle	• All data cabling must be provided by others. Not supplied by vendor. • AVS data to be direct from respective AT, see AT IT Requirements.	• AVS is an Ergotron Dual Stand. • Located with standard TSA search table.

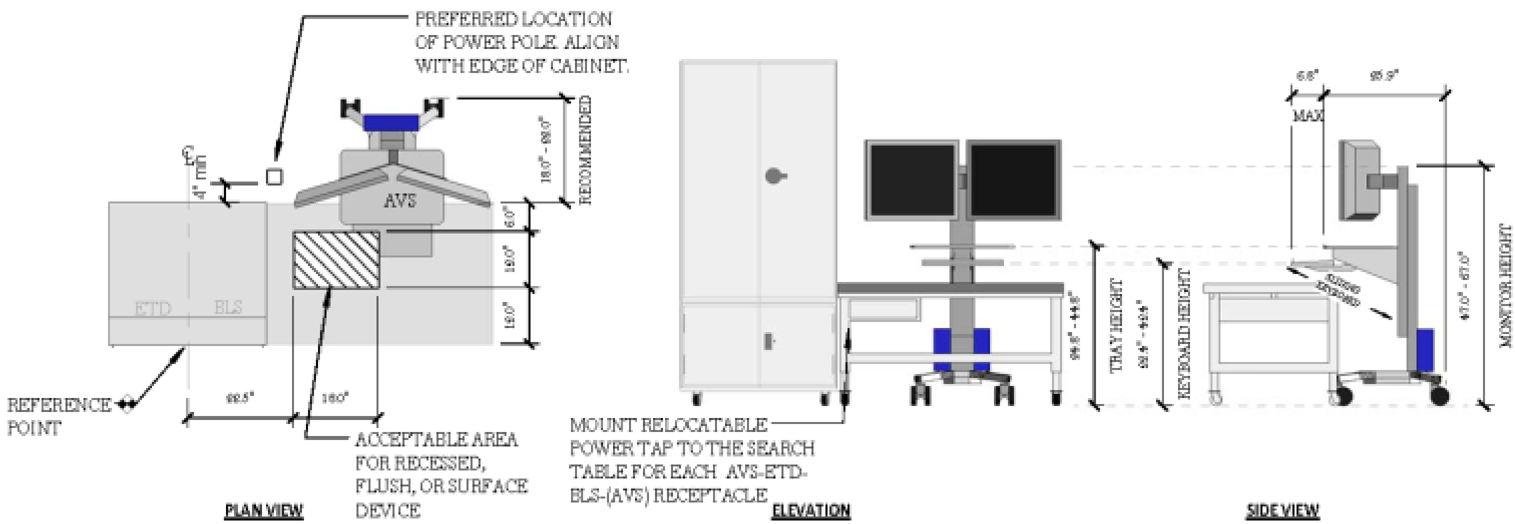


Figure 3-2.14 AT - Smiths

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
Smiths 6040aTiX AT	1 per lane	• Dedicated • 20A, 125V, 1920VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Simplex Receptacle • 15' power cord from the AT to the receptacle	• Data Drops = 4 Total: 2 from device to IT cabinet, 2 from device to respective AVS/ETD/BLS location • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'. • All data cabling must be provided by others. Not supplied by vendor.	• Smiths 6040aTiX comes in a RH (shown) or LH configuration. The LH unit is a 180 degree rotation of the RH unit. Power and data connections are reversed for a LH unit. • The operator workstation is mounted to the X-ray. Existing field equipment may have the operator workstation located on a cart. • Refer to manufacturer product information for more details. • Weight: 3,528 lbs.

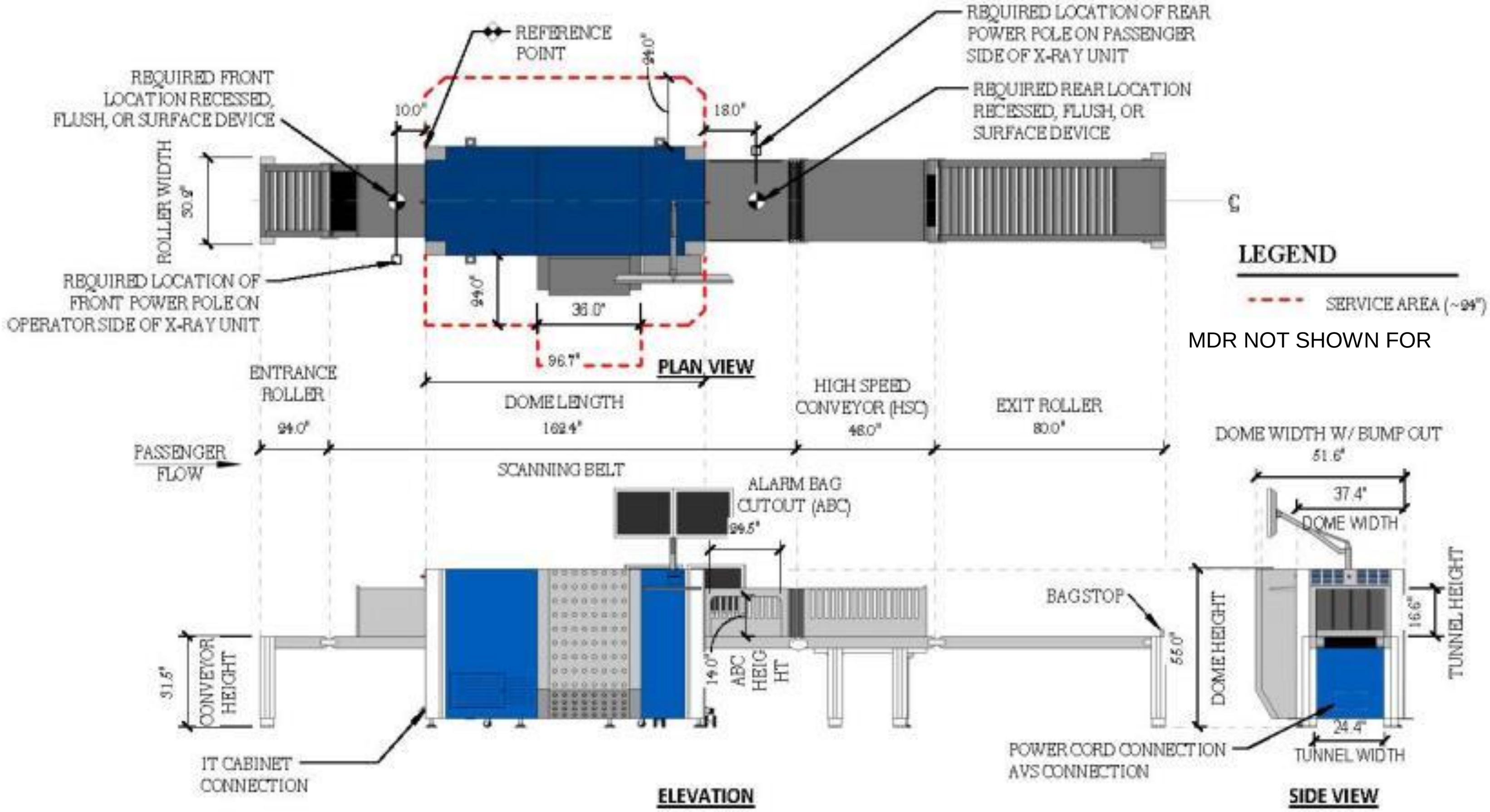


Figure 3-2.15 AVS - Smiths

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
Smiths 6040aTiX AVS	1 per AT Unit	• Non-Dedicated, shared with ETD and BLS circuit at the same search area • 10A, 125V, 144VA/unit, 288 VA/2 units • 2-Pole, 2-Wire Grounding • NEMA 5-20R Receptacle • 5' power cord for two monitors and one PC tower of the AVS to the relocatable power tap provided by the installing contractor for the Smiths search table. • 6' power cord from the relocatable power tap to the receptacle	• All data cabling must be provided by others. Not supplied by vendor. • AVS data to be direct from respective AT, see AT IT Requirements.	• Search table provided by vendor.

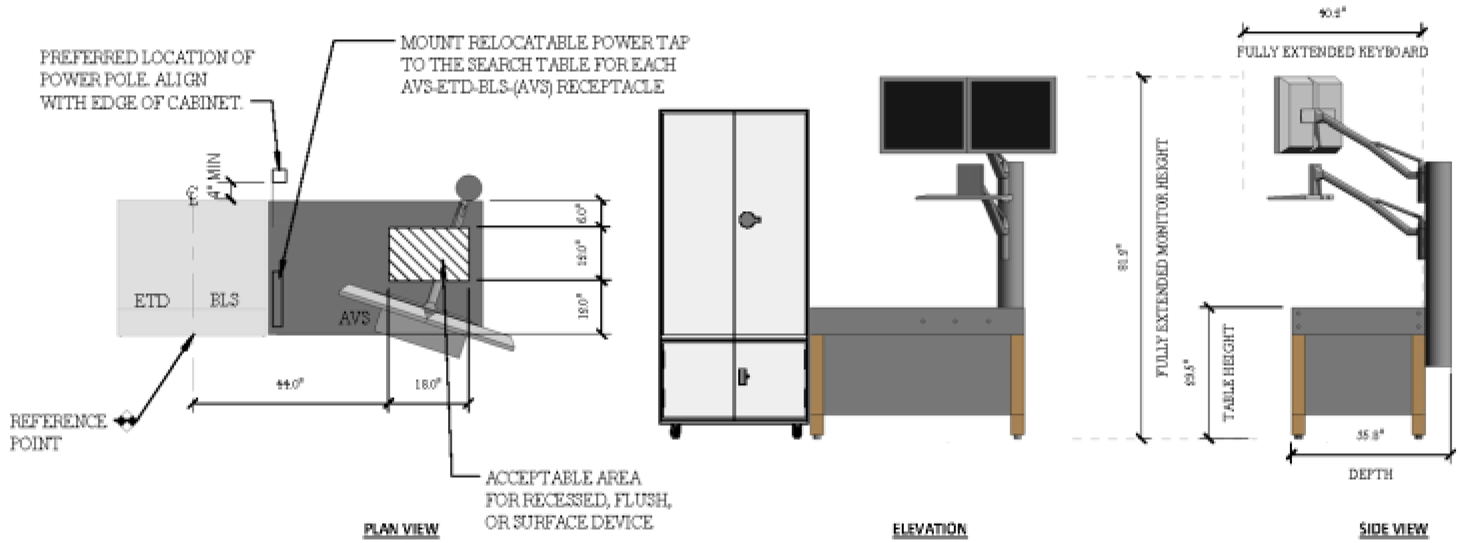


Figure 3-2.16 AT – L3

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
L3 ACX 6.4-MV AT	1 per lane	• Non-dedicated circuit • 20A, 125V, 350VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Quad or Duplex Receptacle	• Data Drops = 4 Total: 2 from device to IT cabinet, 2 from device to respective AVS/ETD/BLS location • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'. • Two 17' Cat5e/ Cat6 cables from the AT to the operator cart. • Two 25' Cat5e/ Cat6 cables from the AT to the two switches of the FDRS. • Two 5' Cat5e/ Cat6 cables from the two switches to the FDRS.	• L3 AT comes in LH configuration only. The operator may sit on either side of the unit. • Weight: • » 2,260 lbs., approx. 380 lbs. per leg • The operator cart can move freely around the unit. • Refer to manufacturer product information for more details.

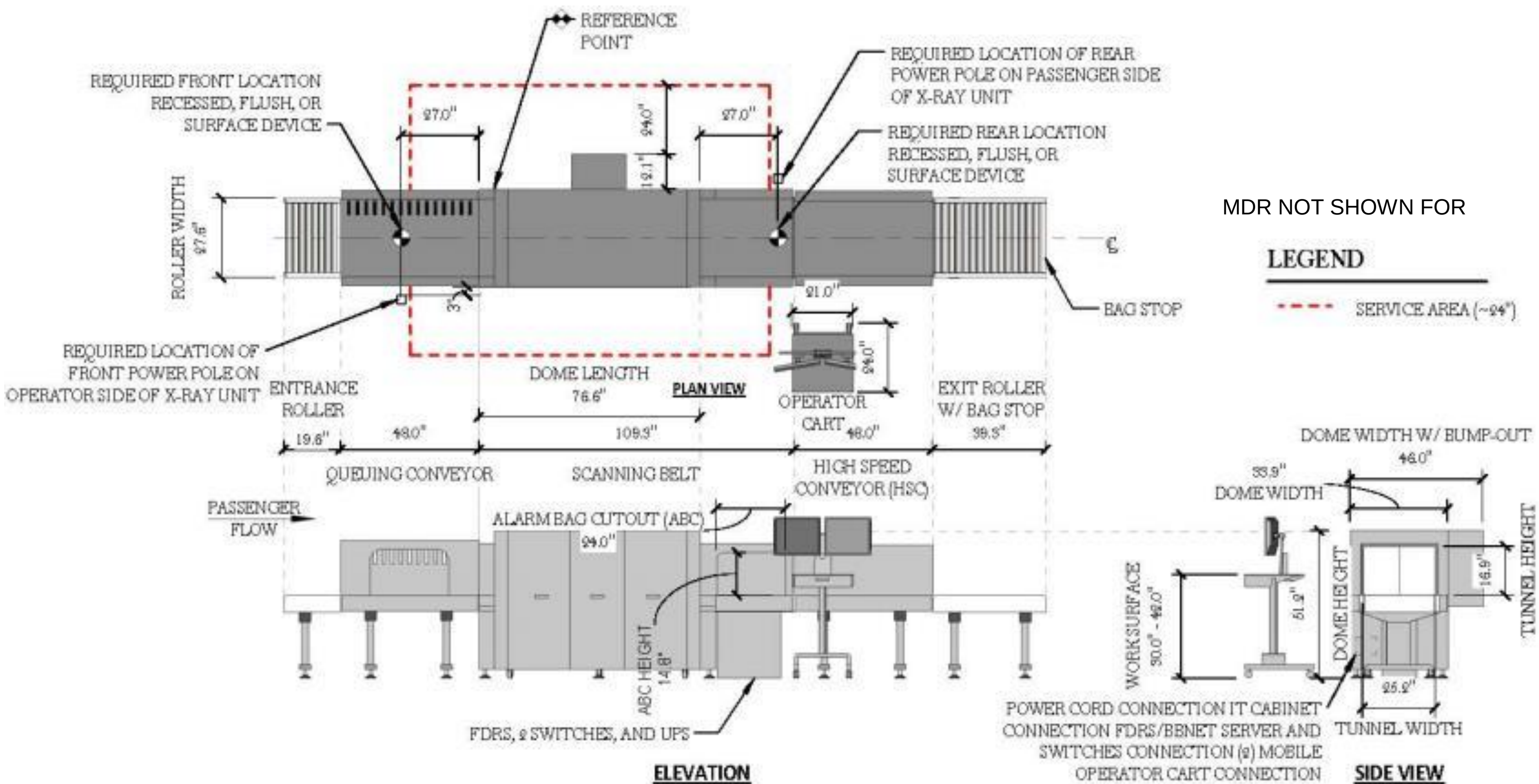
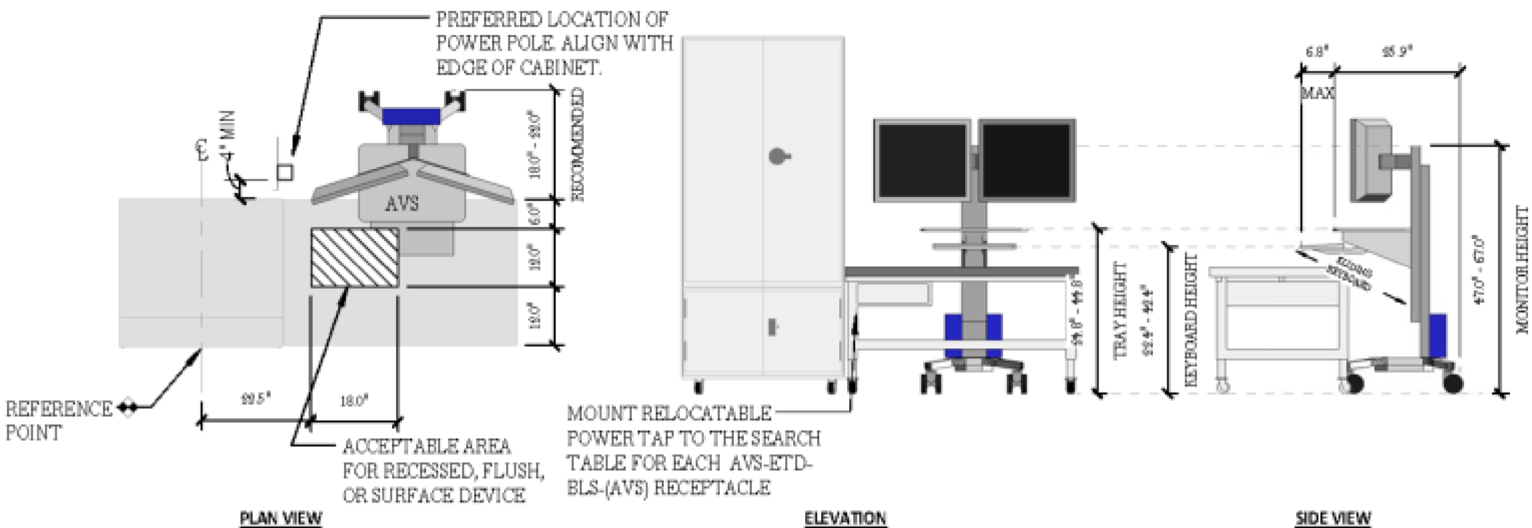


Figure 3-2.17 AVS – L3

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
L3 ACX 6.4-MV AVS	1 per AT Unit	• AVS: • Non-Dedicated, shared with ETD and BLS circuit at the same search area • 6.3A, 125V, 420VA/unit, 840 VA/2 units • 2-Pole, 3-Wire Grounding • NEMA 5-20R Receptacle • 6' power cord from the monitor and PC tower of the AVS to the UPS • UPS (750VA Rating): • Non-Dedicated • 6.3A, 120V, 758VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Receptacle • 6' power cord from the UPS to the relocatable power tap mounted to the TSA search table. Longer cord lengths are available from the vendor. • 6' power cord from the relocatable power tap to the receptacle	• All data cabling must be provided by others. Not supplied by vendor. • AVS data to be direct from respective AT, see AT IT Requirements.	• AVS is an Ergotron single monitor stand. • Located with standard TSA search table.



3-2.6.1 MANUAL DIVERTER ROLLER (MDR)

The MDR is a non-powered, gravity fed, stand-alone roller located on the operator side of any AT unit at the alarm bag cutout. See **Figure 3-2.18**. The MDR comes in a RH or LH configuration which is determined by the side of the dome it is located on when standing on the non-sterile side of the AT looking at the infeed tunnel. The AT operator will be able to slide alarmed bags onto the MDR so that bags can be taken to the secondary screening area to be investigated by a TSO.

The MDR has a Plexiglas® partition that prevents passengers from accessing their alarmed bags from the other side of the composure/extension rollers. The MDR slope and height can be adjusted to align with any AT.

If an MDR does not fit in the operator space due to a column or other obstruction, a 2'-0" x 2'-0" table may be used at the transition table location. The use of this table in lieu of an MDR shall be approved by a TSA Designer. **Figure 3-2.18.A** depicts a generic 2x2 table.

Figure 3-2.18.A 2x2 TABLE

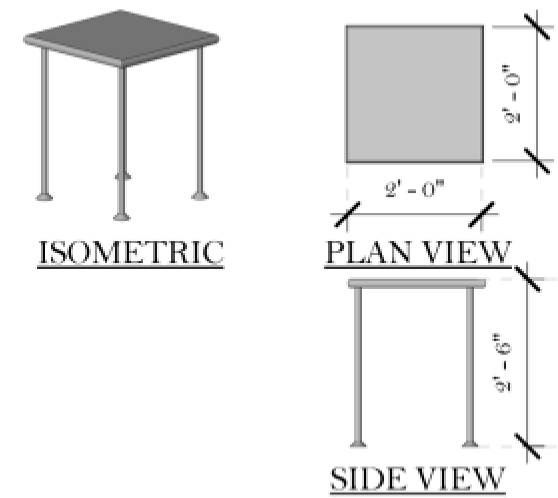
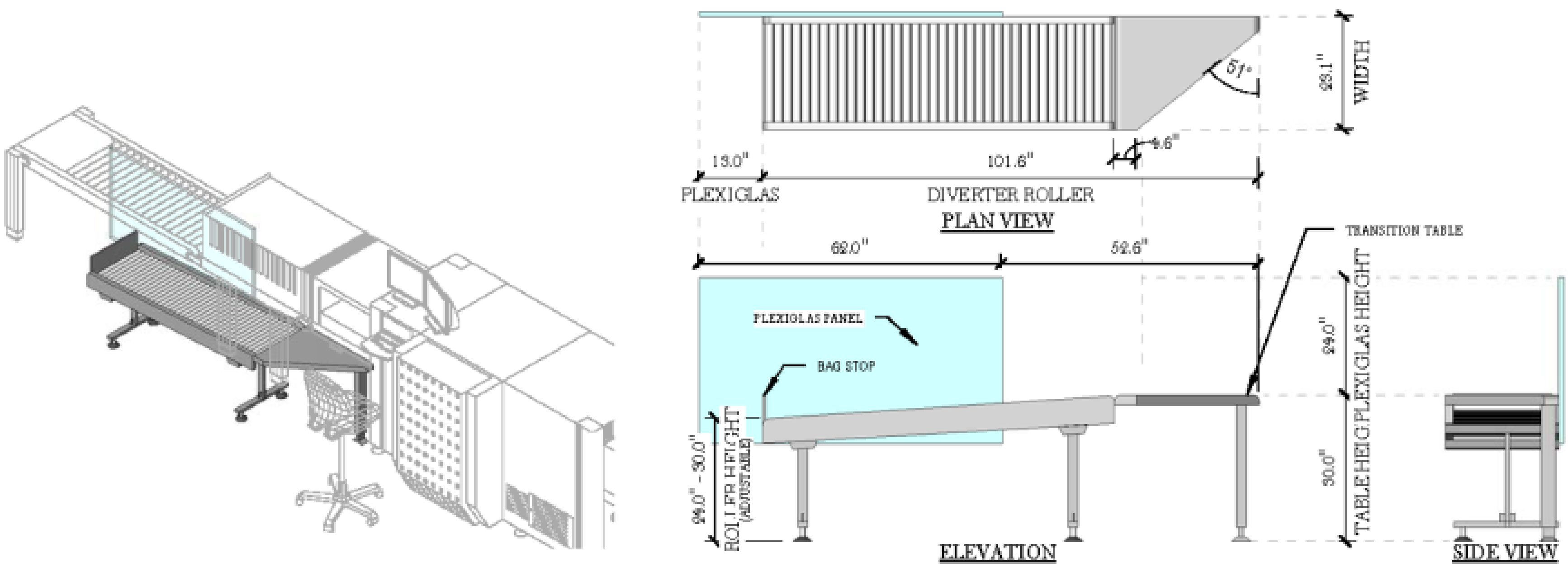


Figure 3-2.18 MDR



3-2.6.2 COMPOSURE/EXTENSION ROLLERS

The TRX and AT units have a High Speed Conveyor (HSC) covered by a tunnel located directly after the scanning belt. A carry-on bag arrives at the HSC after the bag has cleared the image review by the TSO. The HSC carries cleared bags to the composure/extension rollers where passengers can retrieve their personal items. These rollers are either called composure/extension rollers or exit rollers depending on the vendor and where they are installed on the TRX or AT. **Figure 3-2.19** represents a variety of composure/extension rollers that are used today. They attach to the HSC to create length at the back end of the X-ray so passengers can clear the confined screening area and have a more open environment for retrieving their personal belongings and composing. Without extension rollers, bottlenecks would exist at the HSC exit, and passengers would be unable to bypass congestion.

TSA recommends a minimum of 12'-0" of composure length which can be a combination of extension rollers or exit rollers depending on the manufacturer of the TRX or AT. The Rapiscan TRX, Rapiscan AT, and the L3 AT extension rollers come in 1-meter (3'-3") lengths. The Smiths TRX and AT extension rollers come in 48" and 72" lengths. The Rapiscan 520B 1-meter extension roller is compatible with the Rapiscan 620DV AT. The Smiths 6040i 48" and 72" extension rollers are compatible with the Smiths 6040aTiX. Dimensions of each extension roller are reflected in **Figure 3-2.20, Figure 3-2.21**, and **Figure 3-2.22**.

Figure 3-2.19 Composure/ Extension Rollers

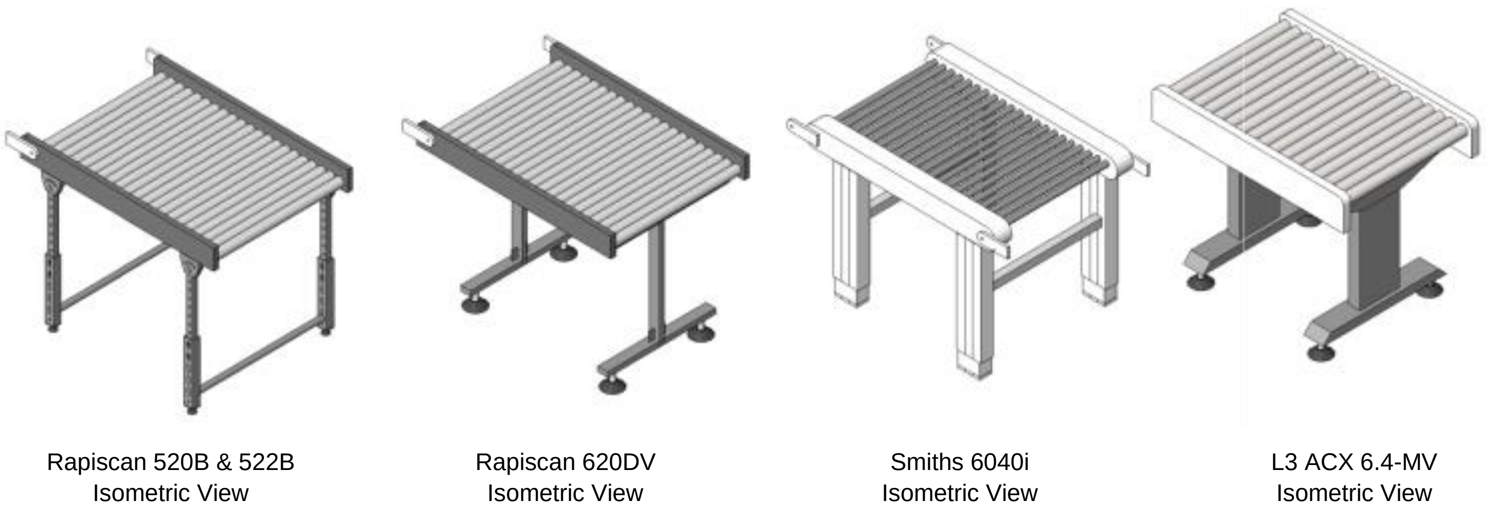
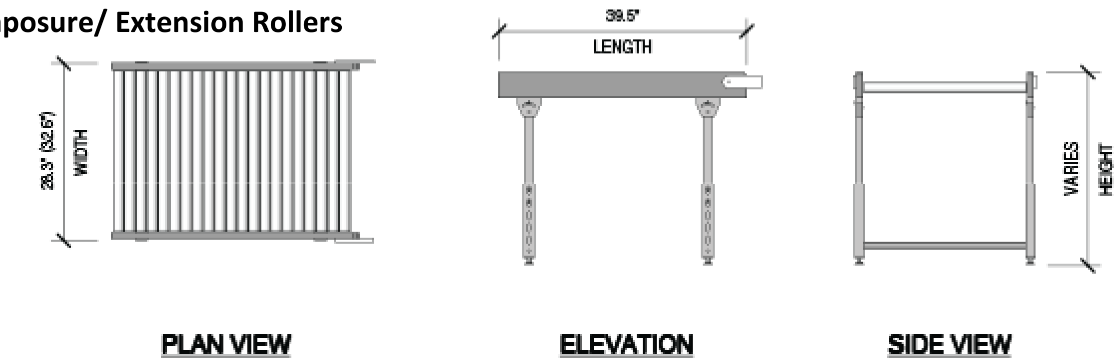


Figure 3-2.20 Rapiscan Composure/ Extension Rollers

Late Model Extension Rollers



NOTE: DIMENSIONS SHOWN ARE FOR THE RAPISCAN 520B AND 522B. WHERE VALUES DIFFER, DIMENSIONS FOR THE 522B ARE SHOWN IN (PARENTHESIS).

RAPISCAN 520B ROLLER IS COMPATIBLE WITH THE RAPISCAN 620DV AT.

Rapiscan 620DV Extension Rollers

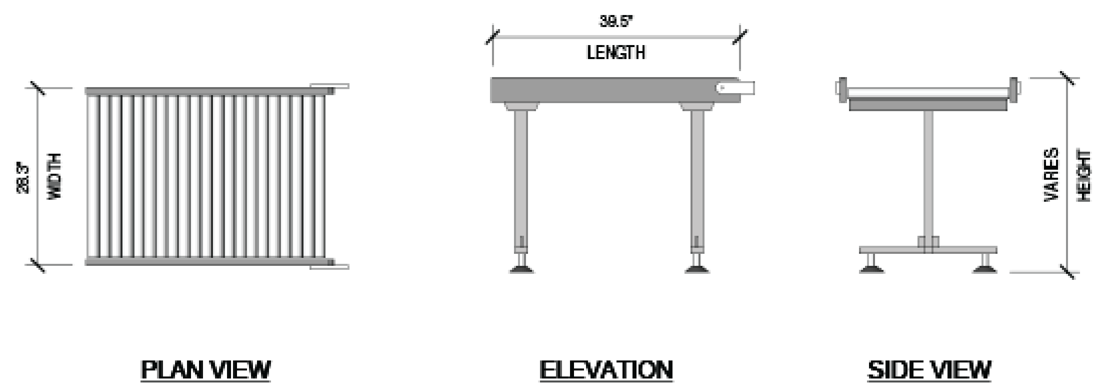


Figure 3-2.21 Smiths Composure/ Extension Rollers

Smiths 6040i Extension Rollers

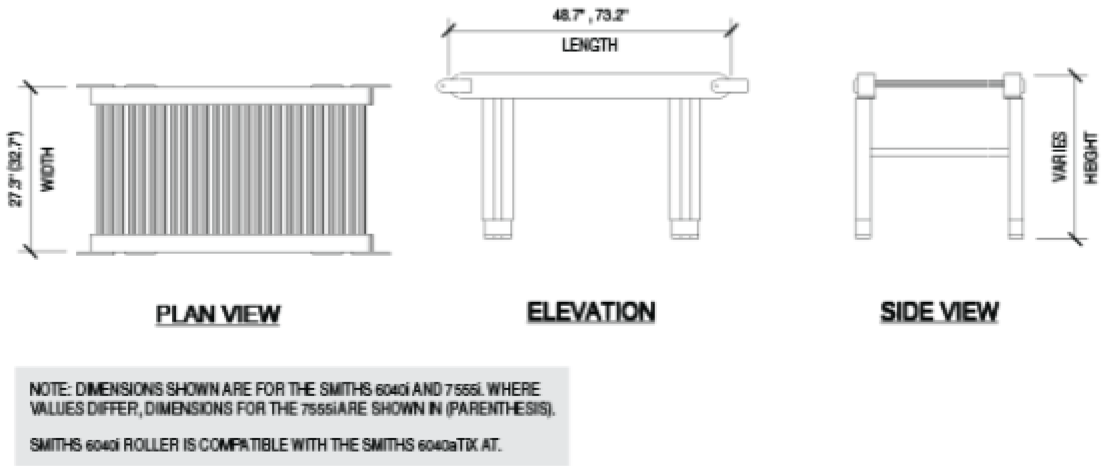
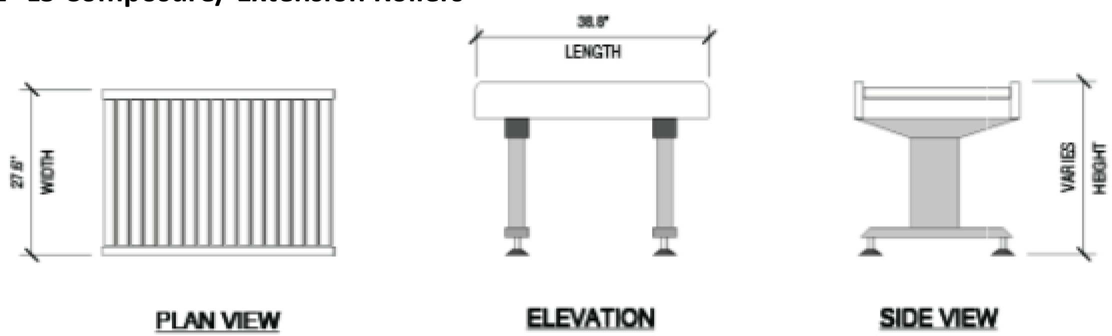


Figure 3-2.22 L3 Composure/ Extension Rollers

L3 ACX 6.4-MV Extension Rollers



3-2.7 WALK THROUGH METAL DETECTOR (WTMD)

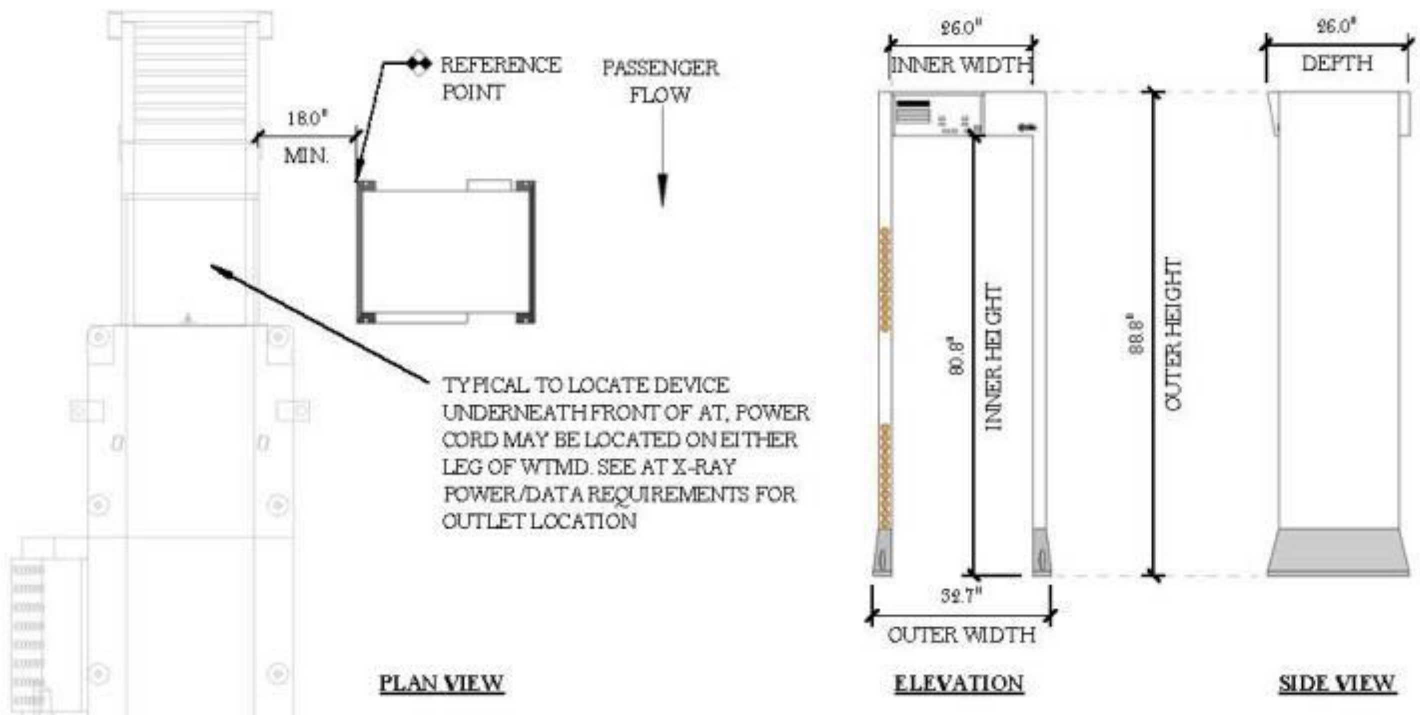
The WTMD is used for passenger screening. It is an archway used to detect concealed metallic items and/or contraband. Refer to **Figure 3-2.23** for an isometric view of the WTMDs currently located in the field. CEIA is the most common WTMD. CEIA specifications can be found in **Figure 3-2.24**. Currently, only the original equipment manufacturer (OEM) and authorized service providers are certified and authorized by TSA to relocate, recalibrate, service, and relocate the power cord to the opposite leg of the WTMD.

In order to minimize environmental and equipment interference with the WTMD, the following guidelines should be applied.

- Align the entrance of the WTMD so that it is 1'-6" behind the leading edge of the AT queuing conveyor hood and center between the AT if it is a 2-lane set and not co- located with an AIT.
- Provide power/data from a lane adjacent to the WTMD where there is no passenger flow between the AT and the WTMD. The power and data connections can originate from either leg of the WTMD and can be modified in the field by the OEM or Siemens if a checkpoint requires that the WTMD be powered from the opposite lane.
- Provide approximately 12" clearance from the legs to all other equipment, walls, or columns to prevent operational interference. Non-metallic ancillary equipment such as barriers and ADA gates can be spaced 2" to 9" from the WTMD legs.
- Locate a WTMD a minimum of 18 inches apart from all electrical fields created by escalators, trains, conveyors, neon fixtures, speakers, transformers, banks of electrical circuit breakers, conduit, wire, and receptacles both overhead and beneath the floor.
- Minimize interference from metal in surrounding architecture, including floors, floor supports, doors, metallic framing, wall studs, façade systems, columns, etc.
- Avoid locating the WTMD across expansion joints or in an area prone to surface vibrations created by equipment above, below or immediately adjacent to the checkpoint such as baggage conveyors, subway trains, heavy truck traffic, etc.
- With floating or raised floors a 10' x 10' concrete pad will be required under the WTMD to eliminate excessive vibrations.
- Provide twist-lock receptacles to prevent the WTMD from being accidentally disconnected which drains the back-up battery.
- Secure the 13'-0" power cord tight to the barrier on the sterile side adjacent to the WTMD to prevent the cord from being run across passenger egress or TSA work paths where the cord is likely to be a trip hazard or become damaged.
- Silicone and/ or bolt the WTMD to the floor.
- The WTMD should not be closer than 24" from the x-ray.
- The maximum distance from AT to WTMD shall be determined on a case-by-case basis.
- When the WTMD is not in operation while checkpoint is open or closed; it shall have a barrier or similar on non-sterile side to prohibit access through the checkpoint.

Figure 3-2.24 WTMD

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
CEIA 02PN20 Garrett PD6500i Metorex 200HDe	Arrangement Dependent	• Dedicated circuit for WTMDs ONLY, maximum of 10 per circuit • CEIA: 20A circuit, 15A Receptacle, 125V, 40VA/unit • Garrett: 20A circuit,15A Receptacle, 125V, 55VA/unit • Metorex: 20A circuit 15A Receptacle, 125V, 45VA/unit • 2-Pole, 3-Wire Grounding • NEMA L5-15R Simplex Receptacle (twist-lock) • 13' power cord from the WTMD to the receptacle • 18" minimum clearance from leg to nearest electrical conduit or device to prevent false alarms • Poke-through and pedestal receptacles for the WTMD can be located in AT device under the lane as long as it is a separate circuit.	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT • Cabinet to the data outlet in the work area shall not exceed 295'.	• Weight: 200 lbs. • CEIA unit provided with a separate transformer/rectifier adjacent to the power cord. • Provide power and data beneath all X-Rays.



3-2.8 ADVANCED IMAGING TECHNOLOGY (AIT)

The Advanced Imaging Technology (AIT) provides an additional element of passenger screening by being able to detect a broad spectrum of materials concealed in or under a passenger's clothing. The current manufacturer deployed today is shown in **Figure 3-2.25a**. The L3 ProVision portal uses millimeter wave imaging technology, similar to the type of waves a cell phone emits, to generate clear views of the items in question. Refer to **Figure 3-2.26a** for the plan views and power/data requirements. Standard layouts with the L3 ProVision AIT are reflected in Section 3. The minimum possible distance between the WTMD and AIT should be maintained for each checkpoint. Decreased spacing between the equipment enhances lane security by reducing the opportunity for contraband exchanges (via "handoff" of prohibited items) between yet-to-be screened AIT passengers and screened WTMD passengers as they move parallel to one another through the lane.

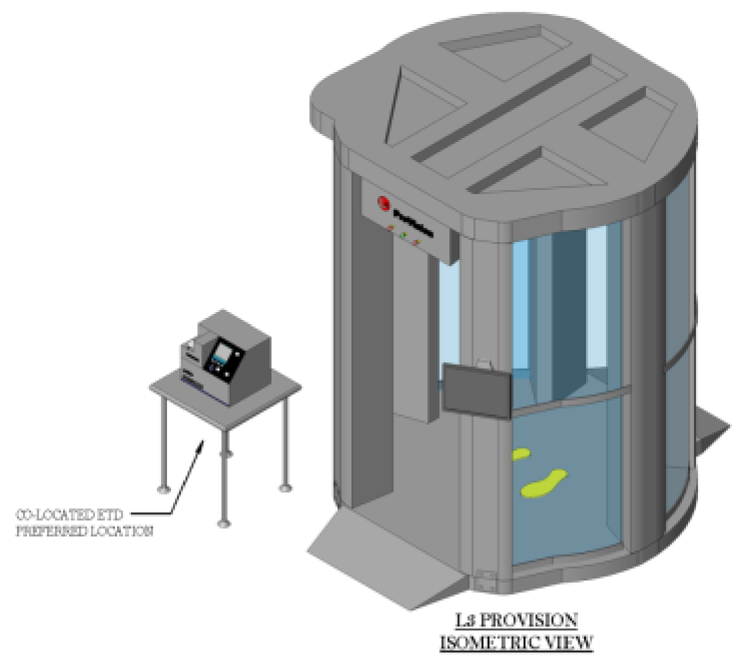
TSA is now deploying L3 ProVision2 AIT units which provide the same Advanced Imaging Technology in a smaller and less massive form factor. Refer to **Figure 3-2.25b** for the isometric view, refer to **Figure 3-2.26b** for the plan and profile views and power/data requirements. Designers are recommended to follow the same standard checkpoint dimensional requirements for the L3 ProVision and L3 ProVision2.

It is best to provide power for the AIT and corresponding UPS from under an adjacent AT X-ray lane. The UPS should be located so that it is not a trip hazard to passengers and the AIT operator at the Touch Control Operator Panel (TCOP). When a barrier is located between the L3 AIT control leg and the AT, the AIT power cord can extend to the receptacle under the infeed or outfeed conveyors of the AT along the barrier in appropriate surface mounted raceway. In some cases, an ADA gate or a WTMD is located between the L3 AIT control leg and the AT. Extending the AIT power cord across passenger flow is a safety hazard and is not an option. For the L3 AIT only when all other options have been exhausted, the unit can be rotated 180 degrees in order to locate the control leg adjacent to a barrier so that the cord can be extended along the barrier in appropriate surface mounted raceway. When there is passenger flow on both sides of the AIT, such as an ADA gate and a WTMD, the potential exists for tripping, damage to cords or unplugging of equipment. Therefore, a full height ceiling-supported power pole should be provided. If a full height ceiling-supported power pole is not acceptable or feasible, a 36" floor-supported power pole should be provided. The Wiremold Vista column is recommended. Designers should review and understand the L3 AIT cord lengths to avoid unnecessarily rotating the AIT.

Designers are reminded to consult applicable codes within their region of the country to determine the applicability and countermeasures to address seismic events for AITs. Manufacturers have brackets available for purchase.

When the AIT is not in operation while checkpoint is open or closed; it shall have a barrier or similar on non-sterile side to prohibit access through the checkpoint.

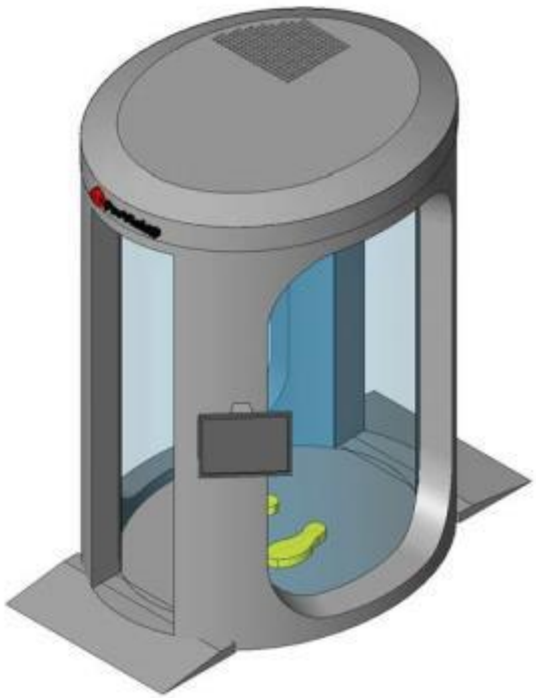
Figure 3-2.25a L3 AIT Unit



3-2.8.1 AIT WITH CO-LOCATED ETD

Explosive Trace Detection (ETD) units on a movable stand, cart, or table are located at the exit of the AIT to perform additional screening. This can be on either side of the AIT exit depending on where the power/data is located. The ETD should be fed from the same device but separate circuit feeding the AIT. Designers are advised to provide power and data for the ETD when developing construction drawings to provide maximum installation flexibility for the optional ETD. Ideally, this ETD should not be located at the TCOP or scanning operator (SO) monitor so that the TSO doesn't have to review images and perform ETD screening in the same small area. Unfortunately, this is not always possible. A 36" space should be provided for the operator when the ETD and AIT are co-located. ETD units are discussed further in Section 2.12.1.

Figure 3-2.25bL3 AIT2 Unit



3-2.8.2 SLOPE TOLERANCE

An AIT can be installed on an inclining or a declining floor within the maximum manufacturer recommended slope. These tolerances pertain to the technical functionality of the equipment and do not take into account building codes or ADA accessibility. For ADA passengers, the slope cannot exceed two percent perpendicular to the direction of travel.

The L3 ProVision system can be operated as follows.

- If the floor slope is parallel to passenger travel, the comfortable maximum floor slope is 1:16.
- If the floor slope is perpendicular to passenger travel, the L3 AIT cannot be installed unless the unit can be rotated parallel to the slope. This may be possible at checkpoints with unique shapes.
- Depending upon the slope of the surface the system is installed on, the inner floor of the ProVision system will also be at an angle.

At the aforementioned maximum 1:16 slope, the internal floor of the L3 AIT would have a 1:20 slope after adjusting the downhill leveling screws to their maximum extension. In the normal scanning position, this is equivalent to standing with one foot elevated approximately 1" relative to the other and is not normally noticeable.

At the upper maximum slopes, compensatory steps such as leveling the machine's feet and/or adjusting the floor mat position may be necessary. Contact manufacturer's representative for more information for installing on a sloped floor.

Figure 3-2.26a AIT – L3

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
L3 ProVision	Arrangement Dependent	• Dedicated • 20A, 125V, 1920VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Simplex Receptacle • Freestanding Tripp Lite UPS provided by vendor • 25' power cord from the AIT to the UPS (originates in control leg) • 10' power cord from the UPS to the receptacle • Refer to Figure 3-2.32 for ETD power and data requirements. • Refer to Figure 3- 2.26 equipment plan views for detailed outlet locations when power is fed from the adjacent AT lane.	• Data Drops = 2 • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	• An ETD is to be co-located with the AIT for additional pax screening. The ETD can be located at or on the same side as the control leg. • Height/Ceiling clearance requirement: 9'-0" / 9'-3" • Weight: 1,800 lbs. • Can be installed on a floor with a 1:16 floor slope parallel to passenger travel only. • The Touch Control Operator Panel (TCOP) may not be mounted on control leg. • Power cord can be positioned up and over unit to avoid rotation. • The 16'-0" shipped USB cable can be substituted for a 25'-0" cable in the field if necessary. • The power cable shipped with the unit may be replaced with TSA Designer approval • Manufacturer recommends installation on a slope of 1.5% or less. If slope is between 1.5% and 3.0%, a representative will perform a site validation to determine whether or not the slope is acceptable.
L3 Co-Located ETD	1 Per AIT	• Non-Dedicated • 20A, 125V, 350VA/unit	• Data Drops = 2	

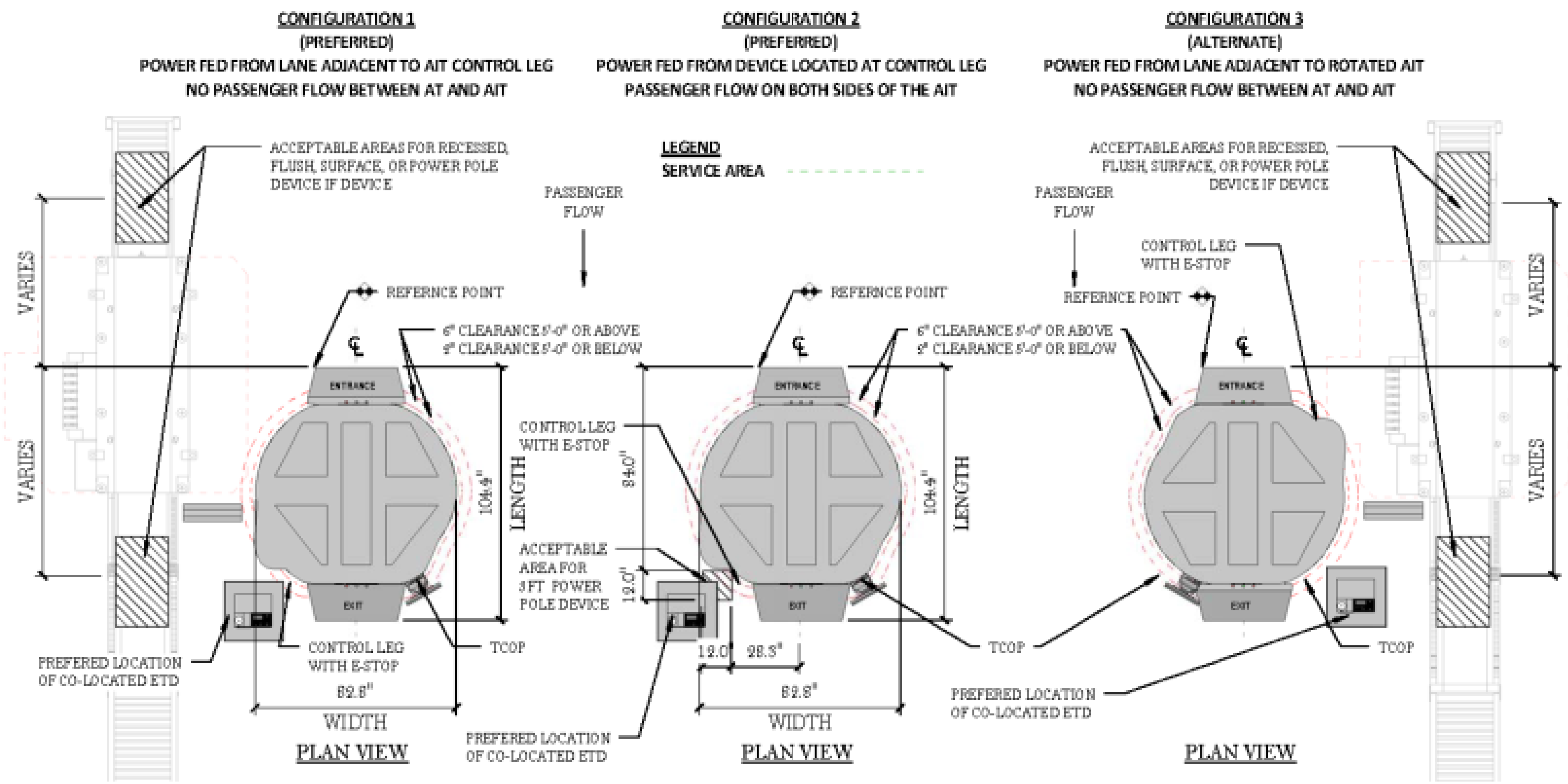
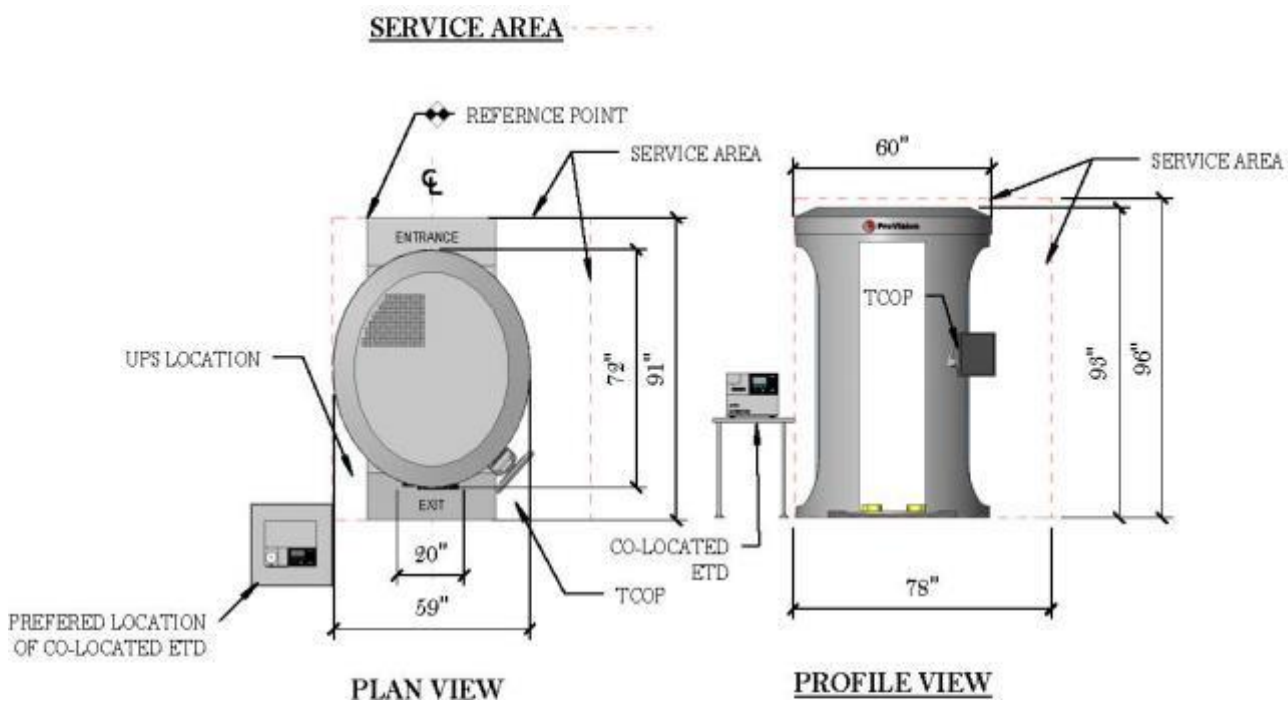


Figure 3-2.26bAIT2 – L3

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information

L3 ProVision2	Arrangement Dependent	• Dedicated
		• 20A, 125V, 1920VA/unit
		• 2-Pole, 3-Wire Grounding
		• NEMA 5-20R Simplex Receptacle
		• Freestanding Tripp Lite UPS provided by vendor
		• 25' power cord from the AIT to the UPS (originates in control leg)
		• 10' power cord from the UPS to the receptacle
			• Data Drops = 2
			• The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.
				• An ETD is to be co-located with the AIT for additional pax screening. The ETD can be located at or on the same side as the control leg.
				• Height/Ceiling clearance requirement: 7'-9" / 8'-0"
				• Weight: 1,500 lbs., 53 PSI per support feet, 0.284 PSI overall
				• The 16'-0" shipped USB cable can be substituted for a 25'-0" cable in the field if necessary.
				• The power cable shipped with the unit may be replaced with TSA Designer approval
				• Maximum slope:
				  ◦ Parallel to pax travel: 2.86 degrees
				  ◦ Perpendicular to pax travel: 1.73 degrees
				• The floor must be flat and must not vary more than 0.75 in. within the installation area

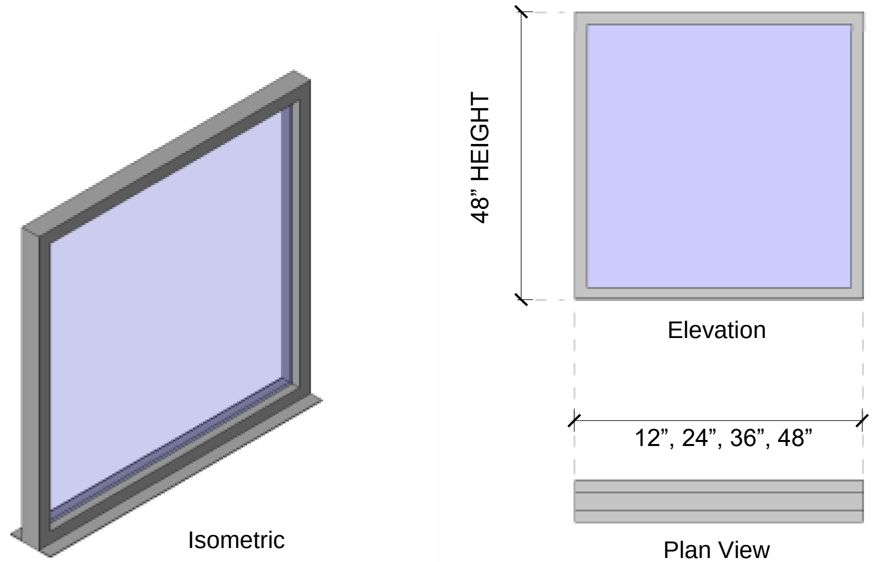
L3 Co-Located ETD	1 Per AIT	• Non-Dedicated • 20A, 125V, 350VA/unit	• Data Drops = 2	



3-2.9 BARRIERS

In order to prevent passengers and items from passing into the sterile area from the non-sterile area without being screened, barriers must be installed to close all gaps exceeding 12" across the front width or façade of the checkpoint. All barriers must be flush with the floor and be at least 48" above finished floor (AFF). Barriers must be rigid enough to prevent vibrations that could interfere with the WTMD and must be self-supporting to reduce any potential hazard to passengers and personnel at the checkpoint. Standard TSA barriers are made of transparent material and come in 12", 24", 36", and 48" widths. See **Figure 3-2.27**.

Figure 3-2.27 Barriers



3-2.10 ADA/ ACCESS GATE

The ADA gate on the passenger side is part of the line that separates the non-sterile area from the sterile area. The ADA gate allows passengers that cannot otherwise traverse the WTMD or AIT to reach the sterile area. The ADA gate is typically used by wheelchair passengers, passengers requiring special assistance, or passengers with pacemakers. These passengers are brought from the queue through the ADA gate and taken immediately to an area for secondary screening. TSA prefers an ADA gate at every 1- or 2-lane set, but sometimes this is not possible. At a minimum, there should be at least one ADA gate for every six lanes. Using an adjacent checkpoint exit lane is not acceptable for bringing ADA passengers into the sterile area of the checkpoint.

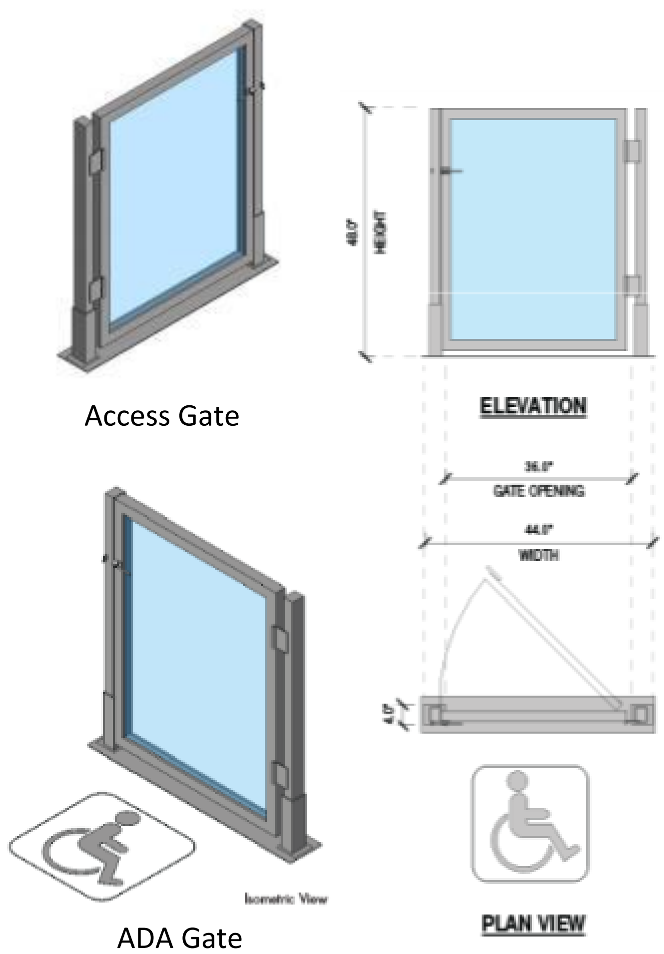
The access gate on the operator side is also part of the line that separates the non-sterile area from the sterile area. However, it is used only by TSA staff to access the sterile side and return bins from the composure/extension rollers to the divest tables. It gives TSA personnel a travel path that is free and clear of passengers. The access gate requirement is less stringent than the ADA gate. It should be provided whenever there is space available. When space is unavailable, a barrier should be used. TSA personnel can still access the sterile side via the passenger path of travel.

The ADA/access gate is approximately 44" wide by 48" tall with a 36" swing gate made of non-metallic, transparent material as shown in **Figure 3-2.28**. The swing direction of the ADA/access gate should always open towards the sterile side of the checkpoint. The latch side should conform to local code by providing enough space to open the gate around adjacent equipment.

There are many types of ADA/Access gates on site. Some have a specific RH or LH swing and some have a swing that can be configured in the field. The floor support for the gate may also vary. If re-suing an existing ADA/Access Gate, it is important to field verify the type and dexterity of gate so that any new/ relocated equipment installations can take the functionality into account.

When an ADA Gate cannot be installed due to space constraints, the checkpoint must have ADA access via either operator access gates or other ADA compliant doorways.

Figure 3-2.28 ADA Gate/ Access Gate



3-2.11 PASSENGER INSPECTION

Passenger inspection can occur at the screening lanes, at the secondary screening area, or in a private room at or near the checkpoint. Private Screening Rooms should be installed by the airport using conventional framing, and should meet the general minimum requirements of the passenger inspection kit. **Figure 3-2.29** represents the common KI Wall glass kits used for passenger inspection. These kits can be anchored to the floor or secured overhead by a bridge kit. The manufacturer should always be consulted when variations are needed. The local TSA is responsible to ensure all private screening rooms have a mirror and it must be made available for passengers subjected to secondary screening of bulky head wear. Passengers will be offered a mirror for re-donning of head wear and similar apparel.

3-2.11.1 PRIVATE SCREENING ROOM (PSR)

The PSR, shown in **Figure 3-2.30**, is approximately 6'-0" by 8'-0" (minimum dimensions) with 8'-0" high glass panels and a 3'-0" door on either the short wall (S3) or the long wall (S3-A). Larger private screening rooms of 8'-0" x 8'-0" or greater is optimal. The location of the PSR should be centralized at the checkpoint when possible in order to minimize the walking distance for passengers and TSOs without causing congestion or impeding TSA and/or passenger flow. For new checkpoints it is preferred that the private screening room is built into the space by the airport. One PSR per eight lanes is required. The room must be available to accommodate passengers who request pat downs out of the public area. The room needs to be able to accommodate one passenger, including those with disabilities, up to two TSOs, a passenger inspection chair and mat, and a bag search table. In some cases, an escort or interpreter may need to be present. The finish of the glass panels is opaque so that privacy is maintained. If a checkpoint does not have the height clearance to support the 8'-0" tall kit, then a 6'-0" tall kit can be used. It is approximately 6'-0" by 8'-0" with 6'-0" high glass panels and a 3'-0" door on either the short wall (T3) or the long wall (T3-A). Glass kits need to have sufficient clearance from the ceiling so as not to affect HVAC and/or lighting. If the PSR can be viewed from a concourse above or if cameras are located above or aimed at the room, then a baffle kit consisting of slats should be installed to prevent a direct line-of-sight into the room. Baffle kits can only be installed on S3 or S3-A kits. There will be a head clearance issue if installed on a T3 or T3-A. The baffle kit is shown on an S3 glass kit **in Figure 3-2.29**.

A private screening curtain or an airport-provided room at or near the checkpoint could also be used for private screening functions.

Curtains are to be selected and purchased by local TSA with TSA HQ concurrence. Various curtain options can be found at www.cubiclecurtainfactory.com . TSA HQ does not have a contract with this vendor. Other vendors can be pursued by local TSA as long as the PSR requirements are met and TSA HQ approves the solution. Designers should include power and data for future technology as shown in **Figure 3-2.30**.

Figure 3-2.29 Passenger Inspection Kits

Private Screening Room

Isometric View

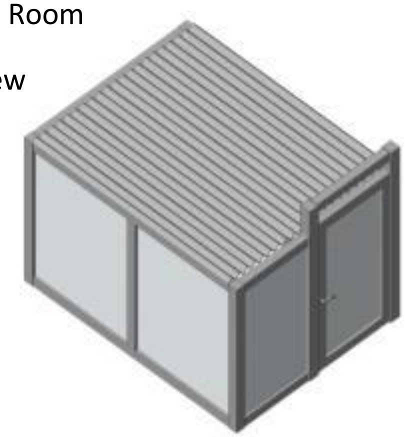
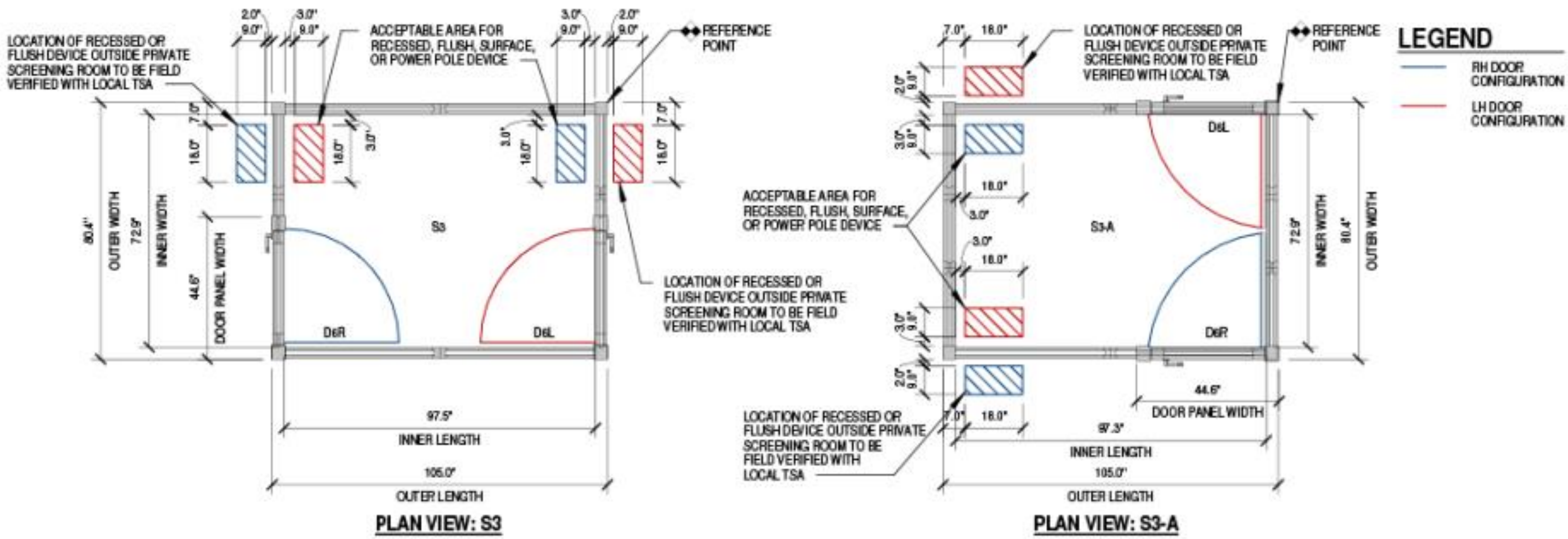


Figure 3-2.30 Private Screening Room (S3 or S3-A)

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
Private Screening Room (S3 or S3-A)	1 per 8 lanes	The following requirements occur once inside and once outside the private screening room: • Non-dedicated circuit • 20A, 125V, 350VA/unit • 2-Pole, 3-Wire Grounding • NEMA 5-20R Quad or Duplex Receptacle	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	• S3 and S3-A kits have 8' high glass panels. • S3 and S3-A kits can have LH or RH door swings. Power/data should be located based on door configuration. The default from KI Wall is a RH door swing. LH door swings must be specified. • S3 and S3-A kits may be installed with optional baffle kits. • The PSR should be centralized at the checkpoint when possible. • If S3 or S3-A kit is installed adjacent to a solid wall, the side wall panels may be removed. • Local TSA will provide a mirror in the PSR.



3-2.12 SECONDARY SCREENING

Secondary screening is additional screening that may be required for passengers and their bags when they alarm primary screening equipment. It is an area that is approximately 3'-0" to 5'-0" from the end of the screening lanes in order to minimize travel time and the distance that TSOs have to carry bags. Secondary screening is typically located in the "dead" operator space on back-to-back lanes or at the end of the lane for odd numbered lanes. This area should be clear of exiting passengers. The secondary screening area typically consists of Explosive Trace Detection (ETD) unit, a Bottle Liquid Scanner (BLS), an AVS (previously discussed in Section 2.5), a Mobile Cabinet, a search table and a passenger search chair and mat. Refer to **Figure 3-2.31**.

3-2.12.1 EXPLOSIVE TRACE DETECTION (ETD)

ETD units are used to swab carry-on bags that have alarmed at the AT. These units should be contained within a mobile cabinet but can sometimes be found sitting directly on a search table. The ETD machines require operational, testing and maintenance supplies located within arm's reach of the working area. If a mobile cabinet is not used, then alternative storage is required for these items. ETD manufacturers and their specifications are listed in **Figure 3-2.32**. The ETD units should be co-located with one search table for a single lane and two search tables for back-to-back lanes. These same ETDs are also located at the exit of AIT units as a method of secondary screening for passengers who alarm the AIT. This is referred to an AIT with Co-Located ETD. Refer to Section 3-2.8.1 for additional information.

ETDs are extremely sensitive to environmental conditions such as temperature, humidity, and air quality. ETDs should be clear of fumes and exhaust to prevent malfunctioning. The ETD units also have a high heat output and should be vented if placed in a non-standard TSA storage device.

3-2.12.2 BOTTLE LIQUID SCANNER (BLS)

These scanners aid the TSA in identifying explosive, flammable, or hazardous substances that have been concealed in a benign container. The containers can be sealed and do not have to be open to perform the analysis. Through the use of Raman spectroscopy (laser) and electromagnetic technology, these units are able to quickly analyze and identify the chemical compositions of a wide variety of unknown solids and liquids, including explosives that are currently on the classified threat list. Manufacturers and the procurement specifications are listed in **Figure 3-2.32** with the ETDs.

Figure 3-2.31 Secondary Screening Area

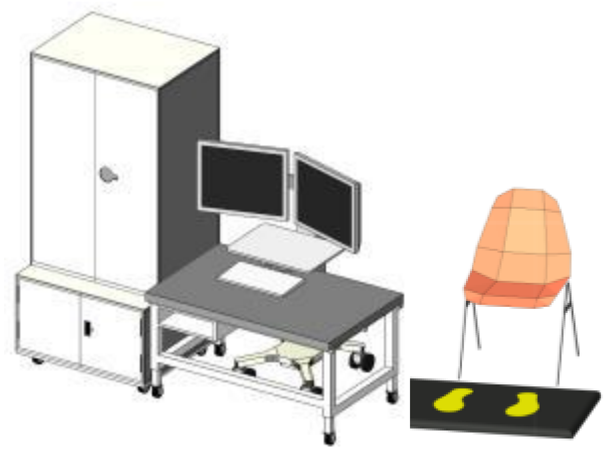
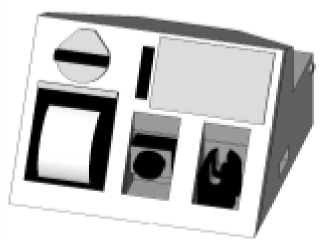
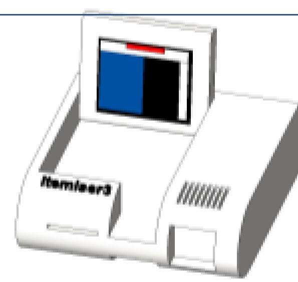


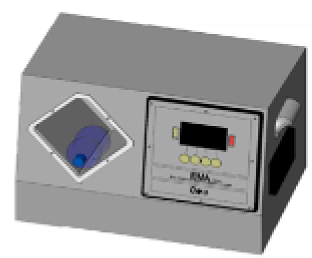
Figure 3-2.32 ETD & BLS Units

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
GE IonTrack Itemiser ETD GE IonTrack Itemiser3 ETD Smiths IonScan 400B ETD Smiths IonScan 500DT ETD Implant Sciences B220 ETD	• Per Cabinet: » 1 per 2 lanes » 1 per odd lane • 1 per AIT if available on site	• Non-dedicated, shared with the AVS and BLS circuit at the same search area or queuing conveyor circuit if @ AIT • 2-Pole, 3-Wire Grounding • NEMA 5-20R Duplex Receptacle • GE: ▪ 20A, 125V, 120VA/unit ▪ 6'-6" power cord from the ETD to the receptacle • Smiths: • 20A, 125V, 350VA/unit • 7'-8" power cord from the ETD to the receptacle • Implant Sciences: • AC input: 100-240 VAC, 47-63 Hz • Max current: 4 amps	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	• ETDs are located with the AVS/BLS • and at the exit of the AIT if available. • Refer to AVS and AIT equipment plan views for outlet locations.
CEIA EMA-MS BLS Smiths RespondeR RCI BLS	• Per Cabinet: » 1 per ETD Screening Station to exclude units co-located with AIT.	• Non-dedicated, shared with the AVS and ETD circuit at the same search area • 2-Pole, 3-Wire Grounding • NEMA 5-20R Duplex Receptacle CEIA: ▪ 20A, 125V, 61.2VA/unit ▪ 6'-8" power cord from BLS to receptacle Smiths: ▪ 20A, 125V, 216VA/unit ▪ 6'-6" power cord from the BLS to the AC/DC converter ▪ 6'-6" power cord from the AC/DC converter to the receptacle ▪ The AC/DC converter should be secured in the ETD-BLS mobile cabinet so as to not strain the power adapter connection to the ResponderR unit.	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	• BLS is located with the AVS/ETD. • Refer to AVS equipment plan views for outlet locations.

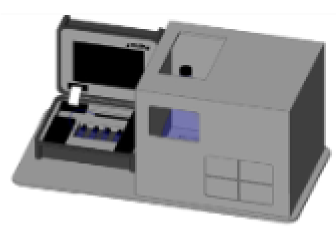

GE IonTrack Itemiser ETD


GE IonTrack Itemiser ETD


Smiths IonScan 400B ETD


CEIA EMA-MS BLS


Smiths IonScan 500DT ETD


Smiths RespondeR RCI BLS

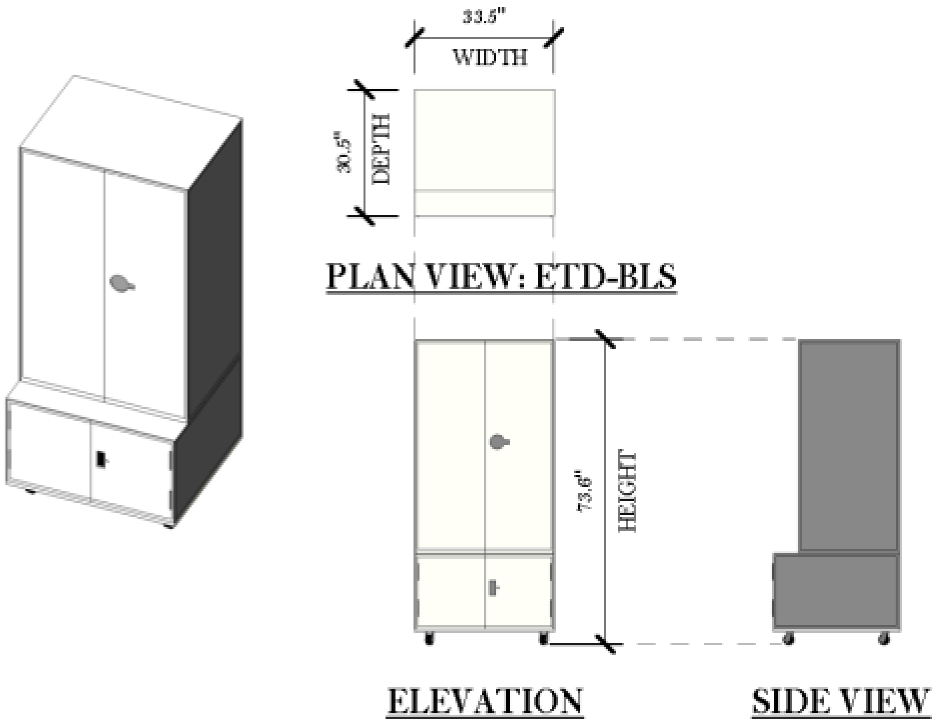

Implant Sciences B220 ETD

3-2.12.3 MOBILE CABINETS

Mobile Security Cabinets provide a secure and vented storage area for secondary screening equipment. There are two mobile cabinets that should be used for secondary screening. The ETD Mobile Cabinet is common in the field today. It encloses the ETD and operational, testing, and maintenance supplies. The ETD-BLS Mobile Cabinet will enclose the ETD and BLS, as well as operational, testing, and maintenance supplies. This cabinet has not yet been manufactured. **Figure 3-2.33** shows the dimensions of both cabinets.

The cabinets have wheels for easy relocation, but the wheels should be locked when the ETD or BLS is in operation. Power/data receptacles for the secondary screening area should not be located under the mobile cabinets as the bottom of the cabinet is low to the floor and would not provide enough clearance for devices or plugs.

Figure 3-2.33 ETD-BLS Mobile Cabinet



3-2.12.4 BAG SEARCH TABLE

Bag search tables are used for target bag searches, ETD swabbing, and BLS testing. The stainless steel surface allows TSA to provide a clean, contaminant-free surface. See **Figure 3-2.34**. The bag search tables have wheels for easy relocation, but the wheels should be locked during ETD, BLS, and bag search functions. The back and side panels offer privacy during bag searches but are often removed when the bag search table is located with an AVS.

3-2.12.5 PASSENGER SEARCH POSITION

When a passenger's body or bag alarms during primary screening, they are escorted to a passenger search position within the secondary screening area unless the passenger requests private screening. Passenger inspection at the secondary screening area consists of a 6'-0" by 6'-0" area that includes a passenger inspection chair and mat. Refer to **Figure 3-2.35**. This area needs to be wide enough for a TSO to screen a standing or wheelchair passenger and for the passenger to be able to maintain eye contact with his/her belongings and family members.

Figure 3-2.34 Bag Search Table

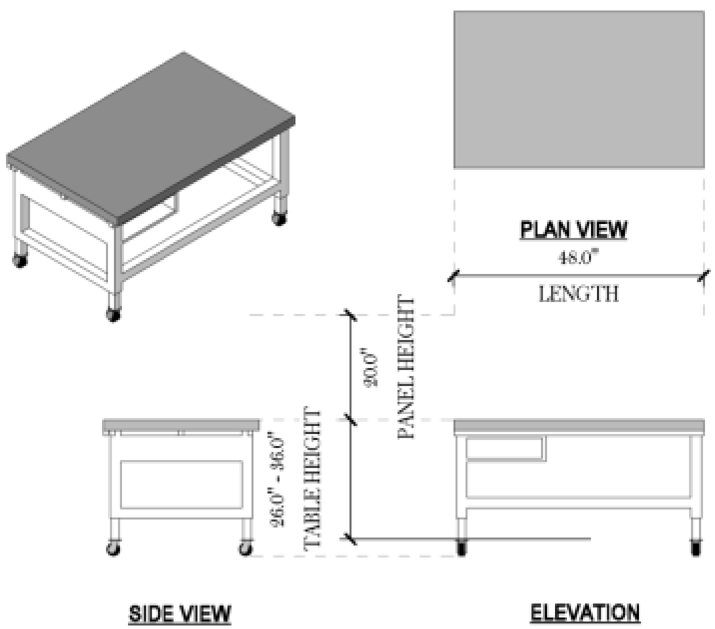


Figure 3-2.35 Passenger Search Position

3-2.13 COMPOSURE BENCH

Egress seating at the checkpoint is used for passengers to sit down and compose themselves with their personal belongings after completing the screening process. The screening experience is greatly improved if passengers can sit down to put their shoes and jackets on. TSA provides composure benches approximately 14'-0" from an AIT depending on the equipment arrangement. This area is typically out of the main passenger flow. **Figure 3-2.36** shows the dimensions of the TSA-provided composure bench. The airport may provide additional benches or seating for this same purpose near the exit of the checkpoint, but they may vary in size.

3-2.13 STSO PODIUM

The Supervisory Transportation Security Officer (STSO) should be positioned at a podium like the one shown in Figure 3-2.37 near the checkpoint exit. Dimensions of the podium as well as the power/data requirements are illustrated in Figure 3-2.38. The STSO should be able to perform administrative duties while viewing and supervising the entire screening operation. The location should have an unobstructed view of the checkpoint.

Figure 3-2.36 Composure Bench

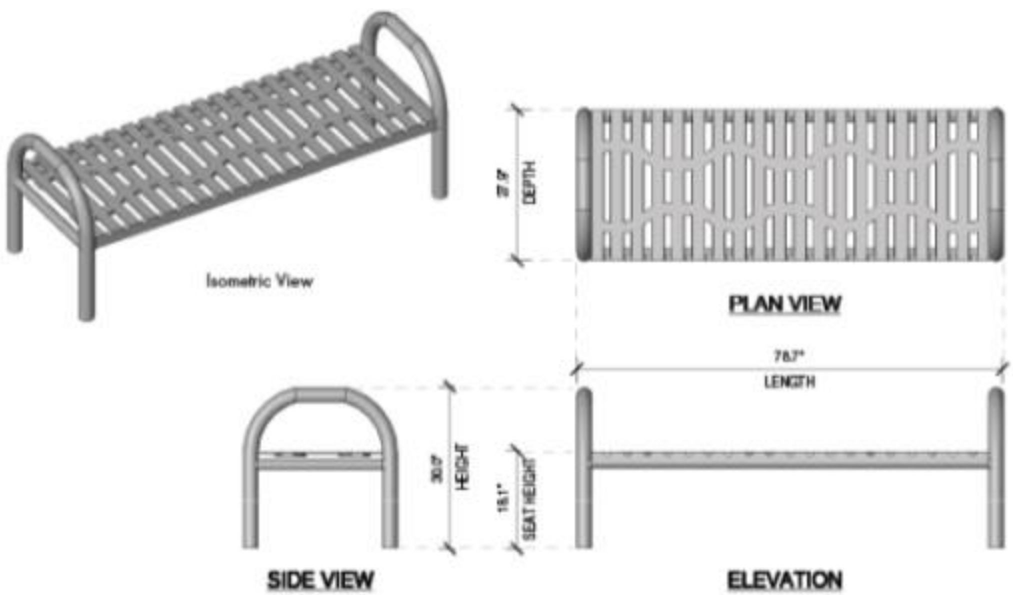
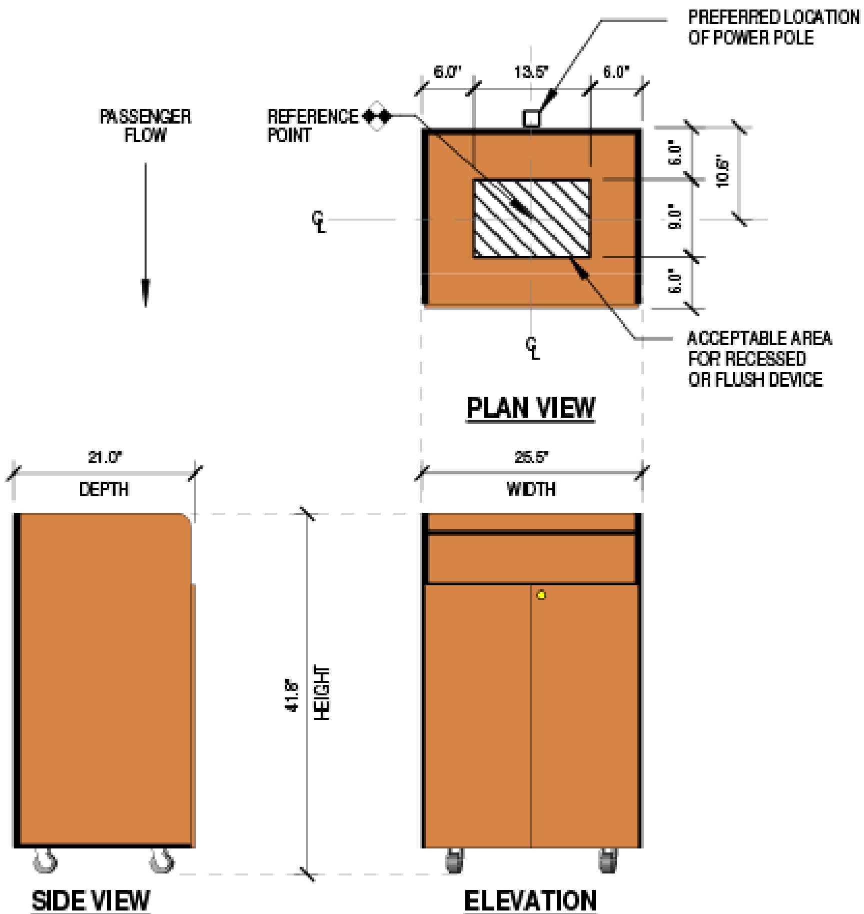


Figure 3-2.37 STSO Podium

Figure 3-2.38 STSO Podium

Equipment	Quantity	Power Requirements	IT Requirements	Additional Information
STSO Podium	1 per 4 lanes	• Non-dedicated • 20A, 125V, 180VA/podium • 2-Pole, 3-Wire Grounding • NEMA 5-20R Quad or Duplex Receptacle • 6' to 10' power cord from the TSA laptop to the receptacle	• Data Drops = 2 • Cat5e / Cat6 cable • The cable length from the termination point in the IT cabinet to the data outlet in the work area shall not exceed 295'.	



3-3 SSCP ELECTRICAL, DATA, AND SAFETY REQUIREMENTS

The power and data requirements for each individual piece of security screening equipment are included in Section 3-2. This section attempts to describe all the electrical systems, specifically data, power, CCTV, and lighting required to support the checkpoint. Familiarity with these requirements will be essential when designing a new checkpoint or reconfiguring an existing checkpoint.

3-3.1 DATA REQUIREMENTS

The TSA HQ Office of Information Technology (OIT) and Security Technology Integrated Program (STIP) requires most powered security screening equipment to have two data drops consisting of flush-mounted 568B data jacks with the associated data labeling. Both drops, even though one is redundant, should be connected using Cat5e/Cat6 data cable and terminated on the patch panel in the closest TSA IT cabinet located at or near the checkpoint in a secured room. The data cable type should be based on the existing conditions at the checkpoint. The purpose of this connectivity is so that TSA HQ can review statistical data over the network from screening equipment for a particular airport and time period without having to go to the site.

Steps toward this goal were made under the High Speed Operational Connectivity (Hi-SOC) program where data outlets and cables for a limited number of locations were connected to the IT cabinet. As checkpoints are reconfigured, either the project owner's contractor or the TSA Headquarters Install, Move, Add, or Change (IMAC) Group gets involved to relocate and provide new data outlets and cables as needed to support new technology. If a checkpoint relocation or reconfiguration is initiated by the airport during an airport renovation, or a new checkpoint is being designed for a new terminal or airport as a part of an Airport Authority Mandate, the airport must restore the checkpoint to its previous state of connectivity ("make whole"). If a checkpoint reconfiguration is initiated by any group within TSA HQ as part of an optimization and safety effort, new technology deployment or any other checkpoint redesign initiative, the TSA will be responsible for restoring the checkpoint to its previous state of connectivity ("make whole"), including development of the scope of work (SOW). Implementation in the field can occur via the TSA HQ Contractor or via the internal IMAC group. This will depend on the scope of work and the number of sites impacted.

In either scenario, a working group must be formed consisting of representatives from the Airport Authority, FSD staff, TSA HQ, TSA OSH, and STIP. The group should meet immediately via conference call once it has been determined that a checkpoint or checkpoints are going to be reconfigured. This action will ensure that all aspects of the checkpoint redesign have been identified and assigned to a specific group for action and funding. This team will organize the working group members, develop, review and approve the SOW. The OIT Field Regional Manager (FRM) should always be consulted when a checkpoint redesign is initiated.

Installation and/or relocation of Cat5e/Cat6 data cabling and installation and operation of IT cabinets shall meet or exceed the specifications as per the ***TSA Structured Cable System Guidelines*** dated July 27, 2012. Contact TSA HQ to obtain a copy of the TSA Structured Cable System Guidelines. **Figure 3-3.1** illustrates all of the equipment that must be connected to the IDF IT cabinet and equipment that must be connected to other equipment such as the AT to the AVS.

At a minimum, the following guidelines should be considered when designing a new checkpoint or reconfiguring an existing checkpoint.

If an existing TSA Main Distribution Frame (MDF)/ Intermediate Distribution Frame (IDF) is within 295' of the SSCP:

- Verify that the existing switches have sufficient open ports to accommodate the required number of drops.
- Install an additional switch if the existing switch capacity will not accommodate the required number of drops.
- Punch down cabling from the individual SSCP devices in the patch panel of the IT cabinet.
- Initiate IMAC group to install jumper cables from the patch panel to the switch and activate port. This is described later in this section.
- If there is no MDF/IDF within 295' of the SSCP:
- Install an appropriate IT cabinet. Refer to **Figure 3-3.3** for the IT cabinet specifications.
- Install fiber optic cable from the IT cabinet to an existing TSA MDF/IDF.
- Punch down cabling from the individual SSCP devices in the patch panel of the IT cabinet.
- Initiate IMAC group to install jumper cables from the patch panel to the switch and activate port.

The IMAC Process is the course of action required by TSA OIT to implement an IT request at a checkpoint. Who takes the lead and who funds the effort will all depend on the group initiating the work. For example, if TSA HQ is deploying new technology at the checkpoint, then the TSA Regional Deployment Manager (RDM) would be responsible for making OIT aware of the airports and checkpoints receiving new equipment that require new or relocated data outlets and cabling. Once this initial contact has been made, a process will need to be identified for each group to execute.

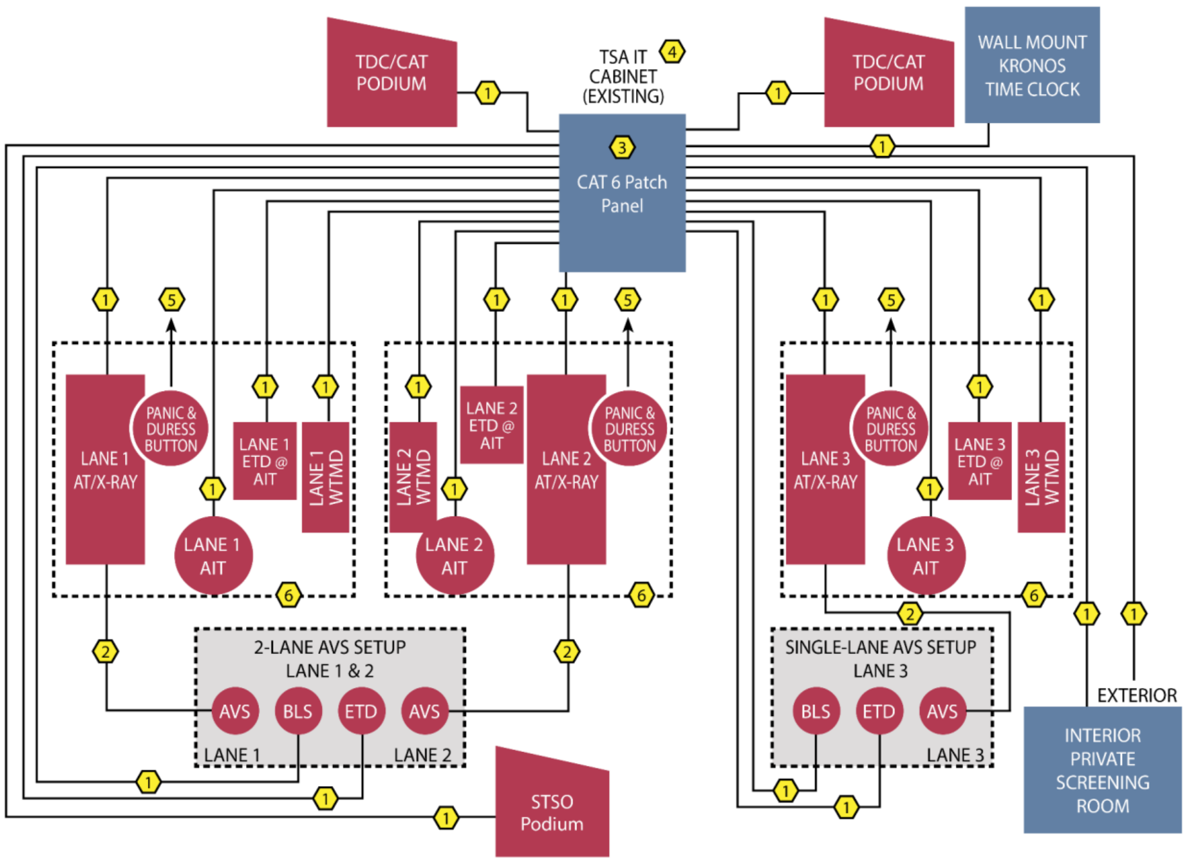
The IMAC process needs to be initiated for the following, which takes 90 to 120 days to implement unless otherwise noted.

- Installation of a new IT cabinet.
- Relocation of an existing IT cabinet.
- Installation of additional IT equipment.
- Relocation or installation of new fiber.
- Relocation or installation of new T1 and/or Out of Band (OOB) Management Analog lines for monitoring modems in the IT cabinets. This takes approximately 45 to 60 days to implement.

The preceding durations are determined from the date when the SOW has been submitted by the OIT FRM and approved by the IMAC team. Since it can take up to several months to implement IT modifications, it is imperative to engage each team member as early as possible in order to avoid any gaps in IT services.

Figure 3-3.4 lists the specifications for the Kronos 4500 Time Clock Terminal. This clock should be located within 295' of the TSA MDF/IDF and it should utilize Power Over the Ethernet (POE). These terminals need to be deployed at TSA airports and offsite locations in support of the Electronic Time, Attendance, and Scheduling (eTAS) Program which monitors and tracks timekeeping of TSOs across the country. Refer to the TSA Kronos Terminal Installation and Configuration Guide Version 1.7 dated October 29, 2009 for additional information.

Figure 3-3.1 SSCP Data Connectivity Diagram



KEYED NOTES

1. (2) CAT 6 UTP CABLES ROUTED FROM THE TSA IT CABINET TO EACH DEVICE AS NOTED. TERMINATE ALL CAT 6 CABLES ON THE OUTLET END WITH A MODULAR RJ-45 CAT 6 RATED 568B JACK CONTAINED IN POKE OR FACEPLATE AS NOTED ON THE DRAWINGS. CONTRACTOR TO TERMINATE TSA CABINET END TO A CAT 6 RATED MODULAR RACK MOUNTED PATCH PANEL.
2. (2) CAT 6 UTP CABLE ROUTED FROM "AVS" TO "AT" AS NOTED ON THE ONE LINE DIAGRAM. TERMINATE BOTH DEVICE ENDS WITH A MODULAR RJ-45 CAT 6 RATED 568B JACK. TELECOM/ELECTRICAL CONTRACTOR SHALL COORDINATE INSTALLATION WITH SITE LEAD AND MANUFACTURER.
3. CONTRACTOR TO PROVIDE NEW PATCH PANEL(S) IN QUANTITY AS INDICATED ON THE DRAWINGS. PATCH PANEL SHALL HAVE A RATING OF CAT 6.
4. EXISTING TSA IT CABINET, SHOWN FOR REFERENCE ONLY.
5. PANIC DURESS BUTTON, CONTRACTOR TO FIELD VERIFY HEAD-END LOCATION FOR TERMINATION OF ANY NEW WIRING. UTILIZE COMMUNICATIONS PATHWAY TO "AT" LOCATION.
6. EACH LANE SHALL BE EQUIPPED WITH DATA CABLING FOR THE AT X-RAY, WTMD, AIT, AND CO-LOCATED ETD @ AIT, REGARDLESS OF WHICH LANE THE EQUIPMENT SERVES TO ALLOW FOR FUTURE CONFIGURATION FLEXIBILITY.

Figure 3-3.2 Power & Data Requirements Table

Power					Data
Device/Space	Circuit Type	Voltage	Receptacle Type*	Comments	Cable Type/Location/Comments
RAPISCAN 620DV AT	DEDICATED 20A FOR X-RAY	125V	NEMA 5-20R	15' POWER CORD FROM AT TO RECEPTACLE	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT) PLUS 2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO AVS (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)
RAPISCAN 620DV AT QUEUING CONVEYOR	NON-DEDICATED 20A FOR QUEUING CONVEYOR, MAXIMUM OF 2 PER CIRCUIT W/ ETD @ AIT	125V	NEMA 5-20R	15' POWER CORD FROM QUEUING CONVEYOR TO RECEPTACLE	NOT APPLICABLE
RAPISCAN AVS	NON-DEDICATED 15A	125V	NEMA 5-20R	5' POWER CORD FOR TWO MONITORS AND ONE PC TOWER OF THE AVS TO THE RELOCATABLE POWER TAP MOUNTED TO THE TSA SEARCH TABLE. 6' POWER CORD FROM THE RELOCATABLE POWER TAP TO THE RECEPTACLE. CIRCUIT SHARED WITH ETD AND BLS AT THE SAME SEARCH AREA VIA RELOCATABLE POWER TAP (FIGURE 3-2.13)	2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO XRAY (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)
SMITHS 6040aTiX AT	DEDICATED 20A	125V	NEMA 5-20R	15' POWER CORD FROM AT TO RECEPTACLE	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT) PLUS 2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO AVS (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)
SMITHS AVS	NON-DEDICATED 20A	125V	NEMA 5-20R	5' POWER CORD FOR TWO MONITORS AND ONE PC TOWER OF THE AVS TO THE RELOCATABLE POWER TAP MOUNTED TO THE TSA SEARCH TABLE. 6' POWER CORD FROM THE RELOCATABLE POWER TAP TO THE RECEPTACLE. CIRCUIT SHARED WITH ETD AND BLS AT THE SAME SEARCH AREA VIA RELOCATABLE POWER TAP (FIGURE 3-2.15)	2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO XRAY (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)
L3 ACX 6.4- MV AT	DEDICATED 20A	125V	NEMA 5-20R	15' POWER CORD FROM AT TO RECEPTACLE. OPERATOR CART IS POWERED BY THE AT. FIELD DATA RECORDING SYSTEM (FDRS) IS POWERED BY THE AT. UPS IS INTERNAL TO AT	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT) PLUS 2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO AVS (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)
L3 AVS	NON-DEDICATED 20A	125V	NEMA 5-20R	6' POWER CORD FOR ONE MONITOR AND PC TOWER OF THE AVS TO THE UPS. 6' POWER CORD FROM UPS TO RELOCATABLE POWER TAP MOUNTED TO THE TSA SEARCH TABLE. 6' POWER CORD FROM THE RELOCATABLE POWER TAP TO THE RECEPTACLE. CIRCUIT SHARED WITH ETD AND BLS AT THE SAME SEARCH AREA VIA RELOCATABLE POWER TAP (FIGURE 3-2.17)	2- CAT 6 ROUTED DIRECT (NOT THROUGH PATCH PANEL) TO XRAY (MAINTAIN LANE ASSOCIATION). (1 PRIMARY 1 REDUNDANT, REDUCTION NOT ALLOWED)

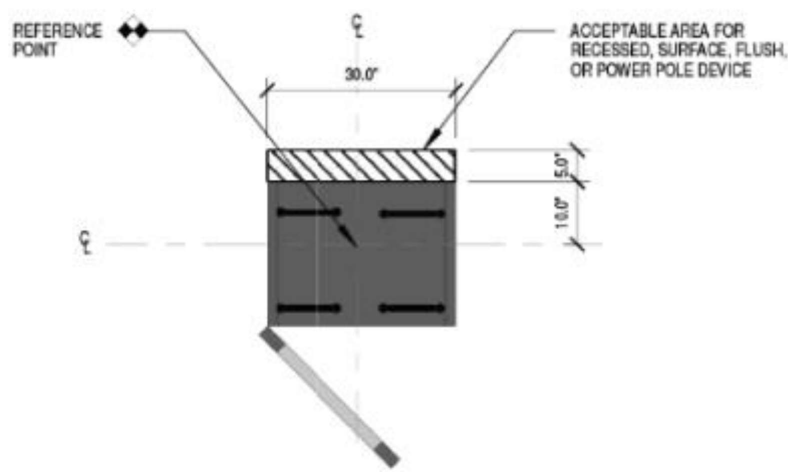
Figure 3-3.2 Power & Data Requirements Table (cont.)

Power					Data
Device/Space	**Circuit Type**	**Voltage**	**Receptacle Type***	**Comments**	**Cable Type/Location/Comments**
L3 PRO VISION AIT/ L3 PROVISION AIT2	DEDICATED 20A	125V	NEMA 5-20R	25' POWER CORD FROM AIT TO UPS. 10' CORD FROM UPS TO AIT. 16' USB CABLE FROM AIT TO UPS. CABLES CANNOT BE RUN UNDER ENTRY/ EXIT RAMPS. TCOP CANNOT BE MOUNTED ON CONTROL LEG.	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
WTMD	DEDICATED 20A	125V	NEMA L5-15R (TWISTLOCK)	WTMD'S CAN BE GROUPED UP TO 10 PER CIRCUIT. WTMD MUST BE DEDICATED "WTMD-ONLY" CIRCUIT. 13' POWER CORD FROM WTMD TO RECEPTACLE. 18" MINIMUM SPACING FROM WTMD LEG TO	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
ETD & CO-LOCATED ETD	NON-DEDICATED 20A	125V	NEMA 5-20R	NON-DEDICATED CIRCUIT, ETD POWER MAY BE SHARED WITH AVS AND BLS CIRCUIT AT THE SAME SEARCH AREA VIA RELOCATABLE POWER TAP. CO-LOCATED ETD POWER CIRCUIT MAY BE SHARED WITH THE QUEUING CONVEYOR CIRCUIT @ SAME MODULE SET. MINIMUM CORD LENGTH 6'-6".	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
BLS	NON-DEDICATED 20A	125V	NEMA 5-20R	NON-DEDICATED CIRCUIT, MAY BE SHARED WITH AVS AND BLS CIRCUIT AT THE SAME SEARCH AREA VIA RELOCATABLE POWER TAP (FIGURE 3-2.32). MINIMUM CORD LENGTH 6'-6"	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
TDC & CAT	DEDICATED 20A	125V	NEMA 5-20R	TDC'S CAN BE GROUPED UP TO 5 PER CIRCUIT. TDC'S MUST BE DEDICATED "TDC-ONLY" CIRCUIT. POWER CORD LENGTH UNKNOWN AT THIS TIME.	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
STSO	NON-DEDICATED 20A	125V	NEMA 5-20R	6'-10' CORD FROM LAPTOP TO RECEPTACLE	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
PRIVATE SCREENING INTERIOR	NON-DEDICATED 20A	125V	NEMA 5-20R	REFER TO FIGURE 3-2.30 FOR RECEPTACLE LOCATION	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
PRIVATE SCREENING EXTERIOR	NON-DEDICATED 20A	125V	NEMA 5-20R	REFER TO FIGURE 3-2.30 FOR RECEPTACLE LOCATION	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)
PANIC/DURESS	NON-DEDICATED 20A	125V	NEMA 5-20R	VERIFY WIRELESS & WIRED DURESS ALARM BUTTON, WIRELESS REPEATER, POWER RECEPTACLES, AND RECEIVING PANEL REQUIREMENTS	VERIFY WITH VENDER
KRONOS (ETA)	POWER OVER ETHERNET (POE)	N/A	N/A	REFER TO PLANS FOR LOCATION	2- CAT 6 ROUTED TO TSA IT CABINET (1 PRIMARY 1 REDUNDANT)

Figure 3-3.3 IT Cabinet

Equipment	Size	Quantity	Power Requirements	IT Requirements	Additional Information
IT Cabinet	Size 24H 24.0”H x 27.3”W x 30.0”D Weight: 97 lbs	1 or more per checkpoint depending on size	For 24H, 36H and 48H: • Dedicated • 30A, 125V, 3KVA/Cabinet • 2-Pole, 3-Wire Grounding • NEMA L5-30R Receptacle 3KVA UPS 6’ power cord from the IT cabinet to the receptacle	• Size patch panels to accommodate all TSA data outlets at the checkpoint plus 100% spares, minimum. • Size giga bit network switch to accommodate all data outlets in checkpoint plus 10%. • Provide a minimum of four pair single mode fiber optic cable from IT cabinet to the TSA main distribution frame	• 30” front and rear access is required. • These cabinets will receive all data communication lines from the SSCP, so the cabinet should be located as close to the SSCP as possible, but in a secure location in a separate room. Careful consideration needs to be given to the IT cabinet location because the exhaust fan for cooling can be loud when located in a confined space with TSA or airport personnel. • Equipment racks can be loaded into the cabinet from the front or the back at the location where the cabinet is installed. Although not required, side access would improve rack accessibility and TSA personnel mobility around the cabinet. • Refer to TSA Structured Cable System Guidelines dated July 27, 2012 for cable management and administration of IT cabinet. • Refer to TSA Structured Cable System Guidelines dated July 27, 2012, for acceptance testing of IT circuits. • Wall-mounted cabinets are an option in some instances, but must adhere to all applicable local codes and standards. Recommend consultation with the Field Regional Manager (FRM) when considering a wall-mounted alternative. • All IT cabinet installations and relocations shall be requested by a ReMAG and should be requested a minimum of 90 days prior to installation.
	Size 36H 36.0”H x 27.3”W x 30.0”D Weight: 124 lbs				
	Size 48H 48.0”H x 27.3”W x 30.0”D Weight: 151 lbs				
	Size 60H 60.0”H x 27.3”W x 30.00”D Weight: 246 lbs		For 60H and 72H: • 30A, 208V, 6KVA/Cabinet • NEMA L6-30R Receptacle 6KVA UPS • 8’ power cord from the IT cabinet to the receptacle		
	Size 72H 72.0”H x 27.3”W x 30.00”D Weight: 274 lbs				

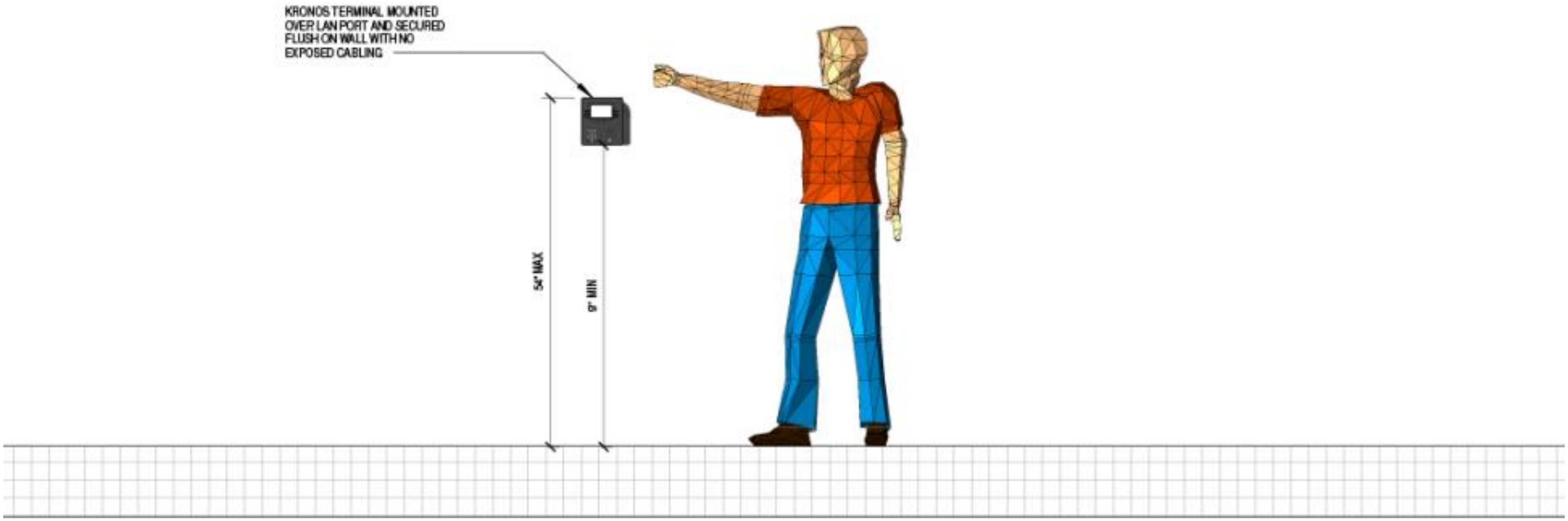
Isometric View



PLAN VIEW

Figure 3-3.4 Kronos Time Clock

Equipment	Size	Quantity	Power Requirements	IT Requirements	Additional Information
Kronos 4500 Terminal	11.7"H x 10.7"W x 4.0"D	1 per airport or checkpoint depending on TSO population	• All Power Over Ethernet (POE)	• Data Drop = 2 • Cat5e / Cat6 cable • Kronos Terminal placement should be within 295' of existing TSA IT Cabinet. • Host communication via Ethernet (10/100 Mbps auto sensing) • Verify switch ports exist in TSA IT Cabinet prior to installation.	• Locate Kronos Terminal in a secure TSA area. Place in protected area to avoid physical damage. • Mount per ADA requirements. Allowed high side reach shall be no more than 54" and the allowed low side reach shall be no less than 9" AFF. • Avoid checkpoint high traffic areas such as exit lanes, queuing areas, public seating, and composure areas. • No exposed cabling or power outlets allowed. • TSA preferred install is to mount the clock over a LAN port and power outlet.



ELEVATION

3-3.2 POWER REQUIREMENTS

Most of the new technology being added to the checkpoint today and in the future requires a dedicated circuit. It is recommended to plan for this now, especially if the existing electrical panel(s) has available capacity. **Figure 3-3.5** illustrates all of the equipment that must be connected to the SSCP power panel board. All checkpoint circuits should be located together in the same electrical panel or panels with non-dedicated circuits grouped together when possible. This is not possible to do for the WTMD or TDC even though the load is approximately 1A. WTMDs and TDCs can only share a circuit with other WTMDs or TDCs, otherwise the units will not function properly. The checkpoint electrical engineer should not assume an existing circuit is dedicated or expect the electrical contractor to trace an existing circuit and remove any excess load during construction. For new checkpoint design and checkpoint reconfiguration, new dedicated circuits should be provided for most security screening equipment. Each dedicated circuit should have its own neutral. There should be no common neutrals used for any checkpoint equipment circuits. This is necessary to prevent accidental over-voltage conditions and potential equipment damage should a neutral conductor be interrupted.

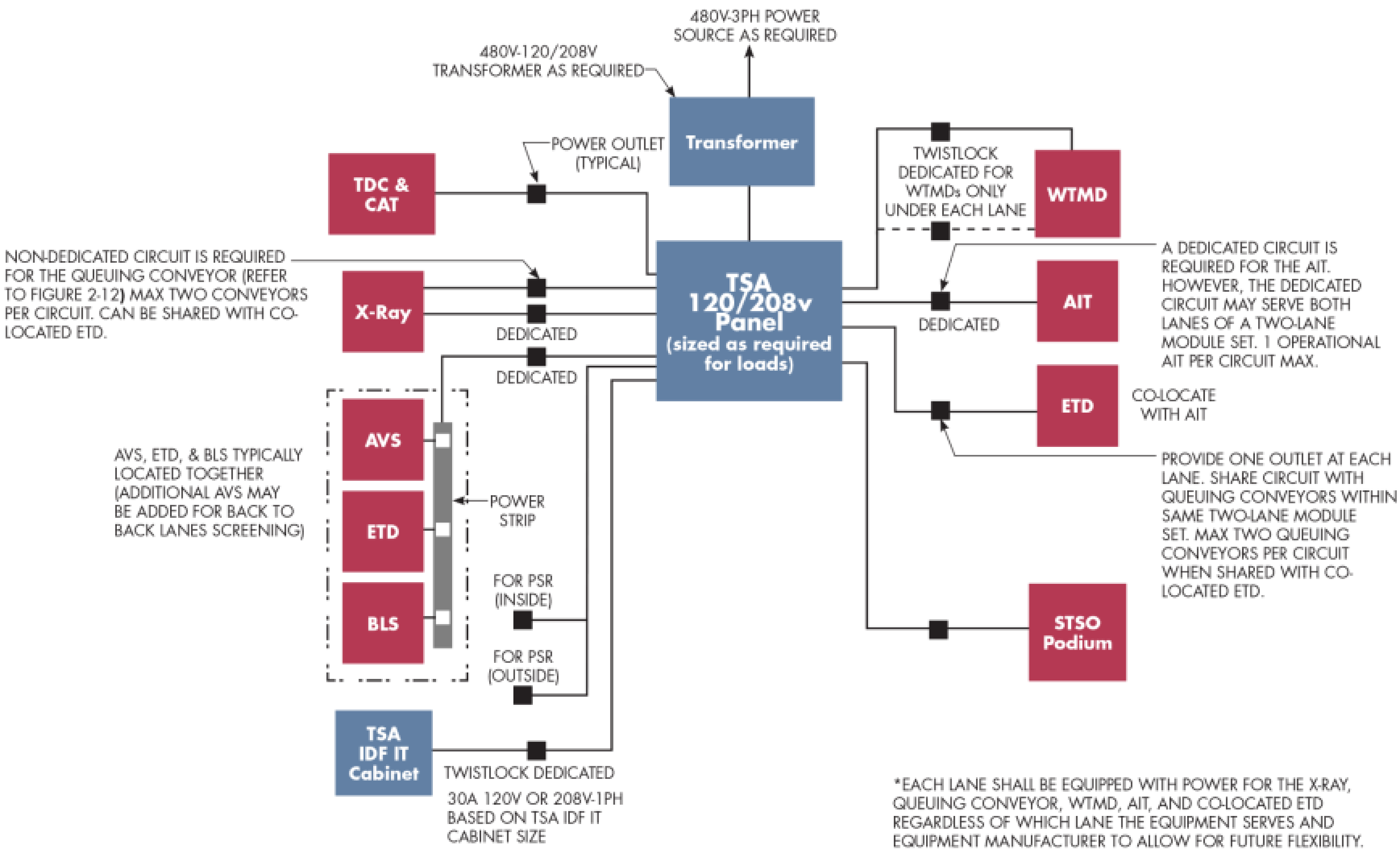
The electrical panel should be located as close as possible to the checkpoint. New electrical panels should be designed to have 20% or more open spaces for future expansion. Each SSCP should have an electrical panel located in a secured area located at or near the SSCP and accessible by TSA staff. The standard voltage for SSCP equipment is 120/208V. SSCP panels can vary in size from 100A, 3-phase to 225A, 3-phase depending on the number of lanes at the checkpoint.

During design, it is important for the electrical engineer to determine the existing electrical system capacity available for checkpoint equipment. Field verification of the existing electrical panel loads and availability of power to support new equipment loads is essential. Circuits from existing electrical panels should be used when available as indicated by the panel board and corresponding panel schedule that serves the checkpoint. Understand, however, that the panel schedule can often lack sufficient detail in regard to what equipment the circuit is feeding. Sometimes there are other loads piggy-backed onto a supposedly spare circuit or even a circuit feeding checkpoint equipment. A load study of the intended checkpoint power source that satisfies the requirements of NEC 220.87 is strongly recommended.

In some cases, a new electrical panel may be required for new circuits in support of a new checkpoint or reconfiguration of an existing checkpoint. This should be determined during the design phase by the electrical engineer and brought to the attention of TSA HQ immediately. When TSA HQ is funding the project, they must approve the cost of the new panel during the design phase as there could be impacts to the planned budget. This is only for deployment projects. An airport could provide a new panel at any time.

The electrical design of a new checkpoint or reconfiguration of an existing checkpoint must meet all applicable national and local codes in addition to any airport, state, county, and/or city requirements, depending on the Authority Having Jurisdiction (AHJ). Uninterrupted Power Supply (UPS) backup power is not required for SSCPs, although it may exist, or be required at some sites where power conditions are unstable and/or unreliable.

Figure 3-3.5 SSCP Power Connectivity Diagram



3-3.3 POWER/DATA RECEPTACLES

In Figure 3-3.7, there are five types of TSA-approved electrical distributions and/or devices for SSCPs. In order of preference, TSA would like SSCP equipment to be powered in the following manner unless the Airport Authority states otherwise.

1. Modular surface-mounted pedestals in the floor and wall
2. Recessed power/data poke-through devices in the floor
3. Flush power/data poke-through devices in the floor and wall
4. Multiplex surface box
5. Ceiling or floor-supported power/data poles

The airport A&E firm should coordinate closely with the airport and TSA HQ when designing electrical systems to ensure that the needs of both parties are met.

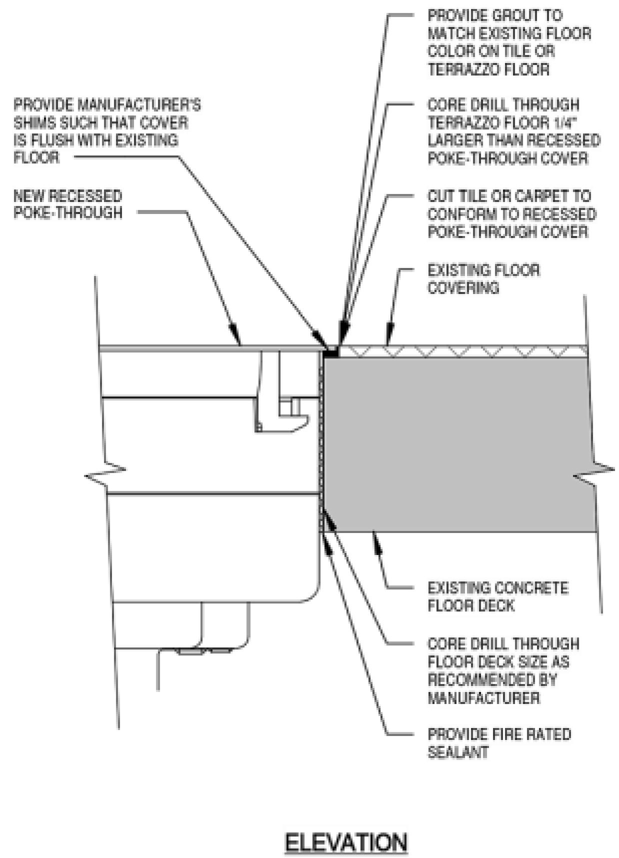
TSA prefers that modular surface-mounted pedestals be located underneath x-ray conveyors. This type of receptacle is highly versatile and requires a smaller floor penetration. When a modular surface-mounted pedestal is not ideal, TSA prefers the Wiremold Evolution Series Model 6AT/8AT recessed poke-through because of the flexibility it provides when installed flush in the floor and the amount of receptacles, data jacks, grommet openings, and connectors it can hold within one device. This receptacle is ideal for high traffic areas and for locations with moving equipment. The downside is that a 6" core drill is required which is often a concern to an airport or the AHJ, as they do not want to impact the structural integrity of the floor. The location of the poke-throughs with respect to the structural framing, quantity of poke-throughs, and proximity to other poke-throughs must be carefully evaluated by the checkpoint electrical and structural engineer.

Although the poke-through is identified as being "recessed", the cover actually sits slightly above the floor. This is acceptable at most locations within the checkpoint except for the TDC and CAT or STSO podium, and outside the Private Screening Room. These three locations should have a truly recessed poke-through because the equipment at these locations is not static and TSA wants the flexibility to make adjustments to the equipment in the future without creating trip hazards to passengers and personnel. This truly recessed poke-through can be achieved by providing a structural detail on the construction drawings that specifies for the contractor to core drill a hole approximately ¼" larger than the recessed poke-through cover so that the lip of the cover sits down in the floor. Refer to **Figure 3-3.6**. This installation is required when power/data is provided to these locations from the floor. Power poles can be used at these locations when a checkpoint is slab-on-grade or power poles are the preferred method of power and data distribution at the checkpoint.

When a checkpoint has a seismic structural slab-on-grade, terrazzo floors or high ceilings with an open plan, it can be a challenge to provide power and data to checkpoint equipment. Freestanding, self-supporting, movable overhead truss systems or modular raised access flooring are viable solutions that have been implemented at a handful of airports in these circumstances. While these options are more expensive up front than some of the other options, they provide TSA a great deal of flexibility to reconfigure the checkpoints in the future or deploy more equipment without incurring significant infrastructure costs.

Power and data receptacles should be of high quality industrial standard to accommodate the high volume traffic at the SSCP. All should be properly mounted and fire-proofed.

Figure 3-3.6 Recessed Poke-Through Installation Detail



All power/data recessed or flush poke-through devices, modular or made-up surface boxes, power poles, fittings, raised access flooring, self-supporting truss systems, or in-floor Walkerduct systems must be coordinated with the Airport Authority. Typically, the airport prefers consistency in the type, finish, and color of electrical devices. So what is typically used throughout the terminal should also be used at the checkpoint. Exceptions may occur if the AHJ wants to minimize the addition of new core drills or wants to have flexibility to relocate the SSCP in the future. The checkpoint electrical engineer should confirm with the Airport Authority if the electrical distribution needs to match what currently exists at the checkpoint today or if it should be changed to match the terminal or to support future needs. The airport and/or the AHJ may also want to evaluate floor core sizes and quantities as well as locations of any new electrical trenches. Airports with terrazzo floors are especially concerned about excessive penetrations in the floors and having areas where the patching is executed poorly. The airport may prefer modular or made-up surface boxes which require only a 1" to 3" core in lieu of recessed poke-through devices which require a 6" to 8" core. While the surface boxes require a smaller core, more boxes would be required to support all the planned TSE, hence more floor coring. A comparison of this is presented in the following section. If possible, the electrical approach should be discussed with the AHJ as early in the project as possible in order to prevent any delays with the permit. Every attempt to re-use existing floor cores should be made when reconfiguring an existing checkpoint.

Acceptable locations for receptacles are included on the plan views for the equipment in Section 3-2. Recessed, flush, or surface devices should be positioned in such a way as to avoid trip hazards for both passengers and TSA personnel. The AT dome is approximately 2-¾-inch above finished floor (AFF); therefore, pedestals, monuments, devices, or fittings located underneath the X-ray dome will not provide sufficient space to accept a plug. These should be located approximately 18" clear of the dome under the infeed or the outfeed depending on the equipment being fed. Under special circumstances only, an existing floor core located underneath an X-ray dome can be reused by providing a junction box on top of the core and extending it with rigid or flexible conduit to a surface box located under the infeed or the outfeed.

Receptacles should be located within reach of the equipment cords. The equipment cord lengths are included in the tables above the plan views in Section 3-2. Extension cords for permanently installed equipment are unacceptable if the equipment cord is too short to reach a receptacle. Equipment cords must be secured to the floor with tape, pancake raceway, cord clips, etc. Equipment cords should not be placed across passenger walkways or TSA working paths, nor should they be run underneath anti-fatigue mats or the AIT units where they may become a trip hazard, damaged from traffic, or be an NEC violation.

Care must also be taken to ensure that electrical receptacles are protected from damage or inadvertent contact by equipment, passengers, and/or TSA personnel. The receptacles for most SSCP equipment are straight blade NEMA 5-20R except for the WTMD and the IT cabinet where the receptacle needs to be twistlock to prevent power cords from being accidentally disconnected. All data jacks should be flush-mounted with the receptacle housing with no loose wires extending from the housing. Any unused ports should be covered.

Duplex outlets that are split-wired with separate circuits to each receptacle must be fed from a two-pole circuit breaker or two side-by-side single-pole circuit breakers that have an approved link between the circuit breaker operator handles in order to meet the requirements of 2008 NEC 210.7 (B). The 2008 NEC 210.7 (B) states, "where two or more branch circuits supply devices or equipment on the same yoke, a means to simultaneously disconnect ungrounded conductors supplying those devices shall be provided at the point at which the branch circuits originate."

When existing recessed or flush poke-throughs, modular or made-up surface boxes are no longer needed at an SSCP, the checkpoint designer should specify for the contractor to perform the following tasks.

- Remove the power/data outlets and devices.
- Pull and remove the existing wiring back to its source.
- Repair the floor core opening to restore the floor slab to its original integrity.
- Install a flush cover plate, as required, for the type of outlet device removed.

Figure 3-3.7 Power/ Data Device Distribution

Item	Service Type	Description	Pro	Con	Recommendation
1	Modular Surface Box 	Pedestal poke-through with a 2-compartment box • 9.25"W x 4.63"D x 2.63"H; 2-3" hole/box, dependent on manufacturer	• 2-3" hole in floor depending on manufacturer • UL listed assembly • Fire-rated • A cover plate can be added if location is abandoned. • Supports any outlet configuration • Can be plugged in beneath X-ray	• Not flush ~ trip hazard • Floor X-ray required in order to avoid existing steel. • The plug is above floor level and can be knocked out.	• Recommended at checkpoints where a small floor penetration is desired. • Recommended for use under x-ray
2	Poke-Through – Recessed 	Poke-through with recessed receptacles • 7.25" diameter; 6" hole/device	• Completely flush installation ~ minimizes trip hazards. • Easy/quick installation • UL listed assembly • Fire-rated • Tamper-proof cover • Recessed connections • 6" device can support any 20A outlet configuration	• 6" hole in floor • Floor X-ray required in order to avoid existing steel. • Extra coring required to mount lip of the receptacle flush in terrazzo floor.	• Recommended at checkpoints where a large core drill will not impact the structural integrity of the floor. • Recommended at checkpoints where a flush installation is desired. • 6" device has smaller surface presentation than the modular surface box or the made-up surface box.
3	Poke-Through – Flush 	• Poke-through with flush receptacles • 7.5" diameter x 5/16" high; 3-4" hole/device, dependent on manufacturer	• Easy/quick installation • UL listed assembly • Fire-rated • Wide variety of device combinations	• Floor X-ray required in order to avoid existing steel. • Not flush ~ raised lip is a trip hazard. • Electrical devices are proprietary. • The plug is above floor level and can be knocked out. • The floor cover is plastic, in some cases, therefore less durable in high traffic areas.	• Recommended only for equipment that does not require a twistlock or simplex receptacle. • Recommended in low traffic areas, since these receptacles have nonmetallic covers that can break easily.
4	Multiplex Surface Box 	Surface-mount cast box • 8-3/4"W x 6-3/4"D x 3"H, (2) 1-5/8" hole/outlet	• 7/8" hole in floor • 1/2" Rigid Galvanized Steel (RGS) floor penetration • Inexpensive • Easy to relocate and repair floor • Can be reconfigured easily • Limited structural impact to floor • Supports any outlet configuration	• Not flush ~ trip hazard • Floor X-ray required in order to avoid existing steel. • Not attractive • The plug is above floor level and can be knocked out.	• Recommended for slab on-grade checkpoints.
5	Ceiling or Floor-Supported Power Pole 	Floor to ceiling dual channel metallic raceway; 36" AFF floor-supported Wiremold Vista Point 5 Column	• Inexpensive • Easy to relocate and repair floor/ceiling • Can be reconfigured easily • Supports any outlet configuration	• Not attractive • Obscures visibility across the checkpoint. • Safety concern for high traffic areas • Difficult to install at checkpoints with high ceilings.	• Ceiling-supported power poles recommended for slab-on-grade checkpoints where floor trenching is not desired. • Floor-supported power poles recommended for AIT when there is passenger flow on both sides of the AIT.

3-3.4 POWER/DATA CONFIGURATIONS

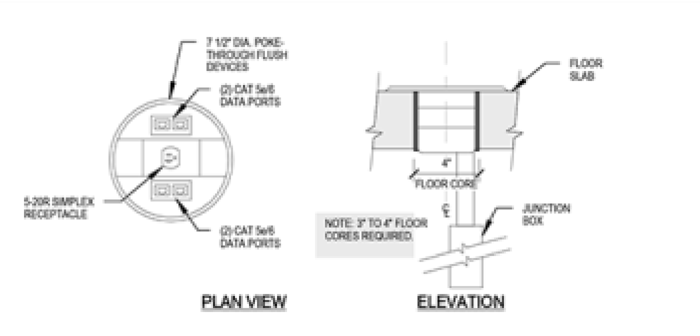
Checkpoint equipment can be fed by a power/data device configured to support one or several pieces of equipment. As the device gets larger, more equipment can be supported; however, as the device gets larger, the floor core gets larger which often becomes a roadblock with the airport and/or the permit authority. When designing a checkpoint with any of the electrical distributions/devices described previously, the configuration of the device should be indicated on the drawings so that the contractor knows the combination of receptacles, data jacks, and connectors needed to support equipment located together.

A physical example of the impacts of using different devices is graphically illustrated in **Figure 3-3.9 through Figure 3-3.11**. The details show how additional devices may be needed in order to achieve the same configuration. Both figures represent how the airport or AHJ may be convinced to use the larger poke-through to support the most equipment in order to reduce the number of holes in the floor. However, they may request a structural analysis to evaluate any impacts before final approval is granted.

Figure 3-3.9 Device Comparison

TYPICAL - (1) 7-1/2-INCH FLUSH

POKE THROUGH



TYPICAL- (1) FLOOR-TO-CEILING RACEWAY

POWER POLE

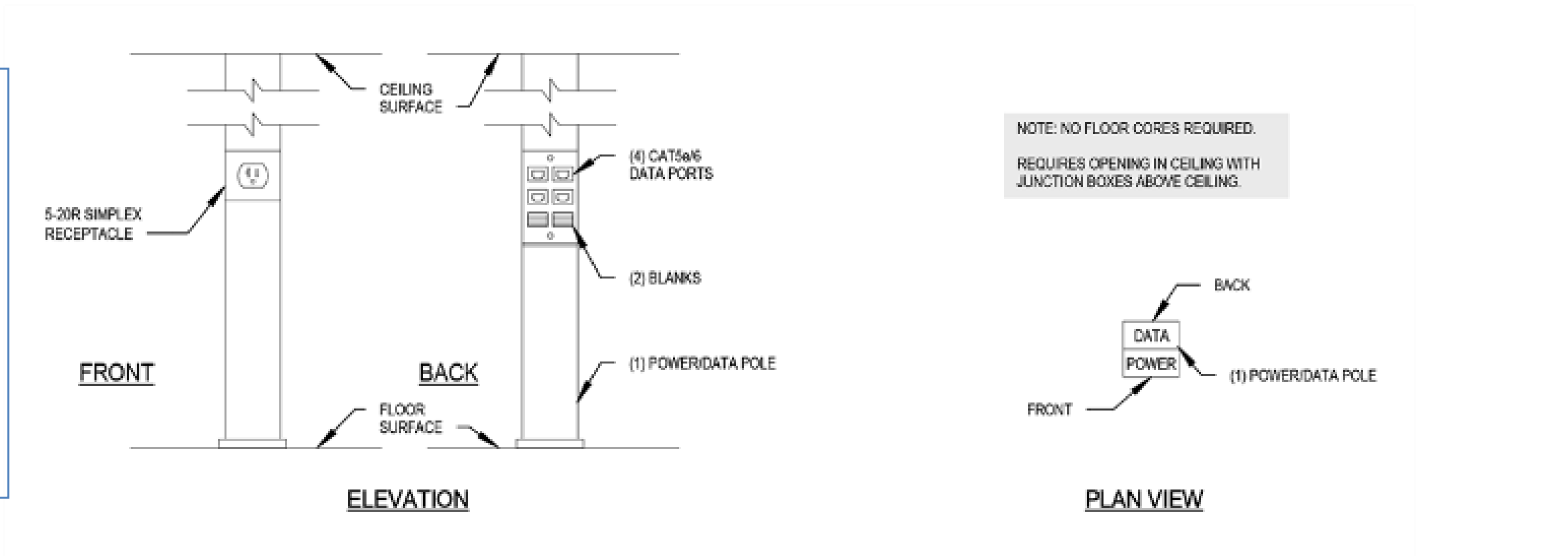
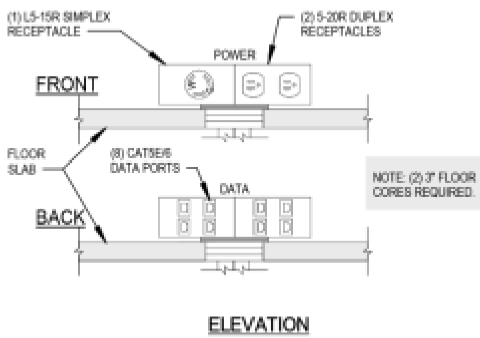


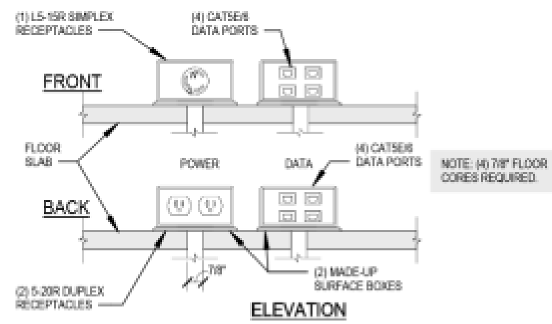
Figure 3-3.10 Device Comparison (Continued)

TYPICAL (2) MODULAR

SURFACE BOXES



TYPICAL (2) MADE UP



TYPICAL (1) MULTIPLEX

SURFACE BOXES

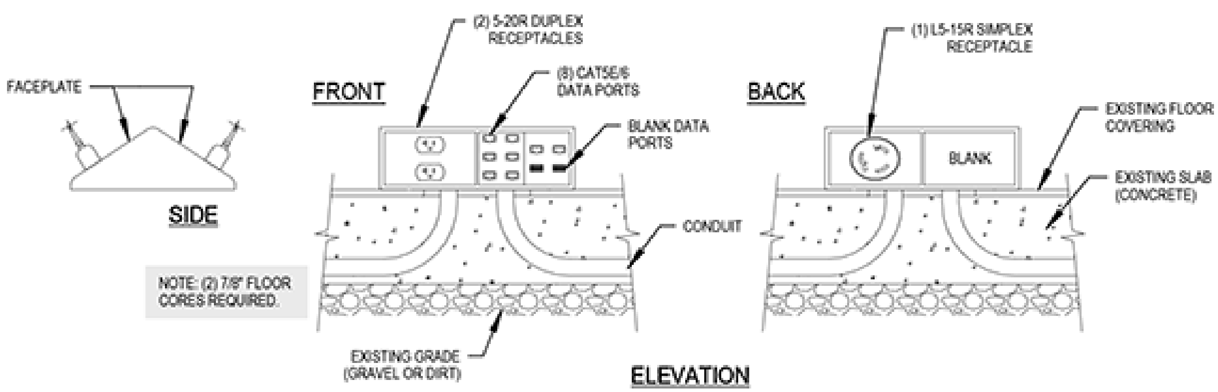
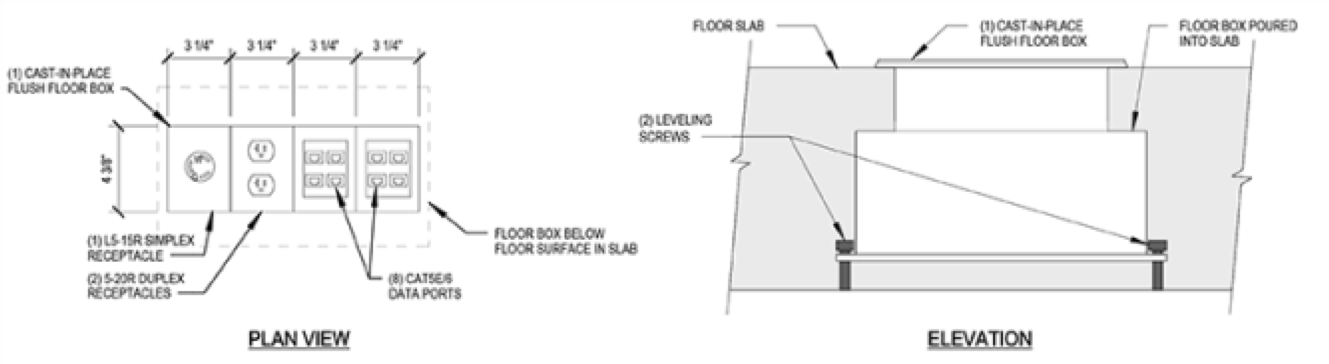


Figure 3-3.11 Device Comparison

TYPICAL- (1) FLUSH/CAST-IN-PLACE

IN-FLOOR BOXES



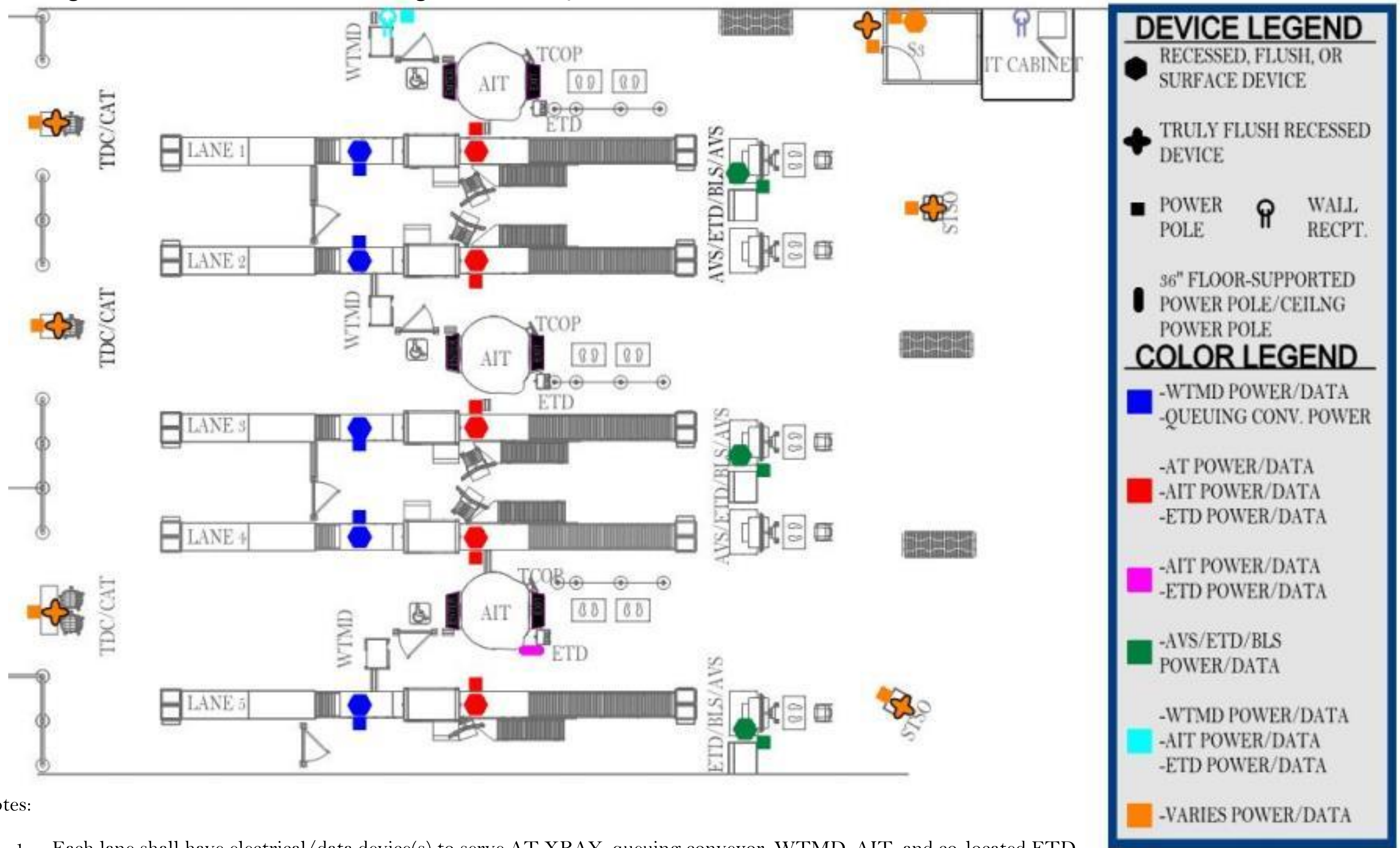
3-3.5 POWER/DATA PLANS

Figure 3-3.12 shows the recommended power/data layout for SSCP Standard Arrangement. These graphics show the approximate locations and of various devices that can be used to support multiple TSE. Recessed, flush, and surface devices are represented by the hexagon. Most of these devices are concealed under equipment with enough clearance for the height of the device and the plug. The truly flush recessed device is shown at the required three locations mentioned previously and is represented by the clover symbol. Power poles are represented by a square or oval. Only one type of distribution should be chosen per location. The power poles should only be designed when the checkpoint is slab- on-grade or the preferred distribution is via power pole. The 36" floor-supported power pole should only be used for the AIT when there is passenger flow on both sides of the AIT from an ADA Gate or WTMD when a ceiling-supported power pole is not possible or feasible. Every attempt should be made to locate receptacles under the lanes to feed the lanes and all infield equipment; however, this is not always possible. In some cases, the L3 AIT can be rotated 180 degrees in order to locate the electrical control leg adjacent to a receptacle located under the infeed or the outfeed of the AT unit. Group power/data circuits within the same device as applicable to limit the number of floor coring required. Each TSE does not need a separate power/data device however; avoid any possible passenger and/or TSO trip hazards from power/data cords.

The SSCP Standard Arrangement shows the power/data receptacles either under the infeed queuing conveyor or under the HSC depending on where the infield equipment is located. Each lane shall be equipped with the power cabling for an AT X-ray, queuing conveyor, WTMD, AIT, co-located ETD, and have space for two additional standard receptacles regardless of which lane the equipment serves. Even though the case may exist where equipment is not installed at a lane within the module set, the electrical/data devices as described are required on all lanes to allow TSA the flexibility to move TSE from one lane to another.

Care needs to be given to the location of recessed, flush, or surface devices so that they are able to support future arrangements.

Figure 3-3.12 SSCP Standard Arrangement Power/ Data Plan



Notes:

1. Each lane shall have electrical/data device(s) to serve AT XRAY, queuing conveyor, WTMD, AIT, and co-located ETD.
2. Refer to section 3-3 for specific electrical device information.
3. Electrical devices are not shown to scale.
4. Choose either floor or power pole device distribution.
5. Refer to Section 3.2 for acceptable area of electrical/data device placement for all equipment.
6. Each power device shall have the capacity to add two additional standard receptacles.

3-3.6 CCTV REQUIREMENTS

Cameras are not mandatory at an SSCP, but they do increase the level of security. Cameras deter theft, reduce claims, provide data in resolving issues, and capture visual records of suspicious activity. They are particularly helpful at unmanned or closed checkpoints. The number of cameras to add will vary depending on the size of the checkpoint, obstructions within the checkpoint, lighting, and the quality of the CCTV system. A sufficient number of cameras should be added to cover each lane, all secondary screening areas, and co-located exit lanes. **Figure 4-13** indicates the recommended CCTV coverage areas of the SSCP. Cameras should not intrude on passenger privacy by locating them in Private Screening Rooms. Cameras should be positioned to show the front view of a person's face and any other identifying characteristics.

TSA prefers CCTV design as an extension of an existing facility security system within the airport. When CCTV is part of an extended system, the equipment should match the existing hardware in order to minimize maintenance costs and provide operator familiarity. Storage and retrieval of video footage will need to be determined on a site-by-site basis. The existing facility security system should provide a minimum of 30 days of recording. Local TSA and law enforcement should be able to access the system at or near the checkpoint. The security system should have a means to maintain an accurate system time. When a CCTV system exists, it is shared between the airport, law enforcement, and local TSA. Sometimes construction documents by the CCTV Owner's designer or some other designated firm are required to indicate the CCTV system scope of work required to relocate or add cameras to support the checkpoint reconfiguration or additional new equipment. These documents are typically full sized and consist of the following:

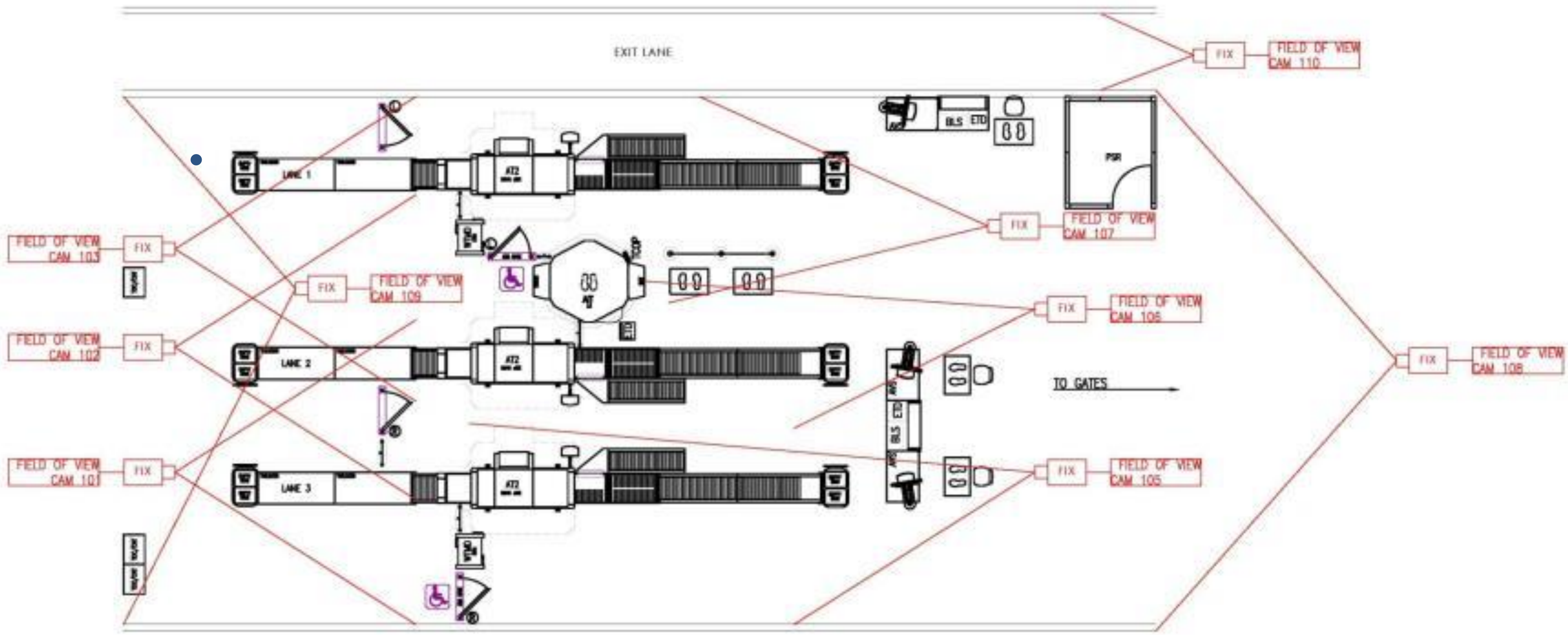
- CCTV & Electrical System Abbreviations, Symbols and General Notes
- CCTV Camera Mounting Details
- CCTV System Demolition indicating components to remain or be removed. Also includes a CCTV camera schedule indicating the focus, aim, mounting, and applicable remarks for each existing CCTV camera.
- New CCTV System Installation indicating components to remain or to be provided as new. Also includes CCTV camera schedule indicating the focus, aim, mounting, relocation, disposition, and type for each new CCTV camera.

These drawings are not typically provided by TSA, but they are part of a checkpoint construction contract. TSA provides the operational requirements from the local FSD that provides enough detail for the system to meet the needs of the program. A typical operational requirement is "provide a view of people entering and exiting a WTMD with enough detail to recognize the person and any object they may be carrying". Specific questions on the generation of requirements should be directed to the ASP program at: ost_asp_video_surveillance@tsa.dhs.gov.

Refer to the TSA Recommended Security Guidelines for Airport Planning, Design and Construction, Part III for additional information. For CCTV systems that are extensions of existing building systems, a cost reimbursement program may be available through TSA HQ.

Typical camera coverage is shown in **Figure 4-13**. All camera coverage details need to be discussed with TSA HQ; specific coverage requirements cannot be detailed in the CDG.

Figure 3-3.13 Recommended CCTV Coverage



3-3.7 DURESS ALARM REQUIREMENTS

Duress alarms must be installed at TSA Security Screening Checkpoints their intent is to provide a silent alarm system with no audible or visible alerts at the location where the button is activated. The system will notify the monitoring authority of eminent danger to human life by depressing a button mounted on predetermined locations on TSE. The duress alarm system includes a wireless duress button, repeaters (if required,) auto-dialer (if required) and a monitoring panel. In instances where wireless technology cannot be utilized, wired duress alarm systems shall be installed.

A duress alarm button shall be installed at the following locations:

- TDC/CAT Podiums
- Known Crew Member (KCM) Locations (not co-located with TSA-monitored exit lanes)
- X-Ray Operator Positions
- Supervisor (STOS) Podiums
- Exit Lane Locations (where monitored by TSA)
- Permanent Private Screening Rooms (PSR) Locations
- Explosive Detection System (EDS) locations in terminal lobby (Checked Baggage)

Following are guidelines for the checkpoint designer or contractor to follow when installing and locating duress alarms:

- In instances where wireless technology cannot be utilized, it shall be required to install wired connectivity.
- Ensure that any alarm signals do not interfere with airport operations.
- An alarm button shall be installed at each location as described above regardless of proximity to other alarms; any deviation must be approved by TSA HQ.
- The system shall have the ability to identify alarm activation by checkpoint name and location.
- The alarm system shall provide maximum battery life capability (minimum of 1 year.) The system shall have a low battery indicator for any components that utilize a battery.
- The alarm shall be installed in such a way as to be easily accessible, inconspicuous, and so as to avoid accidental activation. The alarm shall not partially or fully cover a panel or any part of the TSE that provides access for maintenance. The system shall have capability to be tested at least once a week and be reset quickly either at the button or the monitoring system.

System Components/Requirements:

- If your Airport has an existing TSA installed Duress Alarm system, all new components must be compatible and able to integrate into the existing system.
- Fixed Duress Button – battery operated so no infrastructure is required (mounted with industrial Velcro).
- Wireless Repeater (if required)– Requires an outlet (within 30' of Repeater) and flat surface for mounting and must have a 24 hour backup battery in case of power loss.
- Wireless Receiver (Monitoring Panel) – Requires an outlet and flat surface for mounting and must have a 24 hour backup battery in case of power loss.
- Auto-dialers (if required) – Requires an outlet and flat surface for mounting and must have a 24 hour backup battery in case of power loss. Also requires access to non-VOIP phone line(s). Auto-dialers are approved for use in Category II, III and IV airports. Use of auto-dialers in Category X and Category I airports must be approved by TSA Headquarters.

Category X and Category I airports may opt to install a solution that is integrated with an existing security system or be integrated to utilize an existing network at the airport. These duress alarm systems still include the components listed above but may also include:

- Input Control Module (ICM) – for use with an existing access control system. The ICM provides system acknowledgement of monitored wireless Duress Alarms through normally open, normally closed, and supervised circuits.
- Area Control Gateway (ACG) – provides integration of the wireless Duress Alarms through an existing Ethernet network connection.

- System Control Processor (SCP) – used for communication with the Area Control Gateway. The SCP processes the wireless Duress Alarms for display in an access control software product.
- Access Control software for managing wireless Duress Alarms.

The Deployment and Logistics Division can provide system and component details for the TSA Duress Alarms. If an airport opts to install another system, this must be coordinated through their FSD and TSA HQ approval is required in advance.

3-3.8 LIGHTING REQUIREMENTS

Lighting requirements for a new checkpoint must meet local and/or national codes and, ideally, should meet the luminance levels identified in ANSI/IESNA RP-104. In locations where critical decisions are made based on visual evaluation (e.g., at bag inspection tables or the TDC podium), a minimum luminance level of 30 fc is required. Emergency lighting as required by the building code, should also be a part of the overall design of SSCPs.

TSA does not provide overhead lighting. The airport is expected to provide sufficient overhead lighting to support the screening functions at the checkpoint.

Additional lighting may be required for a CCTV system at the checkpoint. This lighting should be provided by the group funding and maintaining the CCTV system. Refer to Section 3-3.6 regarding additional information on CCTV.

All lighting designs should be reviewed by the work group as outlined in Section 3-3.1 to identify any issues with window or monitor glare, and to ensure there is enough lighting at the AVS/ETD/BLS locations.

3-3.9 SAFETY REQUIREMENTS

SSCPs must screen passengers and their carry-on baggage without compromising the safety of either the passengers or the TSOs conducting the screening. Safety requirements and safety-related considerations must be built into the SSCP design from the beginning and should be treated as an integral part of the design process. The standard checkpoint layouts in this document are intended to provide good starting points, but safety Subject Matter Experts (SMEs) should be included in every phase of the design to provide input on concept plans and/or construction drawing packages.

All checkpoints must maintain a minimum of two paths of egress to exit the checkpoint at all times. This is achieved by providing exit from the checkpoint via exit to the airport terminal and egress between the AT X-ray and wall or between two operator sides of the AT X-Ray. All egress paths through the non-sterile side of the checkpoint shall be secured by an access gate as described in this document.

Particular safety issues related to equipment or layouts that are likely to arise in the course of SSCP design are discussed within the appropriate sections within this document; however, this document is not intended to provide an exhaustive list of such issues. Safety experts from each discipline should review all available sources of information, such as national and local building codes, fire codes, best practices, Technical Notes, Job Aids, OSHA/OSHE requirements, and TSO injury data to ensure that the most current knowledge is incorporated into each SSCP design.

The SSCP equipment, including PSRs, must meet all local code requirements and/or ASHRAE standards for heating, ventilation, and air conditioning. When checkpoints are located outside, the AHJ should be consulted.

Indoor air temperature and relative humidity levels should be maintained at a comfortable level based on the occupancy, size, and exposure of the SSCP. Air quality should be monitored at the checkpoint to prevent the build-up of carbon dioxide from human respiration and to minimize odors.

The SSCP must meet all local building, mechanical, and OSHA code requirements. New construction or renovated areas with complete heating, ventilating, and air-conditioning system replacement should achieve minimum ventilation rates and other measures intended to provide acceptable air quality and minimize adverse health effects as specified in ASHRAE 62.1 Ventilation for Acceptable Air Quality. Environmental conditions (indoor air temperature and relative humidity levels) should be maintained at a comfortable level based on the occupancy, size, and exposure of the SSCP. Air quality and environmental conditions will be evaluated during the baseline hazard analysis of the SSCP to identify any potential deficiencies.

4-1 CHECKLISTS AND LESSONS LEARNED

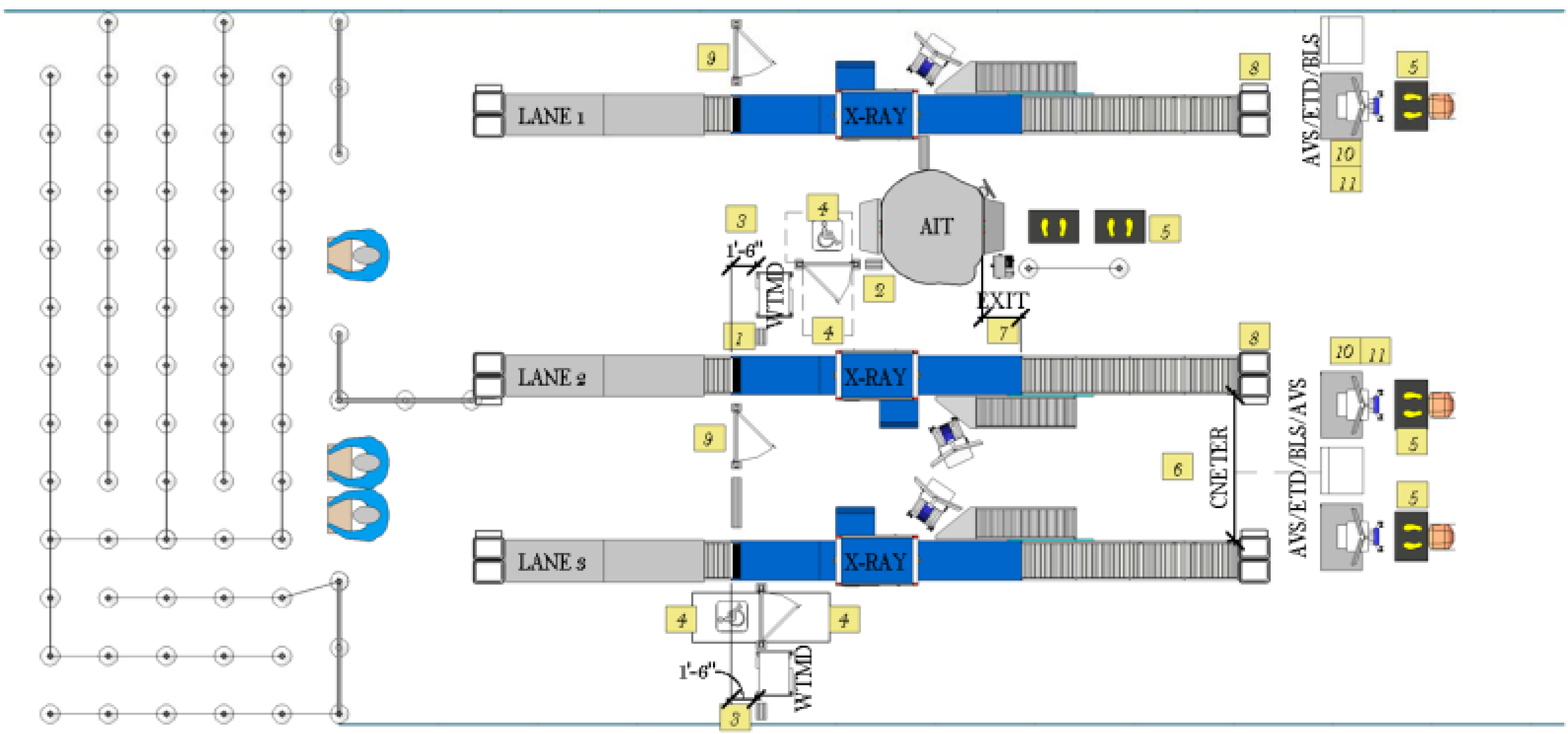
The following pages include items which have been identified as common oversights during checkpoint design and lessons learned during design and construction. All drawing submittals should be carefully reviewed for the following issues before submission. Please contact TSA HQ for additional guidance and review.

4-1.1 QC PLAN CHECKLIST

The following is a checklist of useful design components found during coordination with TSA and A&E designers. Some of these items have been annotated on **Figure 4-1.1**.

1. Place barrier between all WTMDs and X-Ray infeed conveyors.
2. Place 1'-0" barrier adjacent to the ADA gate/AIT positions.
3. Place WTMD 1'-6" beyond the infeed conveyor to avoid passenger backflow after bag placement.
4. Place ADA gate with proper entrance and exit clearances. At parallel lanes, the ADA gate is close to the WTMD with the trailing edge of the ADA gate "plate" aligned with the leading edge of the entrance ramp to the AIT.
5. Place two wanding mats at the AIT exit and one wanding mat per lane near the ETD table. Wanding areas use stanchions in lieu of glass unless the existing glass is to remain.
6. Center AVS/ETD/BLS on the operator's side of the TSA aisle.
7. Place AIT exit ahead of high speed conveyor exit unless directed otherwise.
8. Position AVS closer to the extension roller or MDR than the ETD/BLS.
9. Show TSA access gate to swing toward TSA, not toward passenger divest.
10. Face AVS front toward the TSA work aisle.
11. When passenger flow is on both sides of the AIT, provide a 36" power pole electrical device instead of a floor electrical device (not shown.)
12. Ensure checkpoint ceiling height(s) and floor slope(s) are indicated on each sheet as required.
13. Ensure all lanes are labeled per the standard lane numbering of the airport and/ or TSA requirements.
14. Use only TSA AutoCAD blocks in drawing production (not shown in Figure 4-1.1.)

Figure 4-1.1 Checklist Example

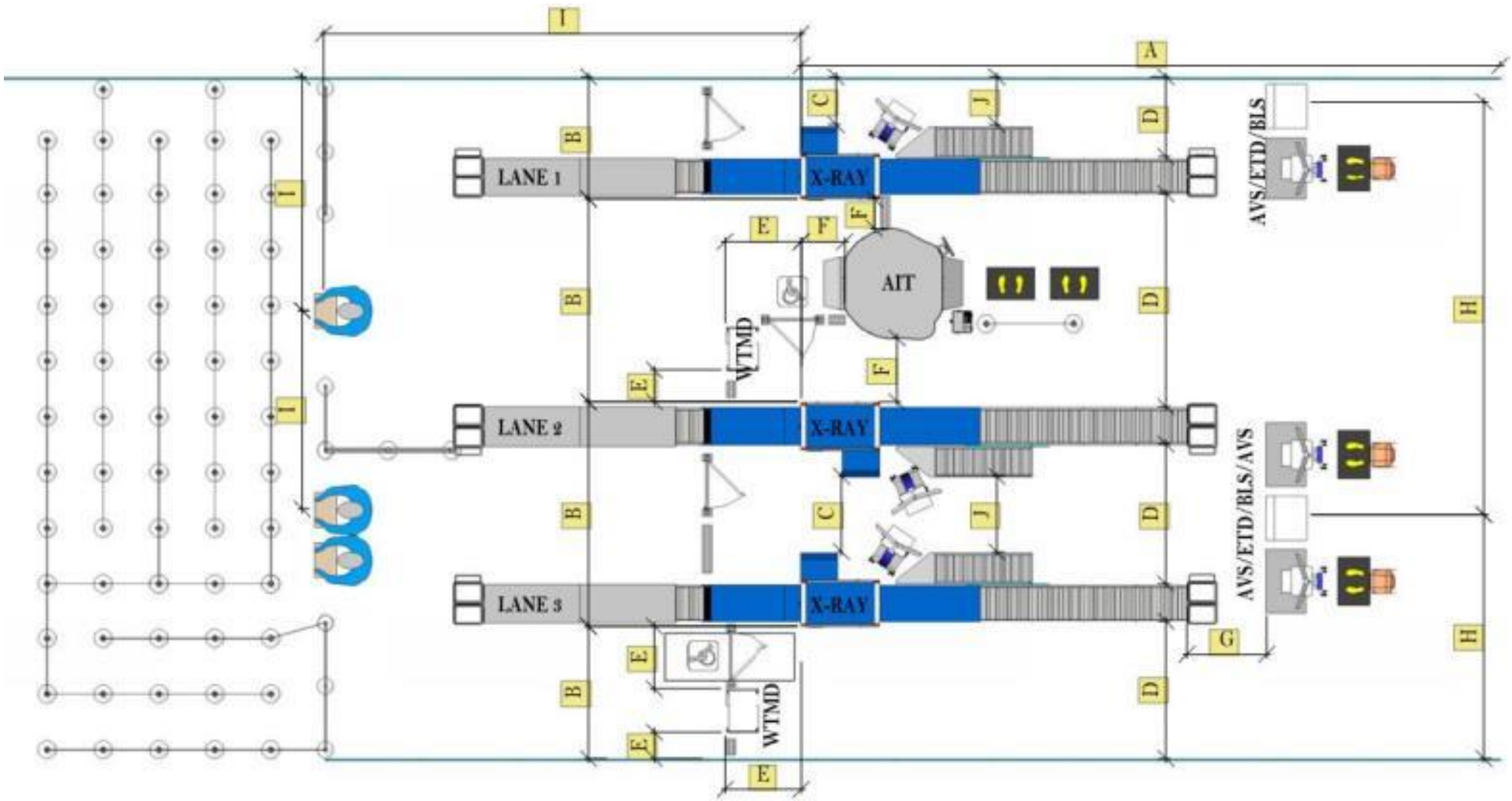


4-1.2 QC PLAN DIMENSION CRITERIA

TSA infield screening equipment is measured from the X-Ray Reference Point (XRP), which is front passenger side corner of the AT X-Ray. Provide the dimensions as shown in Figure 4-1.2 for equipment as follows:

A. X-Ray Reference Point (XRP) to dimensional reference point tied to building structure
B. XRP to XRP of all X-Rays
C. Operator side X-Ray dome to dome or dome to wall
D. Roller to roller, roller to wall, MDR to MDR, MDR to wall
E. X and Y dimensions of WTMD to XRP or wall/column
F. XRP to entrance of AIT body (not ramp), XRP/wall/column to edge of AIT on both sides
G. Last composure roller to edge of AVS table
H. X and Y centerline dimensions of all AVS/ETD/BLS locations
I. X and Y centerline dimensions of all TDC/CAT Podiums

Figure 4-1.2 Minimal Dimensional Criteria

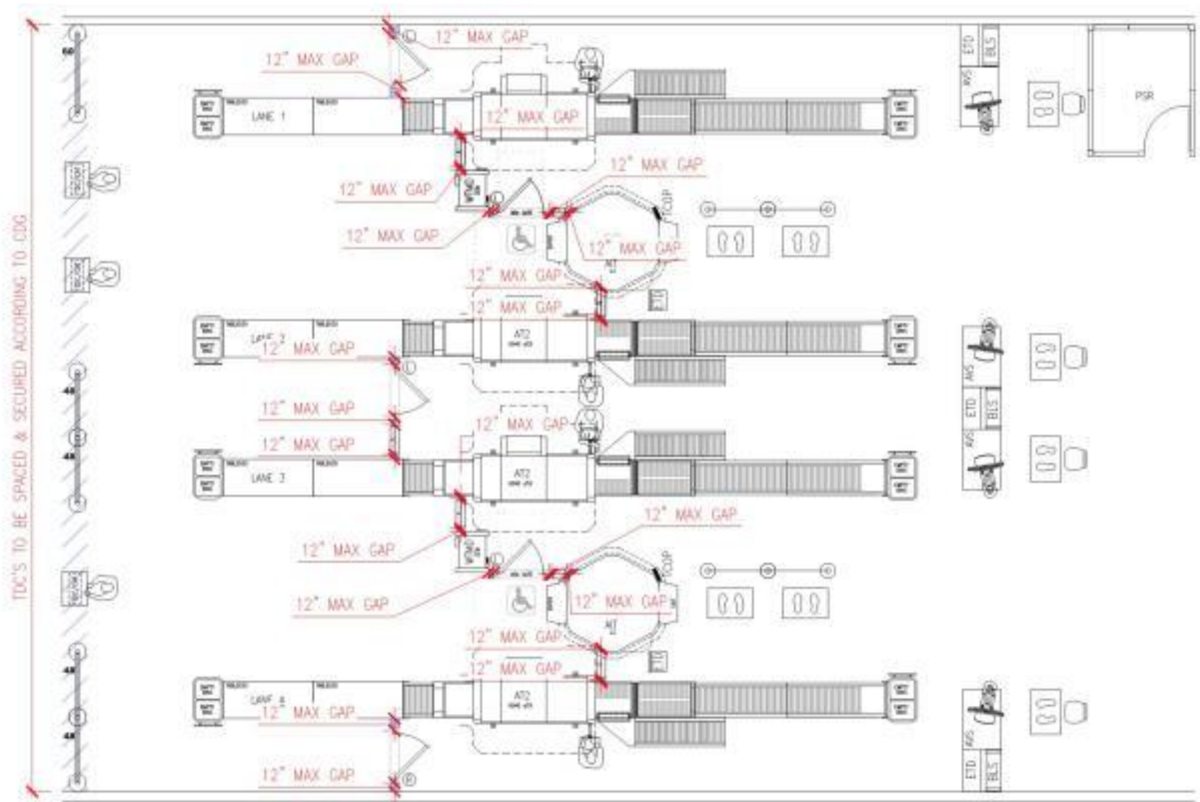


4-1.3 BEST PRACTICES

The following is a brief list of lessons learned during design and construction of a TSA security checkpoint. This list should be reviewed during design to limit unforeseen conflicts occurring during checkpoint designs, construction practices, and coordination between stakeholders.

- AIT power leg should be installed on sterile side of module set for TSO emergency shut off location
- Verify all X-Rays have the correct handedness on the drawings, bump out reconfigurations can be difficult on-site
- Notify TSA if IT cabinet is to be modified, determine if IT cabinet is operated by TSA or Airport Authority
- Ensure all gaps between all equipment does not exceed 12" at any location at checkpoint, see **Figure 4-1.3**.
- Validate location of all existing electrical devices below equipment, mats, etc. and indicate on electrical floor plan
- Verify ceiling heights, ceiling types, and ceiling height transitions at all checkpoint before indicating equipment installation
- Verify slope transitions
- Design placement of WTMD on a rigid area of the floor, away from columns and other possible locations with vibration and/or electrical current
- WTMD placement should be placed away from vibrations in floor or near in-floor electrical wiring

Figure 4-1.3 Typical Barrier Locations



4-1.4 STANDARD POWER/DATA LAYOUT & CONFIGURATIONS

The equipment shown represents three different manufacturers for example of outlet placement, each checkpoint typically includes only one manufacturer. Each equipment location shall utilize either floor outlets or power poles but not both types of power/data devices. Refer to Section 3 of this document for alternative types of power/data devices.

Figure 4-1.4 STANDARD POWER/DATA LAYOUT

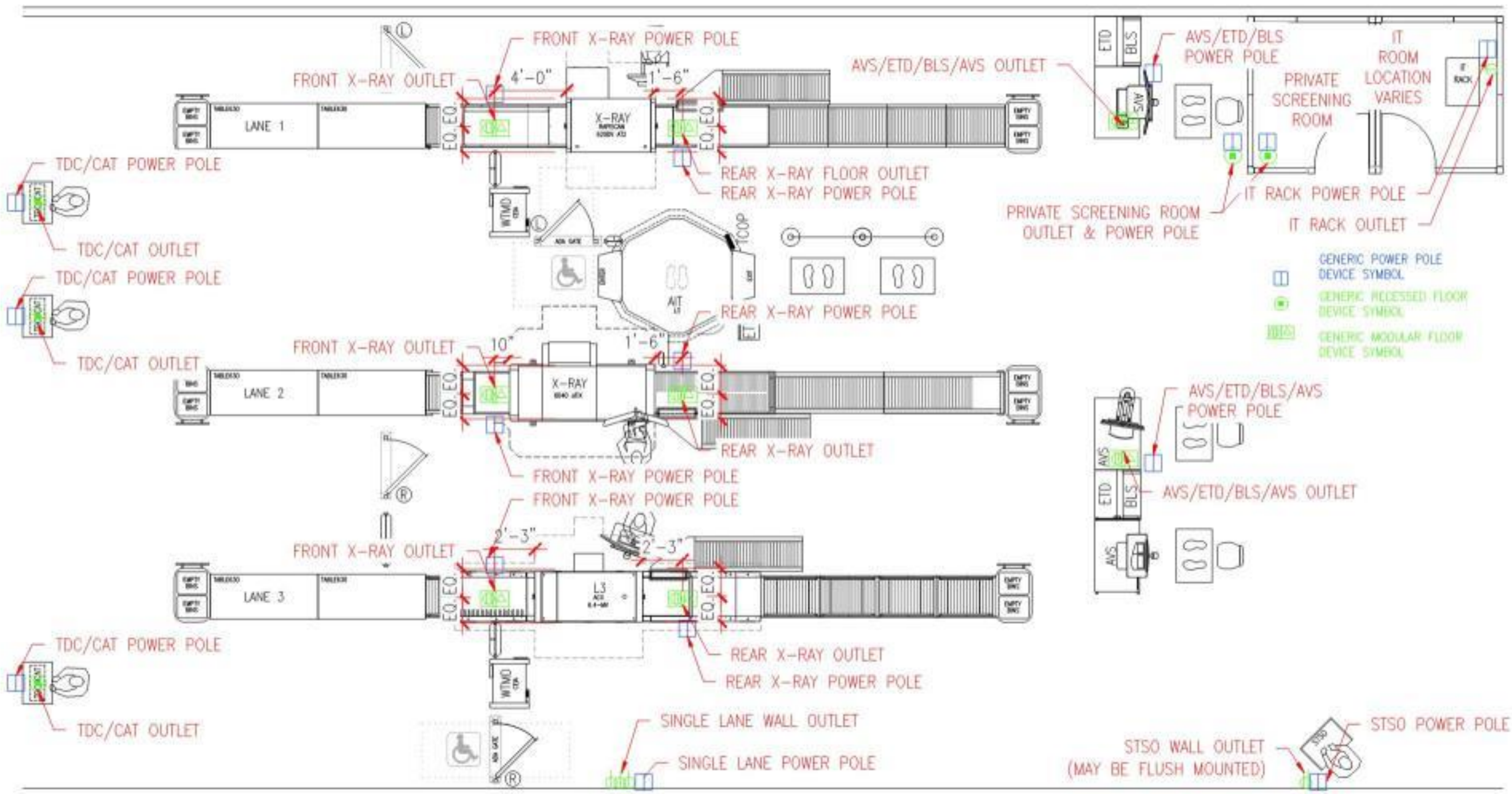
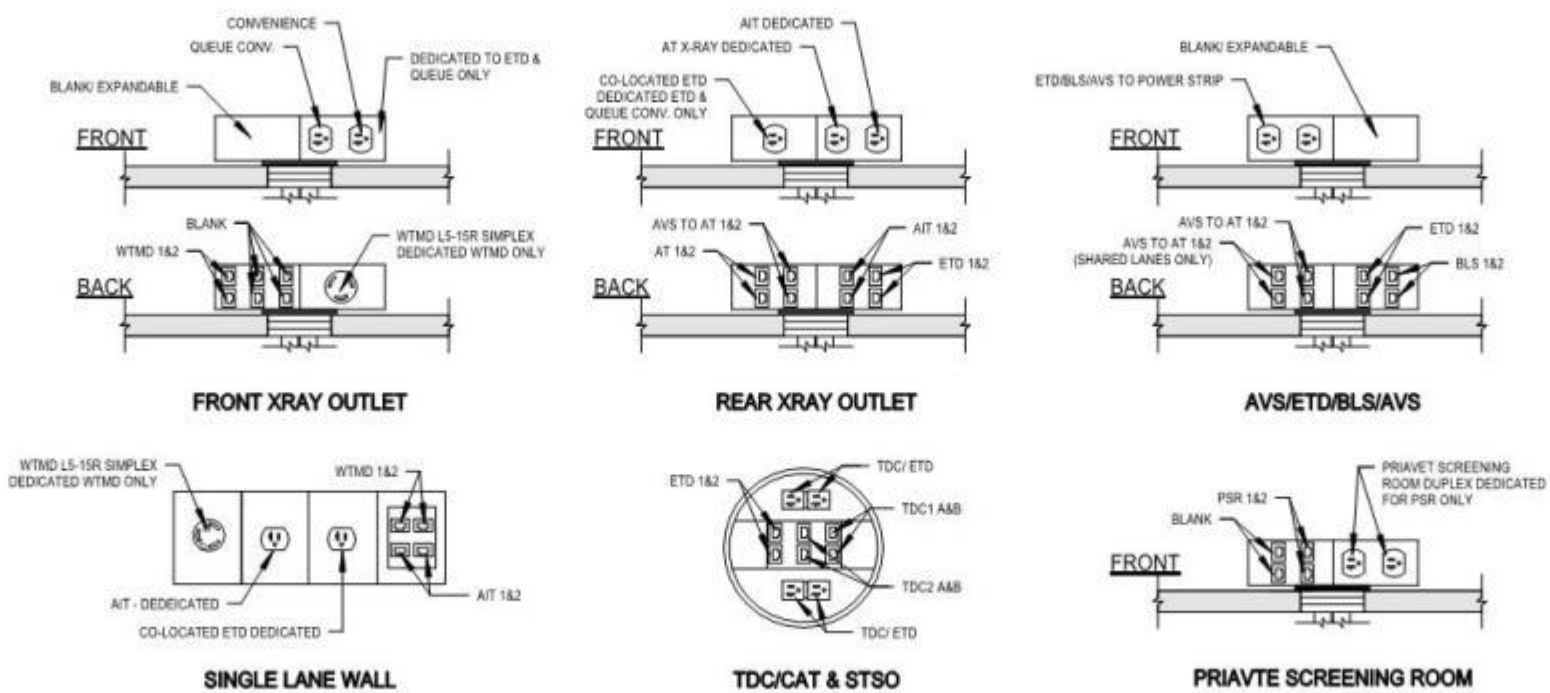


Figure 4-1.5 MAXIMUM NUMBER OF CIRCUITS PER EQUIPMENT

Equipment	Max Number of Equipment Allowed Per Dedicated Circuit	Notes
TDC/CAT	4	PROVIDE FLUSH MOUNTED DEVICE, OUTLET IS DESIGNED TO SERVE (2) MOBILE ETD UNITS INCLUDED WITH TDCs
WTMD	10	L5-15R SIMPLEX RECEPTACLE
AT X-RAY	1	PROVIDE SIMPLEX RECEPTACLE
QUEUING CONVEYOR	2	MAY BE SHARED WITH CO-LOCATED ETD OUTLET WITHIN THE SAME MODULE SET
AIT	1	PROVIDE SIMPLEX RECEPTACLE
CO-LOCATED ETD	2	MAY BE SHARED WITH QUEUING CONVEYOR OUTLET WITHIN THE SAME MODULE SET
AVS/ETD/BLS/AVS	1 SHARED LOCATION	OUTLET POWER RELOCATEABLE POWER TAP
PRIVATE SCREENING ROOM	1	ONE OUTLET INSIDE AND ONE OUTLET OUTSIDE OF PRIVATE SCREENING ROOM
STSO PODIUM	2	PROVIDE DUPLEX OUTLET
IT CABINET	1	30A L5-30R RECEPTACLE
ALL CIRCUITS TO HAVE 20 AMP SERVICE WITH EXCEPTION TO IT CABINET WHICH SHALL HAVE 30 AMP SERVICE		

Figure 4-1.6 STANDARD FLOOR OUTLET CONFIGURATIONS



4-2 STANDARD EQUIPMENT DIMENSIONAL CRITERIA

The intent of this section is to illustrate multiple checkpoint layouts with different manufacturers' equipment. The following figures represent the minimum dimensional requirements for passengers and screeners operating an effective checkpoint. This should be used as a guide when designing not only single, two, or three lane checkpoints, but also the placement of equipment for multiple lane configurations. There are a wide variety of possibilities and all may not be shown in this section.

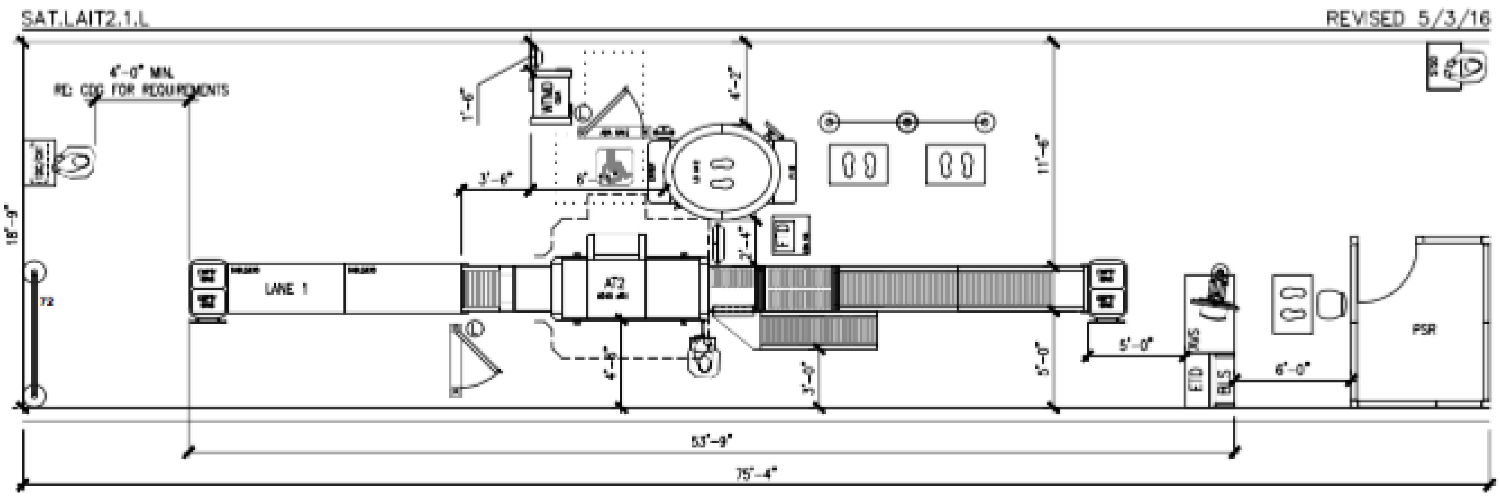
Rapiscan AT X-rays (RATs), Smiths AT X-rays (SATs) and L3 AT X-rays (LATs) can be installed with the different bump out configurations in relation to other checkpoint equipment, specifically the AIT and WTMD. RATs and SATs have the capability to have both left and right hand bump outs, LATs are only left hand bump out configurations. When reconfiguring or reusing existing AT X-Rays, it is important to confirm the existing bump out configuration in the design.

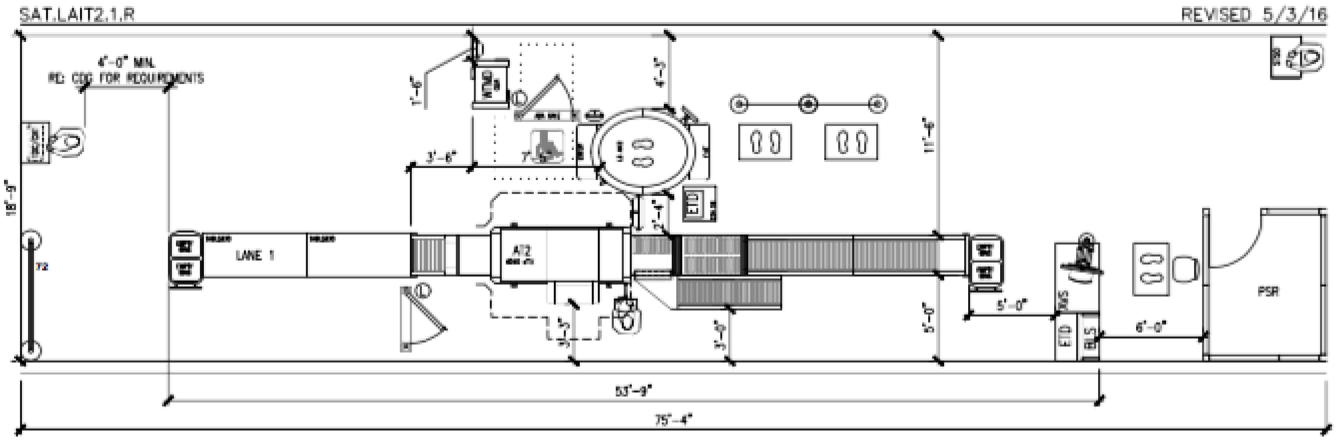
The following figures each have a naming convention that describes first the model of the AT X-ray, second the model of the AIT, third the number of lanes, and last the configurations of the AT bump out starting from the top of the layout. For example: SAT.LAIT.1.L refers to a Smiths AT X-ray with an L3 AIT, with a single lane, and left hand bump out; RAT.LAIT.3.LLL refers to Rapiscan AT X-rays with an L3 AIT, with three lanes, and all three lanes left hand bump outs.

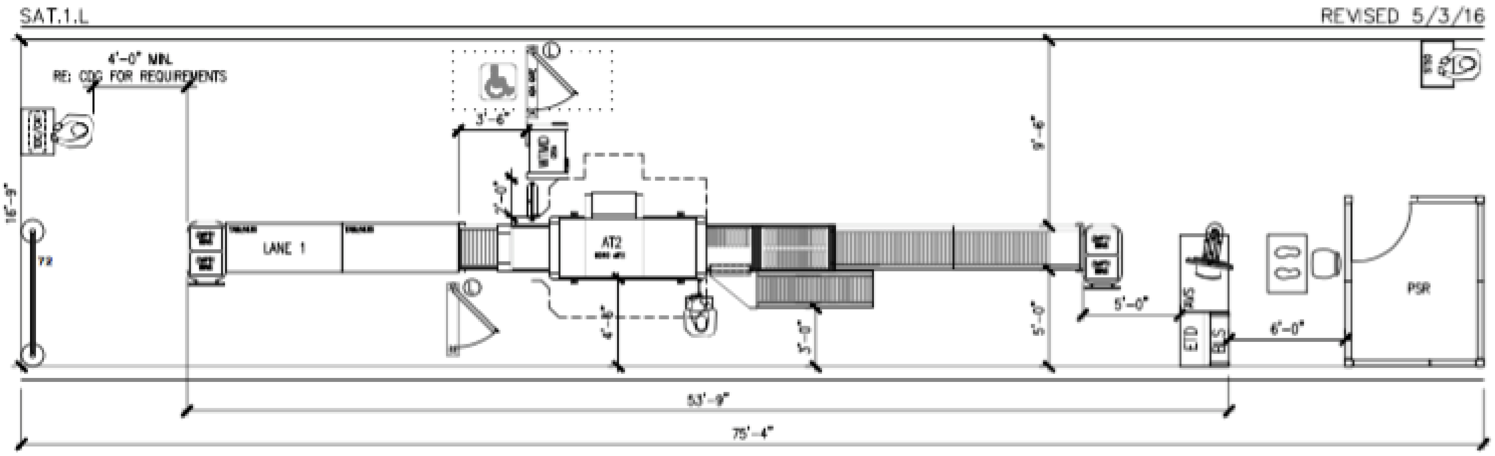
L3 ATs are not included in this section, but the same dimensional criterion applies to each layout configuration. Refer to section 3-1 for additional information on standard SSCP Layouts.

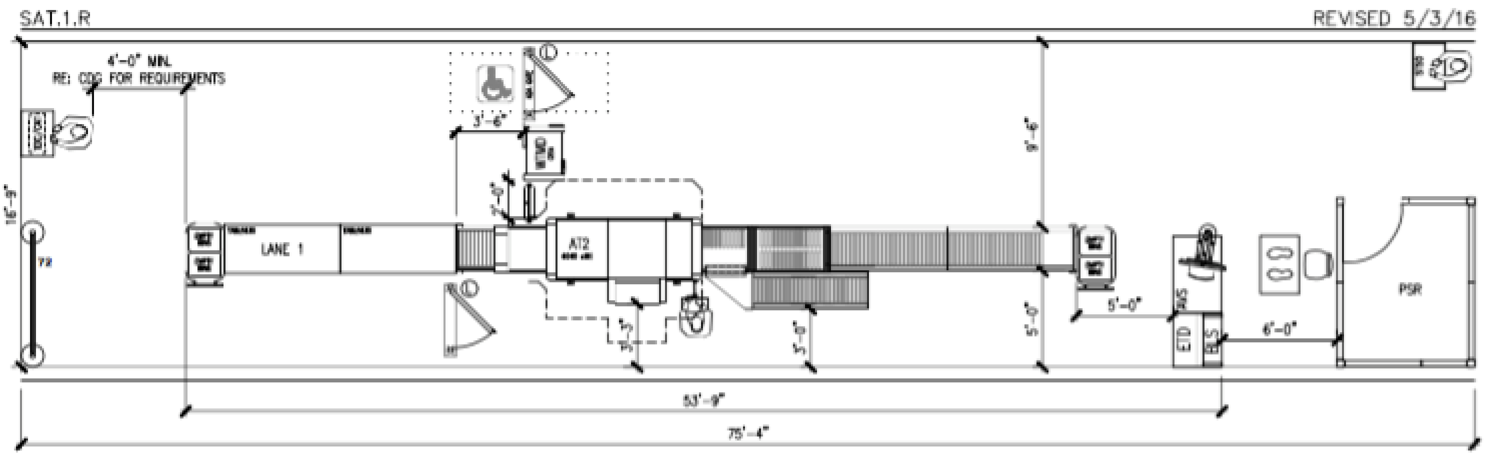
For more information or to obtain a copy of the AutoCAD format blocks and layouts contact the TSA Designer.

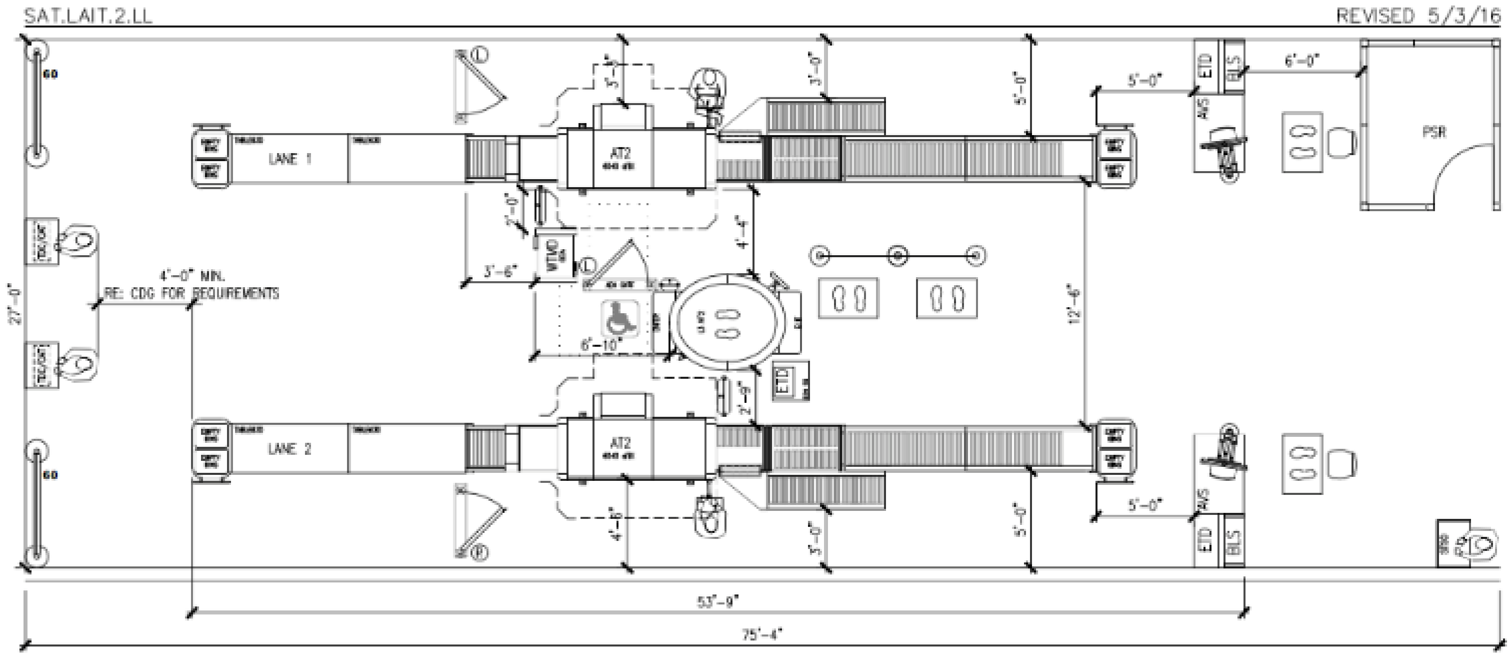
4-2.1 SMITHS AT LAYOUTS



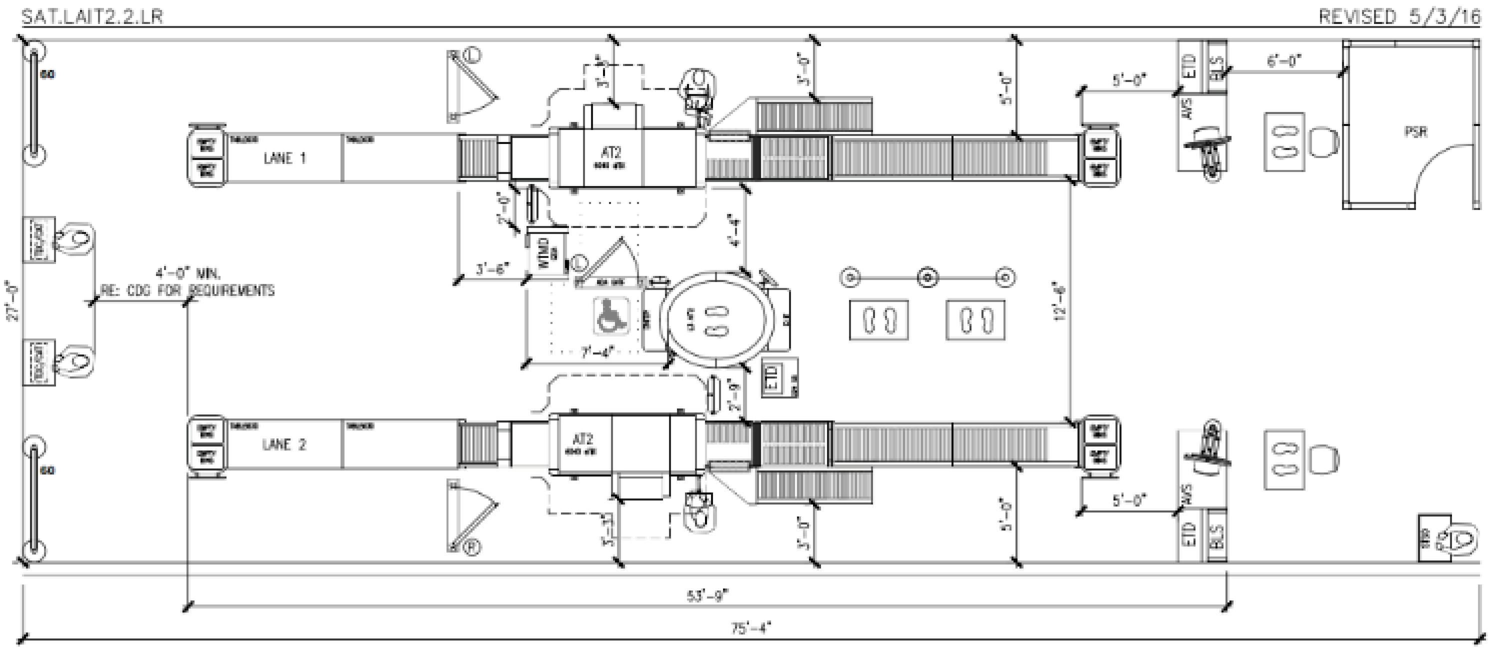

SAT.LAIT2.1.R
REVISED 5/3/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
LANE 1
PSR
ETD
5'-0"
6'-0"
53'-9"
75'-4"

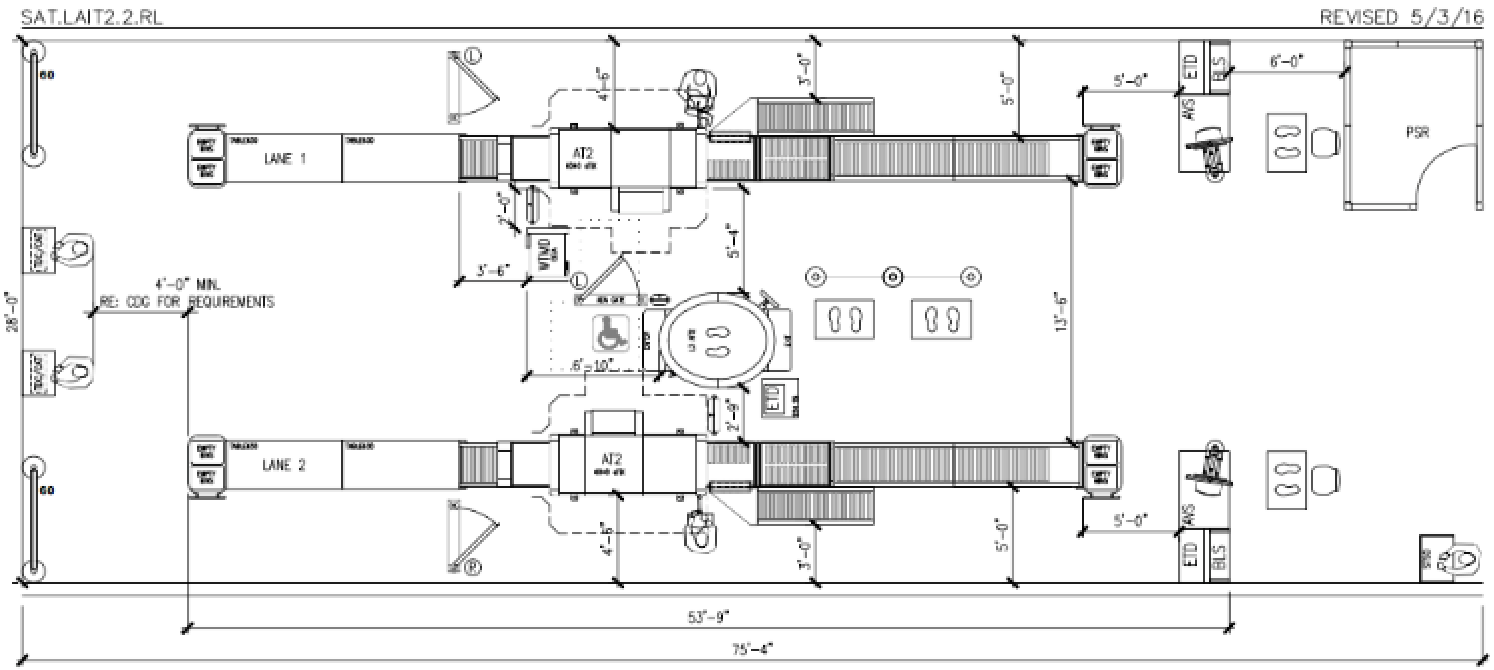

SAT.1.L
REVISED 5/3/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
3'-6"
9'-6"
16'-9"
LANE 1
AT2
5'-0"
4'-6"
5'-0"
ETD
PSR
6'-0"
53'-9"
75'-4"

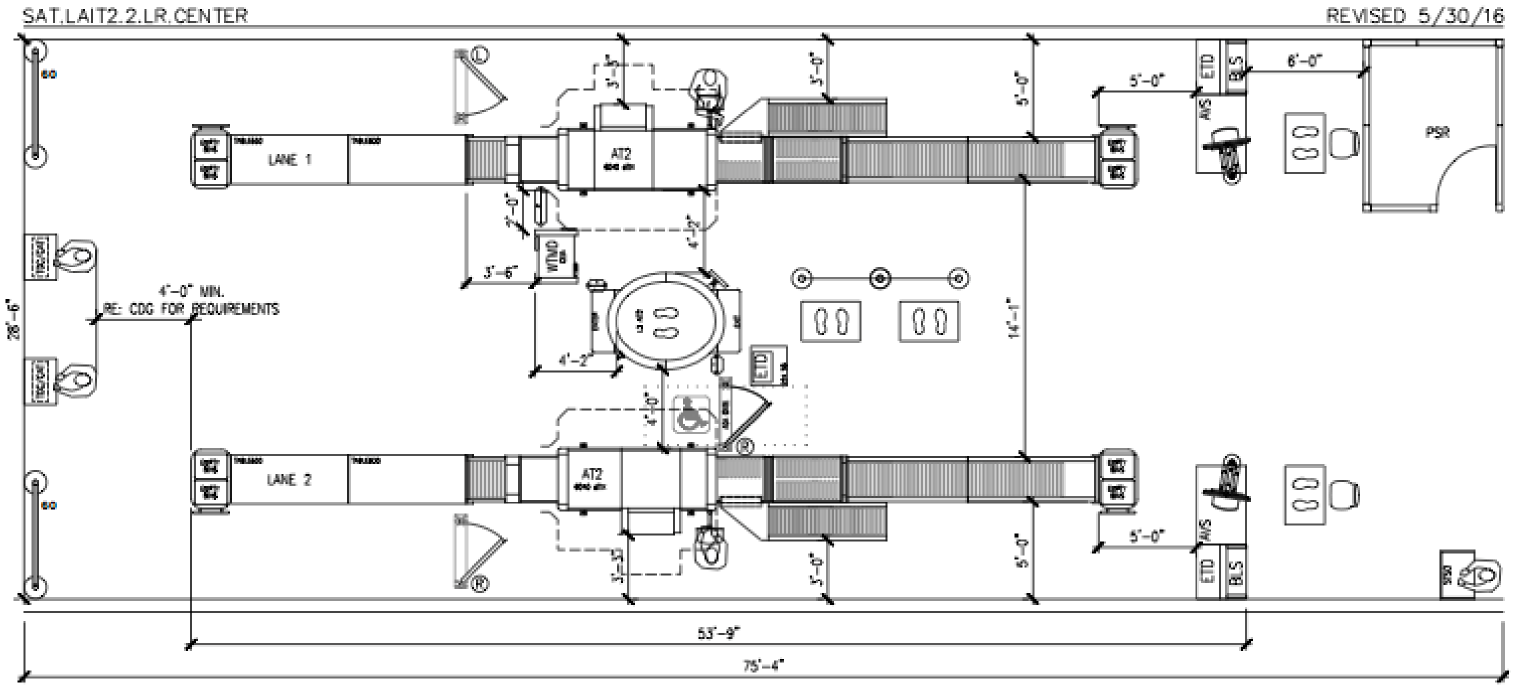

SAT.1.R
REVISED 5/3/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
3'-6"
9'-6"
16'-9"
LANE 1
AT2
PSR
ETD
5'-0"
6'-0"
53'-9"
75'-4"

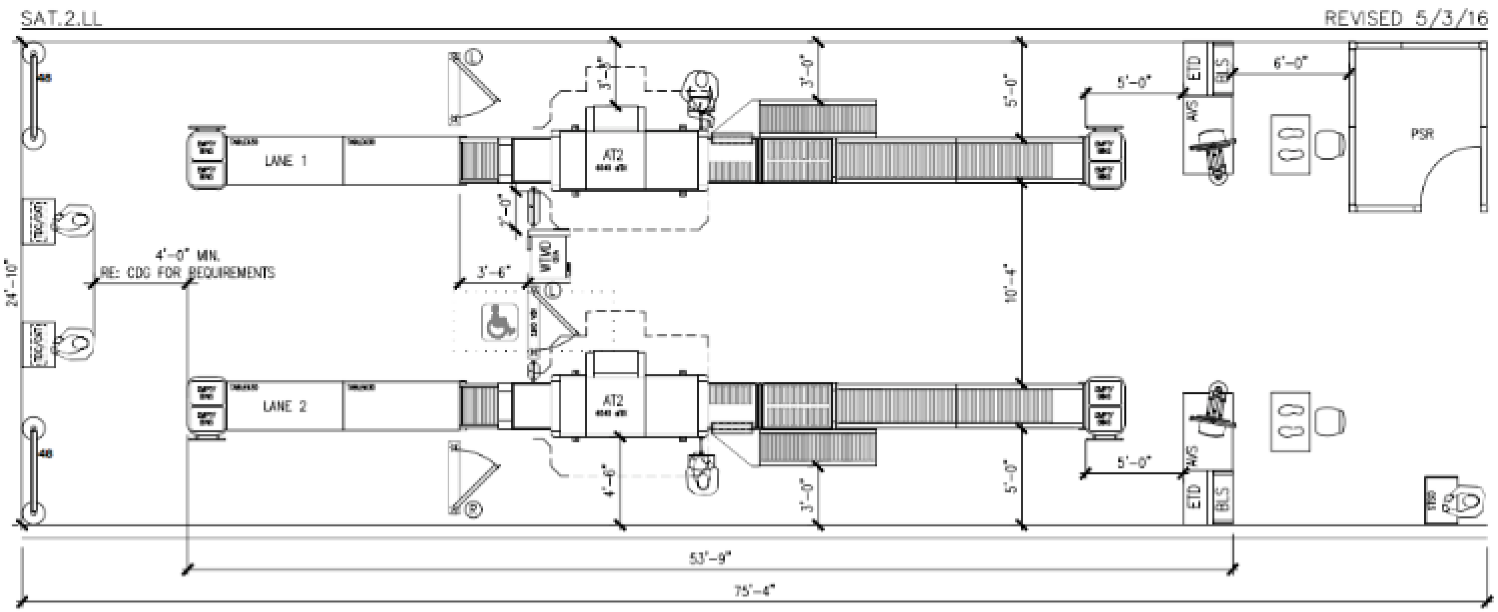


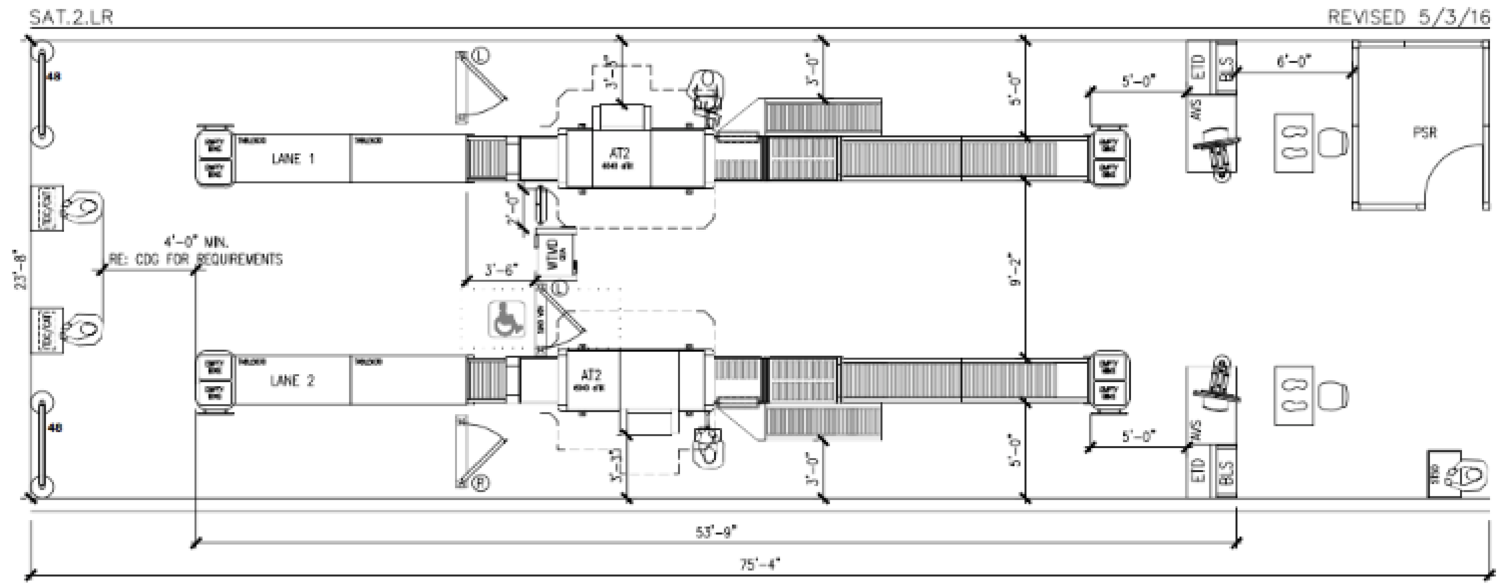
SAT.LAIT.2.LL
REVISED 5/3/16
LANE 1
LANE 2
AT2
PSR
ETD
BLS
A/S
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
27'-0"
12'-6"
53'-9"
75'-4"
6'-0"
5'-0"
3'-0"
3'-6"
6'-10"
4'-4"
2'-0"
2'-9"
4'-6"

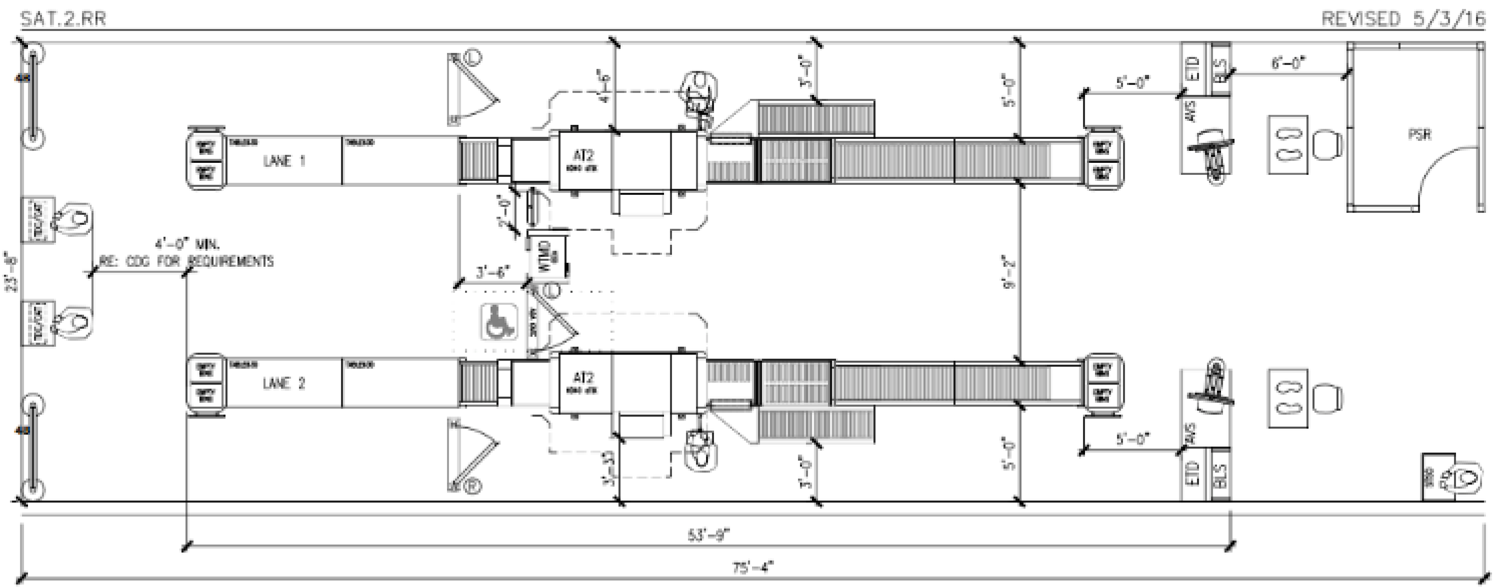

SAT.LAIT2.2.LR
REVISED 5/3/16
LANE 1
LANE 2
AT2
PSR
ETD
BLS
AVS
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
27'-0"
6'-0"
5'-0"
3'-0"
3'-6"
2'-0"
4'-4"
7'-4"
2'-9"
12'-6"
53'-9"
75'-4"

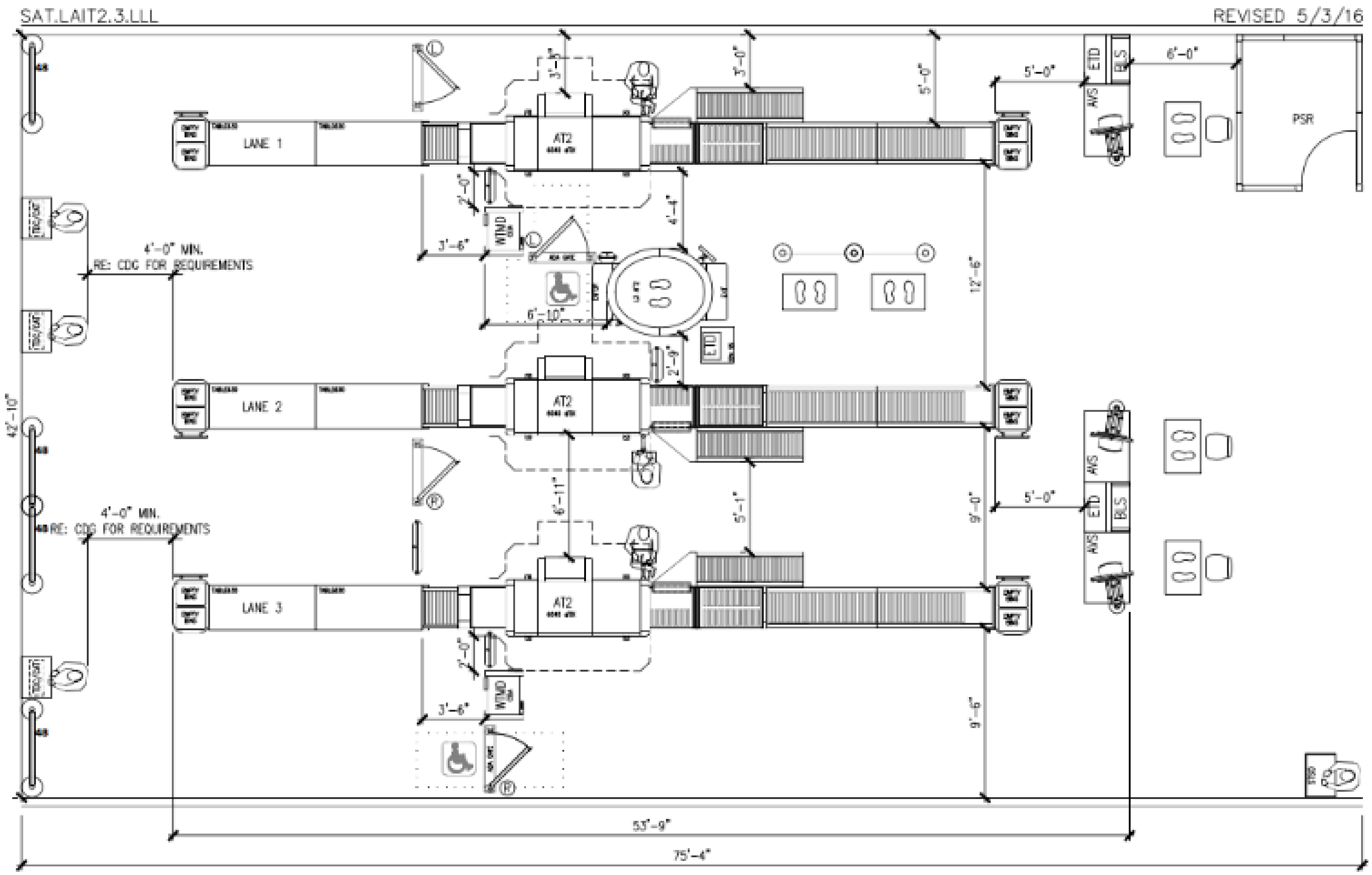

SAT.LAIT2.2.RL
REVISED 5/3/16
LANE 1
LANE 2
AT2
PSR
ETD
BLS
AVS
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
28'-0"
53'-9"
75'-4"
13'-6"
6'-0"
5'-0"
3'-0"
4'-6"
5'-4"
3'-6"
6'-10"
2'-9"

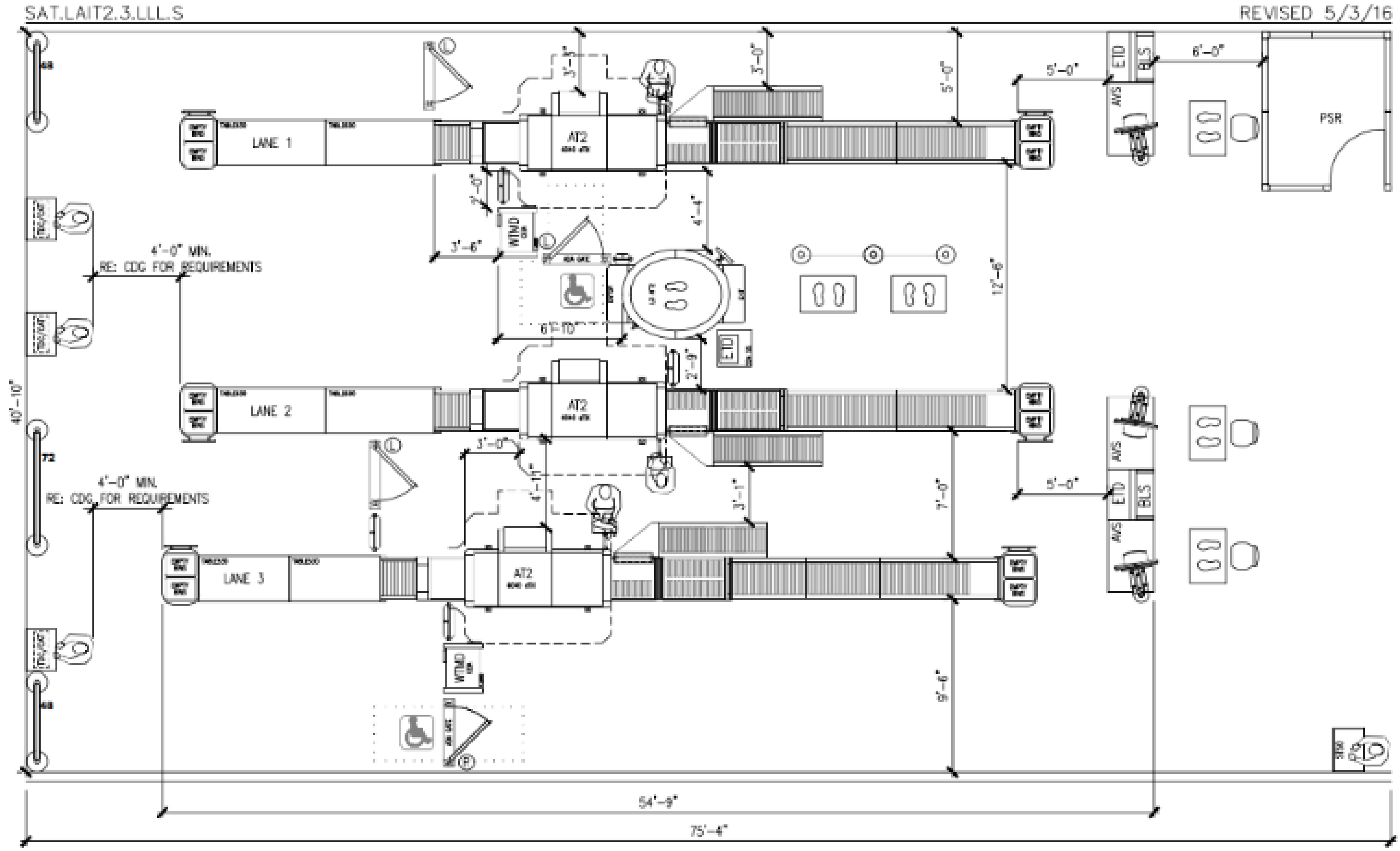

SAT.LAIT2.2.LR.CENTER
REVISED 5/30/16
LANE 1
LANE 2
AT2
PSR
ETD
BLS
AVS
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
28'-6"
14'-1"
3'-6"
4'-2"
2'-0"
3'-5"
5'-0"
6'-0"
53'-9"
75'-4"

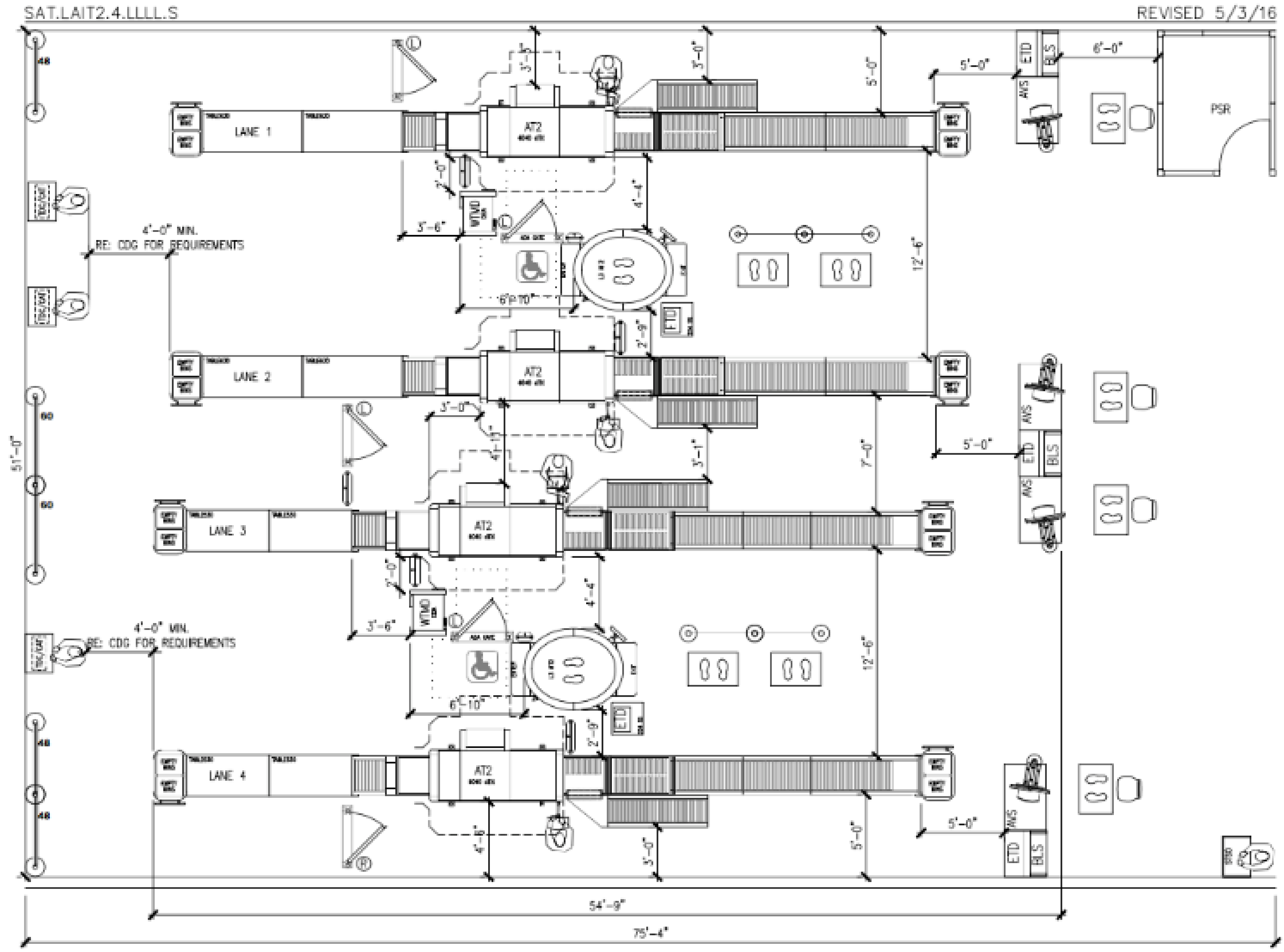

SAT.2.LL
REVISED 5/3/16
LANE 1
LANE 2
AT2
AT2
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
24'-10"
3'-6"
3'-0"
5'-0"
10'-4"
5'-0"
6'-0"
ETD
BLS
AVS
PSR
53'-9"
75'-4"

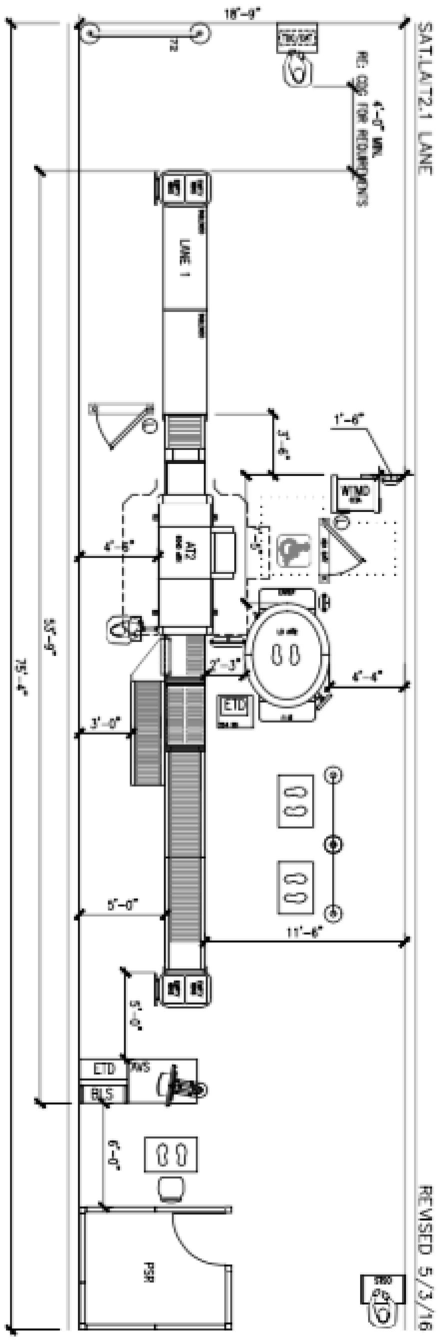

SAT.2.LR
REVISED 5/3/16
LANE 1
LANE 2
AT2
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
23'-8"
3'-6"
2'-0"
5'-0"
3'-0"
9'-2"
6'-0"
ETD
BLS
AVS
PSR
53'-9"
75'-4"

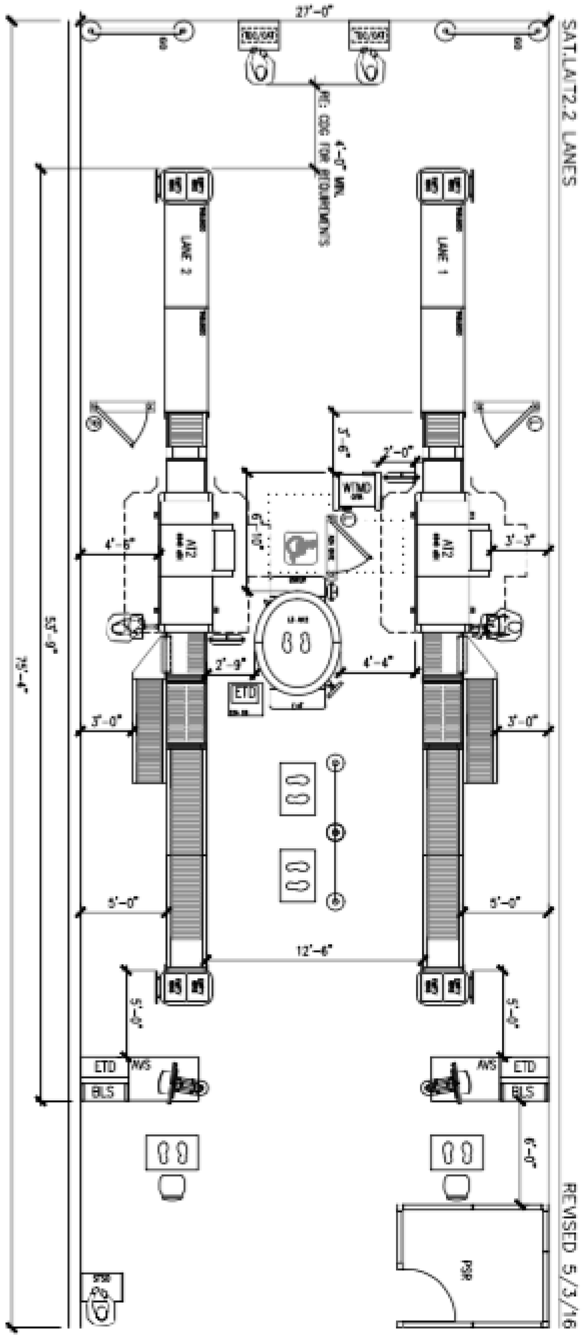

SAT.2.RR
REVISED 5/3/16
LANE 1
LANE 2
AT2
AT2
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
3'-6"
2'-0"
4'-6"
3'-0"
5'-0"
9'-2"
5'-0"
3'-0"
5'-0"
5'-0"
6'-0"
ETD
BLS
AVS
PSR
WTMD
23'-8"
53'-9"
75'-4"

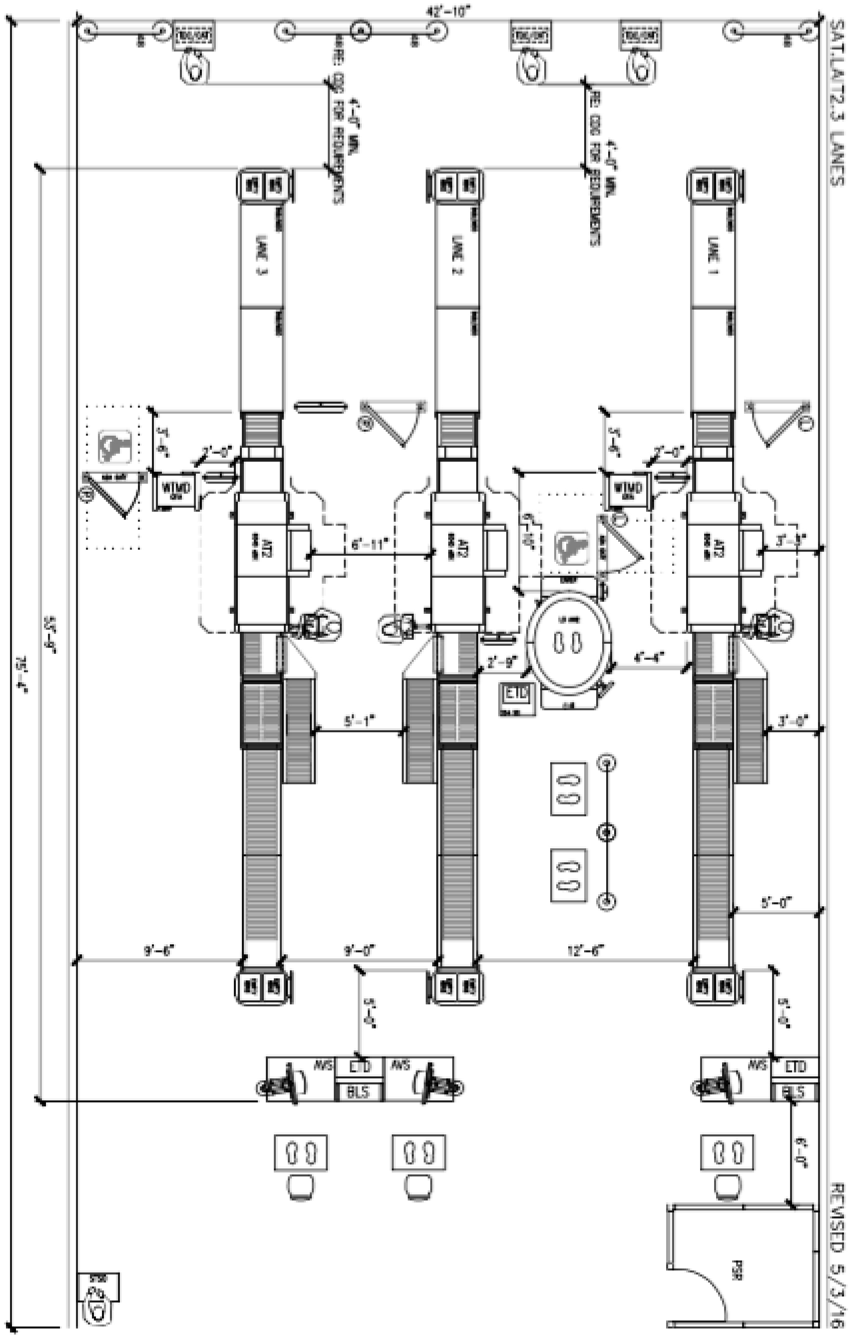

SAT.LAIT2.3.LLL
REVISED 5/3/16
LANE 1
LANE 2
LANE 3
AT2
ETD
BLS
AVS
PSR
WTMD
6'-0"
5'-0"
3'-0"
3'-5"
2'-0"
3'-6"
4'-4"
6'-10"
2'-9"
6'-11"
5'-1"
12'-6"
9'-0"
9'-6"
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
42'-10"
53'-9"
75'-4"

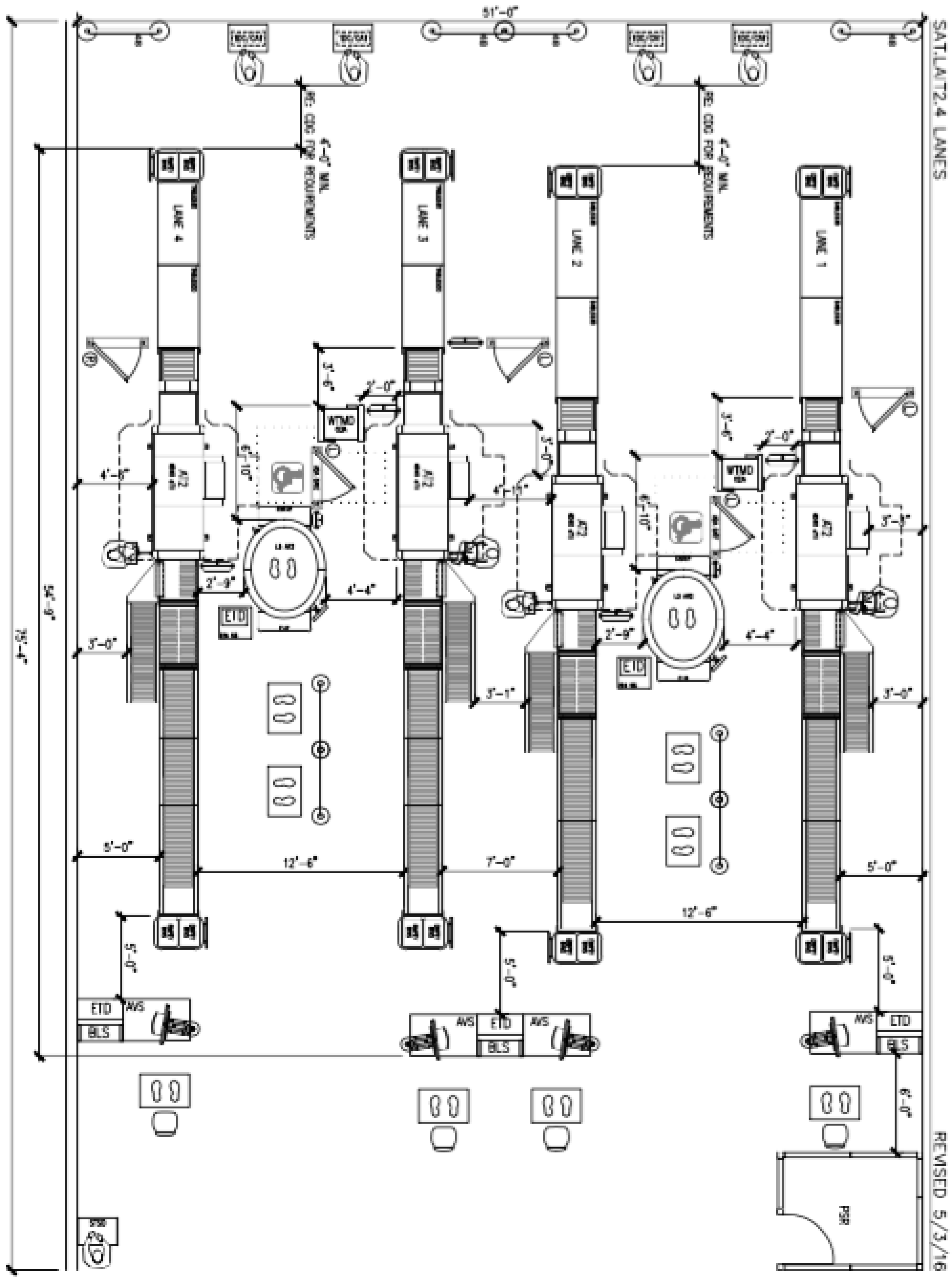

SAT.LAIT2.3.LLL.S
REVISED 5/3/16
LANE 1
LANE 2
LANE 3
AT2
PSR
ETD
BLS
AVS
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
54'-9"
75'-4"
40'-10"


SAT.LAIT2.4.LLLL.S
REVISED 5/3/16
LANE 1
LANE 2
LANE 3
LANE 4
AT2
PSR
ETD
BLS
AVS
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
51'-0"
54'-9"
75'-4"

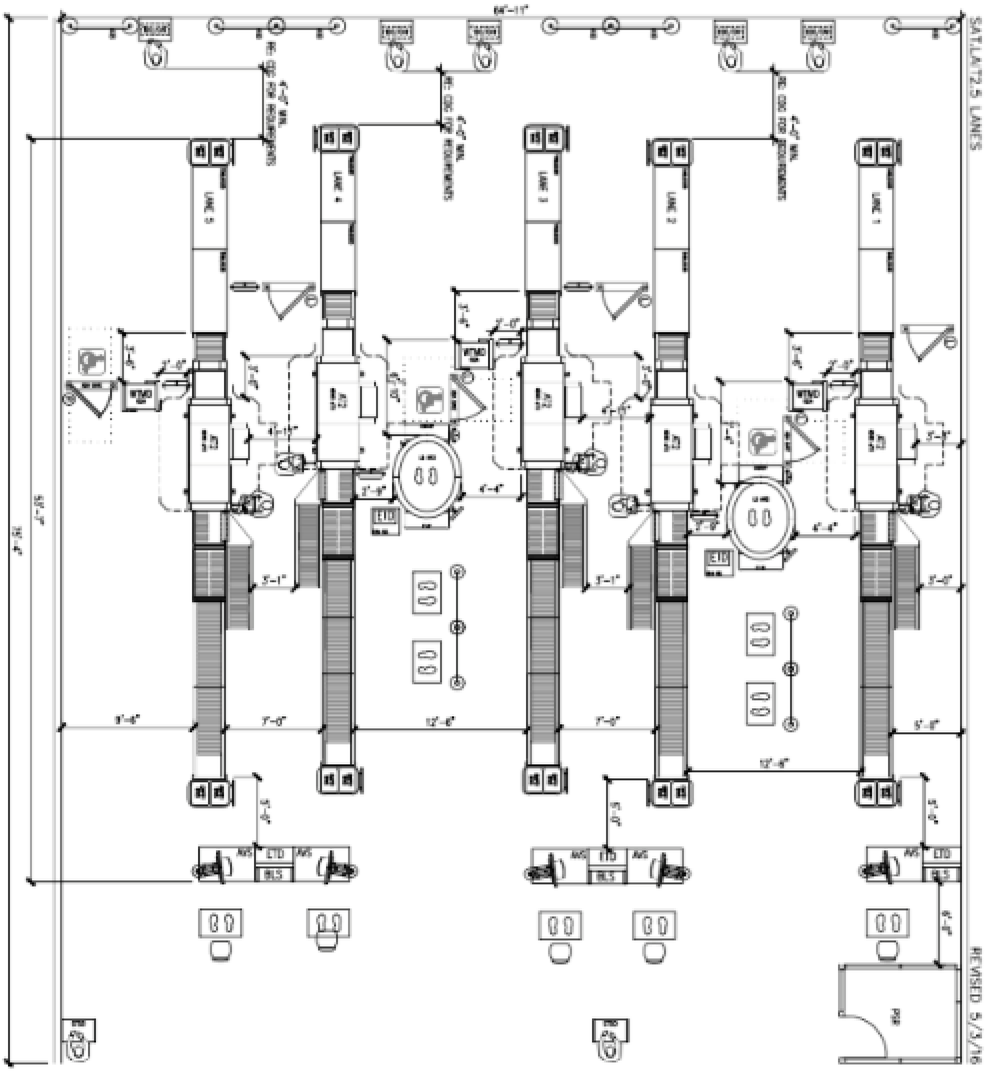

SAT.LA/T2.1 LANE
REVISED 5/3/16
18'-9"
75'-4"
53'-9"
LANE 1
AT2
WTMD
ETD
ETD
AWS
BLS
PSR
1'-6"
3'-6"
4'-6"
4'-4"
2'-3"
3'-0"
5'-0"
11'-6"
5'-0"
6'-0"
4'-0" MIN.
RE: CDG FOR REQUIREMENTS

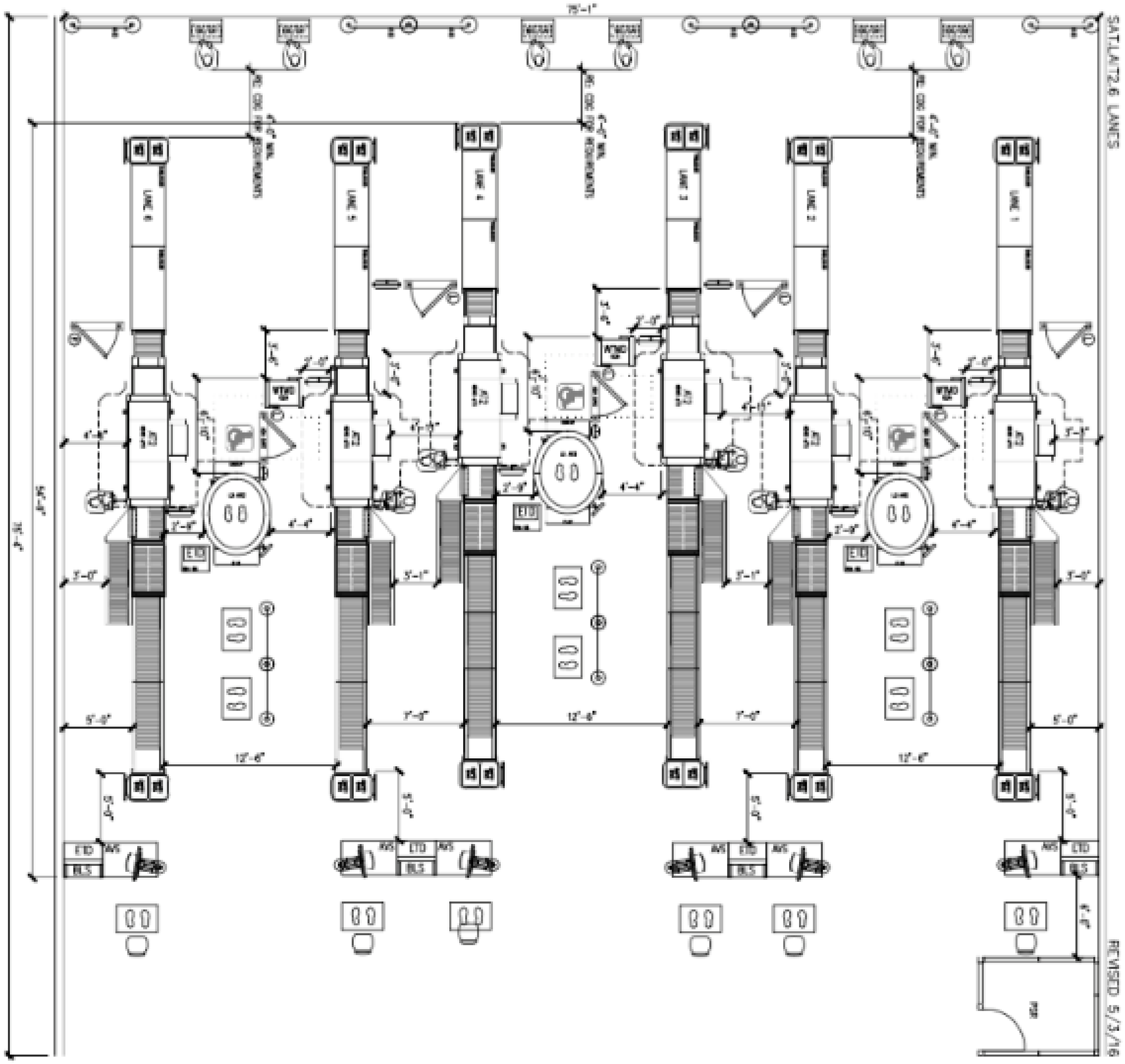

SAT.LAT2.2 LANES
REVISED 5/3/16
27'-0"
LANE 2
LANE 1
WTMD
ETD
AWS
BLS
PSR
12'-6"
53'-6"
75'-4"

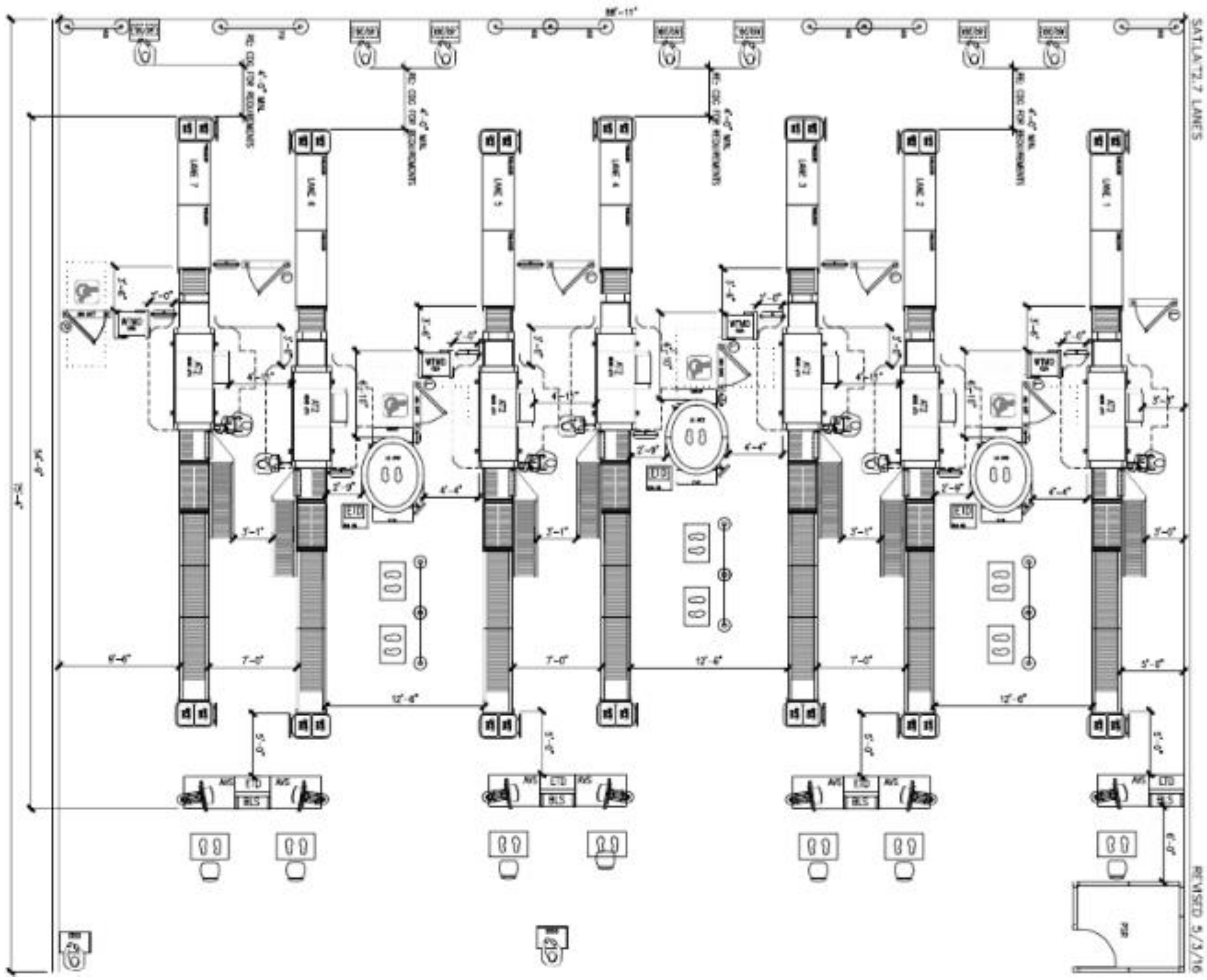

42'-10"
SAT.LA T2.3 LANES
REVISED 5/3/16
LANE 3
LANE 2
LANE 1
4'-0" MIN.
REF. CDG FOR REQUIREMENTS
WTMD
AT2
ETD
BLS
AVS
PSR
75'-4"
53'-9"
6'-11"
5'-1"
2'-9"
4'-4"
3'-3"
3'-0"
5'-0"
9'-6"
9'-0"
12'-6"
6'-0"

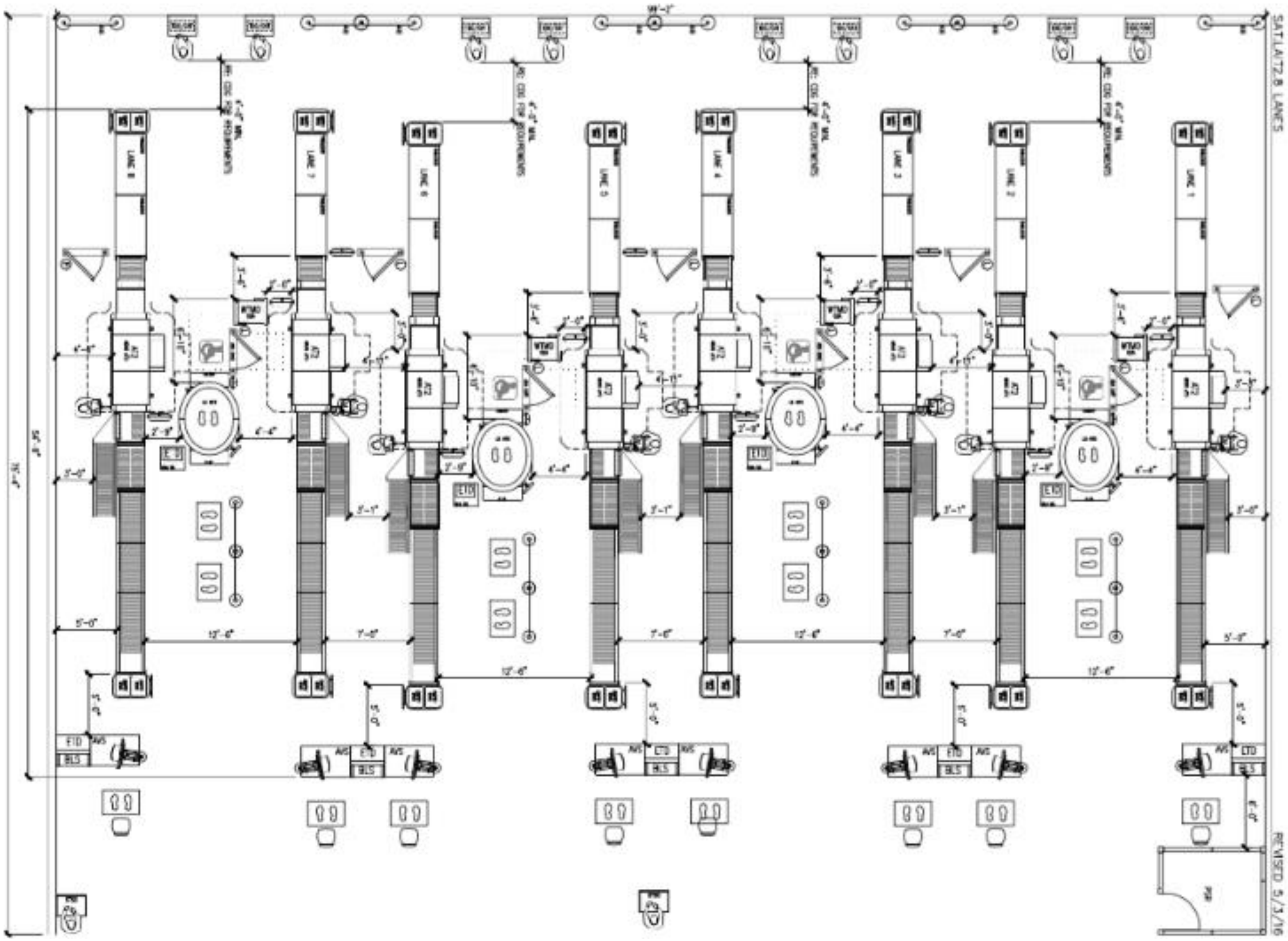


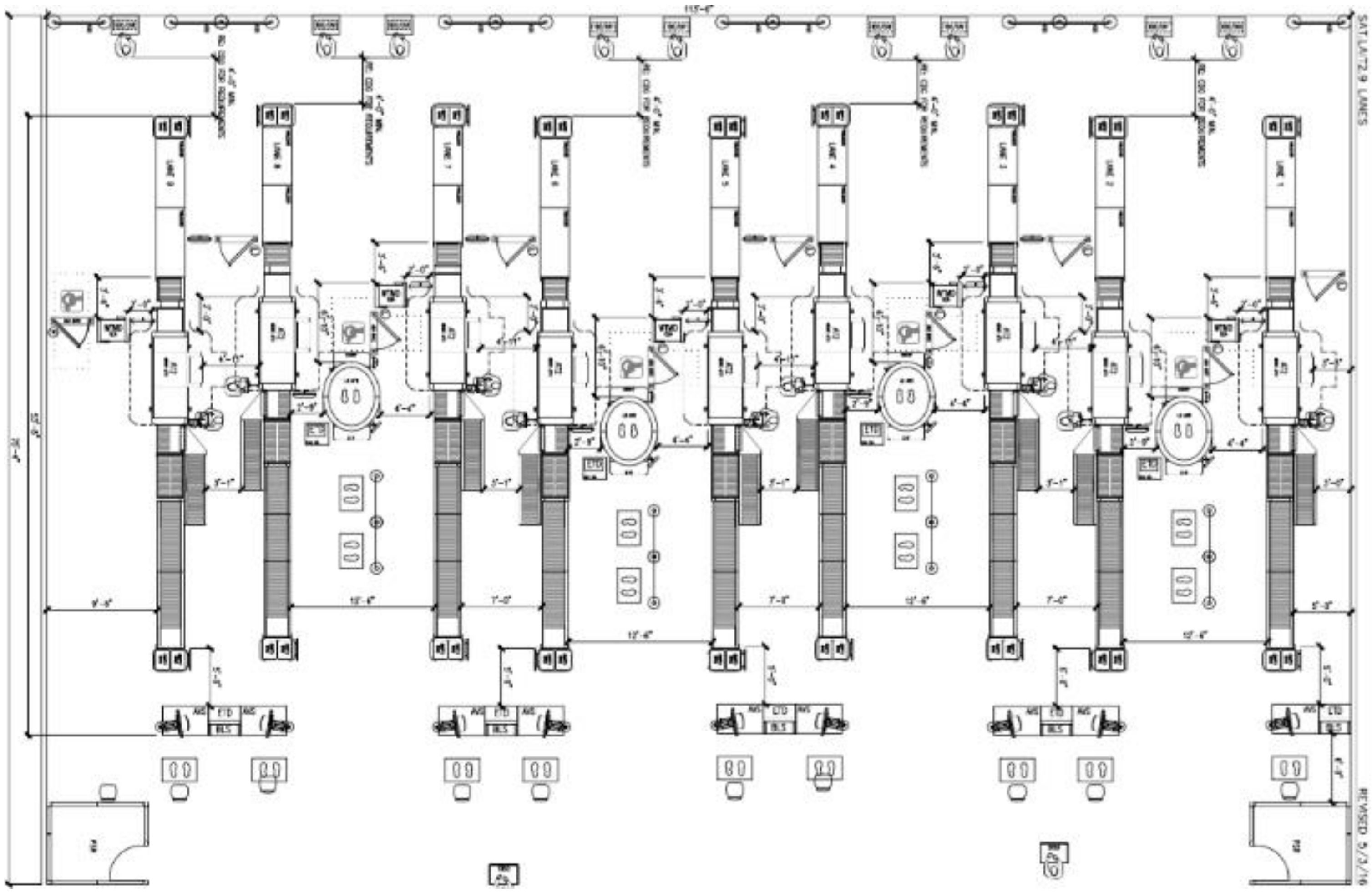
SAT.LA.T2.4 LANES
REVISED 5/3/16
51'-0"
75'-4"
54'-9"
LANE 4
LANE 3
LANE 2
LANE 1
WTMD
ETD
BLS
AVS
PSR
RE: CDG FOR REQUIREMENTS
4'-0" MIN.
12'-6"
7'-0"
5'-0"
6'-0"
4'-4"
2'-9"
3'-0"
4'-6"


64'-11"
SAT.LA.T2.5 LANES
REVISED 5/3/16
LANE 5
LANE 4
LANE 3
LANE 2
LANE 1
ETD
BLS
AVS
PSR


REVISED 5/3/16
ETD
AVS
BLS
12'-8"
7'-0"
5'-0"

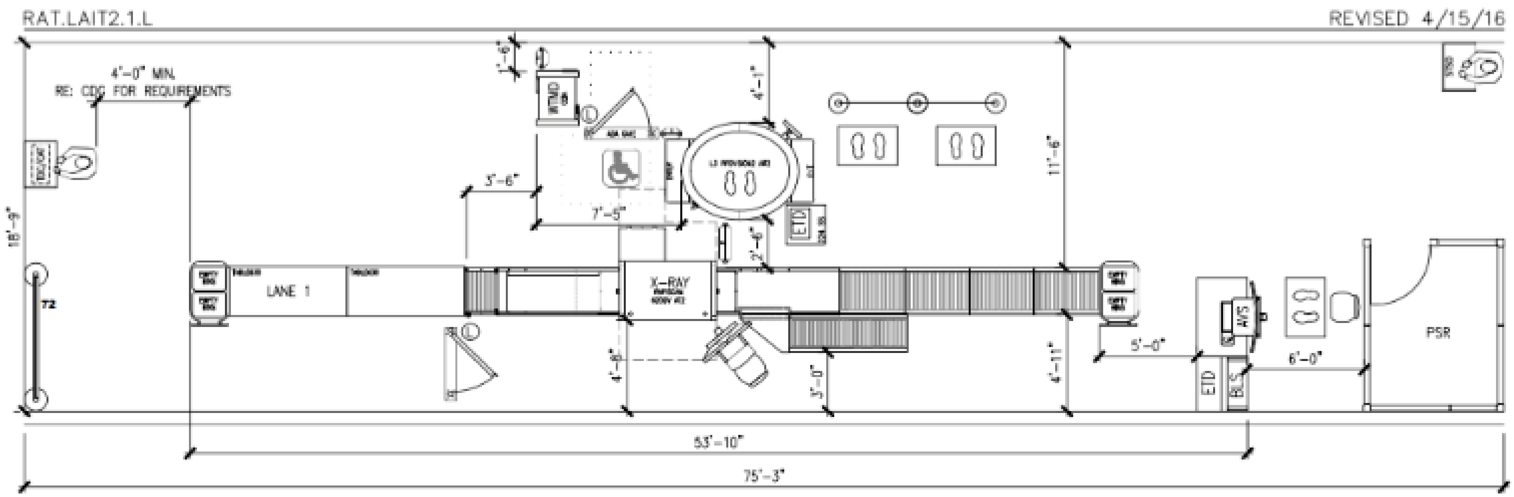

SAT-LA-T2, 7 LANES
REVISED 5/3/16

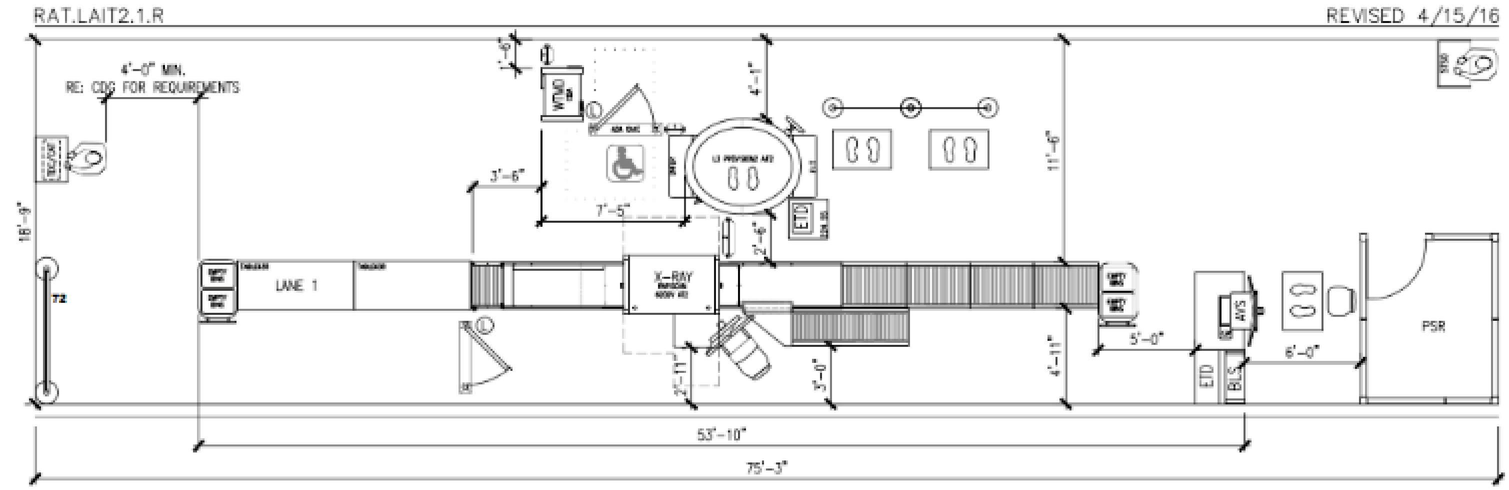

SAT LA/72.8 LANES
REVISED 5/3/16

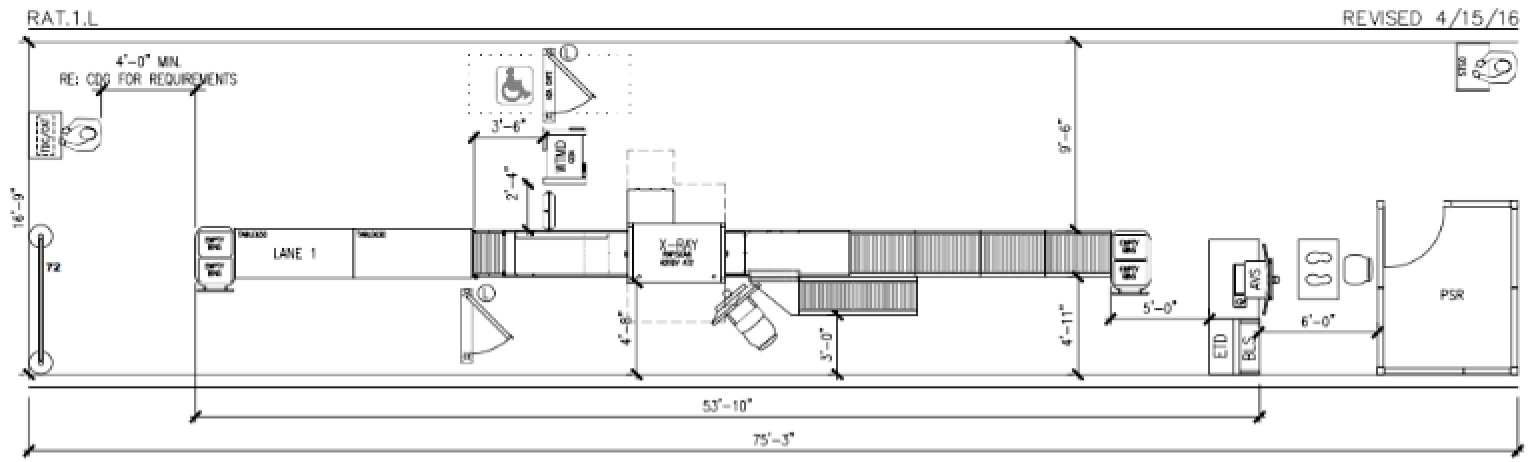


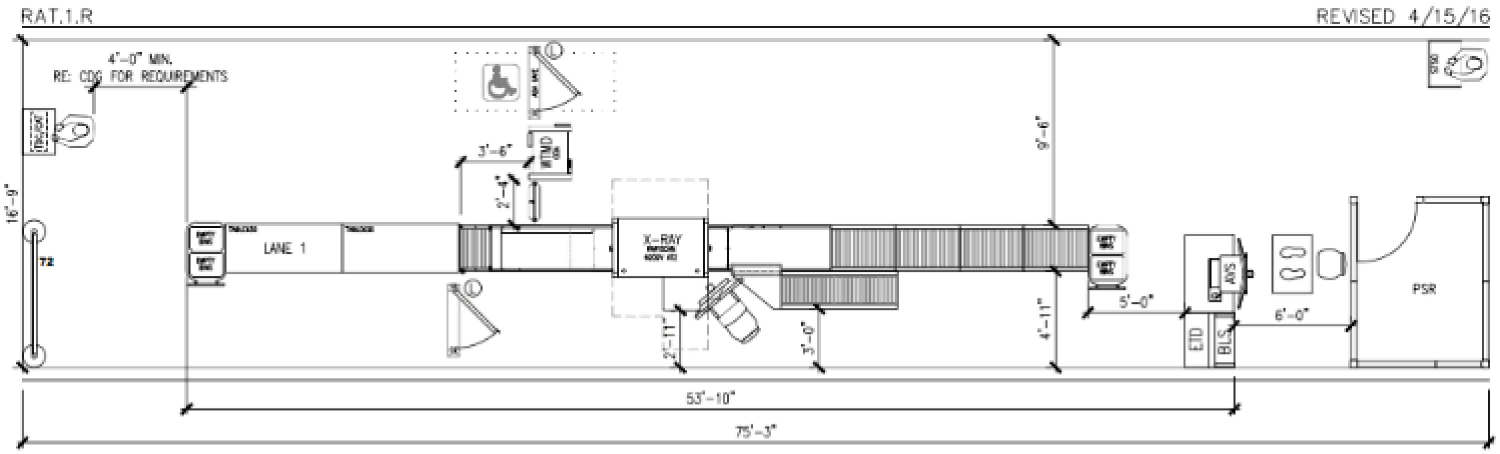

SAT-LA-T2-10 LANES
REVISED 5/3/16

4-2.2 RAPISCAN AT LAYOUTS

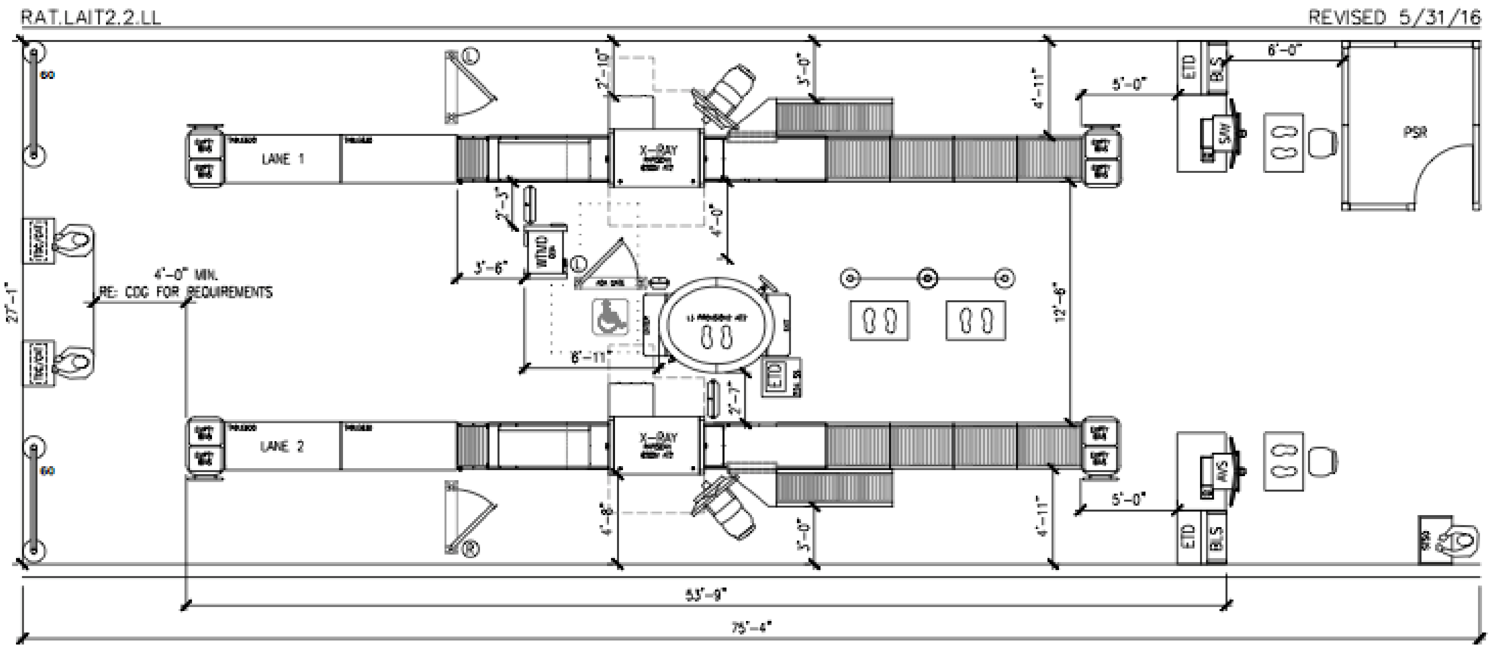


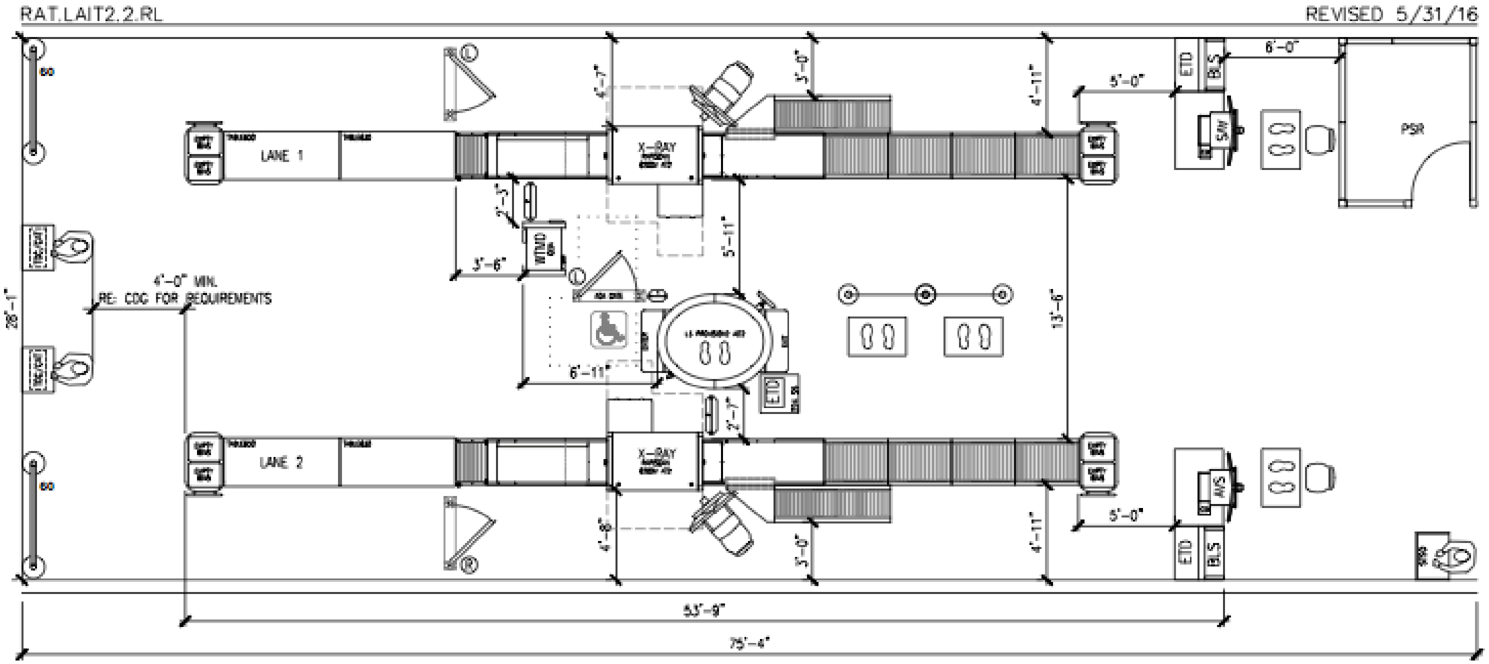

RAT.LAIT2.1.R
REVISED 4/15/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
LANE 1
X-RAY
ETD
AVS
PSR
BLS
3'-6"
7'-5"
4'-1"
11'-6"
2'-6"
18'-9"
2'-11"
3'-0"
4'-11"
5'-0"
6'-0"
53'-10"
75'-3"

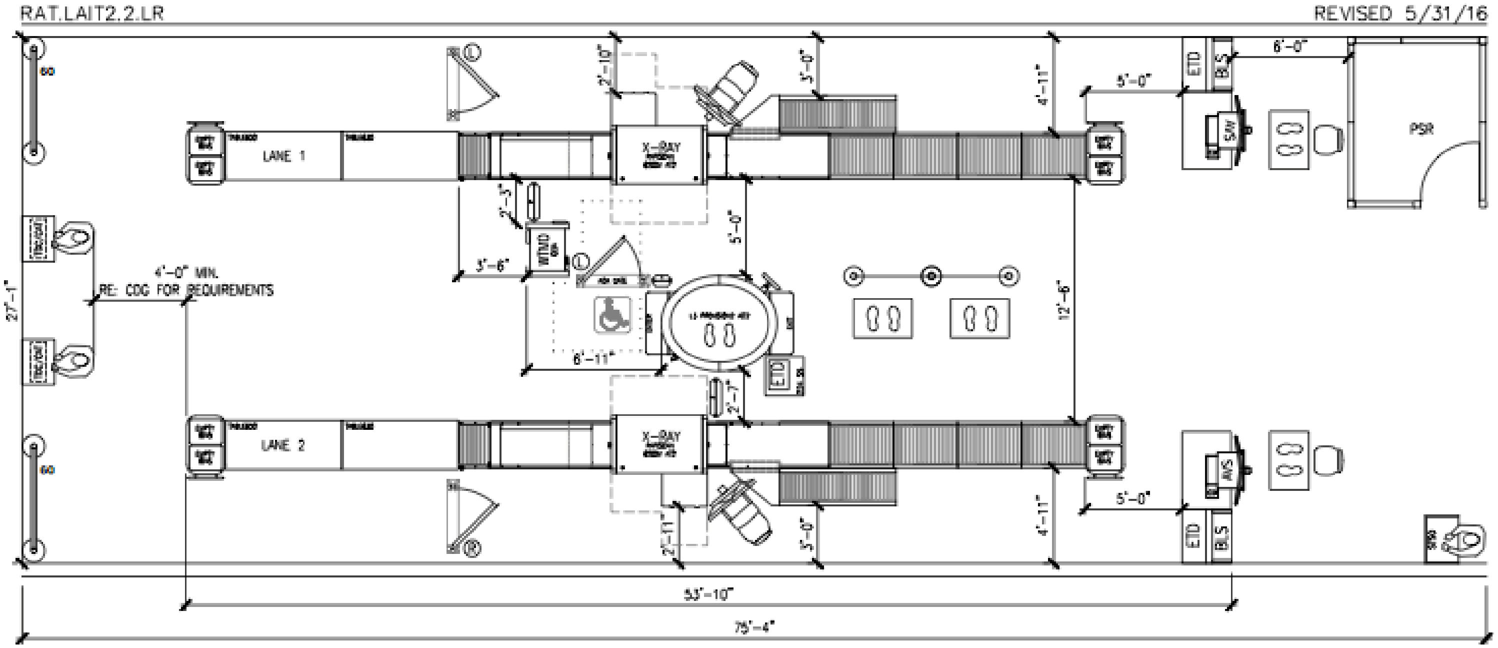

RAT.1.L
REVISED 4/15/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
3'-6"
2'-4"
9'-6"
16'-9"
LANE 1
X-RAY
PSR
AVS
ETD
BLS
5'-0"
6'-0"
4'-8"
3'-0"
4'-11"
53'-10"
75'-3"

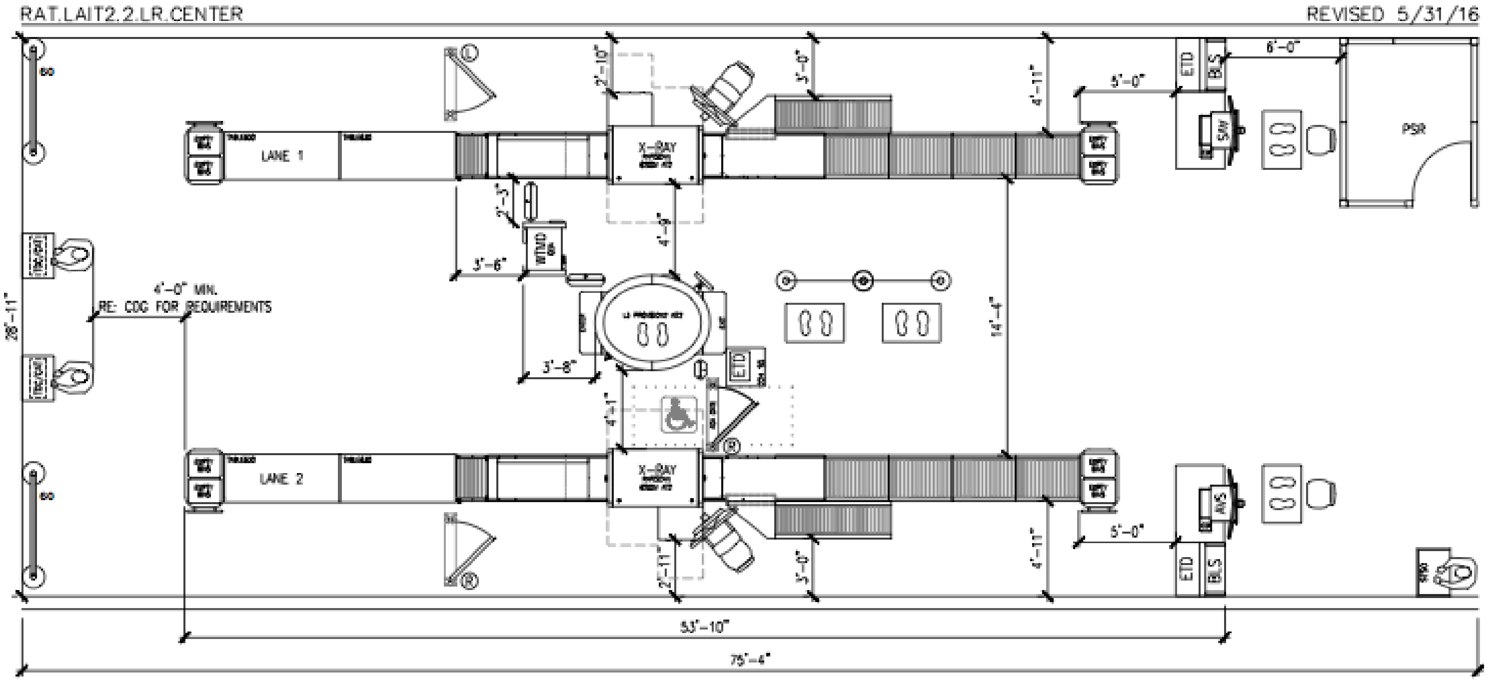


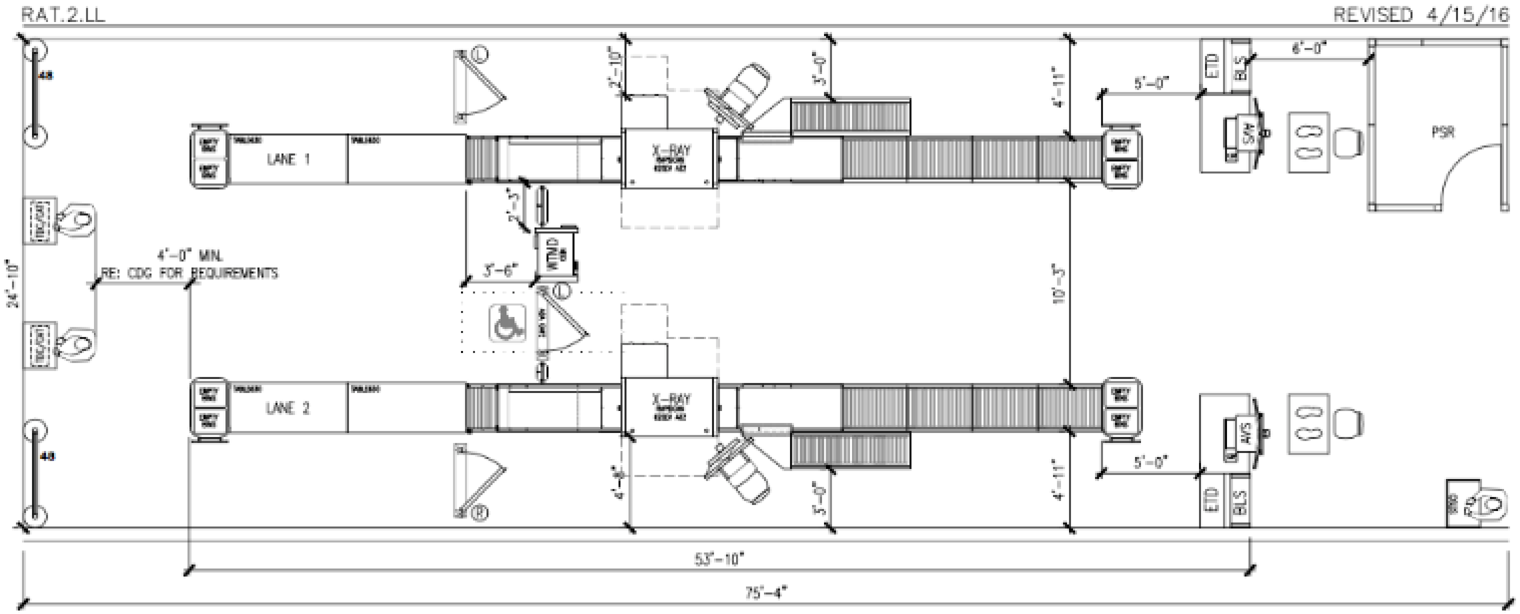
RAT.1.R
REVISED 4/15/16
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
3'-6"
2'-4"
9'-6"
16'-9"
T2
LANE 1
X-RAY
PSR
AVS
ETD
BLS
5'-0"
6'-0"
2'-11"
3'-0"
4'-11"
53'-10"
75'-3"

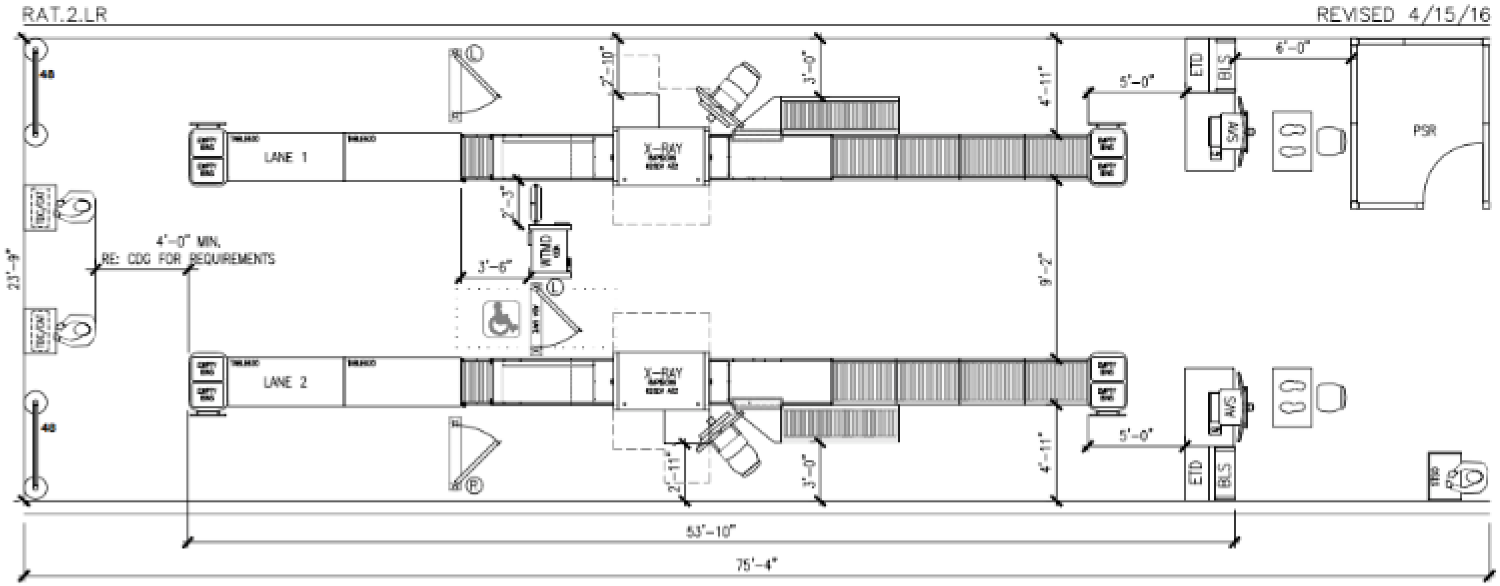

RAT.LAIT2.2.LL
REVISED 5/31/16
LANE 1
LANE 2
X-RAY
X-RAY
ETD
BLS
SAW
PSR
AWS
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
27'-1"
53'-9"
75'-4"
2'-10"
3'-0"
4'-11"
5'-0"
6'-0"
2'-3"
3'-6"
4'-0"
8'-11"
12'-6"
2'-7"
4'-8"
WTMD

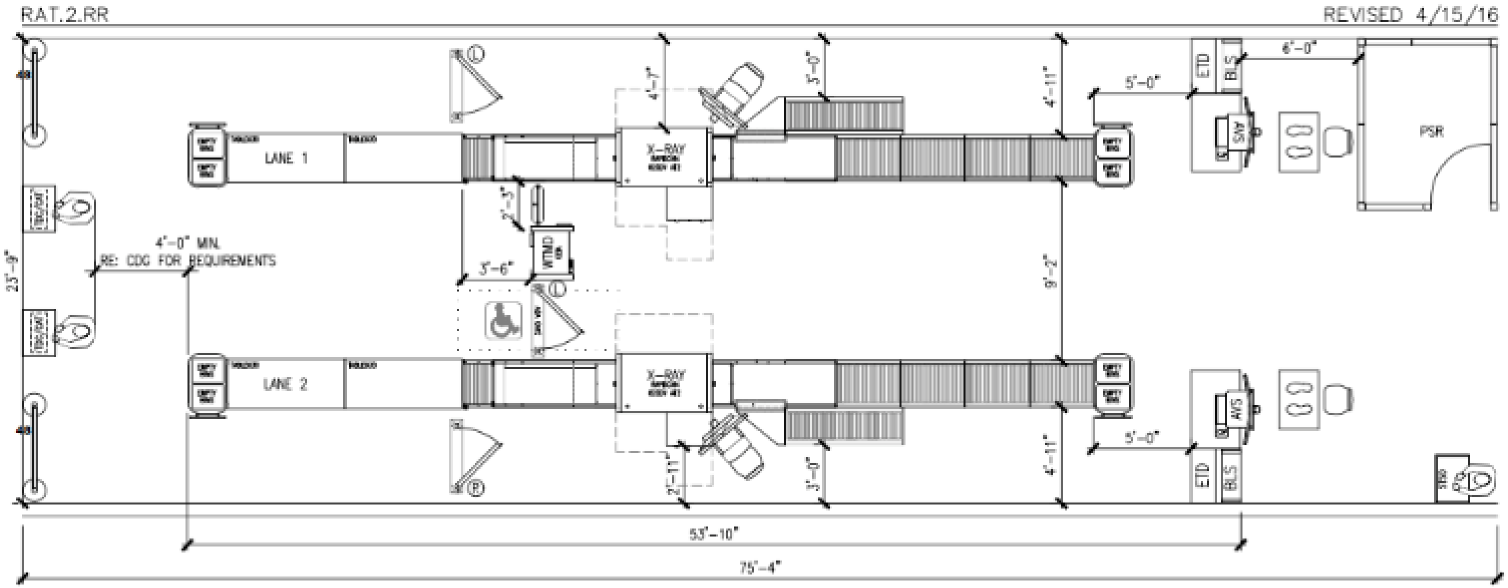

RAT.LAIT2.2.RL
REVISED 5/31/16
LANE 1
LANE 2
X-RAY
ETD
B/S
PSR
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
28'-1"
53'-9"
75'-4"
6'-0"
5'-0"
4'-7"
4'-8"
4'-11"
3'-6"
6'-11"
13'-6"
5'-11"

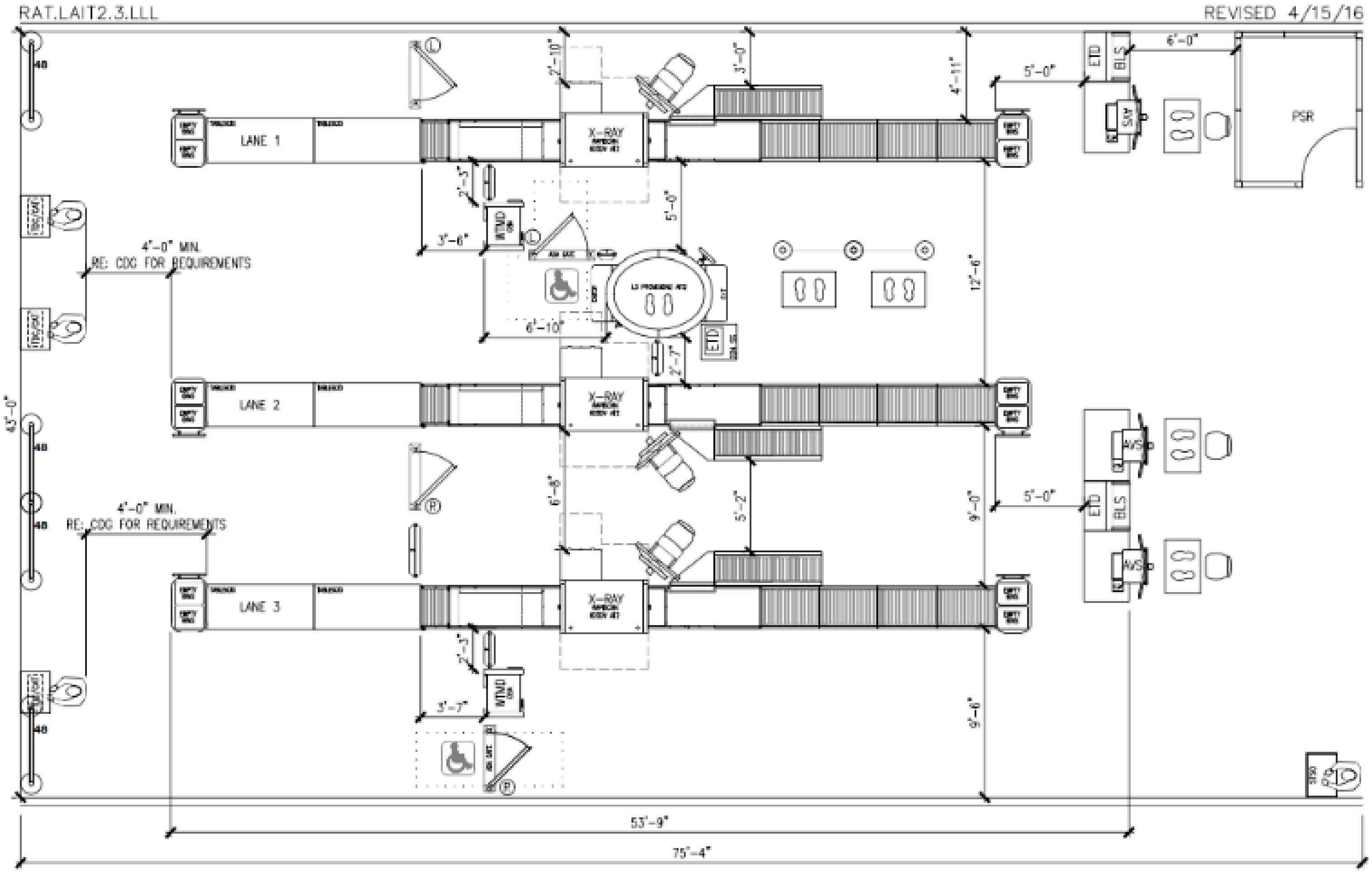

RAT.LAIT2.2.LR
REVISED 5/31/16
LANE 1
LANE 2
X-RAY
X-RAY
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
27'-1"
2'-10"
3'-0"
4'-11"
6'-0"
5'-0"
PSR
ETD
BLS
5'-0"
3'-6"
6'-11"
12'-6"
2'-7"
2'-11"
3'-0"
4'-11"
5'-0"
ETD
BLS
53'-10"
75'-4"


RAT.LAIT2.2.LR.CENTER
REVISED 5/31/16
LANE 1
LANE 2
X-RAY
X-RAY
ETD
BLS
ETD
BLS
AVS
AVS
PSR
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
28'-11"
2'-10"
5'-0"
4'-11"
5'-0"
6'-0"
2'-3"
3'-6"
4'-9"
3'-8"
4'-1"
14'-4"
2'-11"
5'-0"
4'-11"
5'-0"
53'-10"
75'-4"

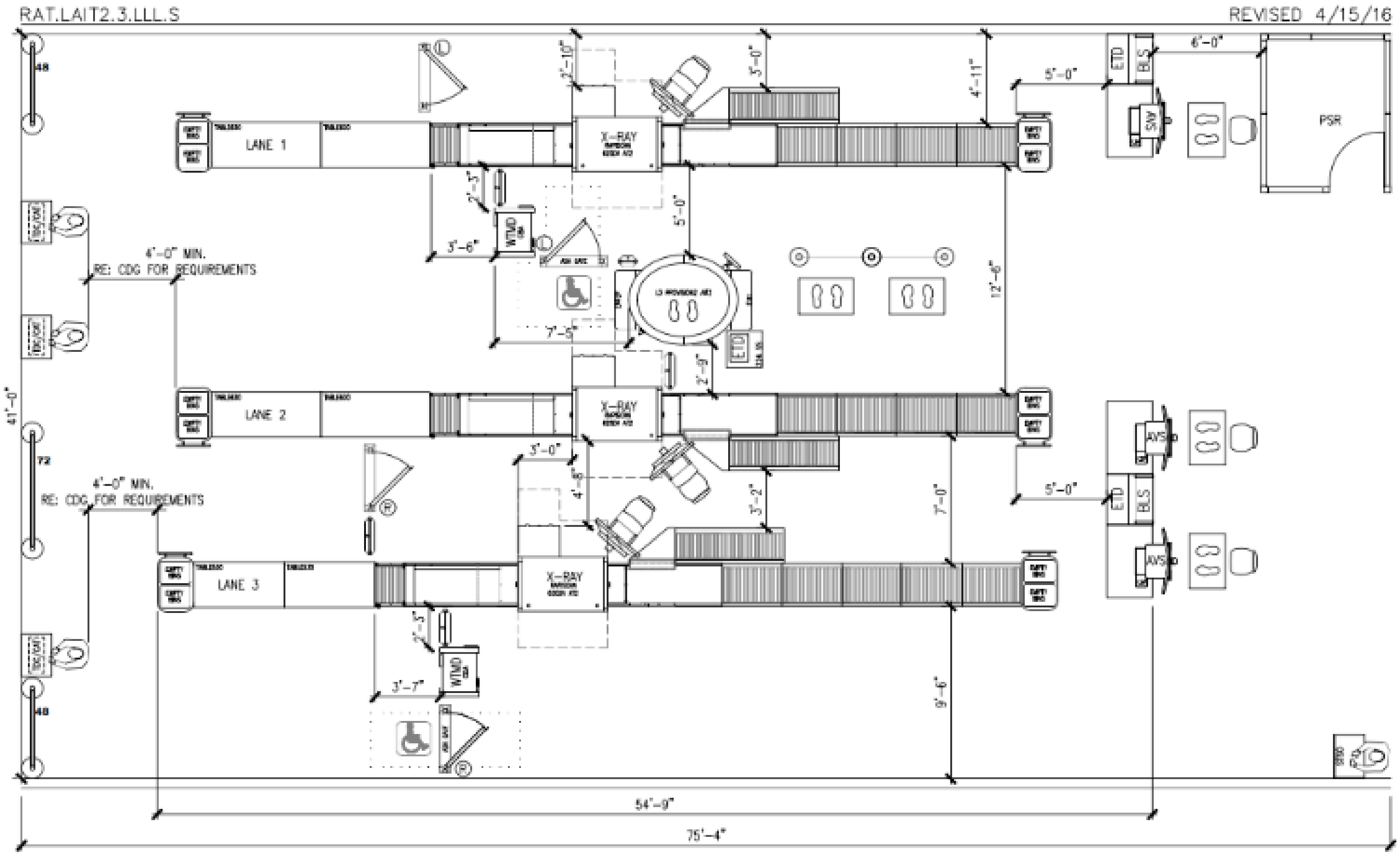

R.A.T.2.LL
REVISED 4/15/16
LANE 1
LANE 2
X-RAY
X-RAY
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
24'-10"
53'-10"
75'-4"
ETD
BLS
PSR
AVS
WTMD
6'-0"
5'-0"
5'-0"
2'-10"
3'-0"
4'-11"
10'-3"
3'-6"
2'-3"
4'-8"
3'-0"
4'-11"
48
48

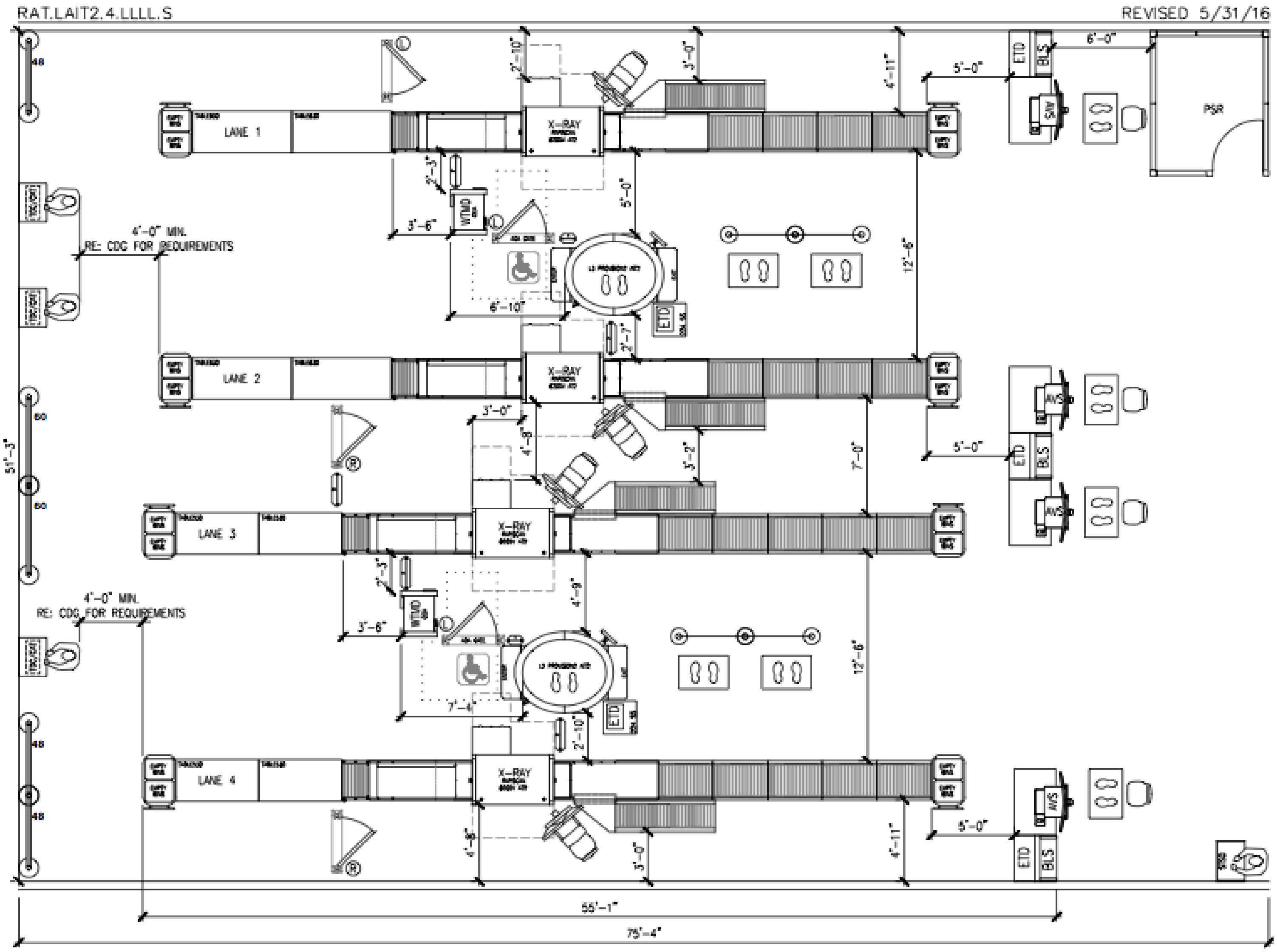

RAT.2.LR
REVISED 4/15/16
LANE 1
LANE 2
X-RAY
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
23'-9"
2'-10"
3'-0"
4'-11"
5'-0"
6'-0"
ETD
BLS
S/W
AWS
PSR
2'-3"
3'-6"
WTMD
9'-2"
2'-11"
53'-10"
75'-4"

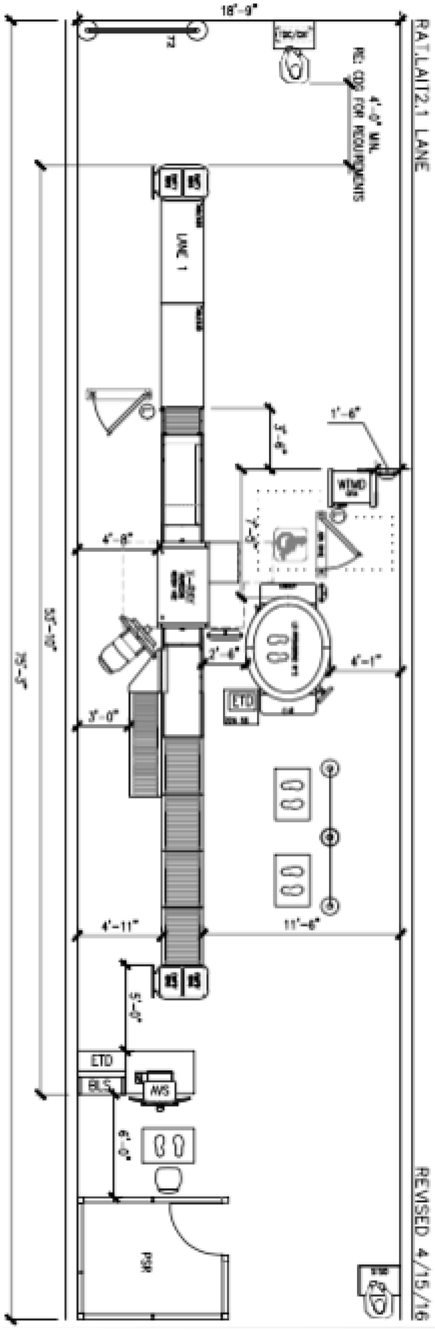

RAT.2.RR
REVISED 4/15/16
LANE 1
LANE 2
X-RAY
PSR
ETD
BLS
AVS
WTMD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
23'-9"
53'-10"
75'-4"
6'-0"
5'-0"
4'-11"
3'-0"
4'-7"
2'-3"
3'-6"
9'-2"
2'-11"

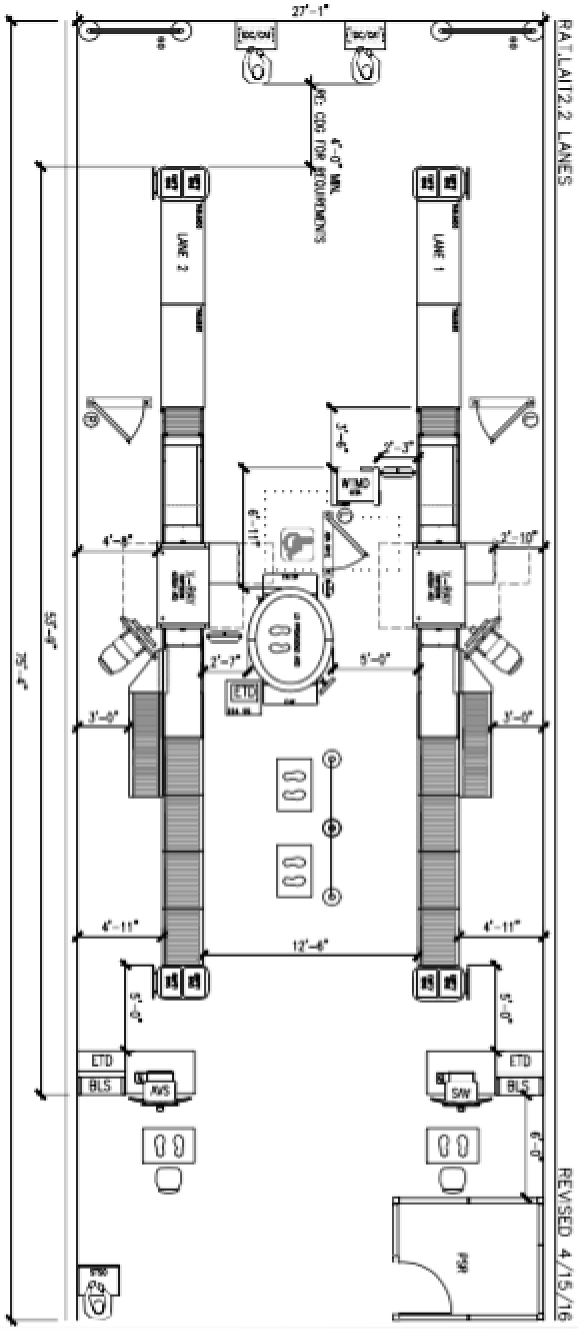


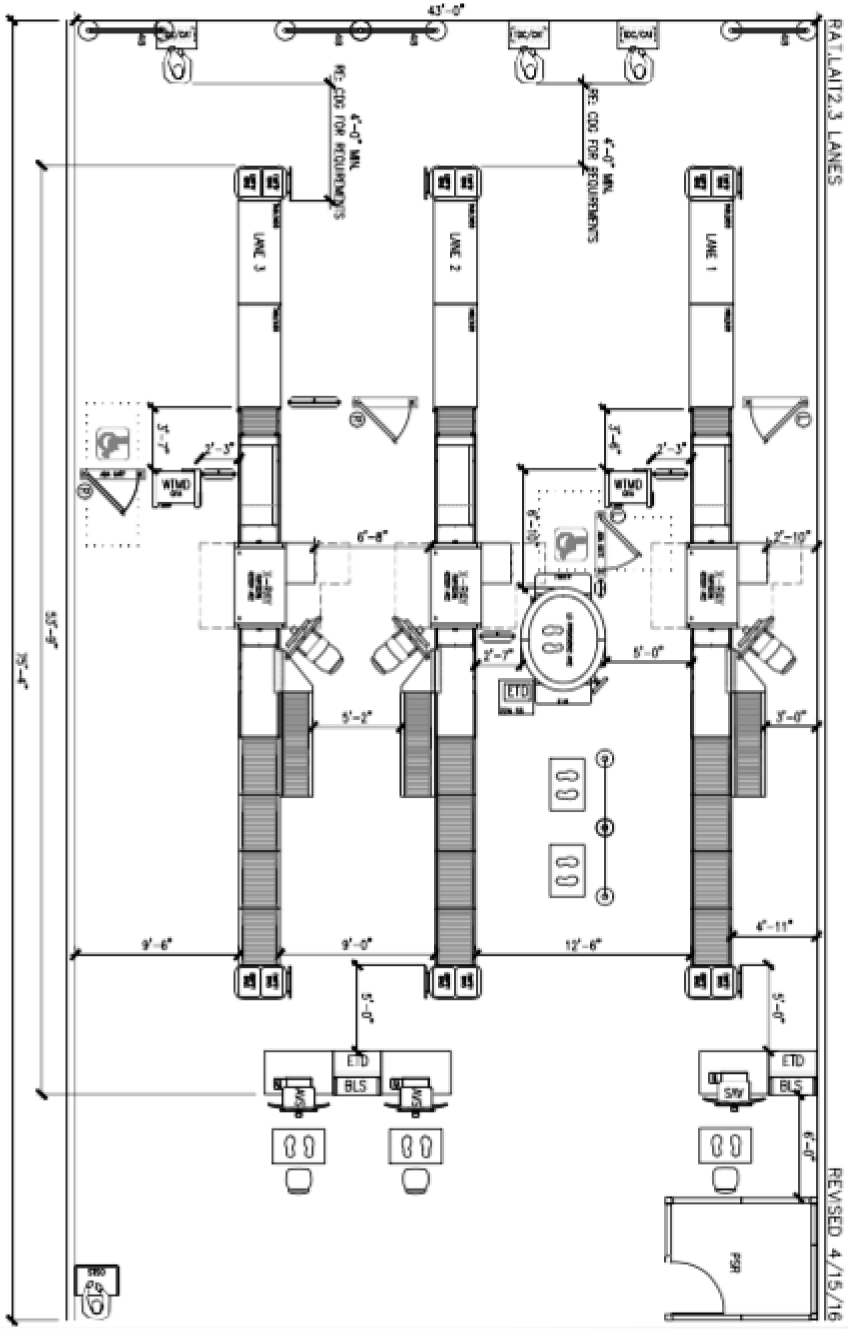
RAT.LAIT2.3.LLL
REVISED 4/15/16
LANE 1
LANE 2
LANE 3
X-RAY
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
PSR
ETD
BLS
AVS
WTMD
43'-0"
53'-9"
75'-4"
6'-0"
5'-0"
2'-10"
3'-0"
4'-11"
2'-3"
3'-6"
5'-0"
12'-6"
6'-10"
2'-7"
6'-8"
5'-2"
9'-0"
3'-7"
9'-6"

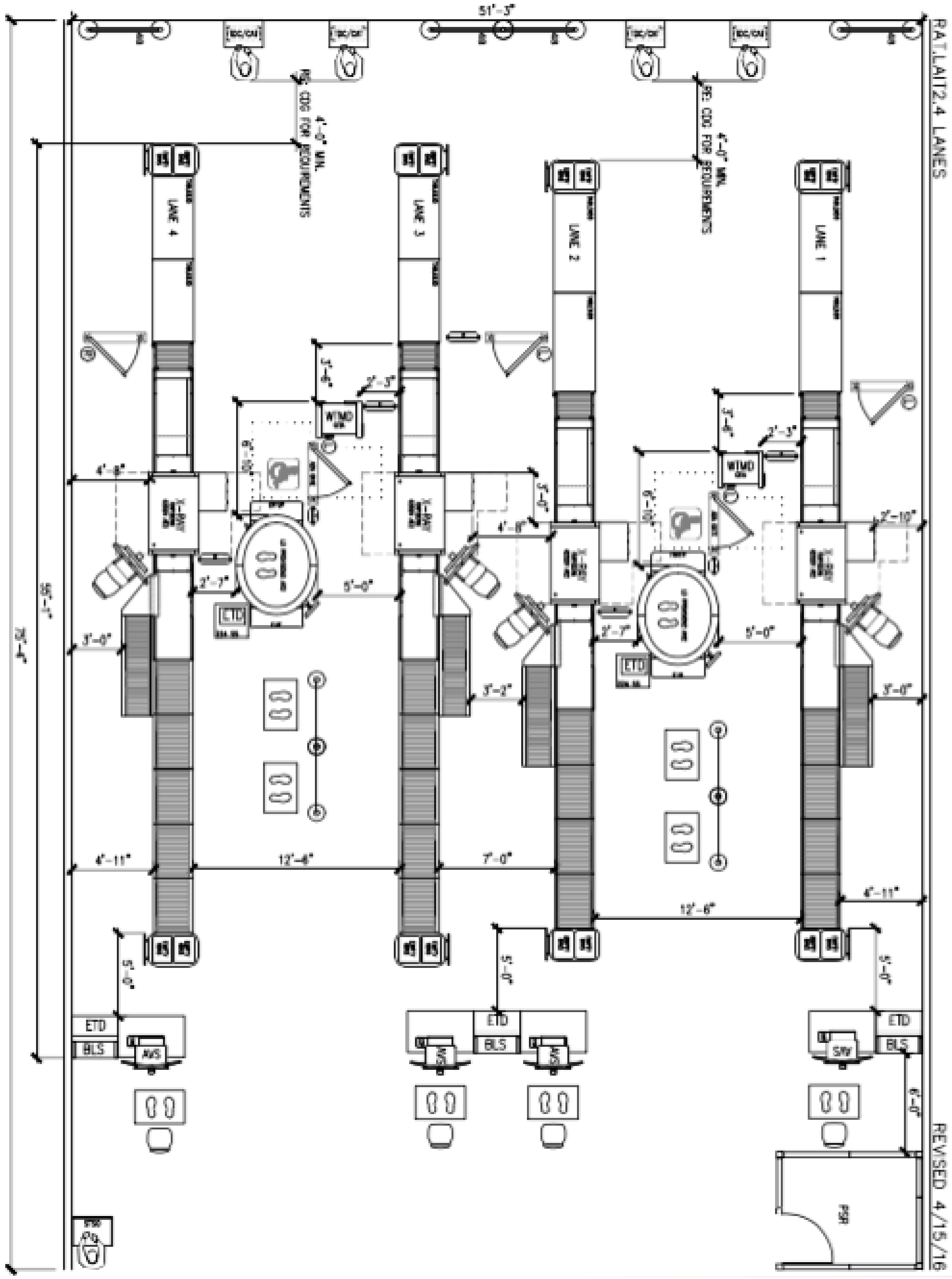

RAT.LAIT2.3.LLL.S
REVISED 4/15/16
LANE 1
LANE 2
LANE 3
X-RAY
X-RAY
X-RAY
WTMD
WTMD
ETD
BLS
SNV
PSR
ETD
BLS
AVS
AVS
ETD
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
4'-0" MIN.
RE: CDG FOR REQUIREMENTS
48
72
48
2'-10"
5'-0"
4'-11"
6'-0"
5'-0"
2'-3"
3'-6"
5'-0"
7'-5"
12'-6"
2'-9"
3'-0"
4'-8"
3'-2"
7'-0"
5'-0"
2'-3"
3'-7"
9'-6"
41'-0"
54'-9"
75'-4"

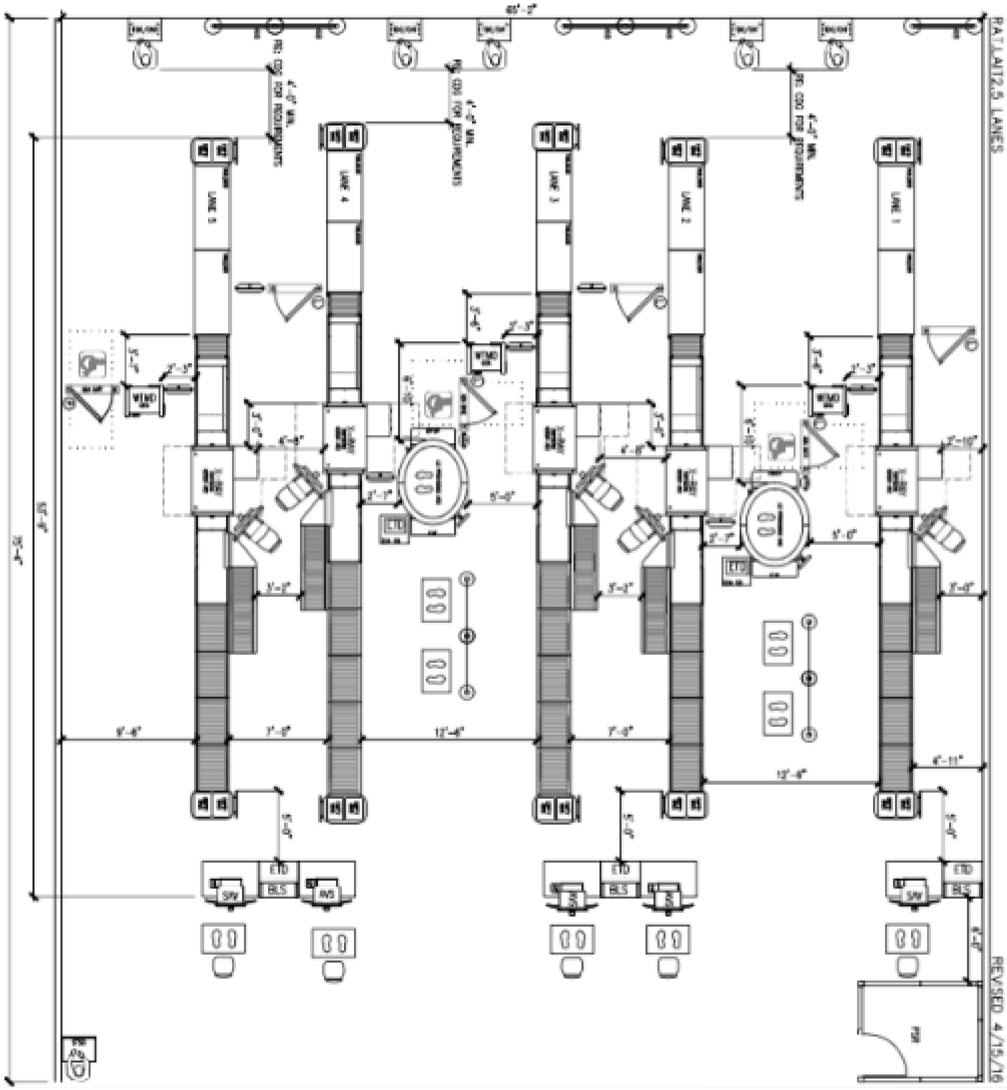

RAT.LAIT2.4.LLLL.S
REVISED 5/31/16
LANE 1
LANE 2
LANE 3
LANE 4
X-RAY
WTMD
ETD
BLS
AVS
PSR
4'-0" MIN.
RE: CDC FOR REQUIREMENTS
2'-10"
3'-0"
4'-11"
5'-0"
6'-0"
2'-3"
3'-6"
6'-10"
12'-6"
2'-7"
3'-0"
4'-8"
3'-2"
7'-0"
4'-9"
7'-4"
2'-10"
51'-3"
55'-1"
75'-4"

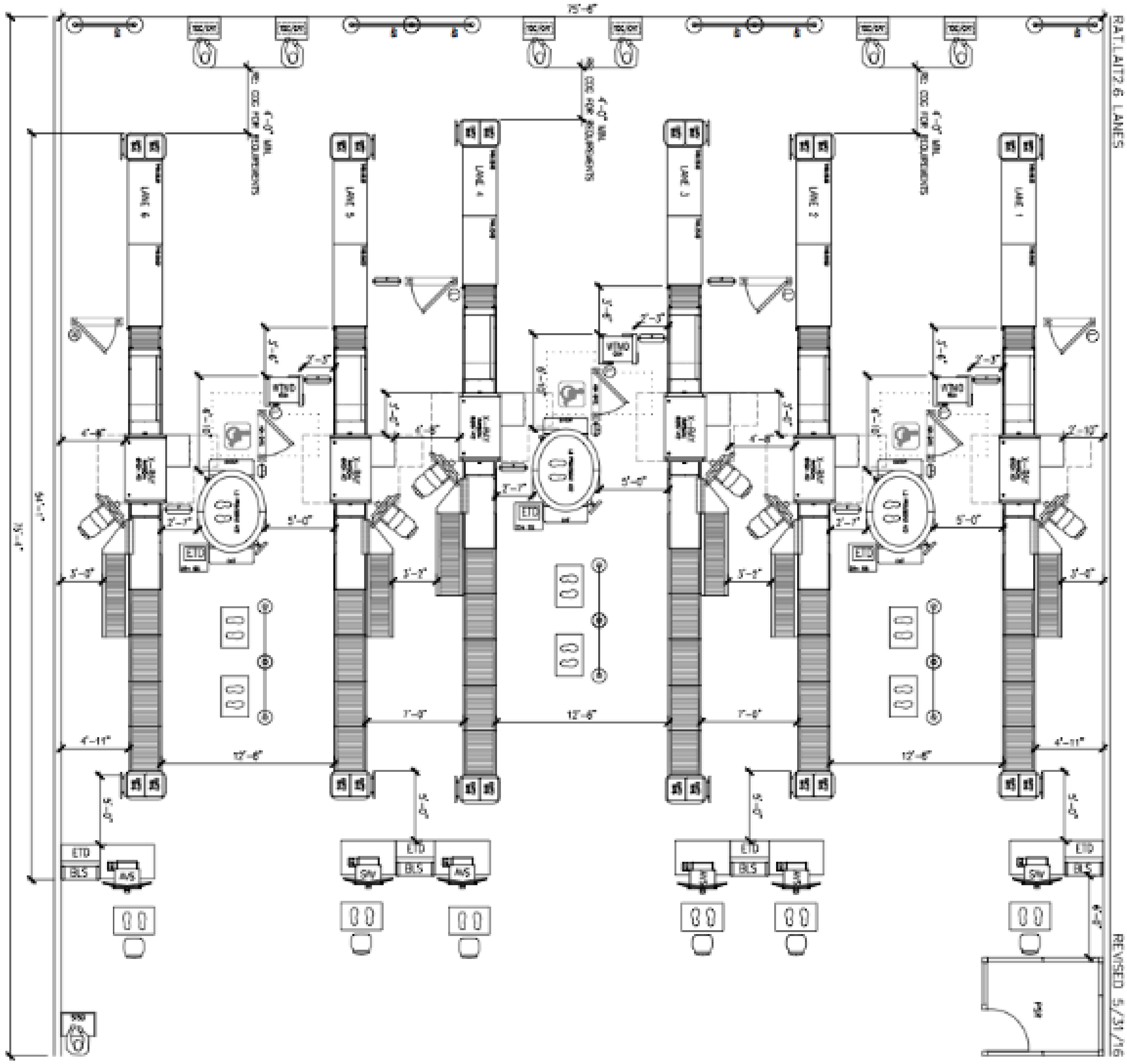

RAT.LAIT2.1 LANE
REVISED 4/15/16
18'-9"
ETD
BLS
AWS
PSR
WTMD
LANE 1
4'-0" MIN.
1'-6"
3'-6"
4'-8"
2'-6"
4'-1"
3'-0"
4'-11"
11'-6"
5'-0"
6'-0"

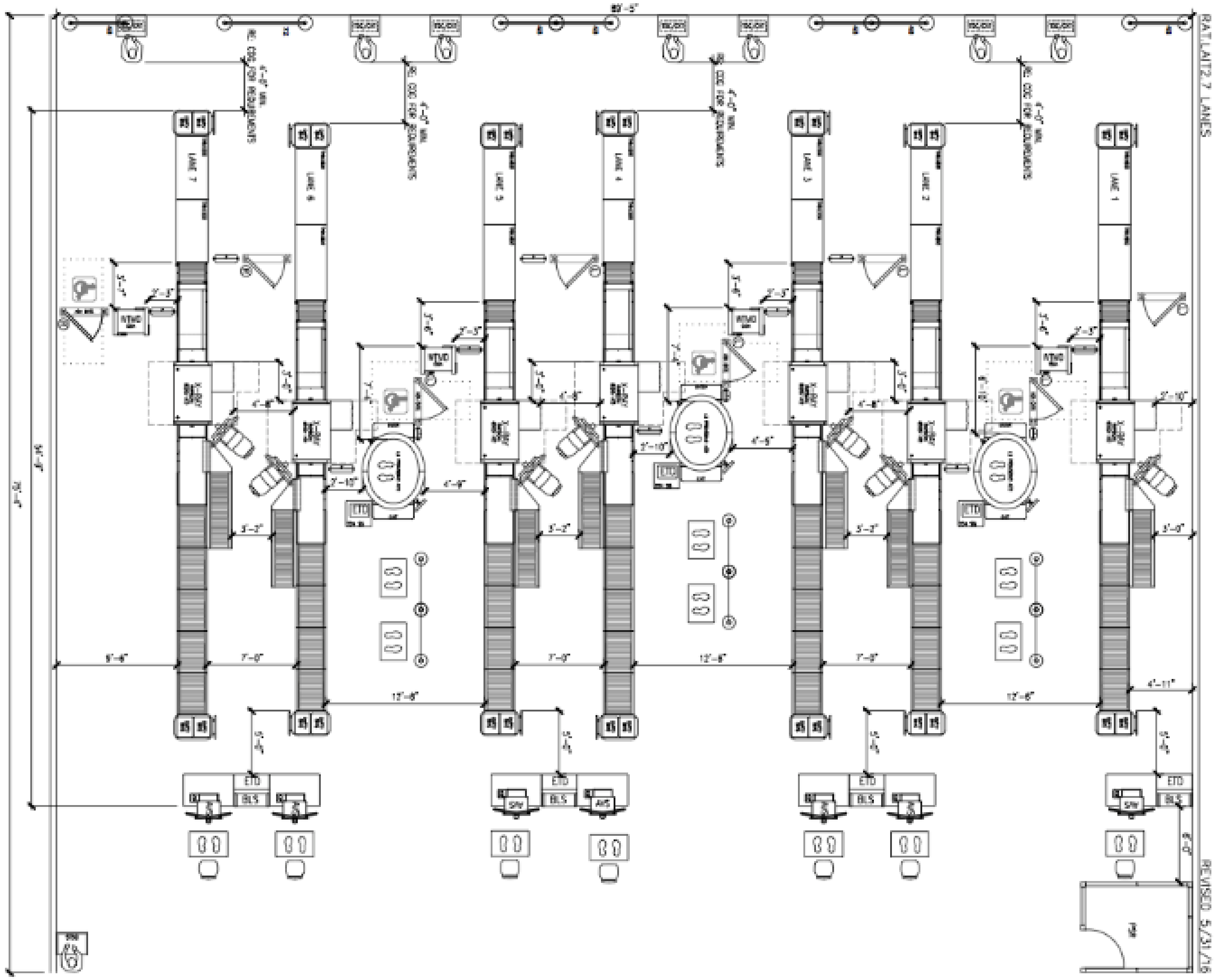

27'-1"
RAT.LAIT2.2 LANES
LANE 2
LANE 1
4'-8"
3'-10"
2'-7"
5'-0"
3'-0"
3'-0"
ETD
4'-11"
4'-11"
12'-6"
5'-0"
5'-0"
ETD
BLS
ETD
BLS
6'-0"
PSR
REVISED 4/15/16

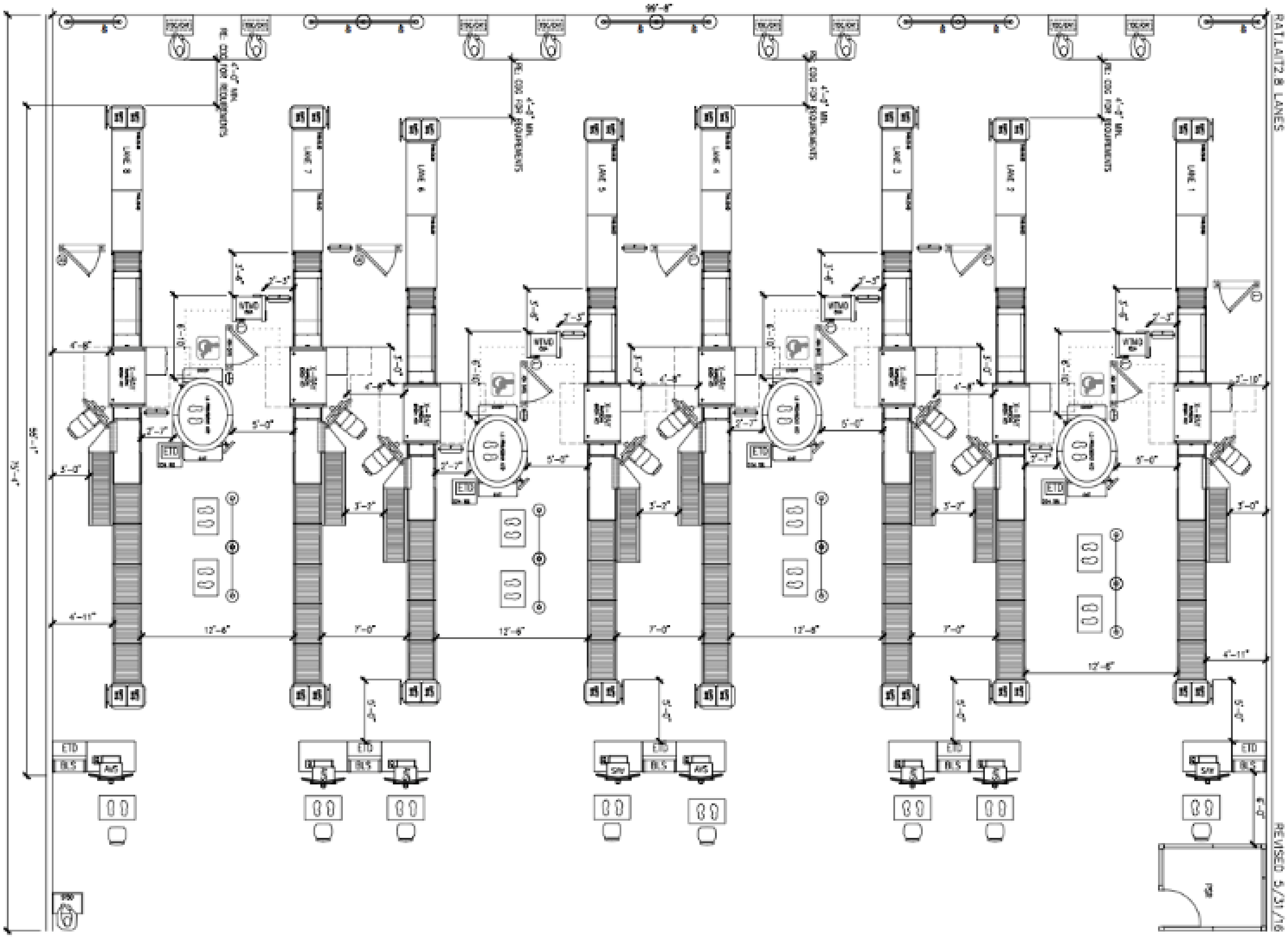

43'-0"
RAT LAIT2.3 LANES
LANE 3
LANE 2
LANE 1
WTMD
ETD
BLS
PSR
REVISED 4/15/16

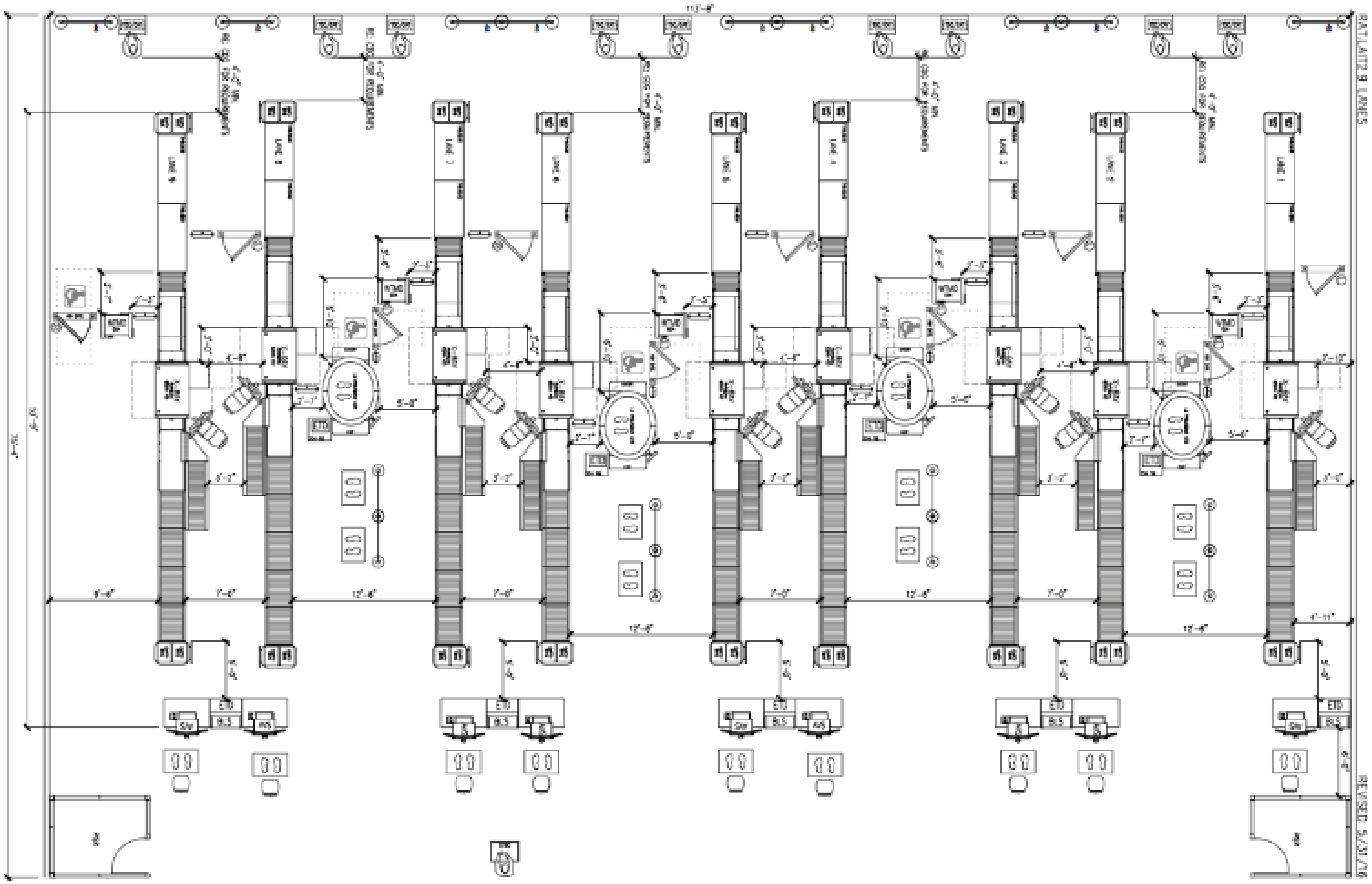

51'-3"
RAT.LAIT2.4 LANES
LANE 4
LANE 3
LANE 2
LANE 1
X-RAY
WTMD
ETD
BLS
AVS
PSR
REVISED 4/15/16

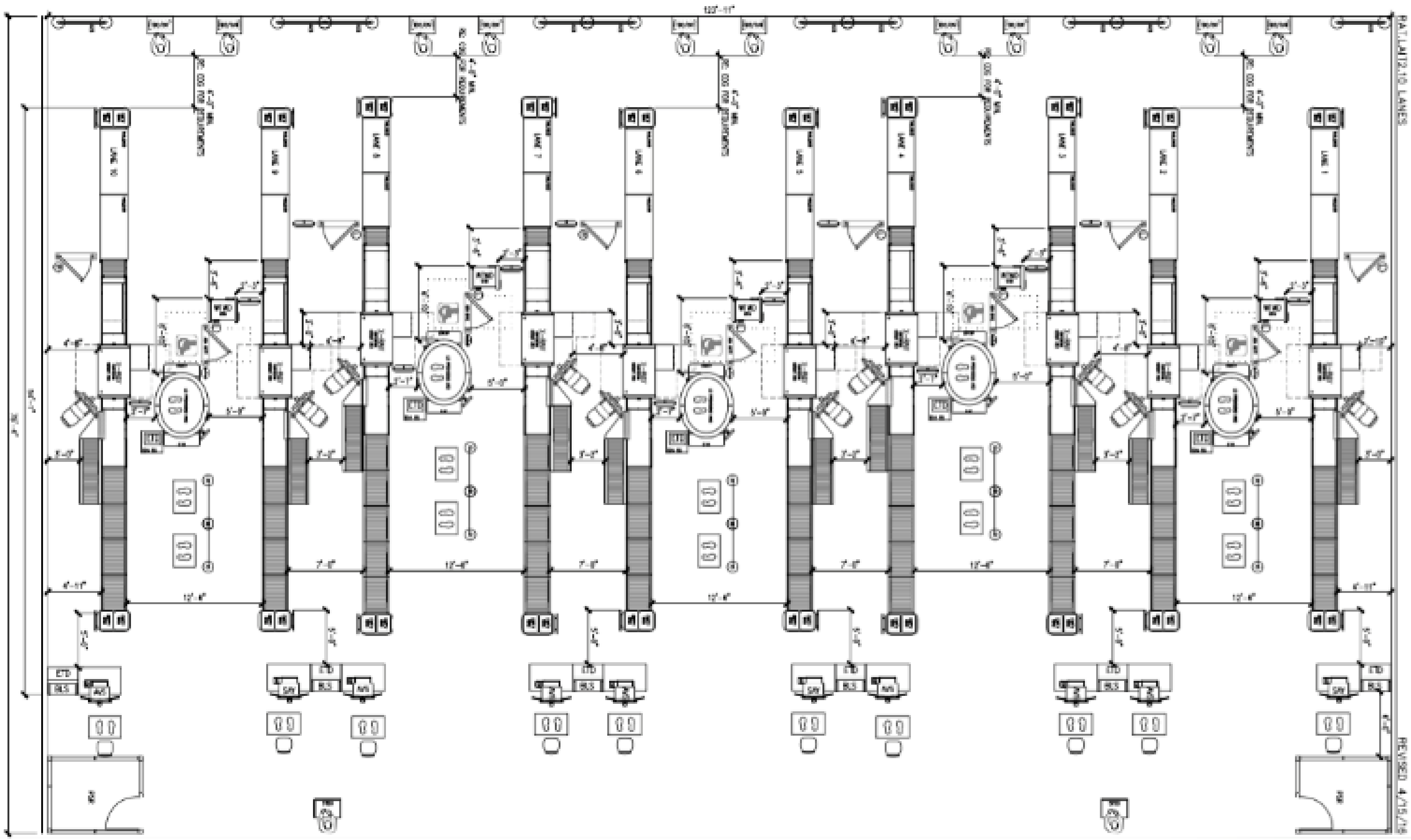

RAT LAIT2.5 LANES
REVISED 4/15/16


75'-6"
RAT.LAIT2.6 LANES
REVISED 5/31/16
ETD
BLS
12'-6"
7'-0"


REVISED 5/31/16
ETD
BLS
SPW
AVS
WTMD


99'-8"
RAT/LAIT2 8 LANES
REVISED 5/31/16
LANE 8
LANE 7
LANE 6
LANE 5
LANE 4
LANE 3
LANE 2
LANE 1
ETD
BLS
AVS
12'-6"
7'-0"
5'-0"
4'-11"





4-3 STRUCTURAL CONSIDERATIONS

Project General Requirements: The project shall be designed and constructed to support all approved TSA designated equipment and building's dead / live loads and be built in accordance with the local building codes and other recognized national standards. The following are items to be considered when designing the support floor:

- Raised floors are permitted, but should meet all design requirements.
- When a raised floor is being used a concrete pad under the WTMD **shall** be provided. The recommended size of the concrete pad is 10'x10' by 5" in depth.
- Minimize vibrations from floors or equipment below Checkpoint and around the equipment. Contact equipment manufacture for further information.
- Consideration should be given to electrical interference from conduit, reinforcement, etc. on TSA equipment.
- Floor protection is to be provided when equipment is being moved or relocated.

The following is a list of weights and sizes for some of the potential TSA equipment in **Figure 4-3.1**

Figure 4-3.1 WEIGHTS AND DIMENSIONS

System[3]	Main Body Dimensions[1] L (In)	W (In)	H (In)	Bumpout Dimensions[2] L (In)	W (In)	Footprint Area (sf)	Weight (Lbs)	Added Loads (Lbs)
L3 Provision ATD[4]	104.38	76.68	104.92			32.3	1800	200[4]
L3 Provision-2[4]	90.85	59.13	93			23	1500	200[4]
Rapiscan 620DV	59.21	35.83		20.47	27.87	18.7	2094	365[5]
Smith 6040 aTix	96.7	37.4				25.1	3528	352[5]
L3 Comm ACX 6.4 - MV[6]	82.94	33.87				19.4	2260	220[5]

[1] Main Body Dimensions are the dimensions of the equipment that contribute to distributing the weight of the machine to the floor.

[2] The AT X-ray Bumpout Dimensions included only if bumpout extends all the way to the floor and contributes to distributing the weight of the machine to the floor

[3] Structural support shall include support during transportation at the final installation at the checkpoint.

[4] Main Body dimension/Footprint Area estimated to be circular based on width of the AIT and manufacturer literature. Does not include passenger entrance / exit ramp. Add Load assumes a 200 lb person inside AIT.

[5] Added load is the maximum baggage weight that can be placed on conveyor.

[6] Weight of this unit is base on the standard conveyor option (see product literature).

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4-4 SSCP TERMINOLOGY

Acronym	Definition
1-D	One Dimensional
1-to-1	1AT for 1 WTMD and 1 AT for 1 AIT
2-D	Two Dimensional
2-to-1	2 AT for 1 WTMD 2 AT for 1 AIT
2 to 2	2 AT for 2 AIT
3-d	Three Dimensional
A	Amps
A&E	Architectural & Engineering
ABC	Alarm Bag Cutout
ADA	Americans with Disabilities Act
AFF	Above Finished Floor
AFSD	Assistant Federal Security Director
AHJ	Authority Having Jurisdiction
AIT	Advanced Imaging Technology
ANSI	American National Standards Institute
ARW	Alarm Resolution Workstation
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
ASP	Advanced Surveillance Program
AT	Advanced Technology X-Ray
AT	Second Deployment of AT; includes AVS
ATR	Automatic Target Recognition
AVS	Alternate Viewing Station
BLS	Bottle Liquids Scanner
BRS	Bin Return System
BVS	Baggage Viewing Station
CAT	Credential Authentication Technology
CAT5/Cat5e/Cat6	Category 5 data cable / Category 5e data cable / Category 6 data cable
CBIS	Checked Baggage Inspection System
CCTV	Closed Circuit Television
CDG	Checkpoint Design Guide
CL	Centerline
DOT	Department of Transportation
DHS	Department of Homeland Security
EDS	Explosive Detection System
EMD	Enhanced Metal Detector
eTAS	Electronic Time, Attendance, and Scheduling
ETD	Explosive Trace Detection
Fc	Foot-candles; unit of luminance or light intensity
FDRS	Field Data Recording System
FIS	Federal Inspection Service

Acronym	Acronym
FRM	Field Regional Manager
FSD	Federal Security Director
FY	Fiscal Year
Hi-SOC	High Speed Operational Connectivity
HSC	High Speed Conveyor
HVAC	Heating, Ventilation and Air Conditioning
IDF	Intermediate Distribution Frame
IEEE	Institute of Electrical & Electronics Engineers
IESNA	Illuminating Engineering Society of North America
IMAC	Install, Move, Add, or Change
IO	Image Operator
IT	Information Technology
LAGs	Liquids, Aerosols, & Gels
LAN	Local Area Network
LCU	Lane Control Unit for the L3 ProVision AIT
LEO	Law Enforcement Officer
LH	Left Hand
MAX	Maximum
MCB	Main Circuit Breaker
MDF	Main Distribution Frame
MDR	Manual Diverter Roller
MIN	Minimum
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
O&D	Origin and Destination
OEM	Original Equipment Manufacturer
OIT	Office of Information Technology
OOB	Out of Band
OSC	Office of Security Capabilities
OSHA	Occupational Safety & Health Administration
OSHE	Occupational Safety, Health, & Environment
PAX	Passengers
POC	Point of Contact
POE	Power Over Ethernet
POR	Program of Requirements
psf	Pounds per Square Foot
PSP	Passenger Screening Program
PSR	Private Screening Room
PWD	Passengers with Disabilities
RDM	Regional Deployment Manager
ReMAG	Requirements Management Advisory Group

Acronym	Definition
RF	Radio Frequency
RGS	Rigid Galvanized Steel
RH	Right Hand
S3	6'W x 8'L x 8'H KI glass room with 3' door on short side. Used for Private Screening Room.
S3-A	8'W x 6'L x 8'H KI glass room with 3' door on long side. Used for Private Screening Room.
SF	Square Foot
SMF	Subject Matter Expert
SO	Scanning Operator
SOW	Scope of Work
SSCP	Security Screening Checkpoint
SSI	Security Sensitive Information
STIP	Security Technology Integrated Program
STSO	Supervisory Transportation Security Officer
TCOP	Touch Control Operator Panel
TIP	Threat Image Projection
TDC	Travel Document Checker
TLC	TSA Logistics Center
TRX	TIP-Ready X-Ray
TSA	Transportation Security Administration
TSA HQ	Transportation Security Administration - Headquarters
TSAPreCheck	Transportation Security Administration PreCheck
TSE	Transportation Security Equipment
TSO	Transportation Security Officer
UPS	Uninterruptible Power Supply
UTP	Unshielded Twisted Pair
V	Volts
VIPR	Visible Intermodal Prevention & Response
WAP	Wireless Access Point
WTMD	Walk Through Metal Detector

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