

ADDENDUM NO. 2

to the Contract Documents
for the Construction of the

REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES

at

SYRACUSE HANCOCK INTERNATIONAL AIRPORT
SYRACUSE REGIONAL AIRPORT AUTHORITY
SYRACUSE, NEW YORK

IFB REFERENCE #2022-1 & # 2022-2

TO ALL HOLDERS OF CONTRACT DOCUMENTS:

Your attention is directed to the following interpretations of changes in and additions to the Contract Documents for the construction of the **REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES** project at the Syracuse Hancock International Airport, Syracuse, New York. This Addendum is part of the Contract Documents in accordance with the provisions of Section 200-05, Addenda, and Interpretation.

GENERAL:

1. Refer to attached document for summary of responses to inquiries received.

CONTRACT SPECIFICATIONS:

1. **Section 34 77 13 – Passenger Boarding Bridges**
 - a) This section has been replaced in its entirety. The following changes have been made:
 - i. Listed acceptable PBB manufacturers
 - ii. Clarified the rotunda column base plate requirements
 - iii. Clarified the disconnect switch requirements
 - iv. Clarified wind load parameters
 - v. Clarified materials requirements

CONTRACT DRAWINGS:

1. **CA-002 – Passenger Boarding Bridge Equipment Details**
 - a) Clarified General Notes
 - b) Changed Baggage Conveyor to Bag Slide
2. **ED-101 – First Floor Electrical Demolition Plan**
 - a) Clarified call-out for work in Border Patrol Security area
3. **E-101 – First Floor Electrical Power Plan**
 - b) Clarified call-out for work in Border Patrol Security area
4. **E-602 – PBB Electrical Connection Details**
 - a) Clarified call-outs for PBB, PCA and 400 Hz feeders
 - b) Added Keyed Note 1 to clarify electrical requirements

REFERENCE DOCUMENTS:

1. **CA-001 – Passenger Boarding Bridge Layout Plan**
 - a) CADD file

END OF ADDENDUM NO. 2

Syracuse Regional Airport Authority
 Syracuse Hancock International Airport Authority
REPLACEMENT OF SEVEN (7) PASSENGER BOARDING BRIDGES



Response To Inquires
IFB Reference 2022-1 General & 2022-2 Electrical

Item	Date	QUESTIONS	Date	RESPONSE
1	1/17/2022	Do we obtain paper plans and specs on our own?	1/18/2022	Yes, Obtaining Paper Copy Documents are the responsibility of the bidding firm/contrator(s)
2	1/19/2022	Specification 34 77 13 Aprone Drive Passenger Boarding Bridge - can the manufacture be provided for the design make of the (7) new bridges?	1/20/2022	Acceptable Passenger Boarding Bridge manufacturers include the following: <ul style="list-style-type: none"> •JBT AeroTech -Ogden, Utah •TKE Airport Systems - Fort Worth, Texas •Others-Meeting Performance Based Specifications
3	1/20/2022	Advertisement states: All submissions must include a Flash drive with the bid documents completed & signed.	1/20/2022	The Advertisement stated required bid submittal documents have changed. Only Electronic Bid submittal documents through Bid Express are required. See IFB# 2022-1 & 2022-2 Addendum No.1
4	1/21/2022	Please provide the estimated cost for the GC-contract.	1/27/2022	The SRAA does not disclose project cost estimates during bidding.
5	1/21/2022	SHEET CA-002, Note 2 States, "PBB Equipment and Installation to be provided by Others." Please clarify intent of this statement which specific PBB Equipment and Installation is by others, and which is by this Contract.	1/27/2022	The PBB and all associated equipment indicated on Dwg. No. CA-002 is to be furnished and installed under the General Construction contract. An addendum will be issued to clarify this requirement.

Item	Date	QUESTIONS	Date	RESPONSE
6	1/21/2022	Please confirm each gate is to receive a new Baggage Conveyor system and that none of the gates are to receive a Baggage Slide.	1/27/2022	A baggage conveyor is not required. A bag chute is to be provided. An addendum will be issued to clarify this requirement.
7	1/21/2022	Sheet S-001 requires PBB Contractor to complete physical testing of the existing anchor bolts and foundations. Please confirm this is a requirement as indicated on S-001 notes. Please also confirm, once we complete testing, if it is determined for new PBB load requirements, code changes or existing conditions test results if the existing foundation is not adequate, how will the foundation work be handled? We can complete new foundation design/installation or will that be handled by another Contract. Can you please provide as-built information of the existing foundations.	1/27/2022	Provide pull tests of existing anchor bolts as indicated on Drawing No. S-001. In the unlikely event foundation improvements are needed, a potential change order will be issued to the General Contractor. Drawing Nos. REF-1 through REF-4 contain the available as-built foundation information. There are no as-builts for the Gate 6 foundation. Reliance on any information shown in the Reference Drawings shall be at the bidder's own risk.
8	1/21/2022	Sheet E-602 states "PBB Bridge Power," "GPU" and "PCA" feeder power below bridge "by others." Please confirm if this is accurate or if the PBB Contractors are supposed to be responsible for the "feeder power below bridge" as indicated on other drawings. Additionally, please confirm PBB Contractor is responsible for all electrical work shown E and ED series drawings.	1/27/2022	The feeder power for the PBB, GPU and PCA between the building and the disconnect switch at the rotunda shall be provided by the Electrical Construction Contractor. The Electrical Construction Contractor shall also terminate the secondary connection for the PBB, GPU and PCA at the disconnect switch. The General Construction Contractor is responsible for all other electrical work associated with the PBB, GPU and PCA "downstream" of the disconnect switch.

Item	Date	QUESTIONS	Date	RESPONSE
9	1/21/2022	Sheet ED-101 has a note that "areas within Border Patrol Security" are hard ceilings and we are to "mount to ceiling." Please confirm this means we mount exposed conduit and pull-boxes within this space. Please also confirm the existing hard ceiling type (drywall, metal panel etc) and the height of ceiling.	1/27/2022	Conduits and pullboxes to be provided in the Border Patrol Security area shall be securely surface mounted to the ceiling. Bidders shall be responsible for verifying the height of the ceiling.
10	1/21/2022	Is there a preferred or required Fire Alarm Contractor for any FACP work or FA scope? Similarly, is there a preferred or required SAACS contractor and/or IT contractor at Syracuse?	1/27/2022	Simplex/Johnson Controls are preferred as they handle the final connections to the existing equipment, but other certified contractors have completed work at the airport in the past,
11	1/21/2022	The bid form has an Owner Allowance for "Security Interface." Please clarify what this work covers so we can determine what - if any - SAACS / Security work we should include in our Bid.	1/27/2022	The Allownce built into the project for Security Interface, is strictly for the SRAA Security Integrator to install the security cammeras and make the necessary connections from the equipment to be provided under the contract, into the SRAA's security network.
12	1/21/2022	The bid form has an Owner Allowance for "Telecomm enhancements." Please clarify what this work covers so we can determine what - if any - Telecomm work shown in the drawings we should include within our Bid.	1/27/2022	This allowance is to assist with costs associated in providing necessary communication or data cable & connections for the gate 15 holdroom & PBB area, to serve as a sublemental boarding gate while the other PBB's are replaced.

Item	Date	QUESTIONS	Date	RESPONSE																																
13	1/21/2022	We understand the project has a 30% WMBE Goal and a 6% SDVE Goal. If one subcontracted firm is both certified WMBE and SDVE by NYS, is it permissible for their scope to qualify for both WMBE and SDVE participation?	1/27/2022	Firms that hold both MWBE and SDVOB certifications may be included in both the MWBE and SDVOB Utilization Plans toward satisfaction of both goals, however they cannot be substituted one for the other.																																
14	1/21/2022	This Bid Form has several unit price line items. Please confirm if the Basis of Award (Section 30-1 of the IFB) will be determined as the lowest total cost of all line item pricing.	1/27/2022	Basis of Award is as described in Section 200-04.																																
15	1/22/2022	Could the model numbers of the existing PBB's and/or the Terminal Floor Height and Ramp Elevation at each gate be provided	1/27/2022	<table border="1"> <thead> <tr> <th>Gate</th> <th>Mfg.</th> <th>Model Number</th> <th>Date of Mfg.</th> </tr> </thead> <tbody> <tr> <td>5</td> <td>JBT</td> <td>SA2-85/119</td> <td>1987</td> </tr> <tr> <td>6</td> <td>JBT</td> <td>SA2-85/119</td> <td>1987</td> </tr> <tr> <td>8</td> <td>JBT</td> <td>SA2-77/111</td> <td>1987</td> </tr> <tr> <td>9</td> <td>JBT</td> <td>SA2-77/111</td> <td>1987</td> </tr> <tr> <td>10</td> <td>JBT</td> <td>SA2-77/111</td> <td>1987</td> </tr> <tr> <td>15</td> <td>JBT</td> <td>A3-58/110</td> <td>1987</td> </tr> <tr> <td>26</td> <td>JBT</td> <td>A3-50/95</td> <td>1987</td> </tr> </tbody> </table>	Gate	Mfg.	Model Number	Date of Mfg.	5	JBT	SA2-85/119	1987	6	JBT	SA2-85/119	1987	8	JBT	SA2-77/111	1987	9	JBT	SA2-77/111	1987	10	JBT	SA2-77/111	1987	15	JBT	A3-58/110	1987	26	JBT	A3-50/95	1987
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16	1/24/2022	We respectfully request the appropriate (Syracuse) project CAD Drawings in DWG Format for the purpose of accurately determining/confirming the bridge models to be quoted.	1/27/2022	Upon review of the existing PBB models provided, if CAD files are still requested, We can provide with contractor acknowledgement they use them at their own risk.																																

Item	Date	QUESTIONS	Date	RESPONSE
17	1/28/2022	When you scroll down to the attachment list page of this website , you see addendum 1 and all the plans and specs. Have the plans and specs changed?	1/28/2022	Each Addendum specifically calls out corrections and changes to the contract documents, specifications and plans. The Placement of Addendum at the top of the attachments list, is meant only to call bidders attention to the specific addendum(s) being posted.

Gate Equipment Overview and Rating

Gate	Mfg.	Model Number	Serial Number	Date of Mfg.	PCAir	GPU	Rating ¹
1	JBT	AT3-61/127	33085	2016	45 Ton	90kVA/28VDC	4
3	TKAS	TB43/20.5-3	05093TB4331093	2005	45 Ton	90kVA	4
5	JBT	SA2-85/119	35994	1987	30 Ton	60kVA	2
6	JBT	SA2-85/119	35993	1987	45 Ton	60kVA	2
8	JBT	SA2-77/111	35999	1987	45 Ton	60kVA	2
9	JBT	SA2-77/111	36000	1987	45 Ton	60kVA	2
10	JBT	SA2-77/111	35998	1987	30 Ton	60kVA	1
11	TKAS	TB43/20.5-3	05093TB4331094	2005	30 Ton	90kVA	4
12	JBT	AT3-58/116	33435	2017	30 Ton	90kVA/28VDC	4
15	JBT	A3-58/110	35898	1987	45 Ton	90kVA/28VDC	0
20	JBT	AT3-58/116	33750	2018	45 Ton	90kVA/28VDC	5
23	JBT	AT3-58/116	33436	2017	45 Ton	90kVA/28VDC	4
26	JBT	A3-50/95	36001	1987	30 Ton	90kVA/28VDC	1

SECTION 34 77 13

APRON DRIVE PASSENGER BOARDING BRIDGE

PART 1 - GENERAL

1.1 General Requirements

This specification describes the Apron Drive Passenger Boarding Bridge with standard equipment.

Location - Syracuse International Airport

Gates: 5, 6, 8, 9, 10, 15 and 26

- A. The Apron Drive Passenger Boarding Bridge (PBB) covered by this Section shall be designed to extend from a terminal departure lounge doorway to the aircraft boarding door. The design shall enable passengers to enplane and deplane during normal or emergency operations while providing an environment protected from weather and hazardous conditions. The PBB shall provide a simple, convenient and controlled method for boarding passengers. The complete assembly shall be protected against inclement weather conditions, both when sealed against an aircraft and when parked with the weather door closed.

NOTE: For consistent orientation when referring to left or right, the observer shall be positioned with his/her back to the terminal end and facing the aircraft end of the PBB.

- B. Drawings take precedent over technical specifications for aircraft servicing and operations. For integration of Exterior Steel Connectors and Ramp Service GSE, review all construction documents in addition to the following:

1. Exterior Walkways, Columns and Haunch Supports: Gate #15 only.
2. GSE Ancillary Equipment:
3. PCA - Review design drawings and refer to Section 23 74 16.
4. 400hz 28volt DC Combo Unit – Review design drawings and refer to Section 26 08 50.

- C. **Acceptable Passenger Boarding Bridge manufacturers include the following:**

1. **JBT AeroTech -Ogden, Utah**
2. **TKE Airport Systems - Fort Worth, Texas**
3. **Others-Meeting Performance Based Specifications**

1.2 Detailed Description

A. Rotunda

1. Rotunda General. The rotunda assembly shall be designed as the terminal-end pivot for the PBB's vertical and horizontal motion. As the main pivot for the PBB, the rotunda assembly shall allow the PBB to swing a total of 175 degrees: 87.5 degrees clockwise and 87.5 degrees

counterclockwise from the corridor centerline. The rotunda assembly shall be designed such that no loads or vibrations shall be transmitted to the building. Rotunda steel collars up to three feet in length (if required) shall be deemed part of the standard rotunda structure.

2. Rotunda Components shall include a corridor, rotunda, support column and electrical disconnect panel:
 - a. Corridor. The corridor shall be the interface between the rotunda and the terminal building or fixed passageway. The inside clear width of the corridor shall be 52.5 inches (1334mm) and length 15.5 inches (393mm). The clear height shall be 90.5 inches (2300mm). The corridor shall accommodate installation of flexible exterior weather seals and interior metal flashing and floor thresholds for connection to the terminal building or fixed walkway meeting all NFPA 415 and ADA guidelines.
 - b. Rotunda. The rotunda shall provide a smooth transition between the corridor and the telescoping tunnels. Flap type seals shall provide weather protection between the rotunda and the hinged telescoping tunnel section. The rotunda shall include a frame that rotates about the vertical axis of the support column and supports the terminal end of the telescoping tunnels. The tunnel attachment shall be pinned to allow the tunnels to rotate about a horizontal axis and allow the tunnels to move vertically through their intended range of motion.
 - c. Support Column. The support column shall be the structural support for the PBB. The support column **base plate** shall be **connected bolt** to a foundation/**column pedestal** supplied by others. The support column **and its base plate** shall be custom built to meet specific site conditions and shall have limited adjustment for height and leveling once the column is constructed. All existing anchor bolt locations for the Apron Drive PBB shall be field verified. Coordination and support for all technical and structural detail design and load information shall be provided by the PBB manufacturer to the EOR for project distribution.
 - d. ~~Electrical disconnect panel. A NEMA 4X (IP65) rated stainless steel heavy-duty electrical disconnect panel, mounted on the rotunda support column, shall provide electrical disconnects, overcurrent protection and transformers if required to adapt and distribute the specified, customer-provided 3 phase supply power to the electrical systems of the gate equipment. The disconnect panel shall incorporate the same provisions for the pre-conditioned air, ground power unit and other systems at the gate in addition to the PBB (where required). As an alternate, separate disconnect switches can be provided for the bridge and any supplied auxiliary equipment including PCA, 400 Hz, and potable water cabinets.~~ Electrical disconnect switch. Coordinate with the Electrical Construction contractor the connection of electrical wiring serving the PBB to a disconnect switch near the base of the rotunda column.

- e. Rotunda bearing. The rotunda bearing shall employ a flanged, bronze bearing to support vertical loads. A separate bronze sleeve bearing shall also be used; together the bronze sleeve bearing and bronze flanged bearing shall support and prevent overturning of the bridge. The bearing system shall be designed such that the bearing is accessible for lubrication. The bearing system shall be designed such that a catastrophic bearing failure will not result in a toppling or fall of the boarding bridge. Rotunda turret bearings are also acceptable.
- f. Slope limits shall be located on the rotunda assembly. Slope limits shall be adjustable up to 10% (5.71°) for both up and down slopes. This limit shall be adjustable to meet local operating conditions and requirements. Passenger Boarding Bridge shall comply to all ADA requirements. Interior transition ramp slopes shall not exceed 1:20 (V:H) (2.9 degrees) relative to tunnel floors as noted in Part 1.1.B.2.b.
- g. Swing limits - operational and ultimate. The operational and ultimate swing limits shall include a position sensor located in the rotunda ceiling that shall be accessible from the rotunda interior or physical limit switches mounted at the support column. If physical limit switches are used they will limit rotunda swing, as required below. One physical limit switch located on the support column shall be used as an ultimate limit, serving as backup to the operational limits defined by the position sensor. Together the sensor and limit switch shall provide three levels of safety for bridge swing (side-to-side) motion: 1) Approach: Bridge speed shall be reduced when within 1 to 2 degrees of the operational limit. 2) Operational Limit: Bridge motion shall be stopped when operation limits are reached. A yellow warning text message shall be displayed at the PBB controls informing the operator that an operation swing limit has been activated. Additionally, an audible alarm shall sound while the bridge is at the limit and the Joystick is active. Motion in the opposite direction shall remain enabled. 3) Ultimate Limit: Bridge 3-phase power shall be disconnected and a red fault text message displayed at the PBB controls. Should the bridge pass through the operational swing limits, the ultimate swing limit shall trip and stop bridge motion. The ultimate limit switch shall be normally set 2 to 3 degrees past the point where the operational limits are set. Should the ultimate swing limit be reached, maintenance personnel will be required to move the bridge. Swing limits shall be coordinated with aircraft parking layout and the SRAA.

B. Telescoping Tunnels

- 1. Apron drive PBBs shall contain three (3) telescoping tunnels for best value operational ranges. Two-tunnel PBBs not acceptable. The specific PBB tunnel model and size shall be selected and identified by the PBB manufacturer within the drawings which take precedent over the technical specifications for operation.
- 2. The PBB manufacturer is responsible for achieving the required operational conditions at each gate. The wall and floor panels shall be constructed utilizing smooth steel sided cold roll panels for basis of design, or galvanized steel panels attached to a framework of angle and tubing. The

roof shall be 14-gauge (.075 inch) steel construction reinforced with structural steel tube cross members. Provide diverter slats at the aircraft end of each tunnel roof to divert water to the drainage system. Exterior wall panels shall be constructed using water-tight, continuous welded seams or PBB manufacturer's standard factory methods.

- a. Tunnels, A (smallest), B (mid-size) and C (largest) shall be rectangular in cross section. The tunnels with the larger cross sections shall be toward the aircraft end of the PBB.
- b. Transition ramps with both fixed and hinged sloping sections shall accommodate the differences in floor elevations where telescoping tunnel sections overlap. Slope of the transition ramps shall not exceed 1:20 (V:H) (2.9 degrees) relative to the tunnel floors. The fixed transition ramp sections shall comprise sloping floor areas within the tunnels to minimize the slope of the hinged transition ramp sections. Handrails shall be provided on both sides of the tunnels in the ramp areas. The handrails for the A-tunnel transition ramp fixed section shall be attached to the tunnel walls. The B-tunnel handrails shall be attached to the tunnel header. Transition ramps shall contain yellow safety nosing and overhead safety signs depicting elevation changes.
- c. Minimum interior clear dimensions for the "A" tunnel in 3-tunnel PBBs, shall be as follows:

Minimum width, wall-to-wall	57.5 inches (1460mm)
Minimum interior height	84 inches (2134mm)
Minimum inter-tunnel ramp width	53.5 inches (1359mm)
Minimum corridor width	52.0 inches (1321mm)

- d. Electrical cable conveyance and management. The telescoping tunnels shall be equipped with an exterior side-the-bridge-mounted pantograph or side trolley electrical cable conveyance system. The cable system shall be accessible to maintenance personnel for inspection at all PBB positions and operating conditions. Access to the cable conveyance system shall not impede passenger traffic or bridge operation. The cable conveyance system shall be capable of supporting a combination of cables and hoses not limited to the PBB, PCA, 400hz, HMS, VGDS and all communications cables.

The system shall be capable of supporting a cross-sectional area totaling 12 square inches (7742mm²), which shall consist of 2 each 6 square inch (3871mm²) areas. The system shall be capable of supporting any combination of two or more cables and hoses totaling 12 pounds per foot (17.6dN/m).

C. Aircraft Cab

1. Cab rotation. The aircraft cab shall rotate 125 degrees, 92.5 degrees counterclockwise and 32.5 degrees clockwise from the tunnel centerline. The cab shall rotate at a speed of 145 degrees per minute (2.41°/sec). The rotation limits shall be controlled by an analog position

sensor with programmable operational limits in addition to limit switches and physical stops. As an alternate, limit switches with adjustable trips can be provided.

2. Control console and operator visibility. The cab shall be equipped with a forward facing control console, with a laminated safety glass window providing full forward view of the aircraft interface. It shall be possible to operate the PBB without opening the cab weather doors. Additional visibility shall be provided for the operator by a wire glass window to the left of the operator, a window to the right, and by windows in the weather doors and a wire glass window in the service door. Wire glass vision panels shall be provided in the cab side-coiling curtains. Mirrors located outside the cab on the left and/or right-hand sides, visible through the operator's windows.
 3. Glass window winterization defrost system shall be installed for left cab side window and forward window above the operator's console.
- D. Weather doors. Double inward-swinging weather doors shall be installed to the right side of the operator's control console to secure the PBB from unauthorized access and seal the interior of the PBB from adverse weather conditions when the doors are closed. The minimum clear width of the weather door shall be 43 inches (1092mm), and the minimum door height shall be 92.5 inches (2349mm). The upper portion of each door shall be equipped with a 12 inches wide x 32 inches high (305mm x 812mm) safety glass window.
- E. Aircraft spacer. A full width yellow elastomer spacer 122 inches (3100mm) wide shall be located at the aircraft end of the cab floor. The spacer material shall meet the fire protection specifications of NFPA-415 and shall be sufficiently flexible and non-abrasive to prevent scratching or other damage to the aircraft fuselage. A left side cutout in the spacer may be required for additional clearance of the aero sensors if the B737 aircraft is in the mix.
- F. Adjustable cab floor. The aircraft end of the cab shall be equipped with a cab floor that adjusts to level for various aircraft floor heights and bridge slope angles. The floor shall be individually actuated and independently adjustable to adapt to aircraft doorsills. The adjustable cab floor shall level automatically and shall be equipped with a manual override control switch. The floor shall be capable of providing a level surface adjacent to the aircraft doorsill for PBB slopes from -10% to +10%. The automatic leveling system shall correct the floor to a slope not to exceed $\pm 2\%$ ($\pm 1.2^\circ$) from level.

A double hinge floor shall be included in the adjustable cab floor system to provide a smooth transition and walking surface between the level floor and the tunnel section. There shall be no raised surfaces that may introduce a tripping hazard to the passenger. Adjacent surfaces shall be at the same level regardless of the position of the cab floor or the PBB.

Outer Cab floor shall be equipped with all mechanical/electrical operational components/functions and mechanisms for automatic adjustments for docking regional jet operations not limited to (CRJ and Embraer) aircrafts. PBB RJ floor shall operate without the use of an aftermarket ramp device and shall be self-contained within the outer PBB floor.

The cab floor shall have an aluminum substrate, and the walking surface shall be ribbed rubber. Cab floor heaters shall be installed for all exterior surfaces outside the bi-fold cab doors.

- G. Auto level arm: An auto level arm shall be located on the right side of the PBB cab area, inside the canopy closure area, in full view of the PBB Operator. The arm shall deploy and make contact with the aircraft fuselage when the PBB is in auto level mode. See Part K; Automatic Leveling System.
- H. Security Camera Provisions: In the future the airport will install a full service security 360 degree camera which will be installed within the cab ceiling for direct access of viewing the operator. Provide a camera mounting plate, junction box and cabling within the PBB for hard wiring the camera connection point to the SRAA's security system. CAT 6 cable is required with additional length tied off for airport security connection into existing system (approximately 60 ft).
- I. Illumination. Two exterior LED floodlights shall be provided to illuminate the apron directly ahead of the PBB. A LED floodlight shall be provided to illuminate the drive column wheel carriage. This light shall be located under the tunnel section.

A weatherproof LED fixture shall be provided outside the cab weather door to illuminate the cab-aircraft interface.

J. Aircraft Closure

The aircraft end of the cab shall be equipped with a folding bellows type aircraft closure canopy. The closure, when fitted against the fuselage, shall surround both the open aircraft door and the doorway to protect passengers from the elements. The closure shall be designed to accommodate any special door requirements associated with specified aircraft types. The horizontal width of the canopy opening at the aircraft interface shall be at least 10 feet (3.05m). The closure fabric shall be grey in color and shall not absorb water, shall be highly tear resistant and remain flexible throughout the rated operational temperature range of the PBB. The closure shall meet the requirements of NFPA 415. A protective metal hood mounted on the cab shall protect the canopy when retracted to prolong the life of the canopy.

1. Each side of the aircraft closure shall independently seal against aircraft contours.
2. A means of preventing excessive pressure on the aircraft shall be incorporated into the canopy operating mechanism.
3. The contacting seal shall be a soft material to prevent scratching or damage to the aircraft skin. The seals that contact the aircraft shall be segmented and attached to the main closure assembly with Velcro type fastener strips for easy replacement.

K. Automatic Leveling System

The PBB shall be equipped with an automatic leveling (auto level) system. This system shall allow the PBB to follow the normal aircraft elevation changes that occur during loading and unloading of specified aircraft types. The auto level system shall function with equal reliability for all specified aircraft types. The auto level arm shall be located on the right side of the cab inside the aircraft closure in full view of the operator at the control console. The auto level arm shall extend and contact the aircraft when auto level mode is selected at the control console.

The auto level control circuit shall include a sustained travel timer. The timer shall limit continuous bridge vertical motion due to auto level operation. The timer shall be factory set at 4 seconds and adjustable for an operational range of 1.6 to 10 seconds. If the travel timer reaches its preset time limit a fault condition shall be identified. Upon identification of an auto level fault condition, all vertical drive shall be disconnected and audible and visual alarms shall be energized.

A safety shoe switch is provided for additional protection against aircraft door contact with the cab floor.

L. Drive Column

The drive column provides the vertical and horizontal motion of the PBB. The drive column and its control systems shall be designed for smooth, quiet operation. It shall be possible to operate the vertical and horizontal PBB motion simultaneously.

The drive column shall be divided into two major components: vertical drive and horizontal drive.

1. Electro-mechanical vertical drive. The PBB shall be moved vertically by means of two recirculating ball bearing screw assemblies. Vertical travel speed shall be approximately 60 inches (1524mm) per minute $\pm 15\%$ measured at the aircraft end of the PBB.
 - a) Each vertical drive assembly shall be independent. Each independent assembly shall be capable of supporting the PBB under full design load.
 - b) The ball nut in each recirculating bearing type ball screw shall be equipped with wiper brushes to remove grit and dirt from the screw threads.
 - c) Each ball nut shall be equipped with a special thread profile designed to be self-locking. This feature will support the PBB in the absence of the recirculating ball bearings.
 - d) The vertical drive motors shall each be an AC induction motor with an integral speed reducer and brake. The motor brake shall be spring applied and electrically released and shall hold securely at all PBB elevations whenever electrical power is not applied.
 - e) A fault detector shall sense differential motion of the ball screw assemblies. The detector shall disconnect electrical power from the vertical drive motors and provide a message to the operator if a fault is detected.

2. Hydraulic vertical drive, achieving vertical lift via two extra-capacity hydraulic ram cylinders.
 - a) Each ram is independent of the other and capable of supporting the bridge under full design load. An adjustable flow control valve provides a lift speed of approximately 2' 6" per minute measured at the aircraft cab bumper.
 - b) The lift cylinders are equipped with internally mounted, poppet valves that prevent the bridge from descending in the event of fluid loss or other system failure.
 - c) Mechanical stops in the cylinders prevent over-travel of the lift column. The system will not be damaged if the bridge is raised or lowered into the cylinder stops.
 - d) A self-contained hydraulic power unit is mounted on the crossmember for easy maintenance access. A petroleum-based hydraulic fluid is selected to match the operating temperature requirements for the airport. Manifold construction to minimize plumbing the number of hydraulic connections.
3. Horizontal Drive. A variable speed, electro-mechanical drive system shall provide horizontal travel.
 - a) The tires used on the horizontal drive wheels shall be solid elastomer, specially designed for PBB applications and rated for the applicable load.
 - b) The horizontal drive system shall use AC gear motors with integral brakes. The AC motors shall be driven by solid state, variable frequency motor controllers for smooth variable speed proportional control operation. The AC drive system shall provide high efficiency, smooth performance, and good component availability. The individual variable frequency drive controller for each drive motor shall provide adjustable speeds from 0 to 90 feet per minute (27.4m/min), and be factory preset to a maximum 60 feet per minute (18.3m/min). The controller shall be adjustable to provide optimum responsiveness to the horizontal controls. The controller shall provide built-in diagnostics to assist with trouble shooting.
 - c) A steer angle of 200° shall be possible both in place and in motion. The wheel carriage shall steer 110° to the left and 90° to the right of the centered position. Steering speed shall be adjustable between 16° and 42° per second. The steering rate shall be factory set at a maximum 23° per second. A wheel position sensor shall monitor rotational alignment with the bridge and provide operational steering limits before the mechanical hard stops are contacted. Wheel bogey position shall be indicated on the touch screen at the operator's console.
 - d) A dynamic braking system shall allow the PBB to come to smooth controlled stops. Integral spring-applied, electrically released brakes shall be provided with each drive motor. The brakes lock the PBB in place when electrical power is disconnected, when the operator control stick is in the neutral position or when operating power is turned off at the PBB controls.

- e) The horizontal drive motors shall be equipped with manual brake releases to allow the PBB to be towed in the event of power failure. Tow lugs shall be provided at the lower wheel frame. Manually releasing the brakes shall automatically lock out all drive functions.
- f) Horizontal drive motors shall include covers to protect against the elements.

M. Service Access

A service door, landing, and stair leading to the apron shall constitute the service access. The service access shall be located on the right - hand side of the cab end of the PBB to provide access between the PBB bridgehead and apron for authorized personnel.

1. The service door shall be steel, hollow core, and meet or exceed the ¾ hour fire rating per ASTM E152. A fire-rated wire glass window shall be located in the service door. The minimum door width shall be 2 feet 6 inches (762mm) and minimum height 6 feet 8 inches (2032mm). The door shall be equipped with medium-duty commercial-type hardware and automatic door closure. The door opens outward onto the landing. A keyed outside knob shall be provided.
2. A 30 inch (762mm) high stainless steel kick plate shall cover the lower inside and outside portions of the door.
3. Lockset shall be a cypher lock.
4. The service stair landing shall be parallel to the adjacent tunnel floor. It shall be made of hot dipped galvanized steel; the landing deck shall be covered with open mesh grating. The landing shall be protected on the open sides by galvanized steel handrails compliant with OSHA standards.
5. Decking material shall be channel section with open serrated grating (similar to Grip Strut™) for a high-traction, high-drainage surface.
6. Modesty shield provided under landing deck.
7. The service stair shall be equipped with self-adjusting risers and open mesh steel treads made from galvanized steel channel sections with open serrated grating (similar to Grip Strut™) providing high-traction, high-drainage walking surfaces. All steps shall have an equal rise. The tread width shall be 28 inches (711mm) and the maximum tread depth shall be 9.5 inches (241mm). The length of the stair stringers shall be selected depending on the operational height range of the PBB. The service stair shall be protected on both sides by handrails compliant with OSHA standards. The entire service stair assembly shall be constructed from hot-dip galvanized steel. The service stair shall be accessible to ramp service personnel at all operational heights and positions of the PBB.
8. Service stair and landing illumination. An exterior 60-watt equivalent LED light fixture shall be provided on the exterior of the PBB above the service stair and landing to illuminate the service access. The light shall be controlled by a light switch provided on the interior wall of the PBB adjacent to the service stair access door. A photocell shall operate the service access light

automatically during darkness, with an interior light switch that shall override the photocell to shut off the light.

9. The service stair landing shall contain a bag chute with proper steel handrail modifications for servicing bags from the PBB deck. Service landing shall accommodate all such loads for additional equipment installation. Product selection shall be based on airport location and ambient conditions for Syracuse, New York. Product information shall be submitted for approval.

Acceptable Manufacturers: Page Industries, P and W Machinery , KCI Inc or equivalent.

10. Wheelchair Lift (Optional): Subject to Owner acceptance, provide a platform lift capable of conveying a 300 lb. wheelchair or similar personal mobility device from ramp level to the service stair landing. The lift shall accommodate the vertical range of the PBB required for the serviced aircraft mix. Submit wheelchair lift product information to the Engineer for approval.

Acceptable Manufacturers: P and W Machinery , KCI Inc or equivalent.

N. Control Station

The control station or operator compartment shall be located at the aircraft end of the PBB. It provides the operator with a control console, service utilities, and control interlocks required for PBB operation. The control station shall be positioned on the left side of the cab and oriented to position the operator facing forward in full view of the aircraft during bridge operations. It provides the optimum PBB maneuvering visibility without obstructing passenger traffic flow. An operator of average height shall have an unobstructed view of the boarding bridge cab spacer to position it at the aircraft fuselage during bridge operations.

1. Control console. The control console shall be located at the control station in the operator compartment and shall be protected from the outside environment. The control console shall include a Graphical User Interface (GUI) touchscreen, joystick and pushbutton controls; and a cabinet containing the main programmable controller for the PBB plus terminal blocks, relays and related electrical components necessary for full, safe control of the PBB.
2. Programmable Logic Controller (PLC). PBB functions and information systems shall be controlled using a Beckhoff Programmable Logic Controller (PLC). The PLC system used shall comply with IEC 61131. Provide 12 inch (305mm) or 15 inch (381mm) touchscreen GUI. Schneider, Allen Bradley or an approved equal PLC is also acceptable.
3. Graphical User Interface (GUI). The control console shall include a Graphical User Interface (GUI) that provides the operator with a means to login, control interfaces, bridge set up displays, maintenance and diagnostic information, wheel position information, fault/limit/status and warning messages and fault history as described in the following sections.

4. Networking with gate equipment. The PLC shall be designed to allow Modbus TCP/IP networking of the boarding bridges and appropriately equipped ancillary equipment, such as pre-conditioned air (PCA) units and ground power units (GPU), to a common remote monitoring station using Ethernet protocols and appropriate hardware.
5. Controls. All bridge major motion controls shall be performed by a joystick located on the control console. All major motions shall only occur while a control is maintained in the active position (“deadman” functionality). All of the motion controls shall be designed to be relative to the function of the PBB being controlled. For example, “raise” push button shall be located above the “lower” push button.
 - a) Horizontal drive control. Bridge movement in the horizontal (forward/reverse propulsion and left/right steering) shall be controlled by a four-quadrant variable control stick (Joystick). Forward/reverse propulsion shall be controlled by fore/aft motion of the control stick and steering shall be controlled by right/left motion of the control stick. A wheel position indicator on the GUI shall display the direction of drive. Speed shall be proportionally controlled: as the control stick is moved progressively from the neutral position, wheel speed increases proportionally with the position of the control stick. The control stick shall have a momentary “dead man” type trigger that when depressed shall enable PBB horizontal motion after a 3-second delay. During the 3-second delay the travel warning bell at the horizontal drive shall sound and an amber indication shall be displayed at the console to inform the operator to wait to drive. After the 3-second delay period is complete and the trigger remains depressed a green indicator on the console shall indicate that drive is enabled.
 - b) Vertical drive control. Push button switches shall be provided that raise and lower the PBB.
 - c) Cab rotation control. Push button switches that provide for cab rotation, left or right, shall be available at the control console.
 - d) Emergency stop. The control console shall be equipped with an illuminated red mushroom type push button switch for discontinuing all bridge movement in an emergency. Two additional illuminated emergency stop switches accessible to ground personnel shall be installed, one at the lower end of the left vertical drive column and one at the lower end of the service stairs.
 - e) Closed-circuit TV (CCTV) monitor. A 5 inch (125mm) diagonal color monitor shall be mounted in the vicinity of the control console that continuously displays a camera image of the PBB horizontal drive wheels area. The CCTV camera shall be mounted at a location that provides a clear view of the wheels area.

O. Operation and Control Logic

Operator log on and security. An Operator, Maintenance or Administration Password shall be required to access PBB operations or maintenance activities. An operator shall be required to log on at the GUI using a valid password to operate the PBB, to include enabling or disabling the automatic

leveling mode. As an alternate, a three-position master key switch used to select "OFF", "OPERATE", or "AUTO" (automatic leveling). The key may be removed only in the "OFF" or "AUTO" positions. Passwords shall be used to control access to set up, maintenance and diagnostic screens and password maintenance.

If using passwords to control bridge functions, then the PBB shall have three levels of passwords. If a selector switch is used then only Level II and III are required:

Level I – Operator Passwords. Up to forty-two (42) operator passwords shall allow access to all aircraft docking functions.

Level II – Maintenance Passwords. One (1) maintenance password shall allow access to all operator and maintenance/setup functions.

Level III – Administrative Password. One (1) administrative password shall allow access to all Level I and II functions plus allow the administrative user to view and edit passwords.

If passwords are being utilized for bridge functions then the following (a) and (b) apply:

1. Log Off. To log off, the Operator shall touch the Logoff touch button on the GUI. This will return the GUI to the opening log on/password screen.
2. PBB Operation Modes. The controls shall provide auto level, operate and logged off modes that shall be selected using touch buttons on the touchscreen.

Auto level. Selecting the “Auto Level Mode” touch button shall initiate the auto level sequence. The auto level arm extends toward the aircraft, and the system shall perform an automatic check (test nod) of the auto level system to verify that the aircraft sensor has made contact with the aircraft and that the auto level control system is functional. Upon completion of the verification process, a message shall be displayed indicating that the PBB is in “Auto Level Mode”. When in auto level mode, the PBB shall allow only vertical travel; canopy, cab rotation and horizontal travel become inactive. In auto level mode, the PBB shall engage the auto level system and automatically follow the vertical movement of the parked aircraft. To exit auto level mode and return to manual mode, the operator must touch the auto level mode touch button and enter a valid password.

3. Operate. Logging on using a valid password, or exit auto level mode using a valid password enables all bridge movements – extend/retract, vertical, floor movement, and cab rotation – provided there are no faults or activated limits. In operate mode, all bridge movement shall be initiated by the operator. The appropriate pushbuttons shall be lighted to indicate those functions available, and a message on the GUI panel shall be displayed indicating the PBB is in Operate Mode.

4. Logged off. The operator must touch the “Logoff” touch button to exit the Main Screen and return to the Log on Screen. All PBB functions except lighting shall be disabled.
5. Languages. The operator shall be able to select one of the optional preprogrammed languages for display on the GUI. English shall be the standard default language, unless otherwise specified. Up to three (3) additional languages can be programmed into the PLC as options. Once a language has been selected, all messages shall be displayed in the selected language until a different language is selected on the log on screen. Airport secondary language choices for operational procedures shall be French and German.
6. Cab floor adjustment. The cab floor of the PBB shall be both automatically and manually adjustable to align the floor level with the aircraft doorsill. Touch buttons on the GUI shall allow control of the cab floor to be toggled between the automatic and manual modes of operation. Text on the touch button shall display which mode is active.

Upon selection of cab floor manual mode, two additional touch buttons become active enabling the manual movement of the cab floor up or down. Touching the Up button shall move the right side of the cab floor in the upward direction. Touching the Down button shall lower the right side of the cab floor. When the PBB is “Auto Level Mode”, all cab floor movement shall be disabled and the touch buttons shall NOT be visible. The Cab Floor mode of operation previously selected when the auto level mode of operation was energized shall be reactivated when the auto level mode is deactivated.

Push button switches shall be provided on the control console that adjust the level of the cab floor.

7. Canopy closure control. The bellows-type aircraft closure canopy shall be powered for extend and retract operation. The control console shall contain GUI touch buttons to control extension and retraction of the canopy.

The aircraft canopy closure shall be capable of dual activation of both sides of the canopy simultaneously or independent activation of the right or left sides of the canopy in the up or down directions. Canopy actuation shall be active only when the PBB is in Operate Mode. When the PBB is in Auto Level Mode both canopy touch buttons shall be not visible. Therefore, the canopies must be deployed prior to entering auto level mode. The left and right side canopy actuator motors shall be independently controlled by limit switches that sense both the pressure against the aircraft, and operational range limits to provide positioning of the canopy to the aircraft and prevent over extension or retraction of the canopy closures.

Canopy shall deploy automatically when auto level mode is engaged and retract automatically when operate mode is selected.

8. Floodlights control. A GUI touch button shall be provided to allow control of the apron floodlights that shall be located on the underside of the PBB. These floodlights shall be positioned to illuminate the apron for a distance of approximately 10 m or 30 feet forward of

the PBB, and around the wheel carriage area. Touching the Floodlight touch button will toggle the apron flood lighting on and off.

9. Travel bell control. A momentary GUI touch button shall be provided to allow manual activation of the travel warning bell. When touched, the travel bell shall be activated until the button is released. (The travel warning bell sounds automatically while the PBB is moving and also during the three-second motion delay period.)
10. “More Controls” button. A touch button labelled “More Controls” shall be available on the GUI to allow additional PBB features to be selected and controlled. These features may include selections such as floor heating, window heating, additional lighting and others dependent upon customer-selected options and features.
11. Maintenance button. A GUI touch button shall be provided that shall access maintenance functions available at the GUI. The maintenance touch button shall function only when a maintenance or administrative password has been entered during log on. The maintenance button shall provide access to:

Calibration	Diagnostics	Warnings history
Save and restore data	Faults history	
Options selection	Passwords (administrative user only)	

12. Operational indicators. The following indicators are displayed on the GUI in both auto level and manual modes.
 - a) Vertical Height: The current vertical height of the PBB measured from ground level shall be measured and indicated. The measurement shall be displayed as a percentage between 0% (minimum height) and 100% (maximum height).

Display PBB height in feet.
 - b) Rotational Angle: As a display option, the rotational angle of the bridge shall be displayed. The display identifies angular counterclockwise (left) rotation in positive (+) degrees, and clockwise (right) rotation in negative (-) degrees from the centerline axis in reference to a programmed zero position.
 - c) Cab Rotation Angle: The cab rotation angle shall be measured and indicated. The zero data point shall be identified when the aircraft spacer shall be positioned perpendicular to the telescoping tunnel centerline. The display shall indicate counterclockwise (left) rotation in positive (+) degrees and clockwise (right) rotation in negative degrees from the centerline axis.
 - d) Wheel Position Angle: The wheel position angle shall be measured and indicated. Zero degrees shall be identified when the drive wheels shall be positioned parallel to bridge telescoping tunnel centerline axis. The display will indicate counterclockwise (left)

rotation in positive (+) degrees and clockwise (right) rotation in negative degrees from the centerline axis.

- e) An amber indicator lamp and a text message on the GUI shall indicate the auto-leveling system is energized and functioning.
- f) A red indicator lamp and a text message on the GUI and an audible warning shall indicate the auto leveler sustained travel timer has activated, indicating an auto level failure alarm.
- g) An amber flashing indicator on the GUI to indicate the aircraft canopy is down. The canopy must be fully retracted before the PBB can be moved forward.
- h) A red indicator and a text message on the GUI and audible alarm indicate vertical drive column faults.

PBB length display. Bridge length shall be measured and indicated from the rotunda center line to the outer edge of the aircraft spacer. The status panel shall display the linear distance accurately regardless of the rotational position of the cab. The measurement shall be displayed in feet.

NOTE: Other operational indicators shall be provided that are not located on the control console. These indicators shall include:

- i) Flashing Travel Beacons: A flashing amber beacon shall be mounted under the cab. The beacon shall indicate that power is on and the bridge may move at any moment. Two additional flashing amber beacons shall be provided, one mounted at the bottom end of each vertical lift column, that shall flash during the 3-second travel delay period and during PBB horizontal motion.
- j) Warning Bell: An audible warning bell shall be mounted under the bridge on the wheel carriage and shall ring (98 decibels at 10 feet (3.0m) when the bridge shall be moving horizontally and also during the 3-second travel delay period.

13. GUI Message Display. The GUI shall provide status and fault information to the operator. Standard messages shall include the following:

Limit Messages: shall be displayed as yellow warning messages.

Horizontal Extend Limit. Forward motion disabled.

Horizontal Retract Limit. Reverse motion disabled.

Vertical Up Limit reached. Drive PBB down.

Vertical Down Limit reached. Drive PBB up.

Cab Left Limit reached. Rotate cab right.

Cab Right Limit reached. Rotate cab left.

Left Swing Limit reached. Rotate PBB right.

Right Swing Limit reached. Rotate PBB left.

ACF Fault. Level floor manually.
Main contactor not energized. Check interlocks and emergency stops.
Limits Disabled. Use caution while driving the PBB with the Limits disabled.
Slope Up Limit reached. Reverse and up motion disabled.
Slope Down Limit reached. Reverse and down motion disabled.
Slowdown Sensor Activated. PBB in Horizontal Slow-down. Speed reduced by ½.
Main Contactor Disabled. To reset Main Contactor you must log OFF then ON.

Limit Messages:

Cab Cable Hoist Down. Horizontal Motion Disabled. Raise Cab Hoist .
Tunnel Cable Hoist Down. Horizontal Motion Disable. Raise Tunnel Hoist .
Ground Power Unit On. Horizontal motion disabled.
Pre-Conditioned Air unit on. Horizontal motion disabled .

Fault Messages: shall be displayed as red fault messages.

Vertical Up Ultimate Limit. Call Maintenance.
Vertical Down Ultimate Limit. Call Maintenance.
Horizontal Extend Ultimate Limit. Retract bridge.
Horizontal Retract Ultimate. Extend bridge.
Cab Left Limit. Rotate right.
Cab Right Limit. Rotate left.
Inverter Fault. Log Off, Wait 5 Seconds, Log back On. Call Maintenance.
Vertical Column Fault. Call Maintenance.
Swing Ultimate Limit. Call Maintenance.
Auto Level Failure. Reset Auto Level System. Call Maintenance.
Left Vertical Overload activated. Call Maintenance.
Right Vertical Overload activated. Call Maintenance.
Cab Position Sensor Failure. Call Maintenance.
Main Contactor Weld Fault. Press E-Stop and Call Maintenance.
Vertical Up Contactor Weld Fault. Call Maintenance.
Vertical Down Contactor Weld Fault. Call Maintenance.
Cab Left Contactor Weld Fault. Call Maintenance.
Cab Right Contactor Weld Fault. Call Maintenance.

14. Control Features and Interlocks. The following control interlocks shall be provided.

- a) Mechanical and logical interlocks shall be provided to prevent damage to control circuits or boarding bridge components by selecting opposite motions simultaneously. For example, depressing an “up” button prevents depressing a “down” button.
- b) When the operator selects the auto level mode, or logs off the control system, all basic bridge operational controls shall be inoperative.
- c) Basic functional logic of the PBB shall be programmed by the manufacturer. This logic resides in non-volatile memory.

- d) The software shall act upon PBB location sensor inputs and operator control inputs to provide valid PBB motions. If a conflict arises between operator inputs and sensor inputs, error routines shall be executed to display messages on the GUI, turn on warning lights, sound an alarm and/or stop the bridge as necessary.
- e) PBB motions that if unprotected could endanger personnel or cause damage to the PBB shall be protected by three levels of limits. First level limits shall provide a slowdown of PBB motion. The second level shall provide warning to the operator and motion interruption. Motions selected by the operator that do not conflict with current limits shall be allowed. Other motions shall be disabled. Information suggesting allowable motions shall be displayed for the operator on the GUI where applicable. A third level of limits shall prevent physical travel. The third level limit devices shall interrupt the main line input power to all bridge control circuits except lighting. The PLC shall monitor the limit fault and the error and operator instructions shall be displayed on the GUI. Maintenance personnel shall be required to resolve the fault and reset the PLC to allow further PBB operation.
- f) A motion-enabled interlock shall require that an operator must initiate any bridge movement by activating a control panel switch. Otherwise, power cannot be applied to the energizing circuitry. As a result, if the PLC should command the bridge to move by sending an erroneous signal, the bridge will not move until a control console switch has been activated as well. Both the PLC command and the motion enable circuitry shall be activated prior to bridge movement.
- g) A non-contact sensor shall slow the bridge horizontal motion as it approaches the aircraft when in operate mode.
- h) An interlock shall prevent the PBB from being driven forward when the aircraft closure canopy is deployed.
- i) An interlock shall prevent the PBB from being driven horizontally if the GPU cable hoist (if the PBB is so equipped) is not fully raised.
- j) An interlock shall prevent the PBB from being driven horizontally if the PCA (if the PBB is so equipped) is operating.
- k) PBB Preposition. Prepositioning Move Button: The PBB shall be designed to allow three-axis prepositioning. The operator can select one of the available pre-programmed aircraft types from the GUI Pre-Position Screen. The operator must depress the “Preposition Move” pushbutton and hold it down for bridge movement to occur and continue through the prepositioning travel. The PBB shall automatically rotate about the rotunda axis, extend to a pre-programmed length, elevate to a pre-determined height, and rotate the cab to a pre-determined angle. This will allow docking of the PBB to an aircraft using the most direct

route with a minimal amount of operator skill. If pressure against the Preposition Move switch shall be released at any time during the pre-positioning cycle, all bridge motion shall stop.

- i) It is intended that the PBB will be prepositioned prior to aircraft arrival and that the PBB will be approximately 10 to 12 feet from the left side of the fuselage of the selected aircraft with the PBB fully oriented to allow a “straight” in dock for the operator.
- ii) The PBB shall be equipped with an infrared proximity sensor to automatically stop the PBB when it approaches within 6 feet of an aircraft while in the Pre-position mode of operation.
- iii) Final docking (approximately 10 to 12 feet of travel directly toward the aircraft door) with the aircraft shall be completed manually with the joystick controller.
- iv) Pre-positioning shall be easily programmed by local maintenance personnel without the use of ancillary programming devices from the GUI Maintenance Set-Up Screen.

P. Maintenance and Set-Up Screens

1. GUI maintenance and set up screens. The PBB shall be designed to provide a quick method for programming the PLC to accept new operational parameters. The Maintenance / Setup Screens shall allow maintenance personnel to complete initial setup or adjustment of the PBB operational parameters directly using the GUI at the PBB control console without the use of additional programming devices or external computer. These screens provide for Preposition and Location Setup, Status Calibration, and initial Bridge Operational Limit Set Up.
2. Calibrations and set up. The following PBB control calibrations and set up operations shall be possible at the GUI touchscreen. A maintenance or admin password shall be required to access these functions.

Calibration:

Height Calibration
Cab Angle Calibration
Rotunda/Bridge Angle Calibration (optional)
Wheel Bogie Angle Calibration
Extension Calibration (optional)

Analog Limit Setup (optional in lieu of mechanical limits):

Vertical Up Limit Set
Vertical Down Limit Set
Cab Right Limit Set
Cab Left Limit Set
Swing Right Limit Set
Swing Left Limit Set

Extend Limit Set (optional)
Retract Limit Set (optional)

Password Control:

Change Passwords (Admin password required)

Adjustable Auto Level Timer (1.0 – 10.0 Seconds)

Optional Features:

Pre-position Setup (optional): Set Pre-positioning Points

Others as required

3. **Prepositioning.** Prepositioning shall be easily programmed by local maintenance personnel without the use of ancillary programming devices. A maintenance person shall be required to log onto the PBB using a maintenance password. From the Maintenance Set-Up Screen located in the Setup Screen menu, the Preposition Setup Mode of Operation shall be selected. The PBB shall then be rotated, moved vertically, extended, and the cab rotated to the desired aircraft service position. Upon reaching the desired aircraft service position, one of the preposition setup buttons, labeled as specific aircraft types, shall be depressed to program the PLC with the required coordinates for that particular prepositioning location. No other programming shall be required.
4. **PBB Calibration.** The Status Calibration screen shall be provided to accommodate input of critical data used in establishing operational parameters for a particular gate location during the initial PBB set-up operation. The calibration includes the following data:
 - a) Units shall be in feet only.
 - b) **Height Calibration:** This screen provides the ability to establish vertical data points that shall be used as the base for calculation for the vertical height measurements displayed on the screen.
 - c) **Wheel Bogie Calibration:** This screen provides the ability to establish a zero or straight forward calibration point and 90° left calibration point used in determining wheel bogie position.
 - d) **Cab Calibration:** This screen provides the ability to establish a zero or straight forward calibration point and 90° left calibration point used in determining Cab position.
 - e) **Bridge/Swing Calibration (optional):** This screen provides the ability to establish a zero calibration point and a second reference point used in determining Bridge/Swing position.
 - f) **Length Calibration (optional):** This screen provides the ability of setting up two length reference points used in determining Bridge Length.
5. **PBB Limits Set-Up (optional in lieu of mechanical limits).**

- a) PBB Height: This gives maintenance the ability of setting Vertical Up/ Down Height Limits anywhere within the operation Vertical range of the PBB with just the touch of a couple touch buttons.
 - b) Cab Rotation: This gives maintenance the ability of setting Cab Left/Right Limits anywhere within the operational Cab rotation range of the PBB with just the touch of a couple touch buttons.
 - c) PBB/Swing Rotation: This gives maintenance the ability of setting PBB Rotation/Swing Left/Right Limits anywhere within the PBB Rotation/Swing operational range of the PBB with just the touch of a couple touch buttons.
6. Password Maintenance. There are three password levels. Operator, Maintenance and Administration.

Operator: There are up to forty-two (42) operator passwords available. These passwords give the operator the ability to logon and operate the PBB in Manual and Auto level Mode with full rights to drive the PBB and select Auto level Mode once they are next to an aircraft. The alarm history screen and I/O diagnostic screens shall also be available to operators.

Maintenance: This password gives the Maintenance person the ability of Operating and Configuring the PBB with all Calibration and Limit set-ups and all other configuration screens.

Administration: This password gives the Administrator the ability to Operate, Set-Up and Maintain passwords on the PBB plus access to Alarm History Screen, I/O Diagnostic Screens and all other configuration screens.

Q. Utilities

1. Networking cables. A high speed communication / networking cable consisting of 3 bundles of 4 pair each category six 24 gauge communications cable shall be provided from the upper rotunda junction box to the control console. Networking cable product information shall be coordinated with local airport IT department and is the sole responsibility of the PBB OEM to provide accordingly to airport requirements.
2. Telephone Port: Operators cab wall shall include a telephone port for airline communications with proper communication cables distributed between the PBB and terminal connection point.
3. Utility outlets. Unswitched 120 volt, 1 phase, 15 amp utility outlets shall be located a) on left wall of the cab, adjacent to the operator's control console and b) in the rotunda corridor . An additional 15 amp GFI duplex outlet shall be provided on the drive column wheel carriage cross beam where it shall be accessible to maintenance personnel at ground level.
4. Fire Alarm: Manufacturer shall supply a fire alarm pull station located within the cab area with associated materials, hardware and electrical cable (18/3) for termination to the building. Electrical

cable length shall be sufficient for termination into the terminal building and be coordinated with cognizant airport personnel accordingly.

5. Smoke Detector: Manufacturer shall supply a smoke detector located within the PBB cab ceiling area with associated components for operation. Termination of electrical cabling shall be coordinated with airport personnel for operation.
6. Emergency Lighting: Two battery pack emergency lighting units with manual test indicators shall be installed to provide adequate illumination for 90 minutes during a power failure. One located in the cab area and one in the "C" tunnel. Battery packs shall be kept charged via an automatic recharging device on the same circuit as the interior lighting fixtures.

R. Interior Finishes

The Interior finish of the PBB shall be designed to be durable and easy to clean. The materials shall be selected and proven to withstand the environmental exposure of airport traffic.

1. Finished Ceiling. Ceiling shall be continuous coil coat painted galvanized sheets. If plank type ceilings are used, each plank shall be 7.25 inches (184mm) wide with a 0.75 inch (19mm) accent between adjacent planks. The planks shall be oriented perpendicular to the tunnel centerline and run continuously from wall to wall. The planks shall be manufactured from 0.020 (0.51mm) thick aluminum. Standard ceiling color brushed aluminum finish.
 - a) Aluminum corner moldings shall be used to support and provide a finished appearance to the ends of the ceiling planks and cover the top edges of the wall panels. The molding shall be black in color.
 - b) Insulation above the finished ceiling shall be 0.5 inch (13mm) thick black, fire resistant fiberglass if plank type ceilings are used.
2. Subfloors. The subfloor in the cab and bubble area shall be aluminum (if wood flooring is used), and the PBB tunnels shall be 0.75 inch (19 mm) thick marine grade plywood that has a high resistance to moisture and moisture damage. Flat galvanized metal sub-floors are an approved equal.
3. Floor covering. Ribbed rubber 0.1875 inch (4.8mm) thick shall be used as floor covering on the cab and bubble floors. Outer cab floor shall contain sub heaters for ambient winter conditions for Syracuse, New York.
 - PBB floor coverings within the A, B and C tunnels, shall be furnished and installed by the PBB manufacturer. Carpet molding shall be supplied by the PBB manufacturer on both sides of the

tunnel floors unless otherwise specified by the customer. PBB manufacturer shall provide carpet based on high traffic areas and warranty carpet for a period of five years.

4. Wall finish. The tunnel wall treatment shall be high pressure laminate melamine plastic panels, floor to ceiling. The panels shall be 0.375 inches (9.5mm) thick and approximately 48 inches (1219 mm) on center (60 inches (1524mm) on center for truss tunnel walls). The wallboard panels shall be supported by anodized aluminum trim with a black accent stripe. The design shall allow each panel to be removed individually. The wallboard colors shall be customer specified. The built-up wall structure shall result in an average thermal resistance R (in the wall structure) of 2.4 Hr-Ft²-°F/Btu (0.42 m²-°C/W). Galvannealed Coil Rolled Paneling system is approved as equal.

Wall treatments in the pivoting sections (rotunda and cab support) shall be galvanized steel slats.

NOTE: Alternate ceiling and wall paneling systems shall be submitted for approval by EOR and SRAA.

5. Other Interior Surfaces Exposed to Passengers

Surface preparation:

Contaminants are removed from the surface in accordance with SSPC SP-1 and appropriate SSPC commentaries.

The surface shall be mechanically cleaned in accordance with SSPC SP-3 to remove loose scale and contaminants from the surface where required.

The cab surface is dry abrasive blast cleaned in accordance with SSPC SP-6 to obtain a 1-3 mil profile.

Primer:

One coat of Sherwin-Williams High Build Chromate Free Epoxy Primer E65AC8\E65AC12 (or equivalent) is applied. The dry film thickness is 6-10 mils.

Finish Coat:

Sherwin-Williams high solids Polane S Plus Poly-urethane (or equivalent) is applied. The dry film thickness is 2-3 mils. The color matches the wallboard color unless otherwise specified.

The total dry film thickness is 6-10 mils.

6. Interior Surfaces Not Exposed to Passengers

Surface preparation:

Contaminants are removed from the surface in accordance with SSPC SP-1 and appropriate SSPC commentaries.

The surface is mechanically cleaned in accordance with SSPC SP-3 to remove loose scale and contaminants from the surface where required.

Primer:

One coat of Sherwin-Williams High Build Chromate Free Kem Aqua 70P (or equivalent) primer is applied. The dry film thickness is 1.1 mils (27 microns).

NOTE: Alternative paint systems shall be submitted for approval by EOR and the SRAA.

7. Interior Lighting.

- Tunnels , cab and rotunda interior lighting shall be provided with manufacturers latest standard LED interior lighting fixtures and all associated components.
The average light intensity at the floor shall be 18 foot candles (194 lux). Note: Lighting intensity levels vary with changes in interior color designs and lighting system shall be submitted for approval for variations.

Single three-way switches shall be located in the rotunda and on the wall near the service door at the aircraft end of the PBB. These switches shall control interior tunnel, bubble, and rotunda lights and the cab floor light fixture mounted outside the cab weather door. Lighting shall be rated for ambient conditions of Syracuse , New York.

S. Exterior Finishes

All exterior steel surfaces shall be protected from corrosion by the following processes:

Surface Preparation:

All contaminants shall be removed from the surface in accordance with SSPC-SP-1 (Solvent Wipe) requirements and commentaries.

Surfaces shall then be dry abrasive blast cleaned in accordance with SSPC SP-6 (Commercial Blast Cleaning) requirement to obtain a 1-3 mil profile.

Galvanized or galvanized steel exterior surfaces shall be prepared with solvent wipe only in accordance with SSPC-SP-1 and shall not be abrasive blast cleaned.

Primer:

One coat of Sherwin-Williams High Build Chromate Free Epoxy Primer E65 AC8/E65AC12 (or equivalent) shall be applied over the prepared surface to a dry film thickness of 6-10 mils (150-250 microns).

Finish Coat:

One single color finish coat of Sherwin-William Polane S Plus aliphatic, high solids, catalyzed, pigmented Polyurethane shall be applied over the primer coat at a dry film thickness of 2-3 mils (50-75 microns). The color shall be customer specified.

The total exterior finish system shall provide a minimum dry film thickness of 8 mils (200 microns).

NOTE: Alternative paint systems shall be submitted for approval by EOR and the SRAA.

1.3 Design Criteria and Accessory PBB Provisions

A. The PBB shall be designed in accordance with good engineering practices and the standards developed and adopted by the passenger boarding bridge industry. Particular attention shall be given to keeping components simple, rugged and easily accessible for routine maintenance, including lubrication, component exchange and ease of adjustment. All access panels and openings shall be sized to accommodate the component being changed or adjusted, as well as the equipment and personnel necessary to accomplish the work.

The General Construction Contractor is solely responsible for a fully operational bridge to meet contractual and technical requirements for servicing all listed aircraft per parking plan. The General Construction Contractor shall be the prime coordinator for supporting the inclusion of all ancillary GSE not limited to PCA, 400hz, HMS and PWC.

B. The General Construction Contractor is responsible to coordinate all structural, electrical, and mechanical design details with the EOR for the duration of project. The coordination process is not limited to communications, CAD drawings, technical design documents, load calculations and full site surveys. The General Construction Contractor shall provide the necessary site surveys to verify each location conditions for PBB foundations, terminal sill heights, walkway columns and interfaces at no additional cost. It is the sole responsibility for the General Construction Contractor to sign off on all loads and coordinates prior to fabrication and installation of PBB units. The PBB manufacturer shall provide airport personnel (2 staff members) and EOR (1) access to the Factory Test.

C. The PBB manufacturer shall provide all factory attachments for installation of ancillary equipment to prevent field welding. It is the responsibility of the PBB manufacturer to coordinate with all GSE vendors and EOR if required to eliminate field welding.

D. Shop drawings and submittals shall be provided prior to PBB approval fabrication and will be reviewed within six weeks by the EOR.

- E. Coordination of all architectural materials not limited to exterior and interior painting schemes, wall panel, ceiling, carpet, cab and rotunda flooring material selections shall be processed during the six - week review period.
- F. PBB manufacturer shall supply safety markings and provisions for passenger enplaning and deplaning accordingly to local airport and ADA requirements not limited to interior safety signage, caution markings and safety paint. An outline shall be submitted during the submittal process not limited to tunnel signs, roller channel markings and electrical high voltage markings.
- G. Gate Signage – PBB manufacturer shall provide triangular illuminated gate signs to match existing gate PBB gate signage. Coordination shall be the sole responsibility of the PBB manufacturer to obtain site conditions for installation.
- H. Tunnel Hand- Rails – PBB manufacturer shall provide aluminum hand - rails on all transition ramps and full -length right and left side of “A” tunnel. If walkways or collars are inclusive of technical documents or attachments hand- rails are to be provided accordingly as “A” tunnel right and left side provisions.
- I. Regional Jet – PBB supplier shall provide cab floors which automatically adapt to the designated regional jets and commercial aircraft fleet for each gate.
- J. PBB Cooling/Heating and Exhaust Fan – PBB manufacturer shall provide a rooftop mounted exhaust fan on the rotunda or back of “A” tunnel without restricting extension or retraction limitations for PBB operations. Exhaust fan shall contain a minimum exhaust capacity of 1500 up to 3000 CFM with 1.4” static pressure and smoke detector. Exhaust fan shall be weather- proof and be installed with a collar and ceiling mounted aluminum exhaust intake grille. Pre-Cool and Heating System shall be inclusive of all parts, materials, controls, electrical components, and operations control system to cool or heat the PBB continuously during operations. Ventilation distribution for air flow shall contain a full- length air duct allowing for airflow throughout the “A” tunnel sized accordingly not to obstruct passenger’s safety while enplaning and deplaning. PCA components such as dampers, hoses, duct work, hard ducting, insulation, plenums, covers, actuators shall be coordinated with the PCA supplier for a fully functional system. Sequence of operations shall be determined by the airport operators. Pre-cool function shall not have precedent over cooling of aircraft. Cooling and heating of the full length PBB and up to twelve feet of walkway shall be accommodated.
- K. PBB manufacturer shall provide roof access ladder and cage. Hand - rails are to be provided for all GSE mounted roof top equipment if applicable. Fall arrest cables are to be provided in accordance with OSHA 1910.66 Appendix C.
- L. PBB manufacturer shall provide all materials, electrical cables and provisions to integrate ancillary equipment for point of use PCA and 400hz/28volt combo unit for electrical, mechanical and structural parts, materials and labor.

M. Safety Wheel Bogie Hoop Rings: Required on all horizontal drive mechanisms, safety yellow or red outer ring.

1.4 Structural Loads

A. The PBB structure shall support at a minimum the following industry standard loads. These loads may be applied in total or in part, singularly or simultaneously. The design shall be based on the combination that imposes the most adverse loading. In addition to the dead loads and strain caused by movement, the entire PBB shall support:

i) Floor load of 40 pounds per square foot (191.5 dN/m²).

ii) Floor load of 40 pounds per square foot (191.5 dN/m²).

iii) **Building Risk Category III**

iv) Wind load:

-Retracted and stowed design wind speed = 115 mph

-Extended and elevated design wind speed = 100 mph

-Exposure Category C

- Components and cladding as per code requirements (ASCE 7-16).

~~25 pounds per square foot (119.7 dN/m²), or an approximate wind velocity of 90 mph (150 km/hr). Note: winds over 90 mph (150 km/hr) can be accommodated with optional equipment.~~

Extended and elevated: 12.5 pounds per square foot (59.9 dN/m²) or an approximate wind velocity of 60 mph (100 km/hr).

v) Snow roof load of 40 pounds per square foot (119.7 dN/m²) rated for Syracuse, New York.

vi) Seismic load as required by the City of Syracuse, New York.

vii) The structural design shall provide sufficient torsional rigidity to avoid excessive sway when the PBB is brought to a gradual stop.

viii) All mechanisms for actuating, guiding and restraining the PBB and its components shall be designed to minimize noise and sway. No operating vibrations or loads shall be transmitted to the terminal building.

1.5 Environmental Considerations

- A. The PBB shall operate without failure under temperature conditions regulated for ambient conditions of Syracuse New York and of -40 degrees F (-40 degrees C) to +125 degrees F (+52 degrees C).
- B. All components and materials shall be individually and collectively designed or selected for long service life under such conditions.

1.6 Power Characteristics

- A. The PBB shall operate on 480 volts, 3 phase, 60 amps, 60 Hz delta configuration with separate ground (4 wire). The 480 VAC shall be transformed to 120/230 VAC for lighting and controls.

1.7 Codes, Regulations and Standards

The PBB shall be designed to meet U.S. Codes and Regulations, which have been adopted by the passenger boarding bridge industry.

A. Structural

American Institute of Steel Construction (AISC) Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings.

American Welding Society (AWS) Standards.

B. Environmental loading

American Society of Civil Engineers (ASCE) 7, Minimum Design Loads for Buildings and Other Structures

C. Material

Structural Steel	ASTM A36, A572
Structural Tube and Shapes	ASTM A500
Steel Pipe	ASTM A53
Steel Sheet	ASTM A570
High Strength Steel	ASTM A514 & A517
Hinge Pins	ASTM A 311 Grade 1018 & Grade 1144
Bolts – High Strength	SAE J429 GRADE 5 and 8 or ASTM A325 and A490
Bars, rods and plates, including base plates:	ASTM A572 Grade 50.

D. Mechanical

All mechanical components and designs shall conform to the recommendations and standards established by the Society of Automotive Engineers (SAE) and the American Society of Mechanical Engineers (ASME) where applicable.

E. Fire Protection

The PBB shall meet the requirements of the National Fire Protection Association (NFPA) “Standard on Construction and Protection of Aircraft Loading Walkways,” NFPA-415. The local Airport Authority Fire Marshall has overall approval of PBB installation conditions and shall review all characteristics of the PBB’s.

F. Electrical

All equipment and methods of installation shall conform, where applicable, to the requirements and recommendations of the National Electrical Manufacturers Association (NEMA) and the National Electrical Code (NEC) latest issue.

The PBB shall be listed in the United States and Canada by ETL, a Nationally Recognized Testing Laboratory (NRTL) for compliance with:

UL #QGLA for Passenger Boarding Bridges

NFPA 415: Standard on Construction and Protection of Aircraft Loading Walkways.

G. Paint

Surface preparation and painting of the PBB shall conform to the guidelines and standards of the Structural Steel Painting Council (SSPC).

1.8 Manuals, Training and Commissioning

A. Operation and Maintenance Manuals

Operations and maintenance manuals that follow the intent of the Air Transport Association (ATA) Specification 101 shall be provided as outlined below. Included in the manuals shall be preventative maintenance requirements and problem-solving procedures.

Submit six (6) Operation and Maintenance Manuals as well reproducible electronic files in .pdf format.

B. PBB Commissioning and Operator Maintenance Training

1. Training shall be provided at scheduled times during the installation. PBB manufacturer and GSE ancillary equipment providers shall allocate two 8 hours shifts per day for three days for both operational and maintenance training to accommodate airport and airline staff. Scheduling details shall be coordinated during installation period. Training shall be provided by PBB authorized staff with a minimum of five years’ experience in PBB operation and maintenance.

2. Commissioning documentation for both factory and site acceptance testing shall be provided by PBB manufacturer.
3. Final acceptance and sign off shall be designated upon completion of punch-list items.

1.9 Warranty, Spare Parts and Installation Procedures

A. WARRANTY:

The General Construction Contractor shall warranty all parts, materials, components and labor for a period of one (1) year from beneficial occupancy of PBB. Addressing any PBB defects and repairs shall be completed at no additional cost to the SRAA.

Warranty shall include the entire PBB and is not limited to the following components and structures:

- : Rotunda and Columns
- : Walkway and Columns
- : Cab and Cab Assembly
- : Tunnels, Roller Channels, Bearings
- : Drive Systems – both horizontal and vertical
- : Wheel Bogie Assembly
- : Canopy Section
- : Steel Structures inclusive of Roof, Sides and Undercarriage
- : Electronic Boards and Assemblies
- : Software Programs
- : Electrical Distribution Parts and Components
- : Electrical Cables
- : Mechanical Systems
- : Drive Motor Assemblies
- : Hydraulic Assemblies
- : Paint – Exterior and Interior Surfaces

Consumables such as fluids, greases and oils excluded.

B. Installation Procedures:

1. PBB manufacturer shall supply a Project Supervisor with a minimum of 3 years of PBB installation experience for the duration of PBB replacement and commissioning. PBB manufacturer shall have a limit of one change of the Project Supervisor if deemed an emergency. For all additional Project Supervisor changes the airport will charge associated rates by the consulting Design and Construction team for time allowance. Professional engineering site surveys are required for all operational aspects of the PBB and GSE installations, not limited to terminal infrastructure connections, ramp obstacles, operational conditions and servicing of aircraft and shall be provided at no additional cost to the SRAA.

2. The General Construction Contractor shall provide the EOR and SRAA with daily updates from commencement of delivery to final commissioning of the PBBs.
3. The General Construction Contractor is responsible for the fabrication and delivery for all PBB and GSE per contract documents and per airport schedule. In the event the work is delayed due unforeseen circumstances, the General Construction Contractor shall make provisions to store PBBs and GSE for up to six months at no additional cost to the SRAA.
4. All subcontractors shall be approved by the SRAA and the EOR. No work shall be performed by a subcontractor without said approval.
5. The General Construction Contractor shall be responsible for coordination of the PBB and GSE integration to provide a fully operation system. Coordination shall include electrical improvements, mechanical connections, GSE fittings and sizing for the aircraft fleet mix for a specific gate.

1.10 Spare Parts:

A recommended spare parts list shall be provided with up-to-date current costs. Long lead time parts shall be highlighted along with delivery estimates. Components which are not readily available on the open market or in stock and hinder the PBB's operations shall be noted and placed as priority airport recommended stock purchase items.

One set of electronic boards shall be supplied within contract for airports stock for three PBB's and be interchangeable between 'LOT' Purchased PBBs.

One spare EDPM bumper, one auto-leveler assembly kit and one NFPA 415 canopy shall be included in contract "LOT" purchase.

1.11 Passenger Boarding Bridge / GSE Demolition and Removal Procedures:

PBB supplier/manufacturer or certified PBB installer/contractor shall remove each existing Passenger Boarding Bridge/GSE with associated steel components at each designated gate location, including all walkways and additional steel columns/haunch supports. PBB/GSE removal and disposal shall adhere to contract and phasing installation schedule.

PBBs and all ancillary GSE shall be transported to a scrap facility for full disposal. Certifications must be provided by the scrap organization for full disclosure. The SRAA retains the right to remove any materials or parts prior to removal and disposal. The General Construction Contractor shall issue a 48-hour timeframe for PBB removal in order to provide airport enough time to facilitate removal of components, if applicable to location.

Electrical Stainless Steel Disconnect Cabinets shall be removed and turned over to the SRAA. No electrical cables shall be “cut”. Proper termination of all electrical cables shall conform to proper demolition guidelines.

Anchor bolts shall be conditioned for re-use for new PBB installations. All precautions shall be taken to protect anchor bolts. Removal of existing grout and pre-preparation for re-use is the sole responsibility of the General Construction Contractor.

Ground Support Equipment (GSE) PCA (LOT) and 400 hz unit (1 unit) shall be properly disconnected and removed from PBB’s. PCA and 400 hz units and with associated accessory equipment shall disposed with the PBB’s and require certification of proper disposal.

Terminal exterior doors shall be bolted shut for safety during construction phase. Façade shall be cleared of all debris and prepped for new weathering seal system.

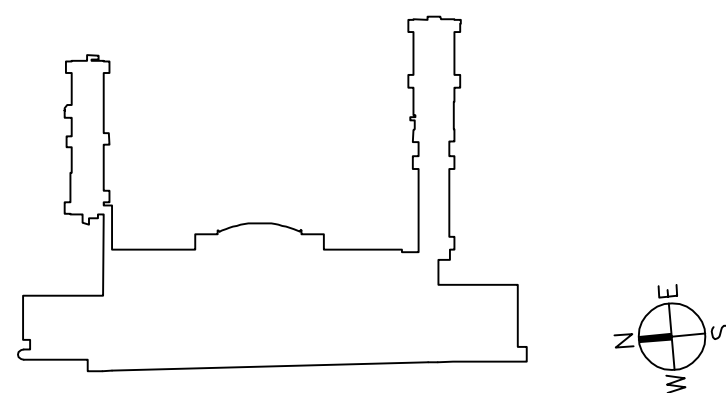
The General Construction Contractor shall obtain all permits and escorts needed for the transportation of disposed equipment off site.

END OF SECTION

PROJECT LOCATION: SYRACUSE HANCOCK INTERNATIONAL AIRPORT SYRACUSE, NEW YORK	CONTRACT NO.: ITB 2022-1
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NOTES:

KEY PLAN:



REGISTRATION:

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CONSULTANT:

REVISIONS:

REV. NO.	DATE	DESCRIPTION	CHKD. BY
1	01/28/22	ADDENDUM NO. 2	PB

PROJECT:

REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES

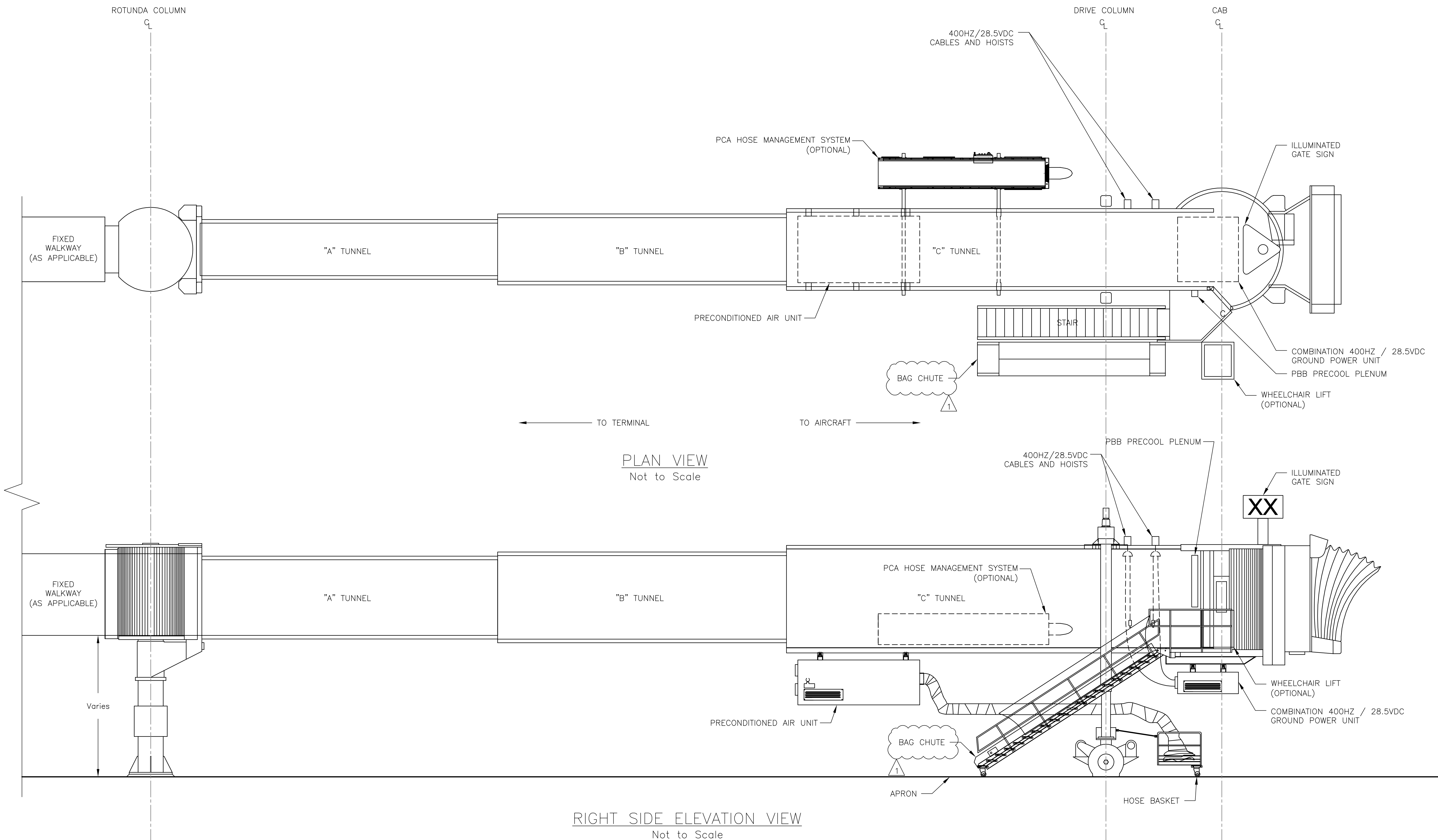
SHEET TITLE:

PASSENGER BOARDING BRIDGE EQUIPMENT DETAILS

DRAWN BY: G.G.	DATE: 01/11/22	SCALE(S) NOTED ON THIS SHEET ARE BASED ON A FULL SIZE 30"x42" SHEET
CHECKED BY: G.G.		GRAPHIC SCALE

SHEET NUMBER:

CA-002



PLAN VIEW
Not to Scale

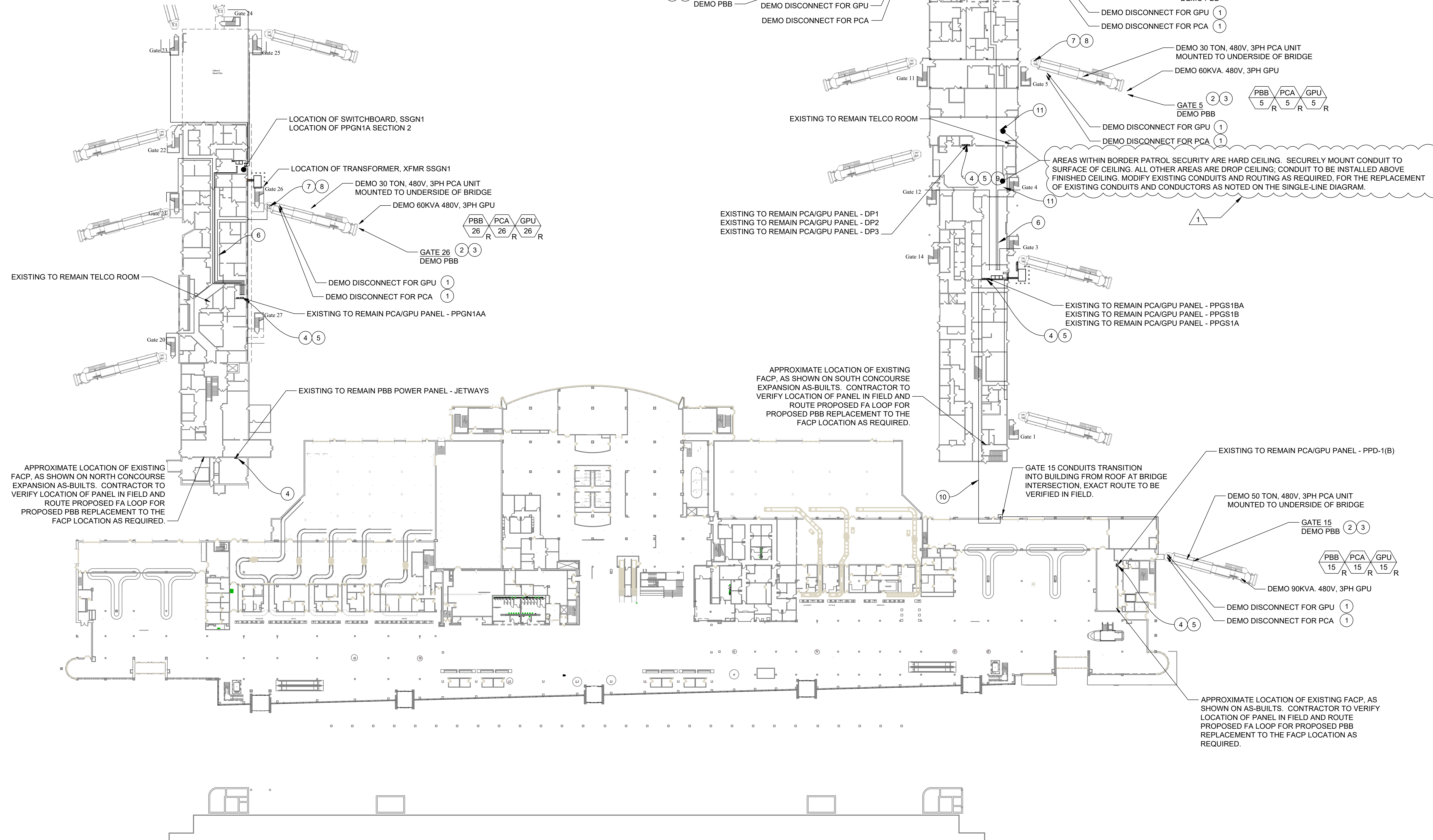
RIGHT SIDE ELEVATION VIEW
Not to Scale

GENERAL NOTES:

1. THIS DRAWING IS A GENERAL REPRESENTATION OF PBB SUPPORT EQUIPMENT LOCATIONS. ACTUAL EQUIPMENT LOCATIONS WILL BE DETERMINED BY CONTRACTOR'S DETAILED DESIGN AS APPROVED BY THE ENGINEER.
2. THE MOUNTING LOCATION FOR THE PRECONDITIONED AIR UNIT SHALL BE UNDER THE PBB C-TUNNEL. NO LESS THAN 3'-0" VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN THE UNIT AND THE APRON WHEN THE PBB IS IN ITS LOWEST POSITION.
3. ALL NEW PASSENGER BOARDING BRIDGE ROTUNDA COLUMNS ARE TO BE MOUNTED ON EXISTING PASSENGER BOARDING BRIDGE FOUNDATIONS. SEE DRAWING S-001.

KEYED NOTES:

- EXISTING NEMA 4X DISCONNECT SWITCH TO BE REMOVED AND TURNED OVER TO THE AUTHORITY FOR USE AS ATTIC STOCK. EXISTING CONNECTION TO PBB POWER, PCA, AND GPU (FEEDER, CONDUIT, CONDUCTORS, SUPPORTS, AND ASSOCIATED APPURTENANCES) TO BE DEMOLISHED TO THE EXTENT REQUIRED FOR REMOVAL OF THE PBB FROM ITS SITE FOUNDATION. REFER TO SINGLE-LINE FOR ADDITIONAL DETAIL ON DEMOLITION LIMITS (TYPICAL FOR ALL PBBs).
- EXISTING FEEDER (CONDUIT, CONDUCTORS, AND ASSOCIATED APPURTENANCES) FROM PBB POWER, PCA, GPU DISCONNECT TO BE DEMOLISHED REFER TO SINGLE-LINE FOR DEMOLITION EXTENTS. EXISTING SUPPORTS AND ASSOCIATED APPURTENANCES MAY REMAIN FOR REUSE TO THE EXTENT POSSIBLE. SEE PROPOSED SINGLE-LINE FOR ADDITIONAL INFORMATION.
- EXISTING POWER PANEL LOCATION. CONTRACTOR IS TO VERIFY IN FIELD KAIC RATING OF EXISTING PANEL/CIRCUIT BREAKERS. THIS INFORMATION SHALL BE UTILIZED FOR PROCUREMENT OF PROPOSED MATERIALS. SEE PROPOSED SINGLE-LINE FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL VERIFY EXISTING CONDUCTORS AND CONDUIT SIZES IN FIELD, AND PROVIDE ACCURATE SINGLE-LINE DIAGRAMS AS PART OF THEIR AS-BUILT DRAWINGS. THIS INFORMATION SHALL INCLUDE ALL FEEDERS ENTERING AND LEAVING THE PANEL, THIS IS NOT TO BE LIMITED TO THE FEEDERS MODIFIED ON THIS DIAGRAM.
- EXISTING CONDUIT RACKS AND CONDUIT RIGHT OF WAYS TO BE VERIFIED IN FIELD, REUSE EXISTING RIGHT OF WAYS WHERE POSSIBLE, PROVIDE NEW AS REQUIRED. (TYPICAL)
- EXISTING DISCONNECT SWITCH AND ASSOCIATED APPURTENANCES FOR PBB POWER TO BE DEMOLISHED AT BASE OF PBB. REFER TO DETAILS FOR ADDITIONAL INFORMATION. ALL EXISTING 120/240V OR 120/208V CIRCUITS, CONDUITS, CONDUCTORS, HANGERS/SUPPORTS AND ASSOCIATED APPURTENANCES NOT REQUIRED FOR NEW PBB INSTALLATION SHALL BE DEMOLISHED BACK TO SOURCE. EXISTING FEEDER (CONDUIT, CONDUCTORS, SUPPORTS, AND ASSOCIATED APPURTENANCES) FROM DISCONNECT TO BE DEMOLISHED BACK TO THE FACE OF BUILDING. CONTRACTOR SHALL PULL BACK CONDUCTORS FOR REUSE TO THE EXTENT POSSIBLE.
- EXISTING 100A CIRCUIT BREAKER IN EXISTING PBB POWER PANEL TO BE REMOVED, CONTRACTOR SHALL TURN OVER BREAKER FOR REUSE TO THE AUTHORITY. CONTRACTOR IS TO VERIFY IN FIELD KAIC RATING OF EXISTING BREAKERS AND PANEL, THIS INFORMATION SHALL BE UTILIZED FOR PROCUREMENT OF PROPOSED MATERIALS. SEE PROPOSED SINGLE-LINE FOR ADDITIONAL INFORMATION.
- EXISTING CONDUIT ROUTED ON ROOF, VERIFY EXACT ROUTING IN FIELD.
- AREAS WITHIN BORDER PATROL SECURITY ARE HARD CEILING. MOUNT TO CEILING STRUCTURE. ALL OTHER AREAS ARE DROP CEILING; CONDUIT TO BE INSTALLED ABOVE FINISHED CEILING. MODIFY EXISTING CONDUITS AND ROUTING AS REQUIRED, FOR THE REPLACEMENT OF EXISTING CONDUITS AND CONDUCTORS AS NOTED ON THE SINGLE-LINE DIAGRAM.



1 FIRST FLOOR NORTH/SOUTH CONCOURSE OVERVIEW - ELECTRICAL DEMOLITION
SCALE: 1" = 40'



PROJECT LOCATION: SYRACUSE HANCOCK INTERNATIONAL AIRPORT SYRACUSE, NEW YORK	CONTRACT NO: IFB 2022-2
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PROJECT KEY PLAN:
KEY PLAN:

REGISTRATION:

PRIME:
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REV. NO	DATE	DESCRIPTION	CHKD. BY
1	1/28/22	ADDENDUM NO. 2	JP

PROJECT:
REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES

SHEET TITLE:
FIRST FLOOR ELECTRICAL DEMOLITION PLAN

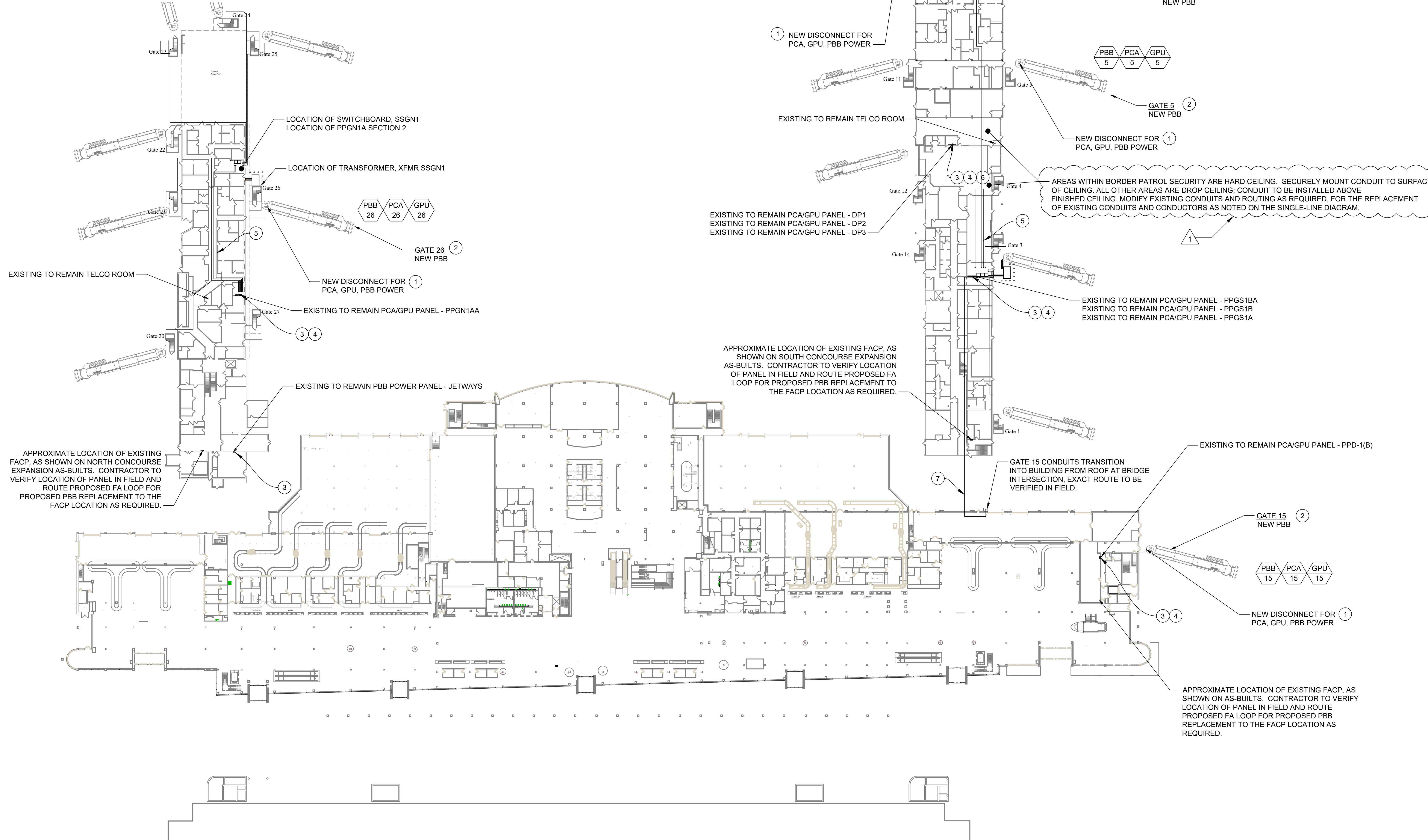
DRAWN BY: M. CERBIN	DATE: 01/11/22	SCALE(S) NOTED ON THIS SHEET ARE BASED ON A FULL SIZE 30"X42" SHEET
CHECKED BY: M. MORRIS		

SHEET NUMBER:
ED-101

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KEYED NOTES:

- CONTRACTOR TO PROVIDE (3) NON-FUSED NEMA 4X STAINLESS STEEL DISCONNECTS MOUNTED AT BASE OF PBB, DISCONNECTS ARE TO BE MOUNTED ON STAINLESS STEEL SUPPORTS WITH STAINLESS STEEL HARDWARE. PROVIDE (1) DISCONNECT FOR EACH OF THE FOLLOWING APPLICATIONS 200A DISC FOR GPU AND PCA UNITS, 100A DISC FOR PBB POWER. (TYPICAL FOR ALL SEVEN PBBs, SEE PBB DETAIL FOR ADDITIONAL INFORMATION)
- PROPOSED CONNECTION TO PBB POWER, PCA, AND GPU (FEEDER, CONDUIT, CONDUCTORS, SUPPORTS, AND ASSOCIATED APPURTENANCES) TO BE REUSED TO THE EXTENT POSSIBLE. REFER TO SINGLE-LINE FOR ADDITIONAL DETAILS ON EXISTING INFRASTRUCTURE THAT MAY REMAIN FOR REUSE. PROVIDE NEW AS NOTED/REQUIRED ON THE SINGLE-LINE DIAGRAMS. (TYPICAL FOR ALL SEVEN PBBs)
- EXISTING POWER PANEL LOCATION. CONTRACTOR IS TO PROVIDE NEW CIRCUIT BREAKERS AS NOTED ON THE SINGLE-LINE DIAGRAMS. SEE PROPOSED SINGLE-LINE FOR ADDITIONAL INFORMATION.
- CONTRACTOR SHALL VERIFY EXISTING CONDUCTORS AND CONDUIT SIZES IN FIELD, AND PROVIDE ACCURATE SINGLE-LINE DIAGRAMS AS PART OF THEIR AS-BUILT DRAWINGS. THIS INFORMATION SHALL INCLUDE ALL FEEDERS ENTERING AND LEAVING THE PANEL, THIS IS NOT TO BE LIMITED TO THE FEEDERS MODIFIED ON THIS PROJECT.
- EXISTING CONDUIT RACKS AND CONDUIT RIGHT OF WAYS TO BE UTILIZED FOR ROUTING OF PROPOSED CONDUITS, REUSE EXISTING RIGHT OF WAYS WHERE POSSIBLE, PROVIDE NEW AS REQUIRED. (TYPICAL)
- PROVIDE NEW 60A CIRCUIT BREAKER IN EXISTING PBB POWER PANEL, SEE PROPOSED SINGLE-LINE FOR ADDITIONAL INFORMATION.
- EXISTING CONDUITS ROUTED ON ROOF, VERIFY EXISTING ROUTE IN FIELD.

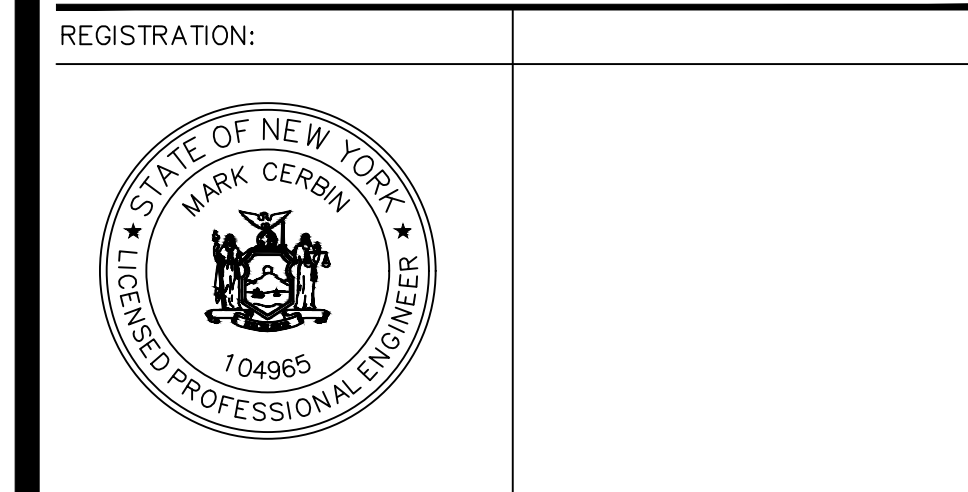
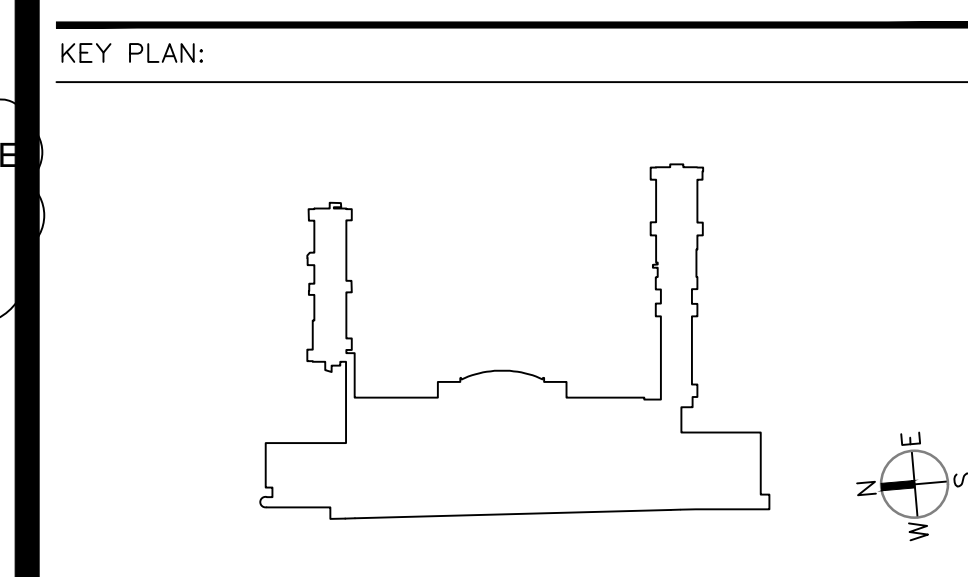


1 FIRST FLOOR NORTH/SOUTH CONCOURSE OVERVIEW - ELECTRICAL PROPOSED
SCALE: 1" = 40'



PROJECT LOCATION: SYRACUSE HANCOCK INTERNATIONAL AIRPORT SYRACUSE, NEW YORK	CONTRACT NO: IFB 2022-2
---	-----------------------------------

PROJECT KEY PLAN:



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REV. NO.	DATE	DESCRIPTION	CHKD. BY
1	1/28/22	ADDENDUM NO. 2	JP

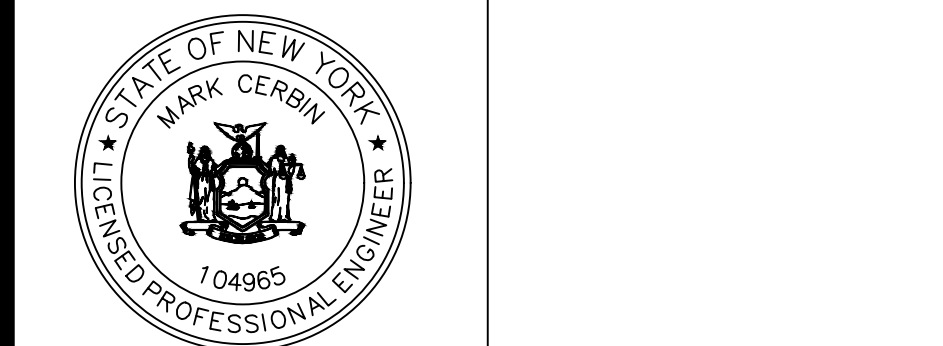
PROJECT:
REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES

SHEET TITLE:

FIRST FLOOR PROPOSED ELECTRICAL POWER PLAN

DRAWN BY: M. CERBIN	DATE: 01/11/22	SCALE(S) NOTED ON THIS SHEET ARE BASED ON A FULL SIZE 30"X42" SHEET
CHECKED BY: M. MORRIS		
SHEET NUMBER: E-101		

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REV. NO.	DATE	DESCRIPTION	CHKD. BY
1	1/28/22	ADDENDUM NO. 2	JP

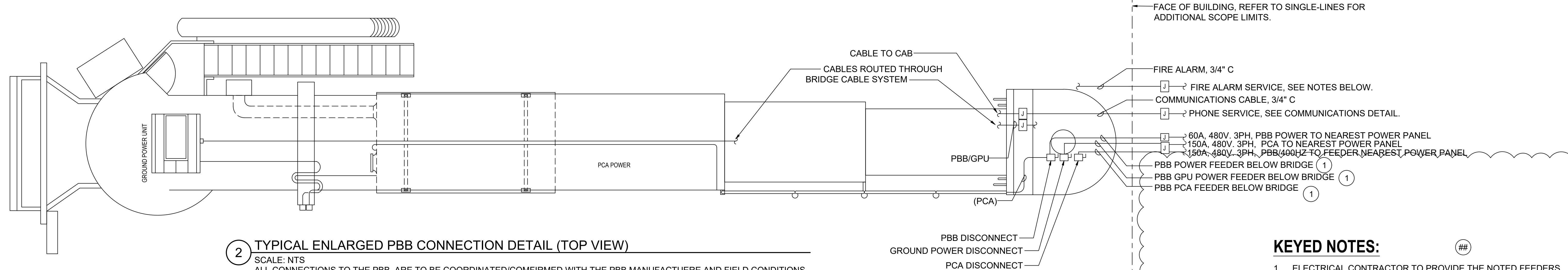
PROJECT:

REPLACEMENT OF SEVEN PASSENGER BOARDING BRIDGES

SHEET TITLE:

PBB ELECTRICAL CONNECTION DETAILS

DRAWN BY: **M. CERBIN** DATE: **01/11/22** SCALE(S) NOTED ON THIS SHEET ARE BASED ON A FULL SIZE 30"x42" SHEET
 CHECKED BY: **M. MORRIS**
 SHEET NUMBER: **E-602**



2 TYPICAL ENLARGED PBB CONNECTION DETAIL (TOP VIEW)
 SCALE: NTS
 ALL CONNECTIONS TO THE PBB, ARE TO BE COORDINATED/CONFIRMED WITH THE PBB MANUFACTURER AND FIELD CONDITIONS

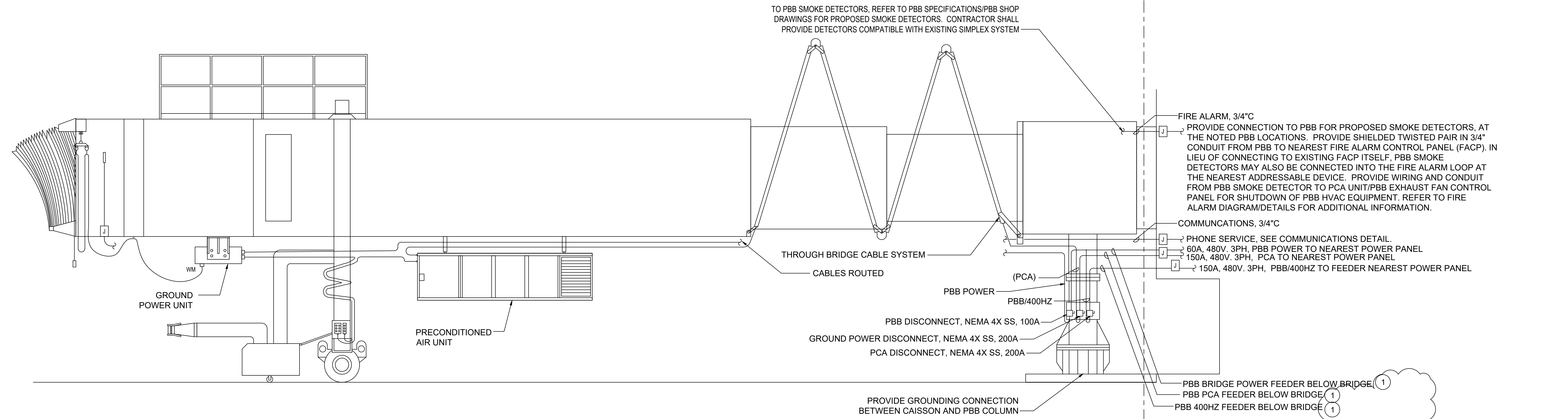
GATE POSITION	LOCATION		PCA FLA (EXIST/PROP)	PBB FLA (EXIST/PROP)	GROUND POWER FLA UNIT (EXIST/PROP)	NOTES
	AREA	CONNECTION TYPE				
5	SOUTH CONCOURSE	A	88/120	80/48	100/120	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
6	SOUTH CONCOURSE	A	120/120	80/48	100/120	1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13
8	SOUTH CONCOURSE	A	120/120	80/48	100/120	1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13
9	SOUTH CONCOURSE	A	88/120	80/48	100/120	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
10	SOUTH CONCOURSE	A	88/120	80/48	100/120	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
15	SOUTH CONCOURSE	A	120/120	48/48	120/120	1, 2, 3, 12, 13
26	NORTH CONCOURSE	A	88/120	80/48	100/120	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13

CONNECTION TYPE	
A	REMOVAL AND REPLACEMENT OF EXISTING PASSENGER BOARDING BRIDGE. COORDINATE WITH PBB CONTRACTOR AS REQUIRED. REFER TO SINGLE-LINES FOR ADDITIONAL INFORMATION.

- NOTES**
- PROPOSED CONNECTION TO PBB POWER, PCA, AND GPU (FEEDER, CONDUIT, CONDUCTORS, SUPPORTS, AND ASSOCIATED APPURTENANCES) TO BE REUSED TO THE EXTENT POSSIBLE. WHERE REUSE IS NOT POSSIBLE DEMOLISH EXISTING AND PROVIDE NEW AS REQUIRED ON THE SINGLE-LINE DIAGRAMS.
 - PROVIDE SHIELDED TWISTED PAIR IN 3/4" CONDUIT FROM PBB TO NEAREST FIRE ALARM CONTROL PANEL (FACP).
 - PROVIDE CONTROL WIRING AND CONDUIT AS REQUIRED FROM SMOKE DETECTORS TO PCA/EXHAUST FAN CONTROL PANEL FOR FAN SHUTDOWN. REFER TO FA RISER DETAIL FOR ADDITIONAL INFORMATION.
 - PROVIDE NEW FEEDER (CONDUIT, CONDUCTORS, AND ASSOCIATED APPURTENANCES) FROM PROPOSED PBB DISCONNECT TO SOURCE PANEL.
 - INTERCEPT EXISTING CONNECTION TO PBB AT FACE OF BUILDING, REUSE EXISTING TO THE EXTENT POSSIBLE.
 - PROVIDE NEW BRIDGE 60A POWER FEEDER FROM NEAREST GATE TENANT POWER PANEL SIZED PER DETAIL/SINGLE-LINE.
 - PROVIDE NEW PCA 150A POWER FEEDER FROM NEAREST GATE TENANT POWER PANEL SIZED PER DETAIL/SINGLE-LINE.
 - PROVIDE NEW GROUND 150A POWER FEEDER FROM NEAREST GATE TENANT POWER PANEL SIZED PER DETAIL/SINGLE-LINE.
 - PROVIDE 3/4" CONDUITS TO FACE OF BUILDING FOR PBB POWER.
 - PROVIDE 1 1/2" CONDUITS TO FACE OF BUILDING FOR GPU POWER.
 - PROVIDE 1 1/2" CONDUITS TO FACE OF BUILDING FOR PCA POWER.
 - CONTRACTOR TO CARRY ALL COST FOR COORDINATION OF PROPOSED BRIDGE WORK WITH PBB CONTRACTOR.
 - EXISTING CONDUIT RACKS AND CONDUIT RIGHT OF WAYS TO BE UTILIZED FOR ROUTING OF PROPOSED CONDUITS, REUSE EXISTING RIGHT OF WAYS WHERE POSSIBLE, PROVIDE NEW AS REQUIRED.

KEYED NOTES:

- ELECTRICAL CONTRACTOR TO PROVIDE THE NOTED FEEDERS (PBB POWER, GPU POWER, AND PCA POWER) TO PBB ROTUNDA SUPPORT COLUMN, UP TO AND INCLUDING THE DISCONNECTING MEANS AND TERMINATIONS OF THE SECONDARY CONDUCTORS IN THE NEMA 4X STAINLESS STEEL DISCONNECT. SECONDARY CONDUCTORS SHALL BE PRESENTED TO THE DISCONNECT BY THE GENERAL CONSTRUCTION CONTRACTOR. ELECTRICAL CONSTRUCTION CONTRACTOR SHALL INCLUDE ALL COSTS ASSOCIATED WITH COORDINATION, CONDUIT, CONDUCTORS, HANGERS/SUPPORTS AND OTHER ASSOCIATED APPURTENANCES WITH THE GENERAL CONSTRUCTION. ELECTRICAL CONSTRUCTION CONTRACTOR SHALL ALSO CARRY COSTS FOR COORDINATING PROPOSED CONDUIT ROUTING BELOW THE PBB TO THE DISCONNECT LOCATION SHOWN WITH THE GENERAL CONSTRUCTION CONTRACTOR. REFER TO SINGLE-LINES DRAWINGS AND SPEC 34 77 13 - PASSENGER BOARDING BRIDGE.



1 TYPICAL ENLARGED PBB CONNECTION DETAIL SIDE VIEW
 SCALE: NTS
 ALL CONNECTIONS TO THE PBB, ARE TO BE COORDINATED/CONFIRMED WITH THE PBB MANUFACTURER AND FIELD CONDITIONS