

DESIGN REPORT

FOR

GATE A23/25 – A31 STERILE CORRIDOR RENOVATION
IT1111

AT

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY
RONALD REAGAN WASHINGTON NATIONAL AIRPORT

Prepared By:

PGAL
201 NORTH UNION STREET, SUITE 500
ALEXANDRIA, VA 22314

703/836-0588

PGAL

In Association with:

Big Sky, Incorporated
WFT Engineering, Inc.

August 31, 2011
100% Submission



DESIGN REPORT

FOR

GATE A23/25 – A31 STERILE CORRIDOR RENOVATION
IT1111

AT

METROPOLITAN WASHINGTON AIRPORTS AUTHORITY
RONALD REAGAN WASHINGTON NATIONAL AIRPORT

Prepared By:

PGAL
201 NORTH UNION STREET, SUITE 500
ALEXANDRIA, VA 22314

703/836-0588

PGAL

In Association with:

Big Sky, Incorporated
WFT Engineering, Inc.

August 31, 2011
100% Submission

TABLE OF CONTENTS

1.0 Project Description..... 2

2.0 Contractor Staging and General Requirements 3

3.0 Architecture 3

4.0 Fire Protection 6

5.0 Mechanical Systems 6

6.0 Electrical Systems 6

7.0 Communications Systems 7

8.0 Security Systems 8

9.0 Multi-User Flight Information Display (MUFID), Public Information System..... 9

10.0 Virtual Multi-User Systems Environment (VMUSE) 10

11.0 Appendices 11

Appendix A – Exhibits 12

Exhibit A.1 – Project Plan Overview 13

1.0 Project Description

- 1.1 Program: The project goal is to reestablish the original sterile corridor configuration to enable Gates A23/25 to A31 to securely transfer arriving international passengers from the aircraft to the existing mobile lounge dock No. 4; where they can be transported to the International Arrivals Building; Customs Border Patrol facility at the Main Terminal.
- 1.2 Background: The original sterile corridor serving Gates A23/25 to A31 was constructed with the original Midfield Terminal facility in the mid to late 1990's. In 2001/2002 the sterile corridor function was removed to make way for the expansion of the existing mobile lounge dock facility (MLD) No. 4 and the installation of public access stairs and escalators to serve passenger traffic to and from the Main Terminal during the construction of the pedestrian tunnel at the previous Main Terminal mobile lounge dock facility. (Concourse floor elevation to MLD floor elevation difference is 6'-9') After the completion of the train system the expanded MLD No. 4 was no longer used for transporting passengers to and from the Main Terminal. The Authority established a project to convert MLD No. 4 back to a sterile corridor serving Gates A23/25 to A31.

Re-constructing the sterile corridor serving Gates A23/25 to A31, back to its original configuration required the removal of the escalator and stair circulation core which was now intruding on the original sterile corridor alignment. A "switchback" and stair configuration designed to permit the original sterile corridor alignment would be installed to replace the escalator/stair configuration. Due to budgetary constraints it was then decided to defer the escalator/stair reconfiguration to a future project, and move the sterile corridor wall south of the escalators. The escalators would both become a downward operating escalator; serving the one-way traffic from the western part of the sterile corridor (arriving passengers from A31) and one-way traffic from the eastern part of the sterile corridor (arriving passengers from A23/25).

1.3 Project Scope – General Description:

- 1) Remove portions of existing interior glazed partition (storefront).
- 2) Remove existing low glazed railing system (Patch and repair floor).
- 3) Remove terrazzo flooring in MLD No. 4 Concourse Level circulation area. Install Authority-furnished carpet tiles to return circulation space to holdroom for A31 (A27)
- 4) Relocate existing boarding podium.
- 5) Relocate/modify existing aluminum and glass door pair and glazing system.
- 6) Install new interior glazed partition (storefront) from column line 24 west, tying into far west holdroom wall.
- 7) Install new all-glass door pairs to facilitate the A31 boarding process and egress (near existing escalators).
- 8) Install relocated/modified portion of glazed railing system (handrail) to "guide" passengers near escalator balustrade as shown.

- 9) Install new hollow metal door pair and partition to close off alcove area adjacent (west) of elevators.
 - 10) Relocate Gate A31 LED sign to new boarding door location.
 - 11) Provide power, data, telecom to relocated sign, new podium position, new/relocated storefront door, electronic hardware/security devices and for an additional Gate Podium at A31 (Authority provided podiums; Contractor installed).
 - 12) Relocate lights and sprinkler heads. Modify existing air diffuser.
- 1.4 Construction Procurement: The project is to be procured through the Authority's Task Order Construction process. Construction drawings and specifications are to be delivered to the Authority in one package.
- 1.5 Exit Egress: Building area is not being changed. There will be no change in occupancy. Travel distances would remain the same from occupied remote areas. Alarmed egress passage doors will be provided in the re-established sterile corridor wall to provide for the second means of egress from the existing MLD No. 4 area.

2.0 Contractor Staging and General Requirements

- 2.1 Temporary Protection: The project will include the erection of interior temporary partitions to isolate the construction from the operational areas of the existing Concourse A facility. (See GN series drawings.) Seven foot height partitions will be installed around the work area with a polyethylene sheet extending from the top of the wall secured to the ceiling areas for dust control.
- 2.2 Phasing: The Authority has requested that this work be expedited, therefore Gate A31 can be closed for the duration of the project. Temporary walls and delivery of large construction elements will be restricted to 10:30 PM to 5:30 AM.

3.0 Architecture

- 3.1 Demolition: Major components to be demolished include:
- A. Portions of the existing sterile corridor storefront system will be removed to accommodate the new corridor configuration.
 - B. Existing terrazzo MLD No. 4 circulation corridor from MLD to main concourse circulation is to be removed and replaced with Authority-furnished carpet.
 - C. Existing glass guardrail segregating MLD No. 4 circulation corridor from adjacent holdroom seating areas is to be removed. (floor connection areas to be patched)

- D. Portions of the existing metal slat ceiling system will require removal to accommodate the new storefront system.
- 3.2 Aluminum Framed Storefront: It is our understanding, based on information derived from other recent Authority projects, that the existing interior aluminum framed storefront extrusions are no longer made. The proposed sterile corridor wall storefront system framing members will be a combination of standard manufacturer mullion configurations with an added fin extrusion to mimic the existing storefront profiles as best as possible, without having to incur the prohibitive costs and procurement schedule associated with custom extrusions.
- A. Two new pairs of all-glass entrance doors will be utilized in the storefront plane (parallel to the concourse facility) will match the existing system and hardware components.
- B. One existing aluminum framed and glass door pair will be relocated and one matching new aluminum framed and glass door pair will be installed in storefront perpendicular to the main east-west sterile corridor. This is to provide intermediate isolation of the sterile corridor to allow simultaneous international arriving “sterile” passengers and “non-sterile” departing passengers. Hardware systems will match existing components.
- C. Formed aluminum (“break-metal”) closure pieces will be used to provide transition from the storefront system to the existing wall configurations and other existing building elements.
- D. Storefront will utilize matching 13mm (9/16”) thick glass panels with a horizontal ½” wide structural glazed sealant to match the existing wall systems.
- E. Because the storefront moves south to accommodate the existing escalators, the existing sloped metal perforated slat ceiling system will need to be modified (trimmed) to accommodate the 16’-4” high storefront wall system.
- 3.3 Flooring:
- A. Carpet: Authority-furnished carpet tiles will be installed at the removed terrazzo floor area to provide a contiguous holdroom between Gates A31 and A27; returning to the original configuration of the Concourse facility. Carpet tile patching will be installed where existing floor surface penetrations occur after relocation of the existing A31 aluminum/glass door pairs and boarding podium.
- B. Terrazzo: A new 3/8” epoxy terrazzo accent floor strip will be introduced at the north face of the relocated storefront wall to replace the portions of removed carpet tile and existing terrazzo and to provide a uniform flooring material and appearance on the sterile (north) side of the wall. Appropriately located zinc divider strips will be located in the terrazzo field: 1/8” interior and 1/4” at the terrazzo to carpet transition. Existing terrazzo flooring will need to be patched under removed floor-mounted elements like the glass guardrail and existing storefront system.
- 3.4 Ceilings:

- A. The existing sloped perforated metal slat holdroom area ceiling will be trimmed at the high end of the slope to accommodate the new storefront wall location. New preformed aluminum trim pieces to be added to “finish” trimmed metal panels.
- B. Existing acoustical panels will be trimmed to accommodate new storefront heads. New aluminum trim will be installed to “capture” trimmed panels and support grid.
- C. A gypsum board bulkhead will be constructed at the removed storefront to facilitate proper transition of the two existing dissimilar ceiling panel/tile systems.

3.5 Wall Surfaces:

- A. A new painted gypsum board and metal stud wall and hollow metal door pair will be installed at the existing niche west of the elevators. The proposed closure of the existing niche is to eliminate security camera “blind spots” (keep passengers from lingering there) and will provide the Authority with optional (i.e., wheelchair) storage if required.
- B. The main east-west elevation new sterile corridor storefront system terminates at the west wall of the A31 holdroom. The existing holdroom wall is finished with the original polyurethane coated wood/mdf panel system. A section of the panels will be removed wide enough to allow the installation of blocking to facilitate the new storefront end wall support. The “trimmed” ends of the existing will be refastened to the wall and will be hidden behind the storefront end mullion.
- C. Other endwall conditions of the proposed storefront configuration will engage existing exterior mullions or existing column enclosures with the formed aluminum enclosure components. No modifications to other existing wall finishes.

3.6 Other Elements:

- A. Millwork:
 - 1) Existing Gate A31 Boarding Podium will be relocated adjacent to new door pair in new storefront.
 - 2) Authority-furnished “standard” two-agent Gate Podium and Backdrop will be installed adjacent to the existing millwork at Gate A31
- B. Glass Guardrail: A portion of the existing glass guardrail system will be salvaged and installed adjacent to the east escalator to help “guide” the passengers around the end of the escalator. Additional custom stainless steel endcaps will be installed at the base and rail.
- C. Mullion Repair: Formed aluminum plates with matching coating will be fabricated and installed at the existing hardware cut-outs at the existing A31 door head and at the power/data penetrations where the existing A31 sign is removed.
- D. Electronic door hardware is to match existing hardware aesthetically and functionally.

4.0 Fire Protection

- 4.1 General: The existing Concourse A building is an International Building Code classified construction type IIB with full automatic sprinkler protection wet-pipe system.
- 4.2 Description: The fire protection scope of work for this project will include the relocation of two sprinkler heads presently located in conflict with the new corridor door locations, and two new head locations to cover the opposite side of the door from the relocated heads. The Engineer-of-Record has reviewed the associated articles in the NFPA that deal with storefront/curtain wall installations and finds no basis for needing to provide a sprinklered curtain for the glass wall. The design assumes that there is sufficient water/pressure in the main and branch for the addition of two new heads.
- 4.3 The design includes installation of “flexible fire sprinkler connections” that allows the existing sprinkler main/branch piping taps to be reused and limits the number of new taps to only one per storefront conflict. The alternate (higher cost and longer implementation time) will require that the sprinkler main/branch piping work include cutting four new taps and capping two existing taps. The flexible fire sprinkler connection design has been preliminarily reviewed and accepted by the Fire Marshall. A catalogue cut of the proposed fire sprinkler connection has been provided with the mechanical calculations, included with this submission in a separate document.
- 4.4 An existing fire alarm device will be relocated and one new one will be added due to the location one of the proposed storefront mullions obscuring views to the existing device

5.0 Mechanical Systems

- 5.1 The mechanical scope of work for this project will include the re-balancing of existing Supply Air diffuser discharge to address the new zone separations created by the added and removed storefront. The basis of design calculates the cooling load requirement for the new corridor zones created by the additional curtain wall and distributes the air available from the existing terminal boxes, or if found to be less during construction TAB activities, assumes that the fan output can be increased sufficiently to supply the new design air quantities. The Contractor will be instructed to clean and service the associated terminal boxes prior to re-balancing.
- 5.2 The HVAC load calculation performed for the new spaces and serving as the basis of the revised SA cfm values is included with this submission in a separate document.

6.0 Electrical Systems

- 6.1 General: The electrical scope of work for this project will include relocation of the existing illuminated Gate A31 LED boarding information sign, two recessed ceiling lights, a fire alarm strobe, and power to a boarding podium, as well as new power connections to an extended gate podium, its backscreen unit, and multiple new door lock power supply locations.
- 6.2 The source of electrical power is a 100A panel in an electrical closet directly adjacent to the relocated boarding podium location, except for the lock power supply connection to an existing panel in the Apron Level room below the Mobile Lounge Dock area that serves other door locks and MUFIDS in the area.

7.0 Communications Systems

7.1 Basis of Design

The communications system design for the A23/25-A31 Sterile Corridor will be comprised horizontal cabling and termination equipment to support voice and various voice and data connections required to support: telephone, MUFIDS, VMUSE, and the Public Address System.

Existing network switches (MUFIDS and VMUSE) have been surveyed and there is ample capacity to handle the additional devices introduced under this project.

7.2 Design Approach

The approach for this design is to utilize existing communications infrastructure, to the extent possible, to support the A23/25-A31 Sterile Corridor project work.

- A. **Communications Rooms:** The current design assumes that the existing communications rooms, A-L1-412 “H”, A-L2-436 “Q” and Audio Equipment room A-L1-442 will be used along with the existing equipment and infrastructure, such as equipment racks, patch panels, etc.
- B. **Horizontal Cabling:** There are a variety of horizontal cable requirements addressed under this design. Such requirement are derived from the different MWAA systems and include, but are not limited to, the following:
 - 1). **MUFIDS:** New data drops will be provided to support the new/relocated MUFIDS equipment. Because an existing Cat 5 patch panel in communications room “Q” is to be used to support these MUFIDS connections, Cat 5 cable/outlets will be utilized for this application.
 - 2). **VMUSE:** For the boarding bridge podium, the existing Cat 5 data cables will be re-routed to the new podium location (cable to be re-used/re-terminated). For the added gate counter, new data cables/outlets will be supplied to support connections to communications room “H”. As there are insufficient ports available on the existing VMUSE patch panels in room “H”, the new cabling and termination panels will be provided in accordance with MWAA’s current data standards: Cat 6.
 - 3). **Paging System:** The work requires the relocation of PA system microphone station outlets and associated conduit and cabling. No new cabling is required.
- C. **Raceways:** For the data and voice cabling, conduits shall be installed from the outlet locations to the nearest existing cable tray system. New communications conduits will be minimally sized at 1-inch per the Design Manual.

8.0 Security Systems

8.1 Basis of Design

This security system design addresses the electronic security system requirements for the Gate A23/25-A31 Sterile Corridor Renovation project. The design specifically addresses the security provisions (access control and alarm monitoring (ACAM) system and the video management system (VMS)) as required to meet both Authority and CBP security requirements. As allowed by published CBP standards (US Custom and Border Protection, Airport Technical Design Standards, 2006), the design will expand the Authority's existing security systems to address the requirements for the CBP Physical Security System (PSS).

8.2 Design Approach

The work of this project shall involve the extension of the Authority's existing ACAM system to control access for those new/relocated doors that are part of the project. The design will address the requirement for both the Authority and CBP to monitor the alarm status of the doors and to watch/review activities associated with movements in, out, and through the Sterile Corridor.

- A. ACAM System: Existing ACAM panels located in communications room A-L2-436 "Q" were reported by ADT to have sufficient capacity for the new doors introduced under this project. Door hardware security requirements have been coordinated with the Division 8 design and include similar locks, door contacts, etc., to match nearby doors associated with the existing Sterile Corridor.
- B. VMS System: In accordance with MWAA and CBP security standards, new cameras are being provided to support remote surveillance and alarm assessment of for the Sterile Corridor and its associated doors. The design will include considerations for the following standards already established by the Authority:
 - 1). The 50% design submission included a single PTZ camera to support the surveillance and assessment requirements. The use of PTZ cameras for this application is consistent with the original sterile corridor security design. However, in a subsequent review of the design with the MWAA Airport Security Coordinator (ASC), concern was expressed that the use of a single PTZ camera may not provide adequate coverage of the various new/relocated doors associated with the project. Current MWAA security philosophy is to rely more on fixed cameras – as opposed to PTZ cameras which often are pointed in the wrong direction when an incident occurs. Instead, it was requested that the design include multiple fixed cameras, rather than a single PTZ camera. Further, it was requested that the fixed cameras be based on the IP/Ethernet, megapixel camera standards that have recently been adopted by MWAA. The current design reflects these requested changes.
 - 2). The current design identifies Megapixel network cameras as the standard for the project. These cameras shall be powered over Ethernet (PoE) and shall support a minimum of 1.3 Megapixels.
 - 3). Wherever possible, cameras shall be located on the secured side of the doors so that the faces of intruders may be seen.

- 4). The cameras will be connected to the existing video management system (VMS) for digital recording and network-based transmission of video signals. Field investigations have revealed that there are adequate numbers of SECNET ports available in room A-L1-412 to support the new cameras. However, the existing switch does not support PoE, so a new mid-span power inserter will be introduced under this project to power the new cameras.
- 5). Camera cables shall be white Cat 6 cables routed in a dedicated raceway system.

9.0 Multi-User Flight Information Display (MUFID), Public Information System

9.1 Basis of Design

This security system design addresses the electronic security system requirements for the Gate A23/25-A31 Sterile Corridor Renovation project. The design specifically addresses the security provisions (access control and alarm monitoring (ACAM) system and the video management system (VMS)) as required to meet both Authority and CBP security requirements. As allowed by published CBP standards (US Custom and Border Protection, Airport Technical Design Standards, 2006), the design will expand the Authority's existing security systems to address the requirements for the CBP Physical Security System (PSS).

9.2 Design Approach

The work of this project shall involve the extension of the Authority's existing ACAM system to control access for those new/relocated doors that are part of the project. The design will address the requirement for both the Authority and CBP to monitor the alarm status of the doors and to watch/review activities associated with movements in, out, and through the Sterile Corridor.

- A. ACAM System: Existing ACAM panels located in communications room A-L2-436 "Q" were reported by ADT to have sufficient capacity for the new doors introduced under this project. Door hardware security requirements have been coordinated with the Division 8 design and include similar locks, door contacts, etc., to match nearby doors associated with the existing Sterile Corridor.
- B. VMS System: In accordance with MWAA and CBP security standards, new cameras are being provided to support remote surveillance and alarm assessment of for the Sterile Corridor and its associated doors. The design will include considerations for the following standards already established by the Authority:
 - 1). The 50% design submission included a single PTZ camera to support the surveillance and assessment requirements. The use of PTZ cameras for this application is consistent with the original sterile corridor security design. However, in a subsequent review of the design with the MWAA Airport Security Coordinator (ASC), concern was expressed that the use of a single PTZ camera may not provide adequate coverage of the various new/relocated doors associated with the project. Current MWAA security philosophy is to rely more on fixed cameras – as opposed to PTZ cameras which often are pointed in the wrong direction when an incident occurs. Instead, it was

requested that the design include multiple fixed cameras, rather than a single PTZ camera. Further, it was requested that the fixed cameras be based on the IP/Ethernet, megapixel camera standards that have recently been adopted by MWWA. The current design reflects these requested changes.

- 2). The current design identifies Megapixel network cameras as the standard for the project. These cameras shall be powered over Ethernet (PoE) and shall support a minimum of 1.3 Megapixels.
- 3). Wherever possible, cameras shall be located on the secured side of the doors so that the faces of intruders may be seen.
- 4). The cameras will be connected to the existing video management system (VMS) for digital recording and network-based transmission of video signals. Field investigations have revealed that there are adequate numbers of SECNET ports available in room A-L1-412 to support the new cameras. However, the existing switch does not support PoE, so a new mid-span power inserter will be introduced under this project to power the new cameras.
- 5). Camera cables shall be white Cat 6 cables routed in a dedicated raceway system.

10.0 Virtual Multi-User Systems Environment (VMUSE)

10.1 Basis of Design

The design currently assumes that the vMUSE equipment to be installed at the new gate counter will be supplied and installed by the Airports Authority. The cost for such equipment and Authority provided labor shall be identified as a “below the line” cost item in the overall project budget.

- A. It is assumed that only one position needs be provided in new two-position counter. This design assumes that the Authority shall provide/install the following VMUSE equipment:
 - 1). Keyboard: Desko BMOL-4004-U (Qty. 1)
 - 2). CPU: HP GX160AV (Qty. 1)
 - 3). Monitor: HP L1750 (Qty. 1)
 - 4). Boarding Pass Reader: Desko GRSK 504 ANP (Qty. 1)
 - 5). Document Printer: Okidata Microline 320 Turbo (Qty. 1)
 - 6). Boarding Pass Printer: IER 400B2-01 (Qty. 1)
- B. The design also assumes that the existing VMUSE equipment at boarding bridge podium shall be decommissioned/re-commissioned by the Authority’s VMUSE maintenance contractor as part of the podium relocations. Associated dat cables will be re-routed (by Contractor) as part of the podium relocation.

- C. The Category 6 data cables along with the data outlets for the VMUSE devices shall be provided under Division 27, Communications work.

10.2 Outstanding Issues

- A. Confirmation is needed that the new VMUSE equipment will be supplied/installed by the Airports Authority under its maintenance contract using project funds.

11.0 Appendices and Separate 100% Submission Documents

11.1 100% CD Submittal Drawings

Drawings have been provided in half-size format as part of separately bound package in accordance with the SOW and the Authority's Design Manual.

11.2 100% CD Specifications

Specifications (in one volume) have been provided in separately bound packages as part of this submission. (Please note that specifications or portions of the mechanical, electrical and fire protection work have been included on the drawings, as agreed by the Authority prior to design implementation.)

11.3 Mechanical Calculations and Catalogue Cuts

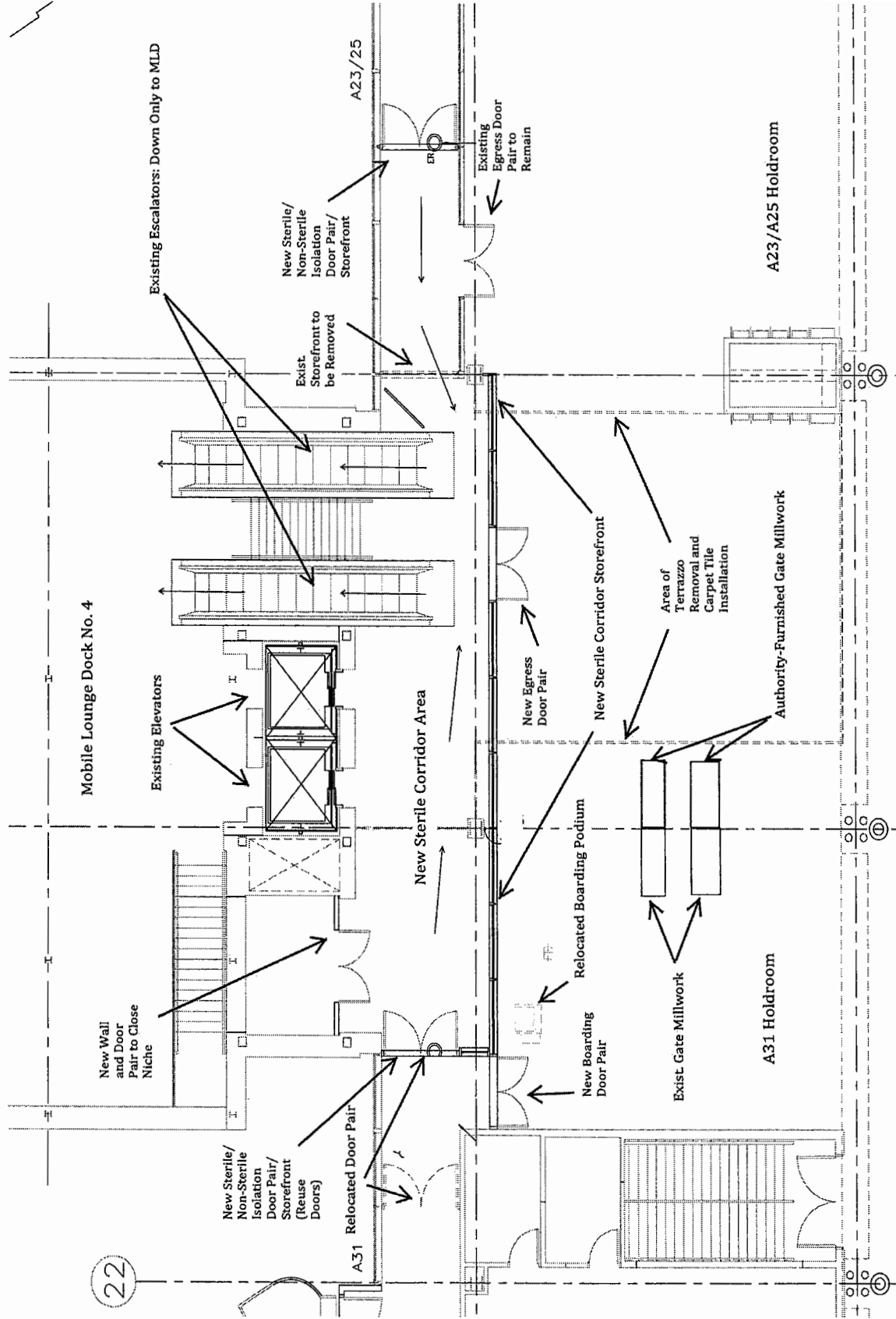
Calculations have been provided in a separately bound document for this Submission. (There are no new mechanical equipment, however to conserve printing costs, the proposed fire sprinkler head product catalogue cut has been included here.)

11.4 Cost Estimate and Estimated Construction Schedule

A Cost Estimate with an Estimated Construction Schedule has been provided in a separately bound document as part of this Submission.

--- End of Design Report ---

APPENDIX A – EXHIBITS



GATE A23/A25 - A31 STERILE CORRIDOR - PROJECT PLAN OVERVIEW

EXHIBIT A.1

