Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Project Submittal & Review Standards

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1.0 PURPOSE

The purpose of these standards is to provide Designers of Record with procedures for submitting a project to the Department of Aviation's Planning & Development (P&D) for technical review and acceptance. All new construction and modifications to any airport's facilities at Hartsfield-Jackson Atlanta International Airport (ATL) shall follow these standards.

2.0 SCOPE

These standards apply to all Designers of Record.

3.0 RESPONSIBILITIES

A. Designers of Record

1. Designers of Record shall be responsible for submitting all project submittals to P&D per P&D's Design Review Process Flow Charts (Appendix A-D).
2. Designers of Record shall be responsible for complying with all P&D's posted Design Standards. (https://atlstandards.com/)
3. Designers of Record shall be responsible for submitting to P&D all revisions and/or modifications to the P&D stamped/accepted documents, for review and acceptance.

B. DOA Planning & Development (P&D)

1. P&D shall be responsible for the Architectural/Engineering technical review of all project submittals submitted to P&D by Designers of Record. Code reviews, Fire/Life Safety code and Grease Interceptor requirement reviews are the responsibility of the City of Atlanta Office of Buildings (OOB), Atlanta Fire Department (AFD) and Department of Watershed Management (DWM) respectively.
2. P&D shall be responsible for ensuring that all project submittals comply with ATL P&D's posted Design Standards. (https://atlstandards.com/)
3. P&D shall be responsible for transmitting the technical review comments to the Designers of Record. (Appendix A-D)
4. P&D shall be responsible for issuing the final P&D/AFD digitally stamped, accepted project submittals to the P&D Project Manager for distribution to the Contractor. The contractor shall be responsible for obtaining all required building permits from appropriate agencies before the start of any construction work. The City of Atlanta Office of Buildings

shall not accept any submittals for permitting without the P&D/AFD stamped/accepted seal.

4.0 PROCEDURE

A. Project Submittals

1. Delivery of Submittals

   a. All project submittals shall be submitted and reviewed electronically per P&D's approved Design Review Process Flow Charts (Appendix A-D). The electronic process is a paperless database online system. All submittals will be done electronically and will replace the existing submittal of hard copy documents. The review of plans will be done through SagesGov and Bluebeam. All comments, response to comments, tracking of comments and notifications for all submittals will be done electronically.

   b. Reviews can be performed at the reviewer's desktop. Reviewers outside P&D can perform their reviews remotely at their desktops.

   c. To access the system, login to https://www.sagesgov.com/atlnext-ga web address. All external users that do not have an account must first register through the same website. Internal users must contact the Design Review Coordinator to create an account.

   d. The overall Review Process will be overseen by the P&D's Design Review Coordinator and supervised by the P&D's Directors of Architecture and Engineering.

2. Design Review Submittals

   Design review submittals shall be submitted electronically through SagesGov for each of the following design review phases:

   a. Schematic Design (30%)

      Submit PDF files of plans, specifications, design calculations and cost estimates

   b. Design Development (60%)

      Submit PDF files of plans, specifications, design calculations and cost estimates

   c. Construction Documents (90%)

      Submit PDF files of plans, specifications, design calculations and cost estimates

d. Issue for Bid/Pricing

Submit PDF files of plans, specifications, and design calculations. Sealed Drawings by the State of Georgia Architect/Engineer of Record are not required for this submittal

e. Issue for Construction (Final Conformed/Permitting)
   i. Sealed drawings by the State of Georgia Architect/Engineer of Record are required for this submittal. Submit the following Source Files:
   ii. PDF and CAD format of the sealed and signed plans
   iii. PDF and Word format of the signed and sealed specifications
   iv. PDF format of design calculations
   v. File Share Revit files if applicable with SagesGov Design Review Coordinator(s)

B. Review Timing

1. P&D's initial review time shall be fifteen (15) business days.
2. P&D's re-submittal review time shall be a maximum of five (5) business days.
3. P&D/AFD final digitally stamped acceptance IFC drawings and Release Notification letter shall be a maximum of five (5) business days.
4. AFD's review time and their resolution of issues are not controlled by P&D. These conditions may be subject to additional review time and full acceptance of the documents.

C. Review Responsibility

1. Review Responsibility
2. City of Atlanta Office of Buildings, Atlanta Fire Department and Department of Watershed Management are responsible for code reviews. Compliance with City, State and Federal Codes, Regulations and Ordinances shall be the responsibility of the Designers of Record.
3. Designers of Record shall be responsible for any liability resulting from their design. And for any errors, omissions and any other conditions resulting from the submitted Issue for Construction documents.

5.0 APPENDICES

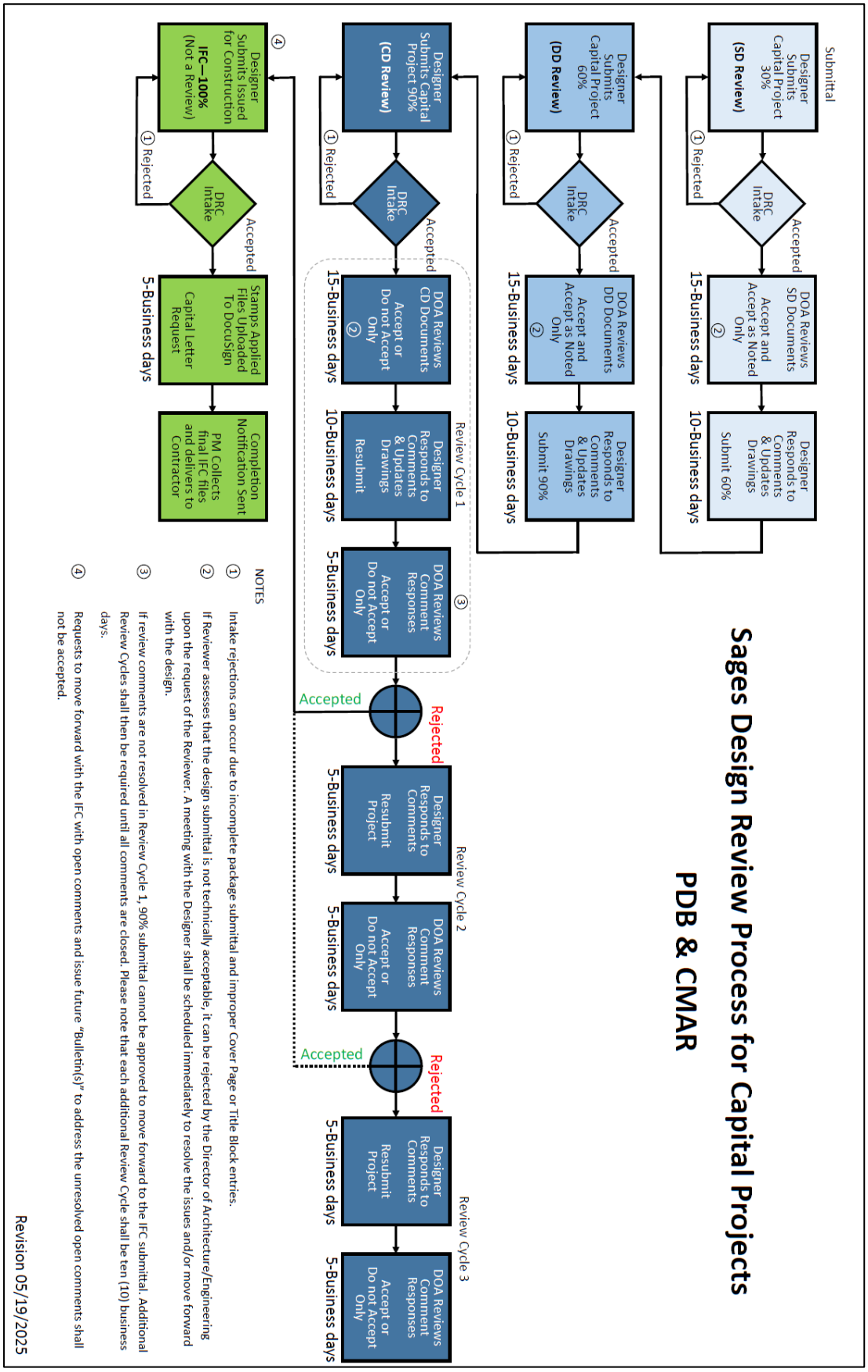
A. Appendix A - Design Review Process for Capital Projects (PDB, CMAR)

B. Appendix B - Design Review Process for Capital Projects (DESIGN, BID, BUILD)

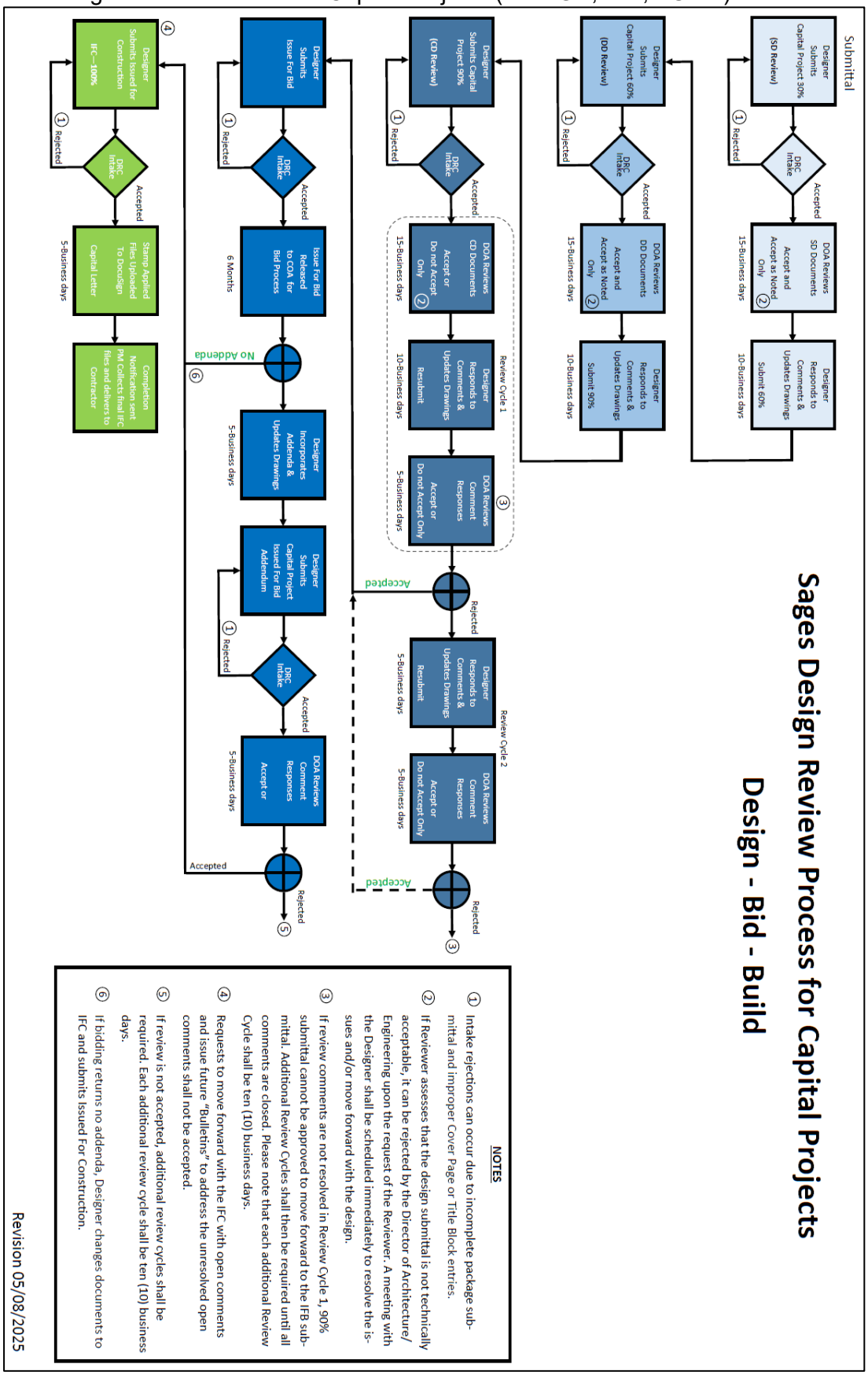
C. Appendix C - Design Review Process for Capital Projects (MGC)

D. Appendix D - Design Review Process for Capital Projects (Review, Planning, Validation)

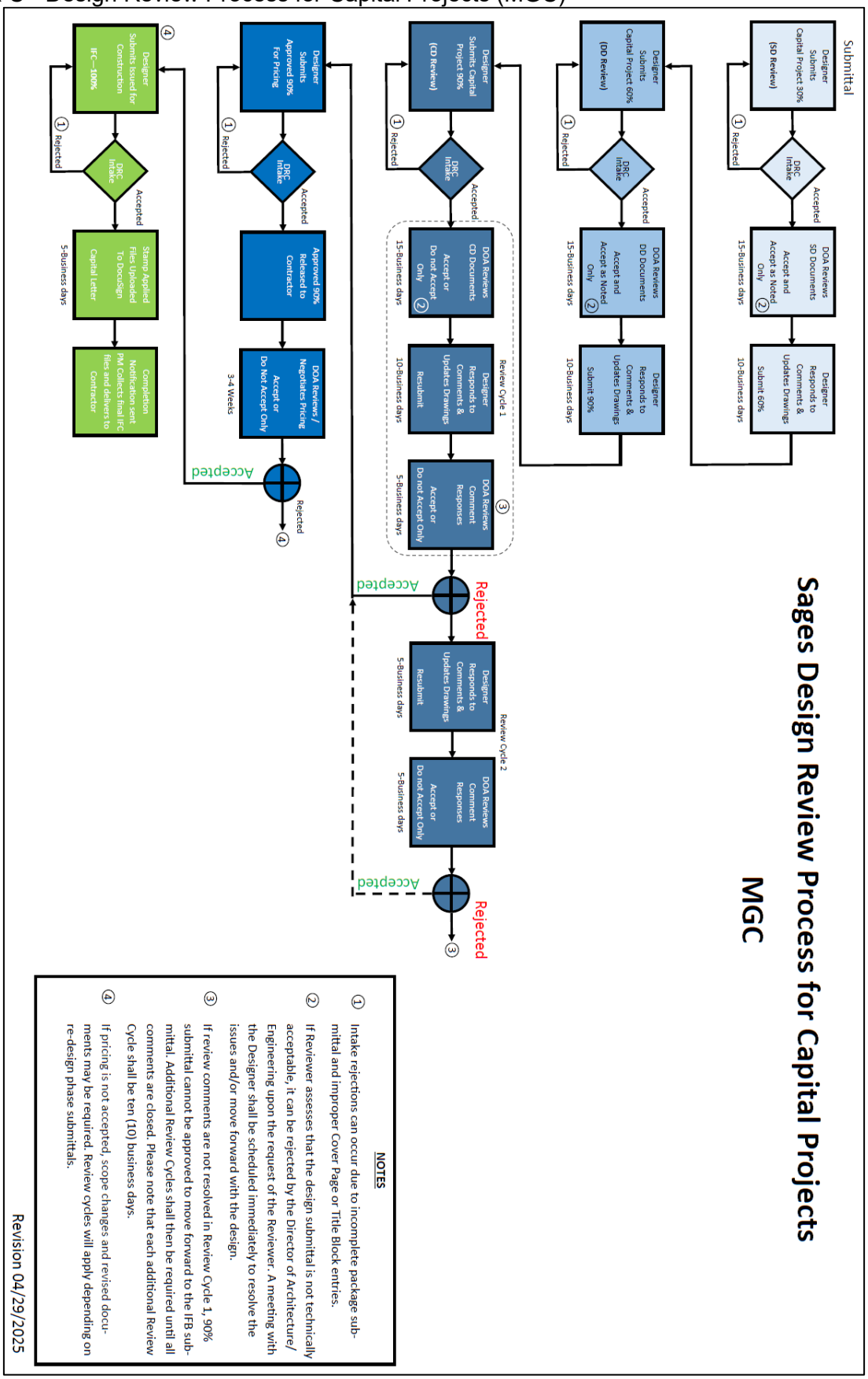
Appendix A - Design Review Process for Capital Projects (PDB, CMAR)



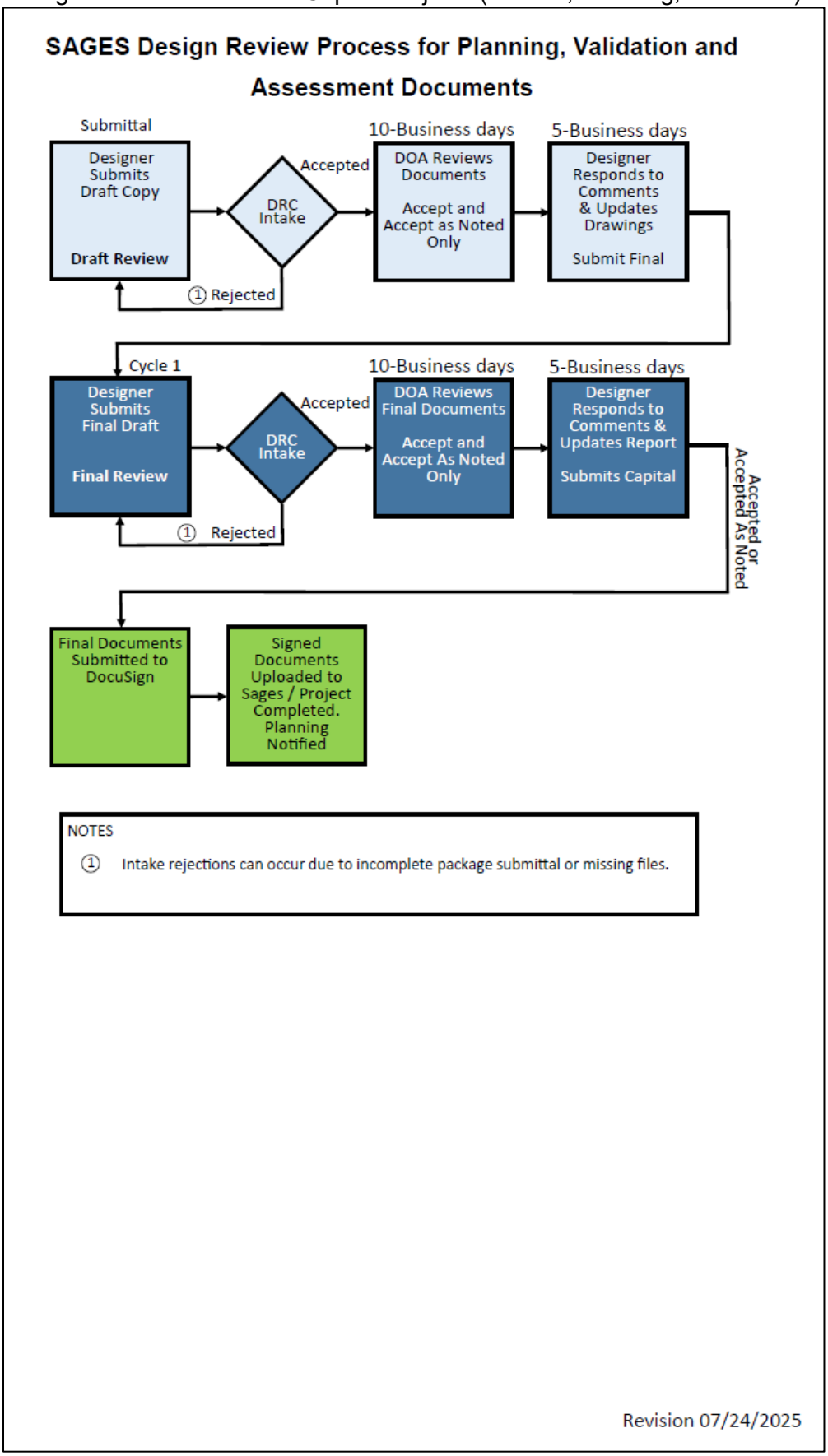
Appendix B - Design Review Process for Capital Projects (DESIGN, BID, BUILD)



Appendix C - Design Review Process for Capital Projects (MGC)



Appendix D - Design Review Process for Capital Projects (Review, Planning, Validation)



Hartsfield-Jackson Atlanta International Airport

City of Atlanta
Department of Aviation
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Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Civil Engineering - Parking Facilities

Design Standards
Civil Engineering – Parking Facilities

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Design Standards
Civil Engineering – Parking Facilities

1.0 Purpose

A. The purpose of this Design Guideline is to set forth standards and criteria to be used for the design and preparation of construction documents for new facilities and renovations of the existing parking facilities at Hartsfield-Jackson Atlanta International Airport (ATL or "Airport"). These standards are not intended to restrict the creativity of the design professional by imposing strict standardization of design.

B. When designing parking facilities, the overall goal is to provide facilities that are safe, attractive to the user, easy to maneuver in, and maximizes the number of parking spaces. The standards established herein provide a minimum level of standards in accordance with Professional Engineering practices. The design criteria and standards presented herein are expected to cover the majority of project work encountered at ATL. However, it is recognized that projects will occasionally require a divergence from these standards because of site-specific conditions. In such cases, the designer is expected to work from a base of sound engineering judgment and experience, and deviations from the standards will be reviewed and approved in accordance with Administrative Procedures of the Design Standards.

2.0 Design Intent

A. All design work shall be done in accordance with accepted professional practices and in compliance with all applicable codes, standards and regulations.

B. In some cases, certain generally acceptable design alternatives are restricted or prohibited because of the special needs of the Airport environment. These situations will be spelled out in the Technical Standards section that follows.

3.0 Airport Parking Services

A. Hourly

1. Hourly Parking is designed for high turnaround. They are located directly in front of each terminal for walkable access.

B. Daily

1. Daily Parking is designed for covered overnight parking. They are located directly across from each domestic terminal for walkable access.

C. Economy

1. Economy Parking is designed for long-term parkers. They are located adjacent to the domestic parking decks within walking distance of the domestic terminal.

D. Park-Ride

1. Park-Ride Parking is designed for long-term parkers. They are located in more remote locations. Access to the Park-Ride Parking lots are provided by an Airport Park-Ride Shuttle. Airport Park-Ride Shuttle operation offers shuttle service from the customer' vehicle or pick up area to the associated terminal of their choice. Upon returning to Atlanta, passengers are picked up at the respective Ground Transportation area and returned to their vehicle.

E. Gold Reserve

1. Gold Reserve Lots are located a very short walking distance from the North, South, and International terminals on the ground level of the parking decks and are covered. The private entrance and exits are equipped with an intercom for customer assistance and parking spaces are reserved.

F. Park-Ride Reserve

1. The Park-Ride Reserve Lot is designed to accommodate Airport customers who prefer a reserved parking space however do not require walkable access to the terminals. Access to the Park-Ride Reserve lot is provided by an Airport Park-Ride Shuttle that picks passengers up at their vehicles and transfers them to the to the terminal of their choice.. Upon returning to Atlanta, passengers are picked up at the respective Ground Transportation area and returned to their vehicle. The lot also serves as an overflow parking lot when all other lots are full.

G. Cell Phone

1. The Remote Parking Lot is designed to accommodate Airport customers picking up passengers at Hartsfield–Jackson Atlanta Airport free of charge until passengers arrive at the terminal curbs.

4.0 Site Considerations

A. Security

1. Recent security considerations have periodically placed restrictions on allowable distances between parked cars and airport terminals. Site placement and/or design elements can have a tremendous mitigating effect on allowable distances between parking and other airport structures. It is essential to assess site selections and/or design elements with the United States Transportation Security Administration (TSA) authorities for obtaining optimal solutions.

2. Fencing around surface parking lots is generally not part of the airport perimeter security fence (separating Aircraft Operations Area (AOA) from landside). In these locations the fence serves as security to prevent unauthorized entry to public vehicle parking areas.

3. The airport has employed a system of CCTV (Closed Circuit Television) security cameras and Emergency Call Boxes throughout its parking structures and surface parking lots. All new parking facilities will be required to include a similar surveillance system and Emergency Call system. The camera signals and call boxes are monitored/responded to in the PSAP (Public Safety Answering Point) in the lower level of the North Terminal and or C4.

B. Traffic Patterns

1. ATL is located among several major Atlanta traffic arteries. Consideration needs to be provided for motorists who are unfamiliar with the area and are likely to enter the wrong drives. “Escape Exits” are desirable wherever possible to allow motorists to exit from parking entrance lanes rather than be forced to enter the parking system. Multiple entry and exit points for the public and shuttle busses, where applicable, shall be provided for redundancy and to accommodate continued service during repairs.

2. Internal traffic patterns must be considered to prevent unnecessary conflicts to traffic flow. Entrances and exits require design considerations to minimize the requirement for rapid lane changes when trying to access different routes. Adequate space must also be allocated to prevent long lines of vehicles that are entering parking facilities from interfering with other traffic flow.

3. Pedestrian traffic flow must be considered in similar fashions to prevent conflicts with vehicular traffic and to avoid hazardous conditions. Clearly understood way-finding signs are essential.

4. Access to firefighting apparatus and pay on foot equipment must also be considered.

5.0 Surface Parking

A. Entry /Exit Lanes

1. Entry lanes shall be 9'-6" clear between curbed islands with all parking revenue control equipment mounted on 6" high curbed islands. The exception would be a parking facility serving oversized vehicles in which case one lane should be 10' clear between curbed islands. Ticket dispensing machines are to issue tickets automatically via the car passing over an embedded wire loop. All entry lanes ticket dispensing machines and gates shall be protected with appropriate barriers (bollards or other means) to prevent being struck by a vehicle. Exit lanes shall match the same requirements as entry lanes.

B. Parking Layout

1. Parking stalls in surface revenue parking facilities shall typically be 18'-0" by 8'-6" in a 90-degree arrangement (70-degree allowed with approval). If necessary, parallel parking stalls shall be 20' by 9' if adjacent to an obstruction less than 8" high and 20' by 10' if adjacent to an obstruction greater than 8" high. The aisle width shall be 24'. If necessary, one-way aisle width shall be a minimum of 20'. Parking stalls in Facility Parking areas, such as Fire Stations or Parking Management buildings, shall be 18'-0" by 9'-0". All ADA (Americans with Disabilities Act) accessible stalls shall be as close to the terminal or facility entrance as possible, and they shall comply with the ADA standards and criteria. All variances must be approved by DOA Engineering.

C. Height Clearance

1. For parking lots in which vehicles will encounter a height limitation with the parking lot, such as a canopy over the entry or exit plaza, the appropriate height clearance should be posted at the entrance, and restricting devices shall be located above the entrance lanes to limit over-height vehicles from entering.

D. Pavement

1. Surface parking lot pavement structure shall be asphalt. Different pavement use areas shall be delineated in the plans. The designer shall consider any special uses for the parking facility which may necessitate a stronger pavement section than indicated below. An example of a special use is a parking lot that has a dumpster pad or trash compactor requiring access for a high axle load vehicle. Entry / Exit lanes, and aisles with more than normal traffic, and bus lanes shall be considered Circulation Roads, and the pavement section shall be thickened according to the following table:

Pavement Use	**Asphalt Surface**	**Asphalt Base**	**Base**
Parking Lot	2" E	2"	6" Crushed Aggregate
Circulation Road	2" E	4"	8" Crushed Aggregate

2. The pavement subgrade shall be constructed in accordance with Planning and Development (P&D) standards and specifications.

E. Signing, Striping, and Pavement Markings

1. All regulatory signing, marking and striping used on ATL parking lots shall comply with Manual on Uniform Traffic Control Devices (MUTCD) and P&D Standards, Details, and Specifications. Substitutions, alterations or additions shall be submitted and will be considered in accordance with the Administrative Procedures of the ATL Design Standards.

2. All stalls shall be marked and striped with painted lines. Georgia Department of Transportation (GDOT) Direction arrows and pavement markings shall be used to supplement signs in conveying certain messages or directions.

F. Grading/Drainage

1. Parking lots shall be graded so that storm water runoff is directed away from areas where pedestrians will walk. Low areas shall be kept away from the walkways leading to the airport terminal entrances. Minimum acceptable grades shall be as required to provide positive drainage and maximum shall be 5%. Pedestrians should be able to exit their cars, unload their luggage and walk to the entrance without walking into accumulated or standing runoff. Inlets shall not be installed in the aisles. Curb inlets located at the curbs of landscaped islands shall be preferable, but drain inlets are acceptable. Slotted drains may be used to prohibit the flow spread outside the desirable limits where grading does not allow the placement of inlets. Slotted drains should not be placed where pedestrians will walk. Note ADA accessible route requirements where appropriate.

G. Pedestrian Access

1. It is anticipated that pedestrians will pass through the stalls to the aisles and from there to the nearest sidewalk or dedicated walkway to the entrance to the terminal(s). Sidewalks shall be required within all parking facilities within walking distance of a terminal where shuttle bus service is not provided. Walkways shall be a minimum of 8’ in width and shall consist of painted edge stripes with appropriate zebra style cross striping when at grade. Pedestrian walkways shall be used to direct pedestrians to prime vertical circulation cores within the structures or to walkways across the terminal curbside roadways.

2. These designated walkways shall be placed wherever possible to separate the pedestrians from the vehicular traffic. Pedestrian paths at intersections with vehicular traffic shall be marked to give pedestrians the right-of-way at all times. Good visibility shall be provided for pedestrians and drivers at all intersections. All ADA accessible stalls shall be as close to the Terminal entrance as possible, and they shall comply with the Americans with Disabilities Act standards and criteria.

6.0 Parking Decks

A. Deck Parking Layout

1. Layout of parking decks shall be determined by which layout provides the highest yield of parking spaces given site constraints. Current Airport parking deck layouts range from 70° angled parking stalls with one-way flow with a 54’ minimum width parking bay (one row of angled parking stalls on each side of a one-way aisle 20’ in width) to 90° parking stalls with two-way flow with a 60’ minimum width parking bay (one row of parking stalls on each side of a two-way aisle 24’ in width). Two-way vehicular cross circulation aisles at the end of each row of parking shall be a minimum of 24’ in width.

2. All ADA accessible stalls and accessible routes shall be as close to the terminal entrance as possible, and they shall comply with the Americans with Disabilities Act standards and criteria. All variances and methodology for choosing parking layouts must be approved by DOA Engineering.

B. Entry /Exit Lanes

1. Entry lanes shall be 9’-6” clear between curbs/islands with all revenue control equipment mounted on 6” high curbs/islands. Ticket dispensing machines are to issue tickets automatically via the car passing over an embedded wire loop. All entry lanes ticket dispensing machines and gates shall be protected with appropriate barriers to prevent being struck by a vehicle. Exit lanes shall match the same requirements as entry lanes.

C. Height Clearances

1. Minimum clearance height within the garage should be designed with a minimum of 8’- 5” clearance to any structure or sign. It should however be signed with a minimum clearance of 8’-2” to allow for variances in construction. Restricting devices shall be

located above the entrance lanes to limit over-height vehicles from entering. Whenever possible, ADA van parking, which requires 8'-2" clearance, should be located on the ground floor with additional height restriction devices placed at the bottom of ramps to preclude vehicles over 7' in height from ascending to the upper levels (for reasons of weight limitations).

D. Ramping

1. Vehicular vertical circulation should be in the form of straight express ramps between floors with a minimum roadway width of 16 feet with a one-foot-wide raised curb on each side. In the event design factors require curved express ramps between floors, they should be designed to allow for a vehicle to pass a stopped vehicle with a two-foot-wide raised curb on the inside and a three-foot raised curb on the outside radius of the curve.

2. The maximum grade shall be limited to 10%. Adjacent grades with an algebraic difference of more than 7% shall require transition sections at the top and bottom of the slope. Transition sections shall be a minimum of 10' in length and have grades that are equal to one half the differential slope.

E. Pedestrian Access

1. Dedicated pedestrian walkways shall be required within all parking structures. These walkways shall be painted on the driving surface and shall be a minimum of 8' in width, consisting of painted edge stripes with an appropriate zebra style cross striping.

Hartsfield-Jackson Atlanta International Airport

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Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Civil Engineering - Public Roadways

Design Standards
Civil Engineering – Public Roadways

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Design Standards

Civil Engineering – Public Roadways

1.0 General

A. The purpose of the Design Standards is to provide direction to Design Professionals and provide the minimum acceptable standards to be used for the design of new facilities and renovations of the existing Roadways Facilities at Hartsfield-Jackson Atlanta International Airport (ATL). These Standards are not intended to restrict the creativity of the design professional by imposing strict standardization of design.

B. These design criteria shall consider at a minimum the following: traffic, safety, economic, funding, physical, public, jurisdictions, and environmental concerns and impacts, while providing efficient movement of people, vehicles, goods, and services that connect ATL facilities to public roads and facilities.

C. Roadway (Landside) facilities shall consist of public access routes outside the ATL airport operations area (AOA) and within the designated right of way areas established for constructing, maintaining, and accessing these roadways and associated facilities. The Roadway Facilities shall include the following:

1. Connections to Interstates and other public roads
2. Passenger terminal curbside operations, including loading zones, parking and drop-off lanes
3. Taxi staging areas
4. Shuttle bus operations
5. Public transit related services
6. Landside service roads for maintenance and emergency vehicles
7. Cargo building, shipping and receiving areas
8. Other public roads in non-AOA areas of the Airport intended for public access and circulation

D. Roadway design will generally be governed by the standards in this document. Where roadway construction is proposed outside of the Airport's property/jurisdiction, such construction shall conform to the requirements of the Authority having jurisdiction. It will be the designer's responsibility to coordinate tasks with overlapping elements and design intent with those outlined in other sections of these Design Standards to ensure that minimum standards are verified and that these conditions are met.

E. Replacement of existing facilities to be maintained by others shall be replaced in kind, unless otherwise directed by Planning and Development. New facilities to be maintained by others shall be designed in conformance with their current design standards of the agency having governing jurisdiction.

F. The intent described herein provides a sound design base for developing standardized engineering documents to accomplish the specific projects goals as outlined by ATL. The design criteria and standards presented herein are expected to cover the majority of project work encountered at ATL. However, it is recognized that projects will occasionally require a divergence from these standards because of site-specific conditions. In such cases, the designer is expected to work from a base of sound engineering judgment and experience, and deviations from the standards will be reviewed and approved in accordance with Administrative Procedures of the Design Standards.

2.0 Basic Goals

A. The basic goals of this chapter are:

1. To outline design intent standards as they relate to various categories, which are applicable and common to all Landside roadways.
2. To focus on established safety standards for ATL patrons throughout the design process.
3. To establish convenient traffic circulation patterns for vehicular and pedestrian movement.
4. To provide for the construction of new access and circulation roads owned by ATL.
5. To provide for the reconstruction of local roads and streets disturbed by ATL construction.

3.0 Design Vehicles

A. All roadways shall be designed to accommodate passenger cars, buses, trucks and all other vehicles, unless otherwise noted, as classified in the “A Policy of Geometric Design of Highways and Streets” latest edition manual of the American Association of State Highway and Transportation Officials (AASHTO). Coordinate with the appropriate Fire and Emergency responders to determine need for specialty vehicle access.

4.0 Design Speed

A. The minimum desirable design speed for all roadways shall be 5 miles per hour greater than the posted speed.

5.0 Capacity

A. Some level of capacity analysis will be performed during the planning stage. Designers may be required to perform additional analysis or to validate analysis already performed by others. If analysis or validation is required, it shall be based on the standards of the Highway Capacity Manual (HCM). The roadway capacity shall consider traffic volume, intersection Level of Service (LOS), warrants, pedestrians, types of vehicles and roadway operational LOS.

6.0 Access and Circulation Roads

A. Access and Circulation Roads are provided to give access to the airport patrons to and from the local highways and streets. The number of lanes shall be established based on a traffic capacity analysis, acceptable level of service for immediate and future needs as determined by ATL, and the width of the roadway shall depend on the number of traffic lanes needed. The roadways shall be located to give patrons the opportunity to be dropped off and picked up as close to the terminal entrance as possible. Preferably roadways shall be one way if possible, especially adjacent to loading and unloading areas.

7.0 Loading Zones, Parking and Drop-Off Lanes

A. Loading zones, parking and drop-off lanes shall be located as close to the terminal entrance as possible and they shall be designed to give priority to different transportation modes in the following order: Buses, passenger cars for persons with special needs, other passenger cars. Sidewalks adjacent to loading zones shall be 16 feet wide desirable, but under no circumstances less than 12 feet wide. Loading Zones shall be clearly defined and signed to minimize confusion of passengers and to promote accessibility. The posted speed through the loading zones shall be 5 miles per hour.

8.0 Traffic Islands and Medians

A. All traffic in two-way roadways shall be channelized using raised medians, raised traffic islands and traffic barrier walls upon specific direction by Department of Aviation (DOA) for each particular project. Traffic medians shall be raised concrete or landscaped islands and the minimum width shall be 4 feet measured from face of curb to face of curb. Where left turning lanes are added the median width may be reduced to two feet measured from face of curb to face of curb. In loading zones where parking and drop off is to be accommodated, the median width shall be 16 feet wide desirable, but under no circumstances less than 12 feet wide.

9.0 Raised Crosswalks

A. Raised crosswalks shall be used to connect parking garages and surface parking lots with the terminal at both levels and they shall be strategically located to provide easy, direct and safe access to and from the different facilities. Raised crosswalks crossing roadways and loading zones shall be ramped providing a maximum cross slope of 12 horizontal to 1 vertical for vehicular traffic. They will be striped and marked with adequate stopping sight distance.

10.0 Intersections

A. Intersections shall be at angles as close to 90 degrees as possible. If the intersection angle is less than 65 degrees, realignment of the roadways shall be considered. It is recommended that horizontal curves should not be allowed within 200 feet of the intersection. Approaching grades shall be as flat as possible, but positive drainage must not be compromised. Intersections, including median openings, shall be designed with adequate stopping sight distance and the intersection area shall be free of obstacles. Sight distance requirements at intersections shall be established according to the standards described in the “A Policy of Geometric Design of Highways and Streets” latest edition manual of the American Association of State Highway and Transportation Officials (AASHTO). Curb cut ramps and pedestrian crosswalks should be provided at all intersections where pedestrian traffic is expected. Curb return radii shall be designed based on site specific requirements allowing for the turning path of the design vehicle.

11.0 Geometric

A. Horizontal Alignment

1. All geometric elements of all roadways shall be determined to provide safe and continuous operation at the design speed for that roadway. The major considerations shall be safety, design speed, topography, and associated construction cost. Curves should be superelevated according to standards described in the “A Policy of Geometric Design of Highways and Streets” latest edition manual of the American Association of State Highway and Transportation Officials (AASHTO). Roadways in tangent sections should be crowned in the center and be sloped towards the outside edges.

B. Horizontal Curvature

1. The horizontal curvature of all roadways shall be determined according to the criteria listed in the "A Policy of Geometric Design of Highways and Streets" latest edition manual of the American Association of State Highway and Transportation Officials (AASHTO) and according to the design speed. Horizontal curvature shall be based upon speed and superelevation. The maximum desirable superelevation rate shall be

   a. 0.04 ft/ft. Spiral curves shall not be used on landside roadways.

C. Vertical Alignment

1. The vertical alignment of all roadways shall be designed to provide adequate sight distance, safety, comfortable driving, good drainage and pleasing appearance. Parabolic vertical curves shall be used to connect tangents of different grades. Vertical curves are also required when connecting a new road (or driveway) into an existing one. Grade breaks are not allowed, unless approved by DOA Engineering. The length of a vertical curve shall be determined using the equations and tables referred in the "A Policy of Geometric Design of Highways and Streets" latest edition manual of the American Association of State Highway and Transportation Officials (AASHTO). Minimum stopping sight distance shall be provided in all cases. Maximum and minimum grades used shall be as indicated below.

D. Profile Grades

1. The maximum allowable longitudinal grade shall be 5 percent. Steeper grades may be allowed in special circumstances with the written approval of DOA. The minimum desirable grade is 0.6 percent; flatter values than this shall be reviewed with DOA Engineering.

E. Clearances

1. Minimum "Clear Zone" widths for horizontal clearances shall be established according to AASHTO Roadside Design Guide and it shall be based on traffic volume, speed and embankment slopes. Minimum vertical clearance shall be 16 feet over city of Atlanta streets, 16 feet 6 inches over Fulton and Clayton County streets, 17 feet 6 inches over state routes and interstate highways. Minimum vertical clearance shall be 16 feet 6 inches over airport roads. Railroad vertical clearances shall be 23'6", unless otherwise noted.

F. Cross Slopes

1. Cross section elements should be designed to meet the requirements of "A Policy on Geometric Design of Highways and Streets", current edition. Normal crown cross slope shall be 0.02 ft/ft. A maximum superelevation rate of 0.04 ft/ft shall be utilized. In design situations where site-specific geometric constraints require a maximum superelevation rate greater that .04 ft/ft to accommodate the design speed, P&D Engineering staff will review these situations on a case-by-case basis.

G. Lane Width

1. The desirable lane width shall be 12 feet. Any lesser lane width must receive prior written approval from DOA.

H. Roadway Width

1. The desirable paved roadway width shall be 24 feet for two-way traffic (not including paved shoulders or 30” curb and gutter). The minimum one-way roadway width shall be 16 feet.

12.0 Pavement Design

A. The roadway pavement shall be designed to accommodate current and projected traffic axial structural load needs in a safe, durable, and cost-effective manner. All pavement structures shall be either bituminous concrete or Portland cement concrete, as determined by P&D Engineering. The different pavement areas shall be delineated in the plans. The bituminous concrete pavement section design will be provided by P&D Engineering. The Portland cement concrete pavement sections shall be as follows:

Pavement Surface	Surface Course	Sub-base
Access and Circulation Road	10” PCC	9” Soil Cement
Loading Zones, Curbside Roads	10” PCC	9” Soil Cement

B. Portland cement concrete pavement shall be designed with an 18-foot maximum desirable transverse joint spacing. The length/width ratio for the slabs should be in the range of 1.25 – 1.50. Using this criterion, a two-lane roadway with 12-foot lanes would have a maximum transverse joint spacing of 18 feet. Transverse joints shall be provided with load transfer dowels. Longitudinal joints in the center of the roadway shall be tied joints. Expansion joints shall be provided at junctures with structures. Joint details shall be as indicated on the Standard Drawings.

13.0 Drainage

A. The roadway surface elevation shall be set and designed in a manner to prevent roadway overtopping and flooding. The water falling on the roadway area shall be collected and drained away from the roadway with either a gutter longitudinal system with strategically located inlets and/or catch basins or a side ditch. The inlets shall be spaced so that the gutter spread resulting from a 10-year storm shall not extend beyond the half point mark of the outside lane measured from the edge of travel way. For curbed roadways, at low points in the profile, flanking inlets shall be used on both sides of the low point inlet, to maintain the spread criteria previously described. An exception to designing low point inlets and piping for a 10-year storm shall be when low point inlets are sumped in a cut section with no provisions for alternate drainage. Sumped inlets and piping shall be designed for a 50-year storm.

B. Low point inlets shall be checked hydraulically for spread assuming 50% clogging of the grate or curb opening, as appropriate. Underdrains shall be used on permanent roadways to provide positive drainage for the subgrade and to protect against water that seeps through cracks in the pavement or from the rise of the underground water table. Roadway drainage facilities shall be analyzed and designed in accordance with the ATL Design Standards - Airfield Paragraphs 5.0 Drainage and 6.0 Subsurface Drainage.

14.0 Erosion Control

A. Temporary and permanent erosion control measures shall be provided during construction and as permanent features of the roadway system. All erosion and sedimentation control measures shall be designed according to the standards listed in the “Manual for Erosion and Sediment Control in Georgia”. When establishing permanent erosion control measures the objective shall be to provide vegetation that will be an aid to aesthetics and safety and will be easy to maintain.

15.0 Signing, Marking, and Striping

A. All signing, marking, striping and signals used on ATL roadways shall comply with the Manual on Uniform Traffic Control Devices (MUTCD) and substitutions, alterations or additions shall not be acceptable unless specifically directed and approved by DOA. Thermoplastic markings may be used if required and directed by DOA. In addition, roadway way-finding signs shall be developed and coordinated with the DOA P&D Graphics Unit.

B. All traveling lanes and raised crosswalks shall be marked and striped with painted lines. Direction arrows and pavement markings shall be used to supplement signs in conveying certain messages or directions. Pedestrian crosswalk markings and curb cut ramps shall be placed at all intersections, unless specifically directed otherwise in writing by DOA.

16.0 Shoulders

A. Shoulders shall be provided where there are no curbs. They shall be 10 feet wide minimum and they shall be paved 6 feet beyond the edge of the paved traveling lanes. Shoulders will be sloped at a maximum 4% cross slope down from the roadway in tangent sections. In transitional and superelevated sections, maximum breakover between the outer driving lane and the shoulder shall be 7%. In high embankment fills, guardrail should be used in lieu of flattening the fill side slopes, which are normally set at 2 horizontal to 1 vertical. Note that the use of guardrail may involve widening of the embankment in certain locations. In cuts, ditches must be provided if a shoulder section is used, and line of sight should be consistent with stopping sight distance for the given design speed.

B. Where curbs are used, the adjacent shoulder width shall be a minimum of 8 feet from face of curb to shoulder P.I. This width may be increased when required to meet criteria for clear zones, utilities, lighting, signage and guardrail.

C. Non-breakaway objects in the clear zone, as defined by the Roadside Design Standards, shall be protected by barrier or guardrail.

17.0 Sidewalks

A. To be determined by demand and the location of the facility in relationship with surrounding facilities. The desirable width shall be 6 feet, while the minimum acceptable width shall be 4 feet. See section 7.0 for minimum and desirable sidewalk width in the loading zones. Contraction joints in sidewalks should divide the sidewalk surface into approximately square panels with a maximum joint spacing of six feet in both longitudinal and transverse directions. Provide expansion joints at junctures with structures, other sidewalks, at curb returns, and where the sidewalk abuts curbs.

18.0 Driveways

A. For ATL driveways the maximum desirable slope is five percent to accommodate large vehicles serving industrial facilities. Driveways that connect to other than ATL roadway facilities shall be designed in accordance with the requirements of the agency having jurisdiction for that roadway. There shall be no obstructions that restrict visibility at driveway exits. The driveway width shall be designed to provide turning space for the design vehicle without the design vehicle having to encroach on the opposing lane to turn into and out of the driveway.

19.0 Right-of-Way

A. Right of way lines are not typically required inside the airport boundary. Outside of the airport boundary, right of way should be determined by the type and width of facility, maintenance needs, utilities and space for sign supports.

20.0 Fencing

A. To be coordinated with the AOA limits and determined by security, land ownership, safety, and overall project need as established in the project scope.

21.0 Roadway Signals and Lighting

A. Roadway Signals

1. The electrical systems for the traffic control devices must correlate with and conform to the standards as approved by the Authority having jurisdiction and the Federal Highway Administration (FHWA) and set forth in the *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)*.

B. Roadway Lighting

1. All roadway luminaire poles are subject to airspace restrictions, based on FAR Part 77, TERPS, and ICAO rules. These lighting installations must be reviewed by DOA Engineering.

22.0 Roadway Structures

A. Design criteria for roadway structures are defined elsewhere in the Design Standards.

23.0 Way Finding/Graphics

A. To be determined by the traffic analysis and design requirements and by the advance warning and notice signs with considerations for weaving and merging movements in proximity to entrance and exits points.

24.0 List of Applicable Design Standards and Criteria

A. A Policy on Geometric Design of Highways and Streets, Published by the American Association of State Highway and Transportation Officials (AASHTO)

B. Roadside Design Guide, published by the American Association of State Highway and Transportation Officials (AASHTO)

C. Manual for Erosion and Sediment Control in Georgia, published by the Georgia Soil and Water Conservation Commission

D. Standard Specifications Construction of Transportation Systems, published by the Georgia Department of Transportation

E. Highway Capacity Manual, published by the Transportation Research Board, National Research Council

F. Manual on Uniform Traffic Control Devices, published by the U. S. Department of Transportation, Federal Highway Administration

G. Manual on Drainage Design for Highways, published by the Georgia Department of Transportation

H. Standard Practice for Roadway Lighting, Roadway Sign Lighting
Document Number: IESNA RP-19

I. Standard Practice for Roadway Lighting Roadway Lighting ANSI Approved Document Number: ANSI/IESNA RP-8

J. Standard Practice for Roadway Lighting American National Standard Practice for Tunnel Lighting Document Number: ANSI/IESNA RP-22

Hartsfield-Jackson Atlanta International Airport

City of Atlanta
Department of Aviation
Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Civil Engineering - Drainage

Design Standards
Civil Engineering – Drainage

Table of Contents

Design Standards
Civil Engineering – Drainage

1.0 Overview

A. This design element sets forth standards to be used in the preparation of construction documents for Airport projects. It is the Department of Aviation's (DOA's) goal to have Airport project designers work to a common standard with respect to engineering design criteria specific to Hartsfield-Jackson Atlanta International Airport (ATL).

B. The preparation of this standards manual assumes that the designer has access to appropriate FAA (Federal Aviation Administration) publications, particularly Advisory Circulars that set forth minimum standards for Airport design. Since these are available publicly through FAA district offices and the FAA website, they are not re-created in this manual.

C. The design criteria and standards presented herein are expected to cover the majority of project work encountered at ATL. However, it is recognized that projects will occasionally require a divergence from these standards because of site-specific conditions. In such cases, the designer is expected to work from a base of sound engineering judgment and experience, and deviations from the standards will be reviewed and approved in accordance with Administrative Procedures of the Design Standards.

2.0 Airfield Drainage

A. General Background

1. The Airport has an extensive storm drainage system with primary outlets to the Flint River and Sullivan Creek. There are also smaller outlets into Mud Creek on the east side of the Airport. The system has been designed over many years under criteria that generally conform to FAA AC 150/5320-5B, with a few exceptions. The AC suggests using a 5-year design storm and allowing for ponding storage at inlets. The ATL system is generally designed for full interception at inlets (little or no ponding) and the design storm used has been adjusted for various reasons at various times. Originally, trunk lines were designed for 10-year events, with small feeder lines designed for 5-year events. The criteria were later modified to 10-year events for all pipes to provide some additional safety factors and to get in line with Department of Transportation (DOT) practice that currently use 10-year storms in urban areas. An exception is the Flint River conduits, which were based on flowing full in a 50-year event, unconstrained.

2. In a situation where a new project requires connection to an existing drainage system, but the existing system appears to have been designed for a storm less than 10-year, the designer should run the computations for a 10-year storm and check the level of the hydraulic gradient. If the Hydraulic Grade Line (HGL) can be maintained at least two feet below finished pavement, the system may be deemed acceptable.

3. The Airport's runoff currently goes through detention at various locations: the original sites are at the Flint River basin between the Runways 27L and 27R; and at Riverdale Road south of the Park-Ride facility. These basins were designed under conservative assumptions of future Airport development, and therefore, additional upstream basins should not be required for these outfalls.

4. Another basin was created for the South Cargo Area and accommodates a small portion of Runway 10-28 drainage. Additional detention basins have been constructed with Runway 10-28 at three locations along the runway length. Another basin has been constructed near Taxiway V, in the northwest quadrant of the Airport. This basin functions as a pumped storage facility.

B. Criteria

1. Recommended design criteria for the airside drainage system are presented in Tables 2 and 3.

TABLE 2
AIRSIDE DRAINAGE DESIGN STORM

Drainage system	Design Storm
Laterals and trunks	10-Year
Slope Drains	25-Year
Flint River and Sullivan Creek conduits	50-Year
Detention Storage	50-Year*

Notes:
1. * Unless dictated otherwise by local jurisdiction

TABLE 3
AIRSIDE DRAINAGE DESIGN METHODOLOGY

Drainage system	Methodology
Slope Drains, laterals and trunk systems	Rational Method
Detention or Flood Protection	SCS

C. Time of Concentration

1. Next to surface area, concentration time is the most sensitive parameter governing peak flows from a watershed. It is recommended that on large basins, concentration time be computed by two different methods as a check for reasonableness. Lag time (with appropriate modifiers as outlined in the Manual for Erosion and Sediment Control in Georgia) and the time of concentration (T_c) procedure outlined in SCS, now Natural Resources Conservation Service (NRCS), Manual TR-55 give good results. For small sites where the primary component of T_c is overland flow, the average velocity chart in the Erosion Control Manual is considered adequate. Note that time of concentration should never be taken at less than 5 minutes, as rainfall charts are not reliable for lesser values.

D. Drainage Structures

1. The user is advised that any drainage inlet, manhole, or structure located within aircraft pavement or anywhere in a safety area is to be designed for direct aircraft loading. Outside of the safety areas, normal H-20 highway loads can be used.

E. Storm Detention

1. Stormwater detention will only be used where directed by DOA Engineering. When these systems are used on Airport, a 50-year design without upstream flooding should be used. For off-Airport locations, the design storm(s) should satisfy the criteria of the local jurisdiction but will not be less than a 50-year storm.

F. Water Quality

1. Fueling aprons constructed since the 1970's have been equipped with holding tanks and diversion systems to capture the first flush rainfall and route it to sanitary sewers. This

practice should be continued until such time as environmental regulations demand more stringent treatment. An extensive 1975 study of apron runoff set the practical first flush quantity as the first 0.03 inches of rainfall spread over the entire apron.

G. Storm Sewers

1. Permanent storm sewers are to be designed as reinforced concrete pipe, strength class as determined by the designer for the anticipated live and dead load conditions. Where future conditions are known that may increase the load on pipes, these future conditions shall be the basis of design. Slope drains and/or pipes known to be temporary may be corrugated metal or polyethylene, with strength class as required for the temporary loading conditions. Calculations for pipe strength classes are to be submitted along with drainage design calculations as part of the design deliverables.

2. Hydraulically, storm sewer pipes should generally be designed to flow full or near full at the design storm flow, except where terrain or conflicting objects dictate otherwise. Pipes should only be set as deep as needed to accommodate their own friction slope required by the design flow, and to avoid conflicts with other existing or proposed utilities.

3. For airfield and roadway work, the smallest storm sewer that should be used is 15” diameter. Where pipe sizes are increasing downstream over the length of a sewer run, the crown of the outgoing pipe should be matched with the crown of the lowest incoming pipes, unless other physical constraints are governing.

4. For design of new pipe systems, use a Manning’s n- value of 0.012 for concrete pipe. When working with older, existing pipe systems, the n-value may be increased, but no higher than 0.014.

5. Slope drainpipes on embankments shall be designed as inlet-controlled culverts, spaced to restrict headwater to a maximum of 1.0 feet in a 25-year storm.

6. Storm drainage conduits should be reinforced concrete, with the exception that corrugated metal or corrugated polyethylene may be considered for temporary applications. Proposed concrete pipes must be evaluated by the designer for adequate strength, considering site specific live and dead loads. The supporting strength criterion to be used is the D-crack load. All other materials are subject to approval by the DOA following alternate material submittals outlined in the Administrative Manual.

3.0 Airfield Subsurface Drainage

A. The Pavement Section Design Manual dated June 2003 prepared by the Facilities Management Group addresses the design of subsurface drainage systems in Chapter 9 of said report. Perforated underdrains are incorporated into all aircraft pavements at ATL as protection against high groundwater and slow draining soils. For airfield pavements, ATL utilizes a system of 6-inch perforated pipes distributed under the pavement at roughly 100-foot intervals and feeding into 8-inch collectors. From there, the underdrains are outlet through 8” non-perforated pipes. It is DOA Engineering’s strong preference that underdrain outfalls should be connected directly to inlets or manholes in the larger drainage system. In cases where this is not practical, underdrain outfalls at ditches should be protected with concrete encasement and varmint screens.

4.0 Roadway Drainage

A. The roadway surface elevation shall be set and designed in a manner to prevent roadway overtopping and flooding. The water falling on the roadway area shall be collected and drained away from the roadway with either a gutter longitudinal system with strategically located inlets and/or catch basins or a side ditch. The inlets shall be spaced so that the gutter spread resulting from a 10-year storm shall not extend beyond the half point mark of the outside lane measured from the edge of travel way. For curbed roadways, at low points in the profile, flanking inlets shall be used on both sides of the low point inlet, to maintain the spread criteria previously described. An exception to designing low point inlets and piping for a 10- year storm

shall be when low point inlets are sumped in a cut section with no provisions for alternate drainage. Sumped inlets and piping shall be designed for a 50-year storm.

B. Low point inlets shall be checked hydraulically for spread assuming 50% clogging of the grate or curb opening, as appropriate. Underdrains shall be used on permanent roadways to provide positive drainage for the subgrade and to protect against water that seeps through cracks in the pavement or from the rise of the underground water table. Roadway drainage facilities shall be analyzed and designed in accordance with the sections 2.0 Airfield Drainage and 3.0 Airfield Subsurface Drainage of this document.

5.0 Surface Parking Grading/Drainage

A. Parking lots shall be graded so that storm water runoff is directed away from areas where pedestrians will walk. Low areas shall be kept away from the walkways leading to the Airport terminal entrances. Minimum acceptable grades shall be as required to provide positive drainage and maximum shall be 5%. Pedestrians should be able to exit their cars, unload their luggage and walk to the entrance without walking into accumulated or standing runoff. Inlets shall not be installed in the aisles. Curb inlets located at the curbs of landscaped islands shall be preferable, but drain inlets are acceptable. Slotted drains may be used to prohibit the flow spread outside the desirable limits where grading does not allow the placement of inlets. Slotted drains should not be placed where pedestrians will walk. Note Americans with Disabilities Act (ADA) accessible route requirements where appropriate.

6.0 Grassing

A. Grass is to be planted in accordance with the Airport standard seeding and mulching specifications. Asphalt spray mulching is required in locations where seeding areas are subject to jet blast, and in areas where the finished surface gradient exceeds 5.0%. Sod may be used in a limited basis as approved by DOA Engineering. This would normally be in a protective strip along the edge of roadway or airfield pavement shoulders.

7.0 Erosion Control

A. Temporary and permanent erosion control measures shall be provided during construction and as permanent features of the roadway system. All erosion and sedimentation control measures shall be designed according to the standards listed in the “Manual for Erosion and Sediment Control in Georgia”. When establishing permanent erosion control measures the objective shall be to provide vegetation that will be an aid to aesthetics and safety and will be easy to maintain.

8.0 List of Applicable Design Standards and Criteria

A. Manual for Erosion and Sediment Control in Georgia, published by the Georgia Soil and Water Conservation Commission

B. Standard Specifications Construction of Transportation Systems, published by the Georgia Department of Transportation

C. Drainage Design for Highways, published by the Georgia Department of Transportation

D. FAA publications, particularly Advisory Circular 15/5320-5D Airport Drainage Design

E. Georgia Storm Water Management Manual published by the Atlanta Regional Commission

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
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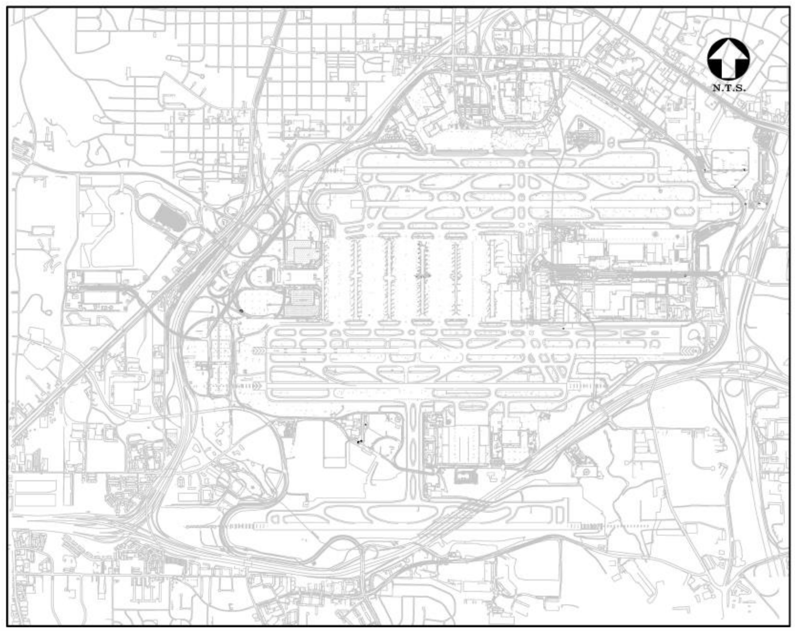
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

CITY OF ATLANTA
HARTSFIELD–JACKSON ATLANTA INTERNATIONAL AIRPORT

DOA CIVIL STANDARD DETAILS



CHANGES TO THESE STANDARDS SHALL BE APPROVED BY DOA IN ADVANCE OF SUBMITTAL.

DOA CIVIL STANDARD DETAILS

DOA CIVIL STANDARD DETAILS

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SHEET NO:
STD-00-100

DWG NO.	SHEET NO.	CIVIL DOA STANDARD DETAILS SHEET TITLE	RELEASE STATUS SUMMARY DATE OF LATEST RELEASE ISSUED	REV1	REV2	REV3	REV4	REV5	REV6			COMMENTS
1	STD-00-100	Cover Sheet	06/20/2014	08/2019								
2	STD-00-200	DOA Civil Standard Details Index	06/20/2014	08/2019	08/2020							
3	STD-00-201	DOA Civil Standard Details Index		08/2019	08/2020							
		STD-01 AIRSIDE - RUNWAYS TAXIWAYS AND APRONS										
4	STD-01-100	Airfield Typical Pavement Sections	06/20/2014	08/2019	08/2020							
5	STD-01-200	Typical Pavement Sections NLVR	06/20/2014	08/2019								
6	STD-01-300	Apron Underdrain Details - New Pavement	06/20/2014									
7	STD-01-301	Underdrain Details - Replacement Projects	06/20/2014									
8	STD-01-400	In-Pavement Manholes	06/20/2014									
9	STD-01-500	In-Pavement Inlets Inlet Type 'A'	06/20/2014	08/2019								
10	STD-01-501	Infield Inlets Type 'B' and Type 'B' Modified	06/20/2014	08/2019								
11	STD-01-502	In-Pavement Inlet Type 'D'	06/20/2014									
12	STD-01-503	Slope Drain Detail	06/20/2014	08/2019								
13	STD-01-504	Paved Drainage Path Detail	06/20/2014									
14	STD-01-505	Miscellaneous Drainage Details	06/20/2014									
15	STD-01-600	Pavement Joint Details - New Projects	06/20/2014									
16	STD-01-700	Pavement Joint Details - Replacement Projects-1	06/20/2014									
17	STD-01-701	Pavement Joint Details - Replacement Projects-2	06/20/2014									
18	STD-01-702	Exist. Pavement Removal and Replacement for Fuel Hydrants	06/20/2014	08/2019								
19	STD-01-703	Spall and Joint Repair Details	06/20/2014									
20	STD-01-704	Typical Spall Repair Rebar Placement Detail	06/20/2014									
21	STD-01-705	Retrofit Conduit Trench Repair Details	06/20/2014									
22	STD-01-800	Apron Striping and Marking	06/20/2014									
23	STD-01-801	Apron NLVR Striping and Signage	06/20/2014	3/16/2020								
24	STD-01-802	Runway Striping and Marking-1	06/20/2014									
25	STD-01-803	Runway Striping and Marking-2	06/20/2014									
26	STD-01-804	Taxiway Striping, Marking, and Signage	06/20/2014									
27	STD-01-805	Taxiway Striping and Marking	06/20/2014									
28	STD-01-900	Miscellaneous Airfield Details	06/20/2014									
		STD-02 LANDSIDE - ROADS AND PARKING										
29	STD-02-100	Typical Pavement Sections - Roadways	06/20/2014	08/2019								
30	STD-02-101	Typical Pavement Sections - Parking	07/14/2016									
31	STD-02-105	Grade Break Standard	08/24/2020									
32	STD-02-200	Joints - NLVR or Landside Roads	06/20/2014	08/2019	08/2020							
33	STD-02-300	Landside Striping and Marking Details	06/20/2014									
34	STD-02-400	Landside Signage	06/20/2014									
35	STD-02-500	Landside Drainage-1	06/20/2014									
36	STD-02-501	Landside Drainage-2	06/20/2014									
		STD-03 GENERAL DETAILS										
37	STD-03-100	Settlement Platforms	06/20/2014									
38	STD-03-200	Chain Link Fences - 1	06/20/2014									
39	STD-03-201	Chain Link Fences - 2	06/20/2014	08/2019	07/2020							
40	STD-03-202	Chain Link Fences - 3	06/20/2014	08/2019								
41	STD-03-203	Chain Link Fences - 4	06/20/2014	08/2019								
42	STD-03-204	Chain Link Fences - 5	06/20/2014	08/2019								
43	STD-03-205	Chain Link Fences - 6	06/20/2014	08/2019								
44	STD-03-206	Chain Link Fence - Signage	06/20/2014	08/2019								
45	STD-03-300	Typical Grease Interceptor Installation	06/20/2014	08/2019								
46	STD-03-301	Typical Grease Interceptor Installation	06/20/2014	08/2019								
47	STD-03-302	Below Pavement Grease Interceptor Details	06/20/2014	08/2019								
48	STD-03-303	Utility Slab Detail For Interceptor Below Pavement	06/20/2014	08/2019								
49	STD-03-304	Additional Pavement Removal	06/20/2014	08/2019								
50	STD-03-400	Pipe Bedding Type 'B' and 'C', Paved Ditch Detail	06/20/2014	08/2019								
51	STD-03-401	Precast Junction Chamber	06/20/2014									
52	STD-03-402	Concrete Pipe Collar, Cleanout, Cap for Exist. Inlet	06/20/2014									
53	STD-03-403	Riser Tee Manhole for Existing or Proposed Pipe	06/20/2014									
54	STD-03-404	Misc Pipe Details	06/20/2014	08/2019								
55	STD-03-405	Waterline Bedding and Excavation Section	6/20/2014	08/2019								
56	STD-03-500	Standard Manhole and Type E Inlet	06/20/2014									

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4	08/2020	RFM	REVISED, ADD NEW SHEET
3	07/2020	RFM	REVISED
2	03/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

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FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-00-200	APPROVED BY: STAFF
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	SCALE:
	SHEET NO: .

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			DATE OF LATEST RELEASE									
DWG NO.	SHEET NO.	SHEET TITLE	ISSUED	REV1	REV2	REV3	REV4	REV5	REV6			COMMENTS
57	STD-03-600	Bollard Details	06/20/2014	08/2019								
58	STD-03-601	Miscellaneous Paving and Bumper Block Details	06/20/2014									
59	STD-03-700	General Notes and Construction Control Plan Airside	06/20/2014									
60	STD-03-701	General Notes and Construction Control Plan Landside	06/20/2014									
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NO.	DATE	BY	REVISION
3	8/2020	RFM	REVISED
2	7/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

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Index

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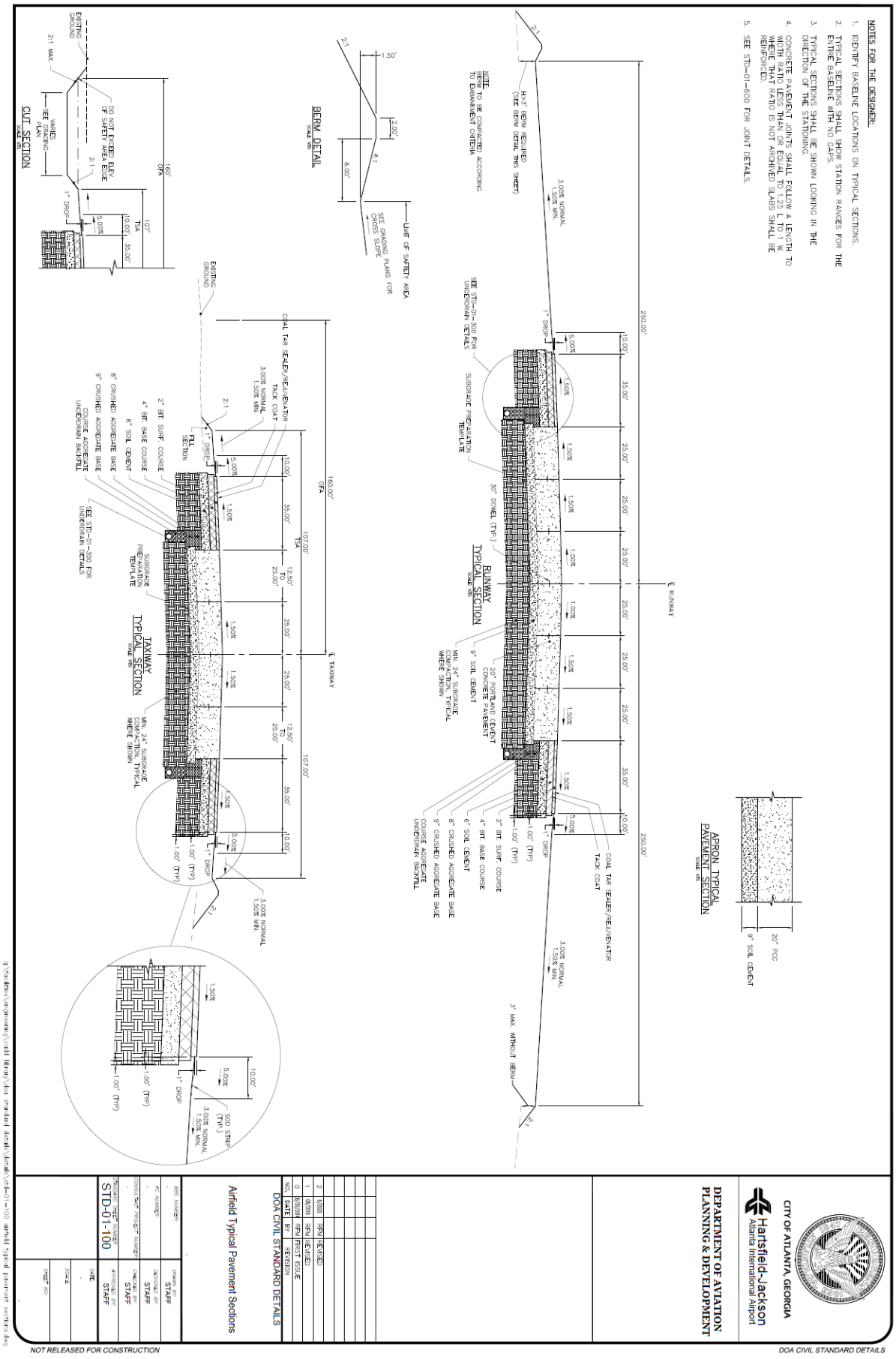
NOTES FOR THE DESIGNER:
1. IDENTIFY BASELINE LOCATIONS ON TYPICAL SECTIONS.
2. TYPICAL SECTIONS SHALL SHOW STATION RANGES FOR THE ENTIRE BASELINE WITH NO GAPS.
3. TYPICAL SECTIONS SHALL BE SHOWN LOOKING IN THE DIRECTION OF THE STATIONING.
4. CONCRETE PAVEMENT JOINTS SHALL FOLLOW A LENGTH TO WIDTH RATIO LESS THAN OR EQUAL TO 1.25 L TO 1 W. WHERE THAT RATIO IS NOT ARCHIVED SLABS SHALL BE REINFORCED.
5. SEE STD-01-600 FOR JOINT DETAILS.
CUT SECTION
BERM DETAIL
RUNWAY TYPICAL SECTION
TAXIWAY TYPICAL SECTION
APRON TYPICAL PAVEMENT SECTION
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Airfield Typical Pavement Sections
STD-01-100
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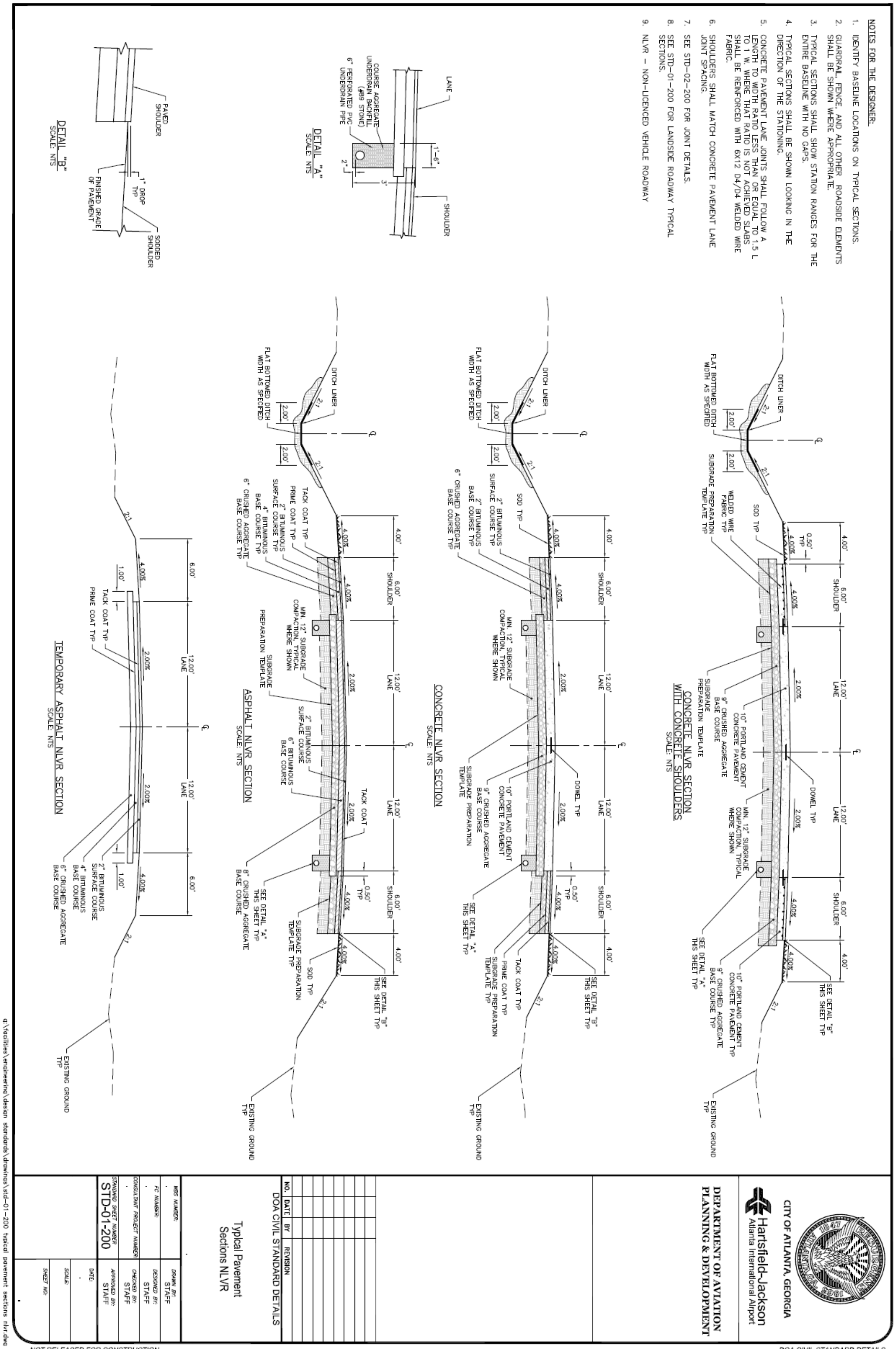
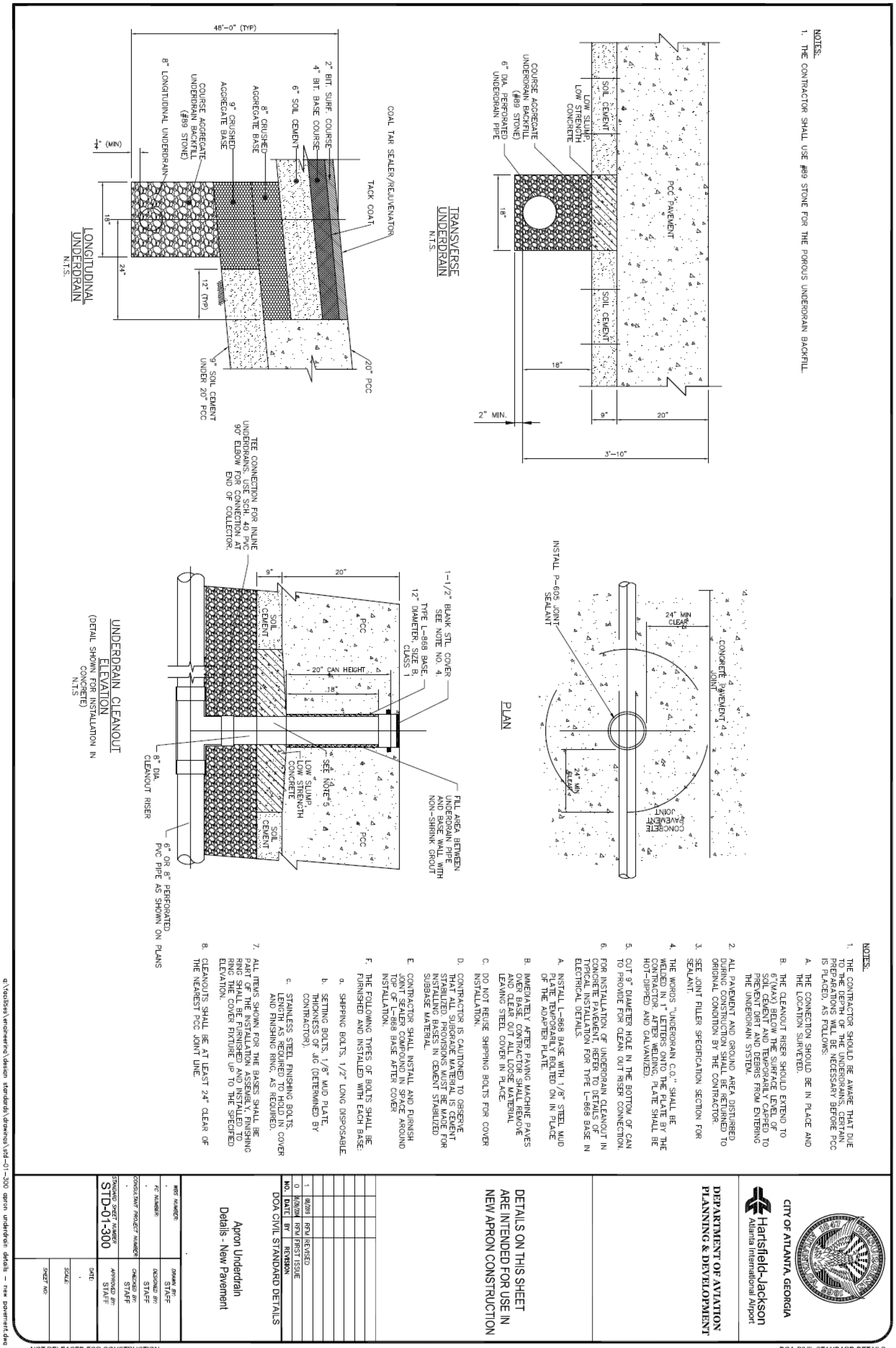
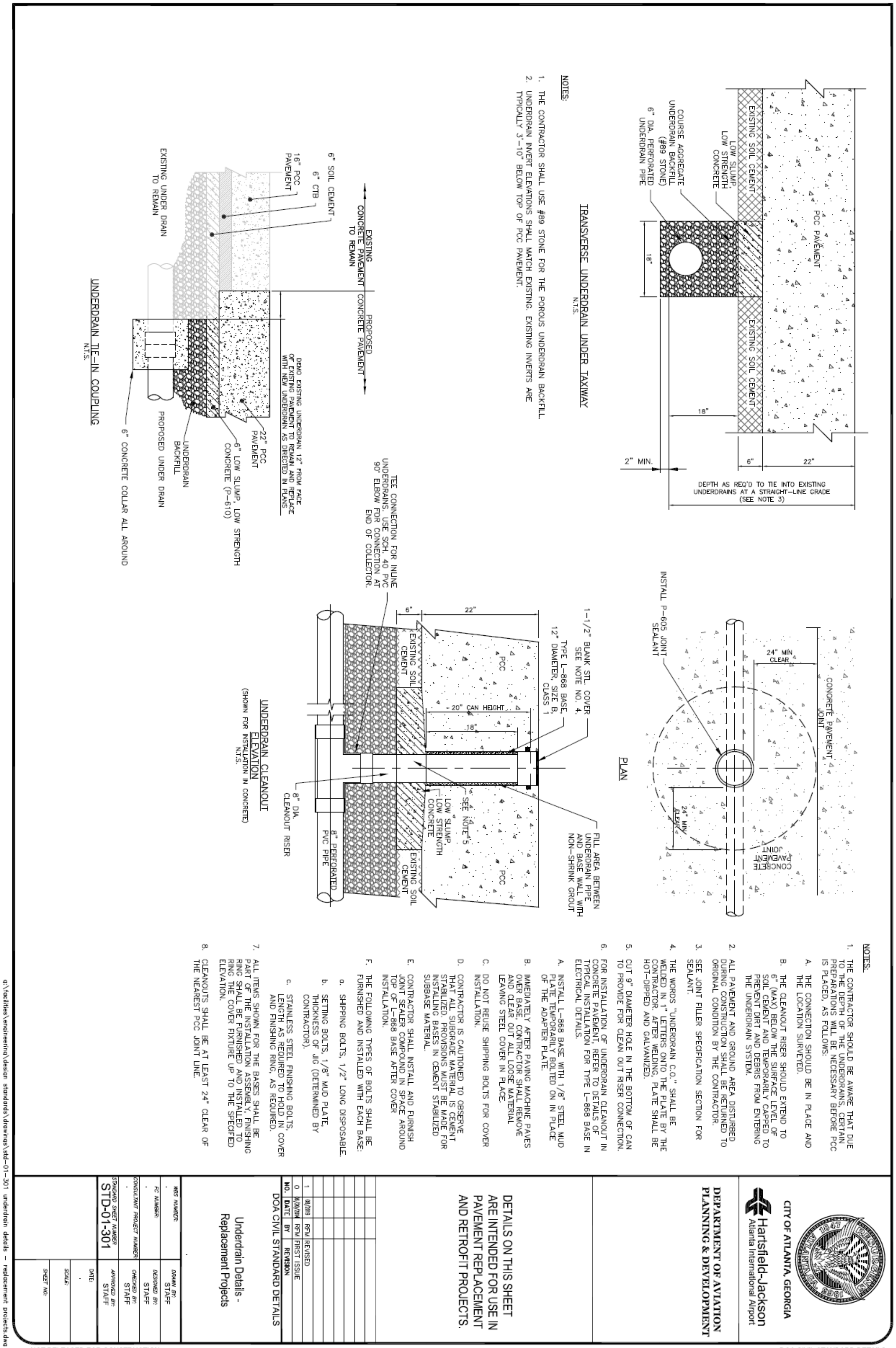

NOTES FOR THE DESIGNER:
1. IDENTIFY BASELINE LOCATIONS ON TYPICAL SECTIONS.
2. GUARDRAIL, FENCE, AND ALL OTHER ROADSIDE ELEMENTS SHALL BE SHOWN WHERE APPROPRIATE.
3. TYPICAL SECTIONS SHALL SHOW STATION RANGES FOR THE ENTIRE BASELINE WITH NO GAPS.
4. TYPICAL SECTIONS SHALL BE SHOWN LOOKING IN THE DIRECTION OF THE STATIONING.
5. CONCRETE PAVEMENT LANE JOINTS SHALL FOLLOW A LENGTH TO WIDTH RATIO LESS THAN OR EQUAL TO 1.5 L TO 1 W. WHERE THAT RATIO IS NOT ACHIEVED SLABS SHALL BE REINFORCED WITH 6X12 D4/D4 WELDED WIRE FABRIC.
6. SHOULDERS SHALL MATCH CONCRETE PAVEMENT LANE JOINT SPACING.
7. SEE STD-02-200 FOR JOINT DETAILS.
8. SEE STD-01-200 FOR LANDSIDE ROADWAY TYPICAL SECTIONS.
9. NLVR – NON-LICENCED VEHICLE ROADWAY
CONCRETE NLVR SECTION WITH CONCRETE SHOULDERS
SCALE: NTS
CONCRETE NLVR SECTION
SCALE: NTS
ASPHALT NLVR SECTION
SCALE: NTS
TEMPORARY ASPHALT NLVR SECTION
SCALE: NTS
DETAIL "A"
SCALE: NTS
DETAIL "B"
SCALE: NTS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Typical Pavement Sections NLVR
STD-01-200
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


NOTES:
1. THE CONTRACTOR SHALL USE #89 STONE FOR THE POROUS UNDERDRAIN BACKFILL.
PCC PAVEMENT
SOIL CEMENT
LOW SLUMP, LOW STRENGTH CONCRETE
COURSE AGGREGATE UNDERDRAIN BACKFILL (#89 STONE)
6" DIA. PERFORATED UNDERDRAIN PIPE
18"
20"
9"
3'-10"
2" MIN.
TRANSVERSE UNDERDRAIN
N.T.S.
COAL TAR SEALER/REJUVENATOR
TACK COAT
20" PCC
2" BIT. SURF. COURSE
4" BIT. BASE COURSE
6" SOIL CEMENT
8" CRUSHED AGGREGATE BASE
9" CRUSHED AGGREGATE BASE
COURSE AGGREGATE UNDERDRAIN BACKFILL (#89 STONE)
8" LONGITUDINAL UNDERDRAIN
48'-0" (TYP)
12" (TYP)
9" SOIL CEMENT UNDER 20" PCC
24"
LONGITUDINAL UNDERDRAIN
N.T.S.
CONCRETE PAVEMENT JOINT
24" MIN CLEAR
INSTALL P-605 JOINT SEALANT
PLAN
1-1/2" BLANK STL. COVER SEE NOTE NO. 4.
TYPE L-868 BASE, 12" DIAMETER, SIZE B, CLASS 1
FILL AREA BETWEEN UNDERDRAIN PIPE AND BASE WALL WITH NON-SHRINK GROUT
20" CAN HEIGHT
SEE NOTE 5
LOW SLUMP, LOW STRENGTH CONCRETE
TEE CONNECTION FOR INLINE UNDERDRAINS. USE SCH. 40 PVC 90° ELBOW FOR CONNECTION AT END OF COLLECTOR.
8" DIA. CLEANOUT RISER
6" OR 8" PERFORATED PVC PIPE AS SHOWN ON PLANS
UNDERDRAIN CLEANOUT ELEVATION
(DETAIL SHOWN FOR INSTALLATION IN CONCRETE)
N.T.S
NOTES:
1. THE CONTRACTOR SHOULD BE AWARE THAT DUE TO THE DEPTH OF THE UNDERDRAINS, CERTAIN PREPARATIONS WILL BE NECESSARY BEFORE PCC IS PLACED, AS FOLLOWS:
A. THE CONNECTION SHOULD BE IN PLACE AND THE LOCATION SURVEYED.
B. THE CLEANOUT RISER SHOULD EXTEND TO 6"(MAX) BELOW THE SURFACE LEVEL OF SOIL CEMENT AND TEMPORARILY CAPPED TO PREVENT DIRT AND DEBRIS FROM ENTERING THE UNDERDRAIN SYSTEM.
2. ALL PAVEMENT AND GROUND AREA DISTURBED DURING CONSTRUCTION SHALL BE RETURNED TO ORIGINAL CONDITION BY THE CONTRACTOR.
3. SEE JOINT FILLER SPECIFICATION SECTION FOR SEALANT.
4. THE WORDS "UNDERDRAIN C.O." SHALL BE WELDED IN 1" LETTERS ONTO THE PLATE BY THE CONTRACTOR. AFTER WELDING, PLATE SHALL BE HOT-DIPPED AND GALVANIZED.
5. CUT 9" DIAMETER HOLE IN THE BOTTOM OF CAN TO PROVIDE FOR CLEAN OUT RISER CONNECTION.
6. FOR INSTALLATION OF UNDERDRAIN CLEANOUT IN CONCRETE PAVEMENT, REFER TO DETAILS OF TYPICAL INSTALLATION FOR TYPE L-868 BASE IN ELECTRICAL DETAILS.
A. INSTALL L-868 BASE WITH 1/8" STEEL MUD PLATE TEMPORARILY BOLTED ON IN PLACE OF THE ADAPTER PLATE.
B. IMMEDIATELY AFTER PAVING MACHINE PAVES OVER BASE, CONTRACTOR SHALL REMOVE AND CLEAR OUT ALL LOOSE MATERIAL LEAVING STEEL COVER IN PLACE.
C. DO NOT REUSE SHIPPING BOLTS FOR COVER INSTALLATION.
D. CONTRACTOR IS CAUTIONED TO OBSERVE THAT ALL SUBGRADE MATERIAL IS CEMENT STABILIZED. PROVISIONS MUST BE MADE FOR INSTALLING BASES IN CEMENT STABILIZED SUBBASE MATERIAL.
E. CONTRACTOR SHALL INSTALL AND FURNISH JOINT SEALER COMPOUND IN SPACE AROUND TOP OF L-868 BASE AFTER COVER INSTALLATION.
F. THE FOLLOWING TYPES OF BOLTS SHALL BE FURNISHED AND INSTALLED WITH EACH BASE:
a. SHIPPING BOLTS, 1/2" LONG DISPOSABLE.
b. SETTING BOLTS, 1/8" MUD PLATE, THICKNESS OF JIG (DETERMINED BY CONTRACTOR).
c. STAINLESS STEEL FINISHING BOLTS, LENGTH AS REQUIRED TO HOLD IN COVER AND FINISHING RING, AS REQUIRED.
7. ALL ITEMS SHOWN FOR THE BASES SHALL BE PART OF THE INSTALLATION ASSEMBLY, FINISHING RING SHALL BE FURNISHED AND INSTALLED TO RING THE COVER FIXTURE UP TO THE SPECIFIED ELEVATION.
8. CLEANOUTS SHALL BE AT LEAST 24" CLEAR OF THE NEAREST PCC JOINT LINE.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DETAILS ON THIS SHEET ARE INTENDED FOR USE IN NEW APRON CONSTRUCTION
1 08/2019 RFM REVISED
0 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Apron Underdrain Details - New Pavement
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER STD-01-300
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
g:\facilities\engineering\design standards\drawings\std-01-300 apron underdrain details - new pavement.dwg


PCC PAVEMENT
EXISTING SOIL CEMENT
EXISTING SOIL CEMENT
LOW SLUMP, LOW STRENGTH CONCRETE
COURSE AGGREGATE UNDERDRAIN BACKFILL (#89 STONE)
6" DIA. PERFORATED UNDERDRAIN PIPE
18"
22"
6"
2" MIN.
DEPTH AS REQ'D TO TIE INTO EXISTING UNDERDRAINS AT A STRAIGHT-LINE GRADE (SEE NOTE 3)
TRANSVERSE UNDERDRAIN UNDER TAXIWAY
N.T.S.
NOTES:
1. THE CONTRACTOR SHALL USE #89 STONE FOR THE POROUS UNDERDRAIN BACKFILL.
2. UNDERDRAIN INVERT ELEVATIONS SHALL MATCH EXISTING. EXISTING INVERTS ARE TYPICALLY 3'-10" BELOW TOP OF PCC PAVEMENT.
CONCRETE PAVEMENT JOINT
24" MIN CLEAR
INSTALL P-605 JOINT SEALANT
PLAN
1-1/2" BLANK STL. COVER SEE NOTE NO. 4.
TYPE L-868 BASE, 12" DIAMETER, SIZE B, CLASS 1
FILL AREA BETWEEN UNDERDRAIN PIPE AND BASE WALL WITH NON-SHRINK GROUT
PCC
20" CAN HEIGHT
SEE NOTE 5
LOW SLUMP, LOW STRENGTH CONCRETE
EXISTING SOIL CEMENT
TEE CONNECTION FOR INLINE UNDERDRAINS. USE SCH. 40 PVC 90° ELBOW FOR CONNECTION AT END OF COLLECTOR.
8" PERFORATED PVC PIPE
8" DIA. CLEANOUT RISER
UNDERDRAIN CLEANOUT ELEVATION
(SHOWN FOR INSTALLATION IN CONCRETE)
N.T.S.
EXISTING CONCRETE PAVEMENT TO REMAIN
PROPOSED CONCRETE PAVEMENT
6" SOIL CEMENT
6" CTB
16" PCC PAVEMENT
DEMO EXISTING UNDERDRAIN 12" FROM FACE OF EXISTING PAVEMENT TO REMAIN AND REPLACE WITH NEW UNDERDRAIN AS DIRECTED IN PLANS
22" PCC PAVEMENT
6" LOW SLUMP, LOW STRENGTH CONCRETE (P-610)
UNDERDRAIN BACKFILL
EXISTING UNDER DRAIN TO REMAIN
PROPOSED UNDER DRAIN
6" CONCRETE COLLAR ALL AROUND
UNDERDRAIN TIE-IN COUPLING
N.T.S.
NOTES:
1. THE CONTRACTOR SHOULD BE AWARE THAT DUE TO THE DEPTH OF THE UNDERDRAINS, CERTAIN PREPARATIONS WILL BE NECESSARY BEFORE PCC IS PLACED, AS FOLLOWS:
A. THE CONNECTION SHOULD BE IN PLACE AND THE LOCATION SURVEYED.
B. THE CLEANOUT RISER SHOULD EXTEND TO 6" (MAX) BELOW THE SURFACE LEVEL OF SOIL CEMENT AND TEMPORARILY CAPPED TO PREVENT DIRT AND DEBRIS FROM ENTERING THE UNDERDRAIN SYSTEM.
2. ALL PAVEMENT AND GROUND AREA DISTURBED DURING CONSTRUCTION SHALL BE RETURNED TO ORIGINAL CONDITION BY THE CONTRACTOR.
3. SEE JOINT FILLER SPECIFICATION SECTION FOR SEALANT.
4. THE WORDS "UNDERDRAIN C.O." SHALL BE WELDED IN 1" LETTERS ONTO THE PLATE BY THE CONTRACTOR. AFTER WELDING, PLATE SHALL BE HOT-DIPPED AND GALVANIZED.
5. CUT 9" DIAMETER HOLE IN THE BOTTOM OF CAN TO PROVIDE FOR CLEAN OUT RISER CONNECTION.
6. FOR INSTALLATION OF UNDERDRAIN CLEANOUT IN CONCRETE PAVEMENT, REFER TO DETAILS OF TYPICAL INSTALLATION FOR TYPE L-868 BASE IN ELECTRICAL DETAILS.
A. INSTALL L-868 BASE WITH 1/8" STEEL MUD PLATE TEMPORARILY BOLTED ON IN PLACE OF THE ADAPTER PLATE.
B. IMMEDIATELY AFTER PAVING MACHINE PAVES OVER BASE, CONTRACTOR SHALL REMOVE AND CLEAR OUT ALL LOOSE MATERIAL LEAVING STEEL COVER IN PLACE.
C. DO NOT REUSE SHIPPING BOLTS FOR COVER INSTALLATION.
D. CONTRACTOR IS CAUTIONED TO OBSERVE THAT ALL SUBGRADE MATERIAL IS CEMENT STABILIZED. PROVISIONS MUST BE MADE FOR INSTALLING BASES IN CEMENT STABILIZED SUBBASE MATERIAL.
E. CONTRACTOR SHALL INSTALL AND FURNISH JOINT SEALER COMPOUND IN SPACE AROUND TOP OF L-868 BASE AFTER COVER INSTALLATION.
F. THE FOLLOWING TYPES OF BOLTS SHALL BE FURNISHED AND INSTALLED WITH EACH BASE:
a. SHIPPING BOLTS, 1/2" LONG DISPOSABLE.
b. SETTING BOLTS, 1/8" MUD PLATE, THICKNESS OF JIG (DETERMINED BY CONTRACTOR).
c. STAINLESS STEEL FINISHING BOLTS, LENGTH AS REQUIRED TO HOLD IN COVER AND FINISHING RING, AS REQUIRED.
7. ALL ITEMS SHOWN FOR THE BASES SHALL BE PART OF THE INSTALLATION ASSEMBLY. FINISHING RING SHALL BE FURNISHED AND INSTALLED TO RING THE COVER FIXTURE UP TO THE SPECIFIED ELEVATION.
8. CLEANOUTS SHALL BE AT LEAST 24" CLEAR OF THE NEAREST PCC JOINT LINE.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DETAILS ON THIS SHEET ARE INTENDED FOR USE IN PAVEMENT REPLACEMENT AND RETROFIT PROJECTS.
1 08/2019 RFM REVISED
0 8/20/2014 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Underdrain Details - Replacement Projects
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER STD-01-301
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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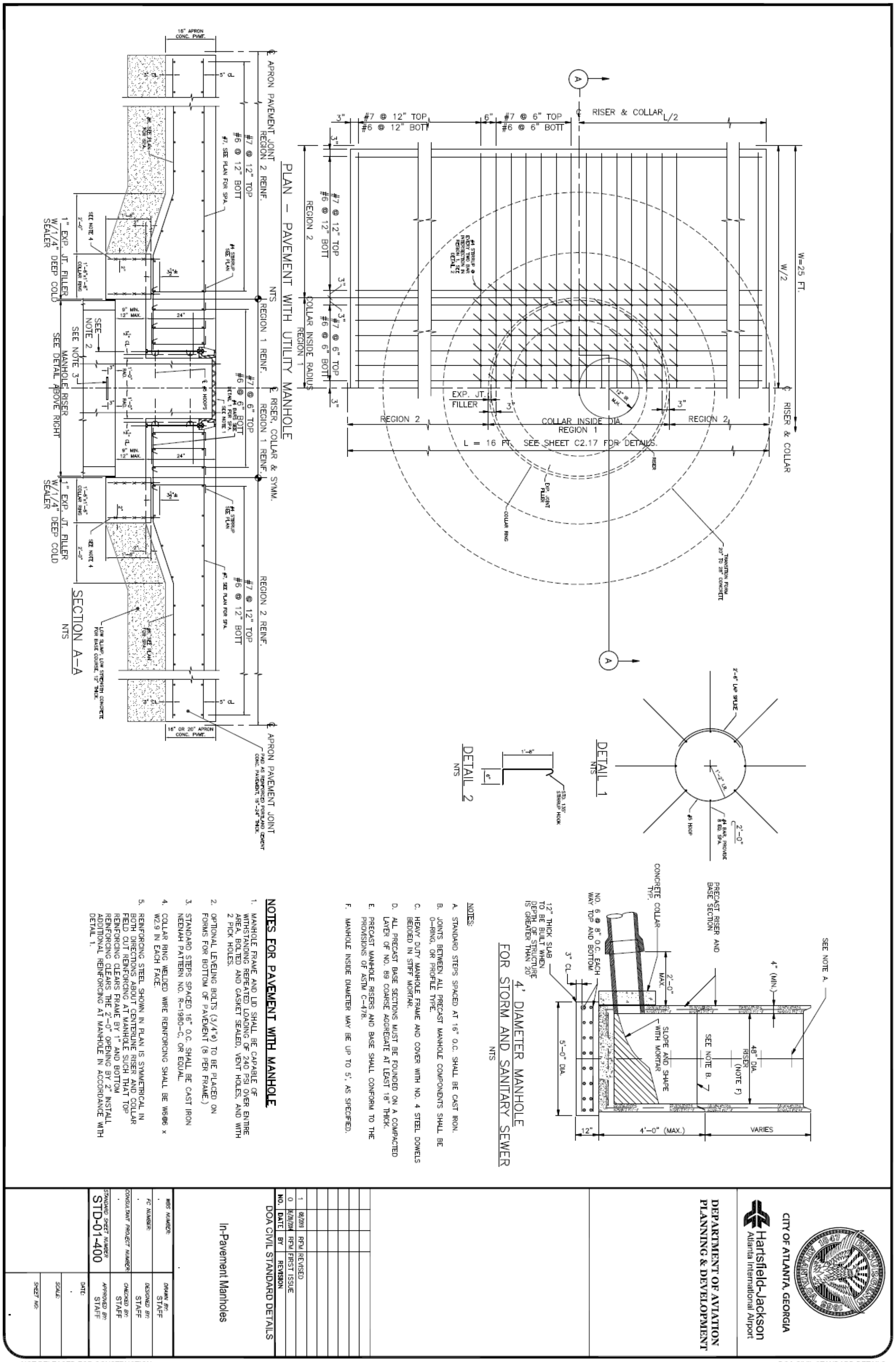
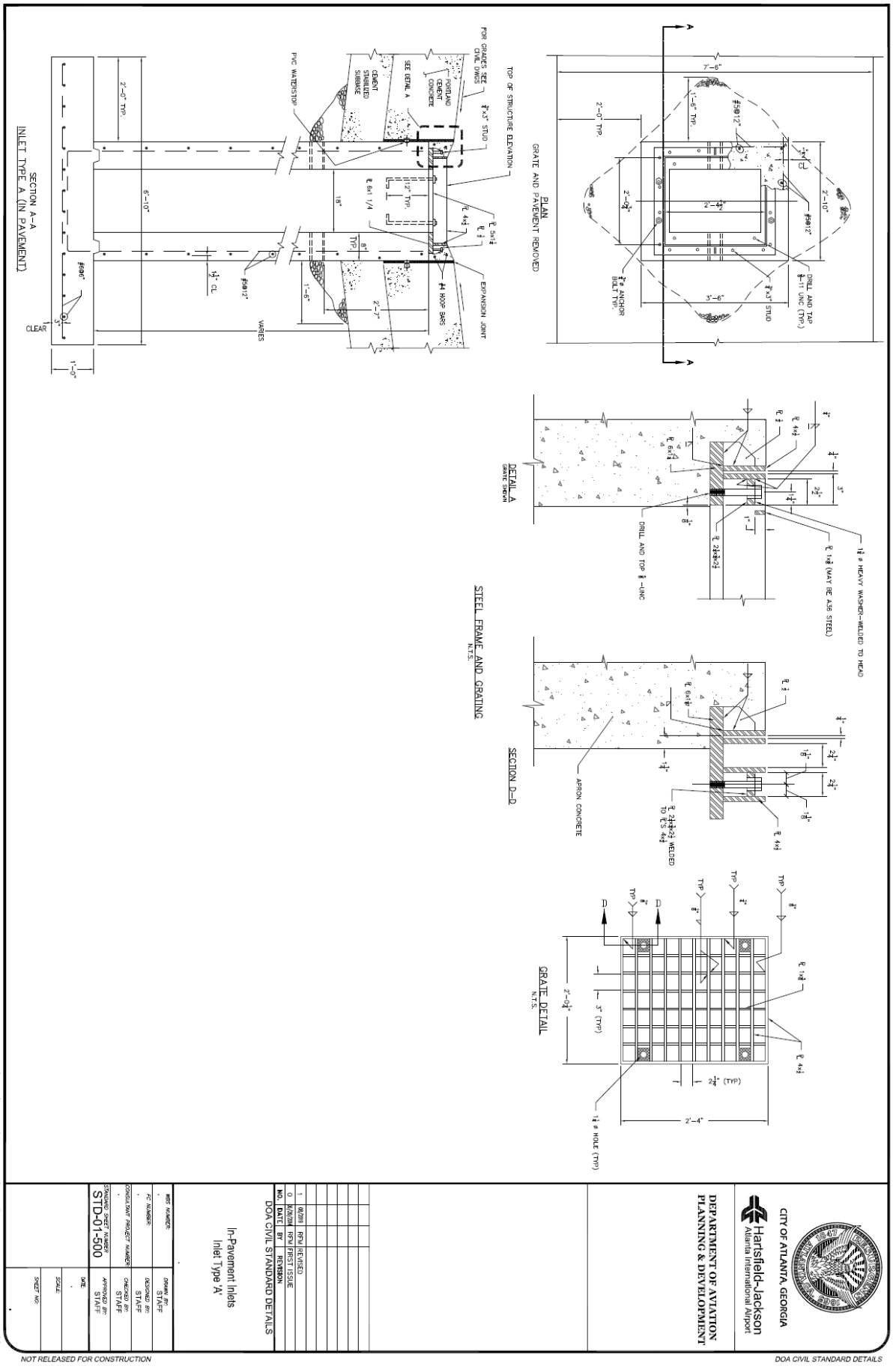
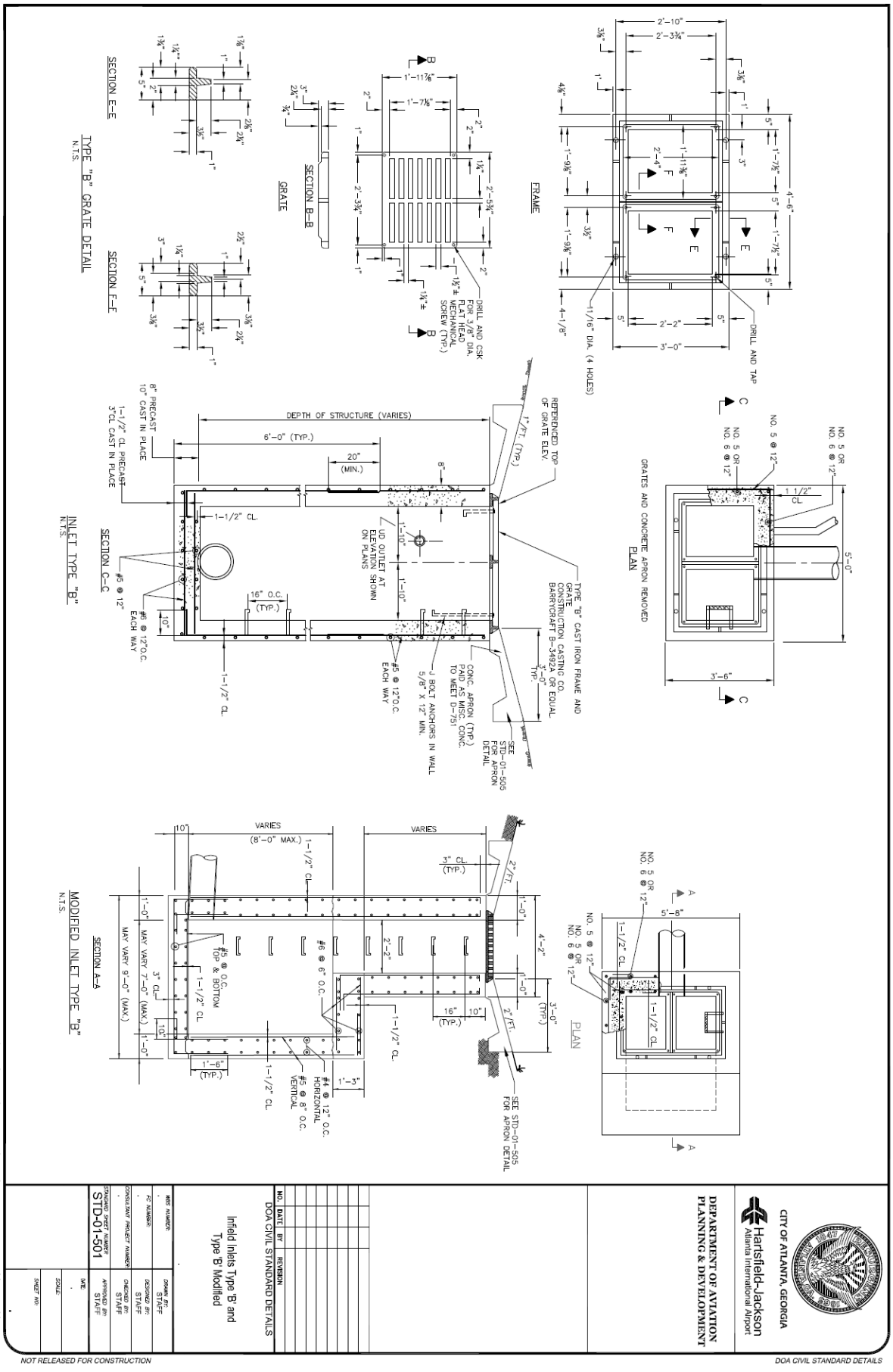
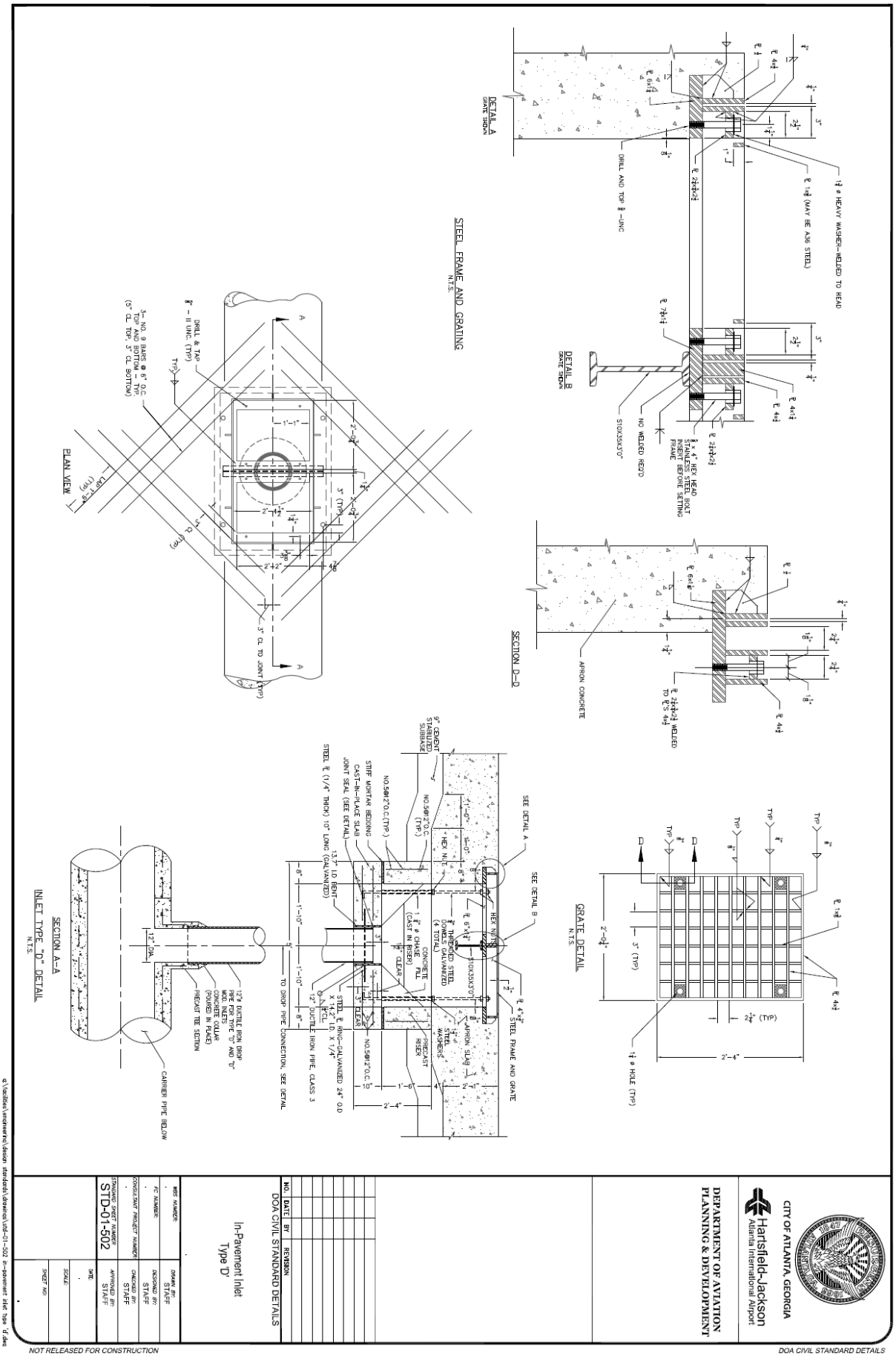
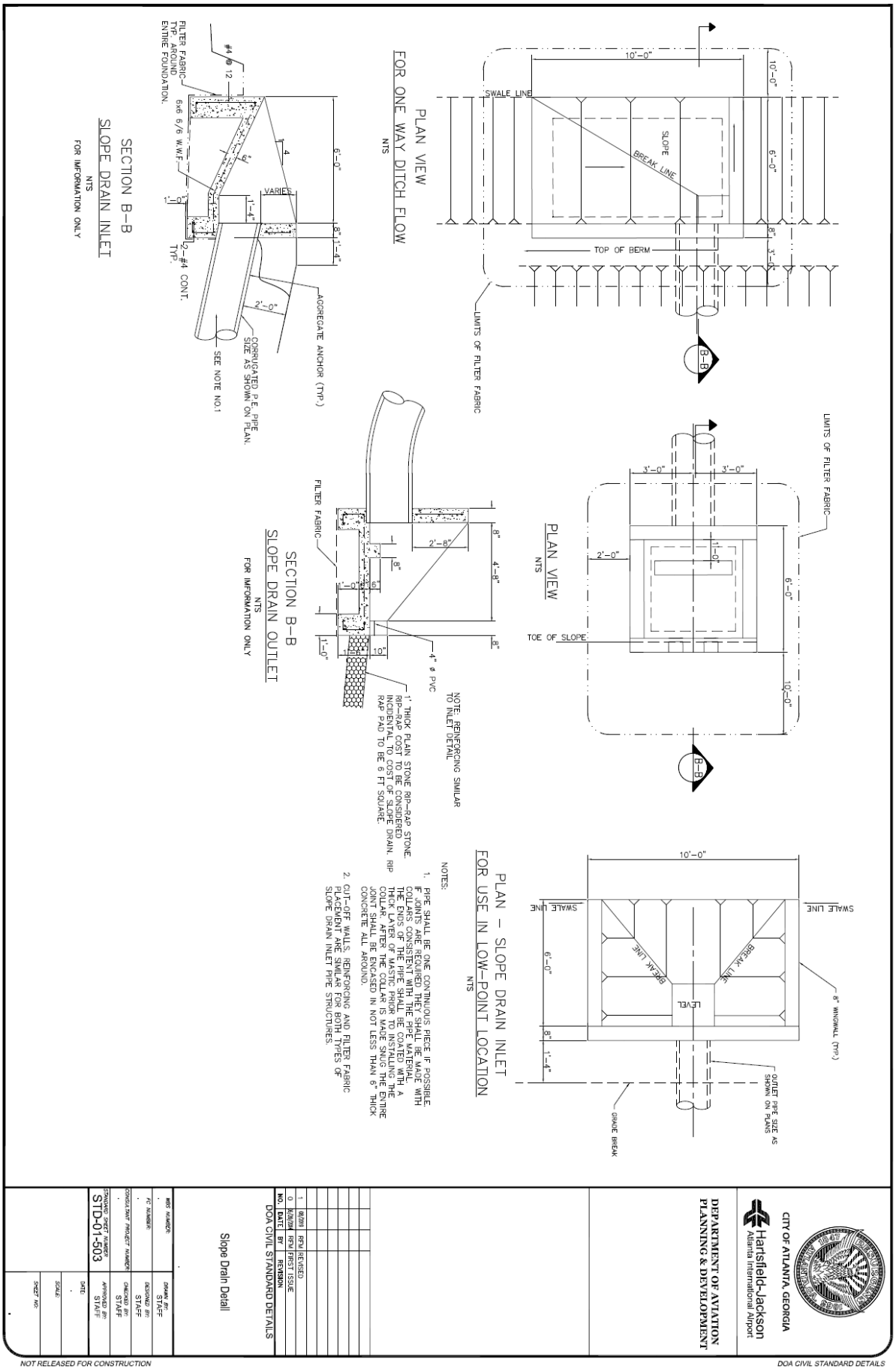

PLAN – PAVEMENT WITH UTILITY MANHOLE
NTS
SECTION A–A
NTS
DETAIL 1
NTS
DETAIL 2
NTS
4' DIAMETER MANHOLE FOR STORM AND SANITARY SEWER
NTS
NOTES:
A. STANDARD STEPS SPACED AT 16" O.C. SHALL BE CAST IRON.
B. JOINTS BETWEEN ALL PRECAST MANHOLE COMPONENTS SHALL BE O-RING, OR PROFILE TYPE.
C. HEAVY DUTY MANHOLE FRAME AND COVER WITH NO. 4 STEEL DOWELS BEDDED IN STIFF MORTAR.
D. ALL PRECAST BASE SECTIONS MUST BE FOUNDED ON A COMPACTED LAYER OF NO. 89 COARSE AGGREGATE AT LEAST 18" THICK.
E. PRECAST MANHOLE RISERS AND BASE SHALL CONFORM TO THE PROVISIONS OF ASTM C-478.
F. MANHOLE INSIDE DIAMETER MAY BE UP TO 5', AS SPECIFIED.
NOTES FOR PAVEMENT WITH MANHOLE
1. MANHOLE FRAME AND LID SHALL BE CAPABLE OF WITHSTANDING REPEATED LOADING OF 240 PSI OVER ENTIRE AREA, BOLTED AND GASKET SEALED, VENT HOLES, AND WITH 2 PICK HOLES.
2. OPTIONAL LEVELING BOLTS (3/4"ø) TO BE PLACED ON FORMS FOR BOTTOM OF PAVEMENT (8 PER FRAME.)
3. STANDARD STEPS SPACED 16" O.C. SHALL BE CAST IRON NEENAH PATTERN NO. R-1980-C, OR EQUAL.
4. COLLAR RING WELDED WIRE REINFORCING SHALL BE W6@6 x W2.9 IN EACH FACE.
5. REINFORCING STEEL SHOWN IN PLAN IS SYMMETRICAL IN BOTH DIRECTIONS ABOUT CENTERLINE RISER AND COLLAR FIELD CUT REINFORCING AT MANHOLE SUCH THAT TOP REINFORCING CLEARS FRAME BY 1" AND BOTTOM REINFORCING CLEARS THE 2'-0" OPENING BY 2" INSTALL ADDITIONAL REINFORCING AT MANHOLE IN ACCORDANCE WITH DETAIL 1.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
In-Pavement Manholes
STD-01-400
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


PLAN
GRATE AND PAVEMENT REMOVED
SECTION A–A
INLET TYPE A (IN PAVEMENT)
TOP OF STRUCTURE ELEVATION
DETAIL A
GRATE SHOWN
SECTION D–D
STEEL FRAME AND GRATING
N.T.S.
GRATE DETAIL
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
In-Pavement Inlets
Inlet Type 'A'
STD-01-500
NOT RELEASED FOR CONSTRUCTION


TYPE "B" GRATE DETAIL
N.T.S.
SECTION E–E
SECTION F–F
SECTION B–B
GRATE
FRAME
DRILL AND CSK FOR 3/8" DIA. FLAT HEAD MECHANICAL SCREW (TYP.)
11/16" DIA. (4 HOLES)
DRILL AND TAP
INLET TYPE "B"
N.T.S.
SECTION C–C
DEPTH OF STRUCTURE (VARIES)
6'-0" (TYP.)
20" (MIN.)
8" PRECAST
10" CAST IN PLACE
1-1/2" CL PRECAST
3"CL CAST IN PLACE
REFERENCED TOP OF GRATE ELEV.
UP. OUTLET AT ELEVATION SHOWN ON PLANS
#5 @ 12" EACH WAY
#6 @ 12"O.C. EACH WAY
TYPE "B" CAST IRON FRAME AND GRATE CONSTRUCTION CASTING CO. BARTON-CRAFT B-34924 OR EQUAL
CONC. APRON (TYP.) PAID AS MISC. CONC. TO MEET D-751
J BOLT ANCHORS IN WALL 5/8" X 12" MIN.
SEE STD-01-505 FOR APRON DETAIL
GRATES AND CONCRETE APRON REMOVED
PLAN
MODIFIED INLET TYPE "B"
N.T.S.
SECTION A–A
VARIES
(8'-0" MAX.)
#5 @ 0.C. TOP & BOTTOM
#6 @ 6" O.C.
#4 @ 12" O.C. HORIZONTAL
#5 @ 8" O.C. VERTICAL
PLAN
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Infield Inlets Type 'B' and Type 'B' Modified
STD-01-501
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
In-Pavement Inlet
Type "D"
STD-01-502
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


PLAN VIEW
FOR ONE WAY DITCH FLOW
NTS
SWALE LINE
SLOPE
BREAK LINE
TOP OF BERM
LIMITS OF FILTER FABRIC
B-B
SECTION B-B
SLOPE DRAIN INLET
NTS
FOR IMFORMATION ONLY
FILTER FABRIC TYP. AROUND ENTIRE FOUNDATION.
#4 @ 12
6x6 6/6 W.W.F.
VARIES
2-#4 CONT. TYP.
AGGREGATE ANCHOR (TYP.)
CORRUGATED P.E. PIPE SIZE AS SHOWN ON PLAN.
SEE NOTE NO.1
PLAN VIEW
NTS
LIMITS OF FILTER FABRIC
TOE OF SLOPE
SECTION B-B
SLOPE DRAIN OUTLET
NTS
FOR IMFORMATION ONLY
FILTER FABRIC
4" ø PVC
NOTE: REINFORCING SIMILAR TO INLET DETAIL
1' THICK PLAIN STONE RIP-RAP STONE RIP-RAP COST TO BE CONSIDERED INCIDENTAL TO COST OF SLOPE DRAIN. RIP RAP PAD TO BE 6 FT SQUARE.
NOTES:
1. PIPE SHALL BE ONE CONTINUOUS PIECE IF POSSIBLE. IF JOINTS ARE REQUIRED THEY SHALL BE MADE WITH COLLARS CONSISTENT WITH THE PIPE MATERIAL. THE ENDS OF THE PIPE SHALL BE COATED WITH A BITUMINOUS MATERIAL PRIOR TO INSTALLATION OF THE COLLAR. AFTER THE COLLAR IS MADE SNUG THE ENTIRE JOINT SHALL BE ENCASED IN NOT LESS THAN 6" THICK CONCRETE. ALL AROUND.
2. CUT-OFF WALLS, REINFORCING AND FILTER FABRIC PLACEMENT ARE SIMILAR FOR BOTH TYPES OF SLOPE DRAIN INLET PIPE STRUCTURES.
PLAN - SLOPE DRAIN INLET
FOR USE IN LOW-POINT LOCATION
NTS
SWALE LINE
BREAK LINE
LEVEL
8" WINGWALL (TYP.)
OUTLET PIPE SIZE AS SHOWN ON PLANS
GRADE BREAK
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE BY REVISION
1 08/2025 RPM REVISED
0 XX/XX/XX RPM FIRST ISSUE
DOA CIVIL STANDARD DETAILS
Slope Drain Detail
WBS NUMBER:
FC NUMBER:
CONSOLIDAT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-01-503
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO.:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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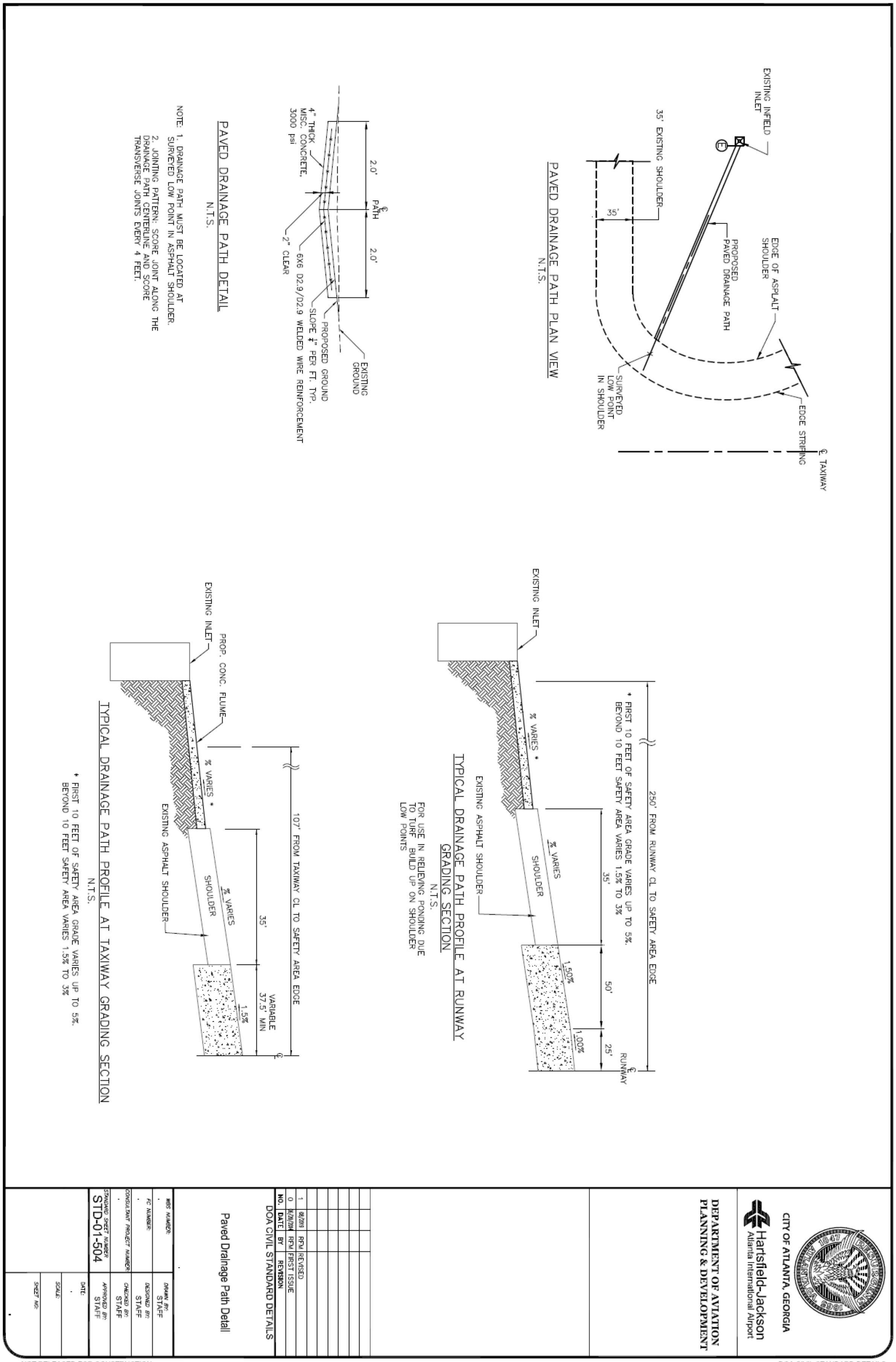
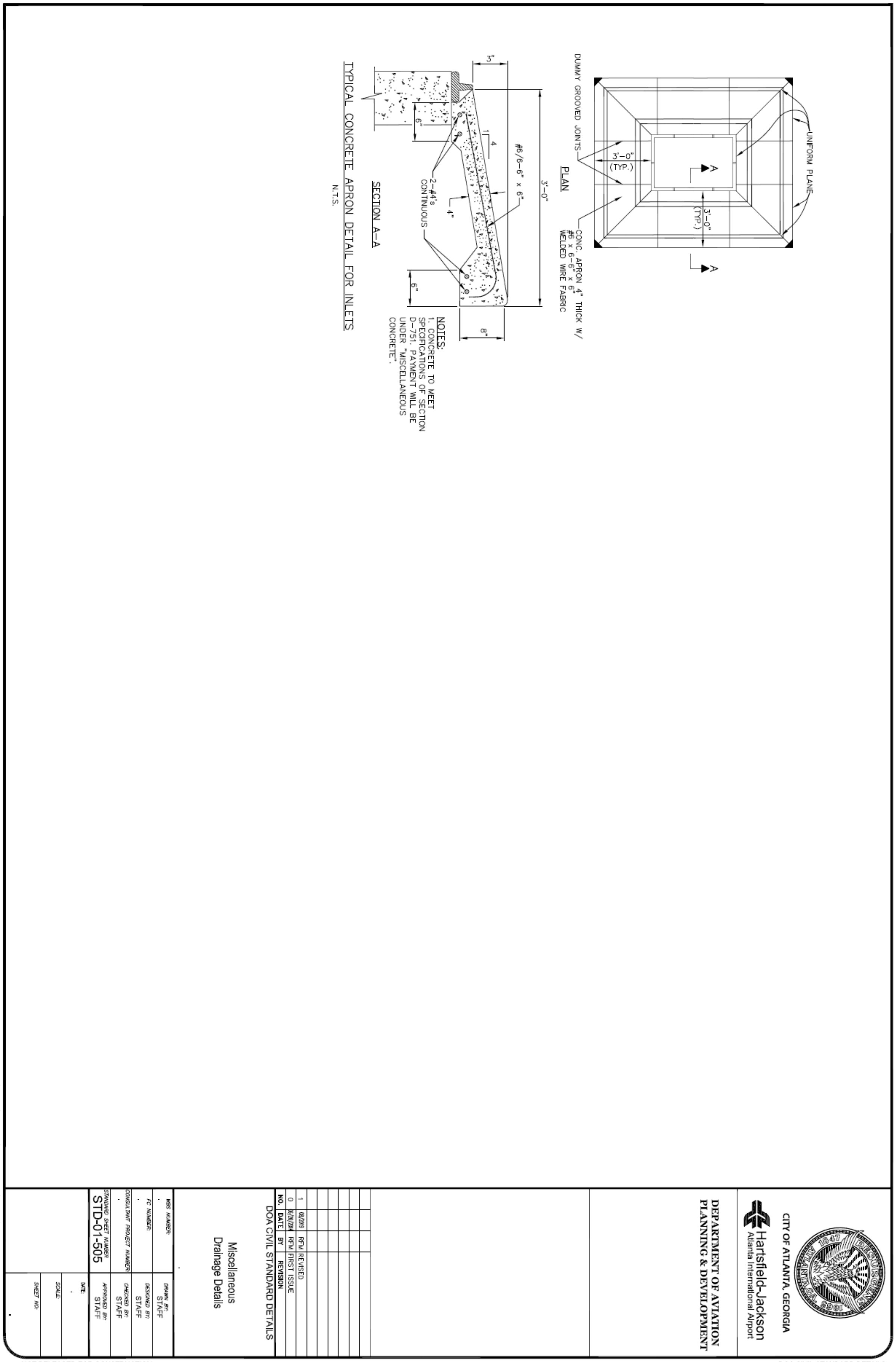
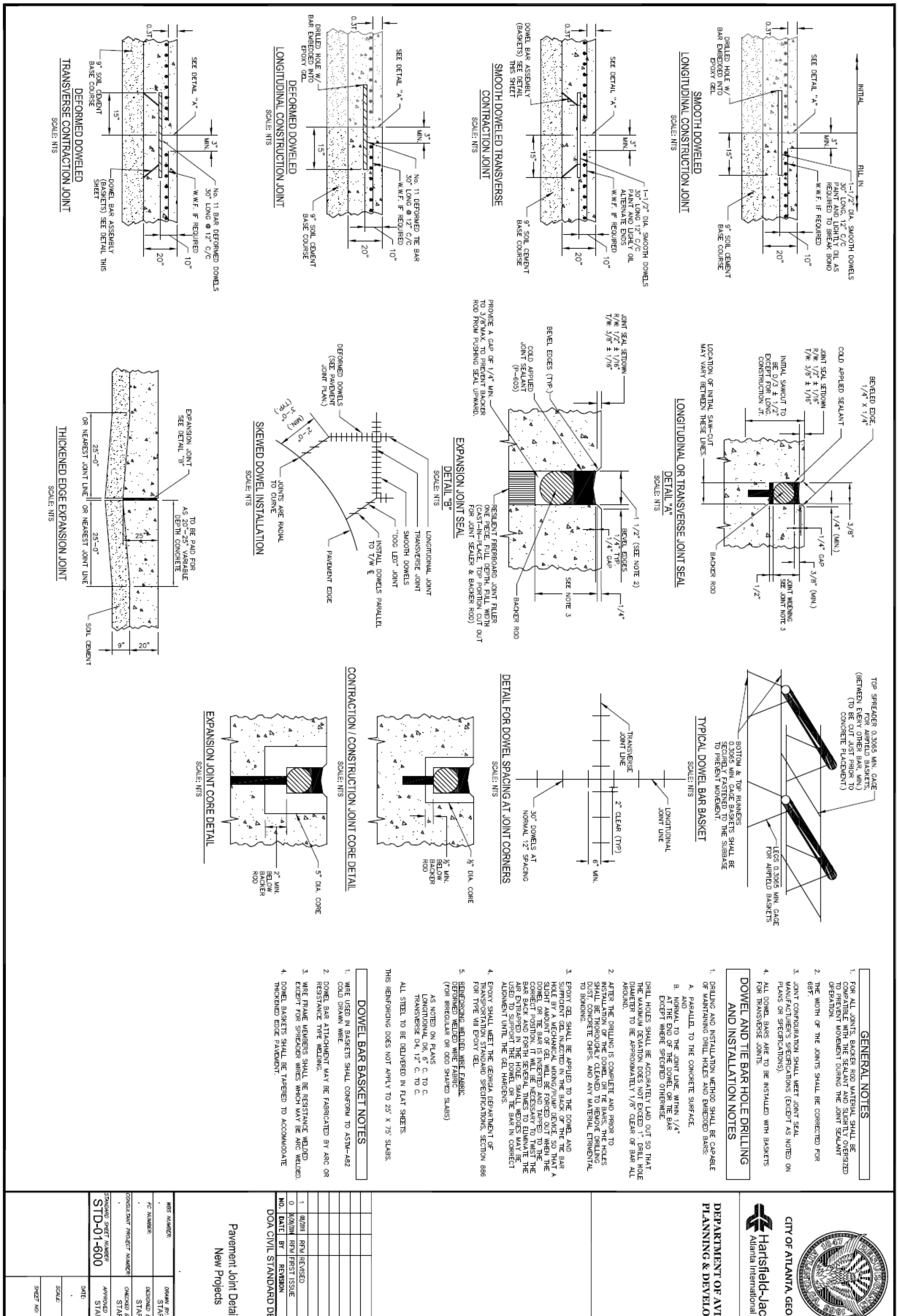

EXISTING INFIELD INLET
35' EXISTING SHOULDER
35'
PROPOSED PAVED DRAINAGE PATH
EDGE OF ASPLALT SHOULDER
SURVEYED LOW POINT IN SHOULDER
EDGE STRIPING
℄ TAXIWAY
PAVED DRAINAGE PATH PLAN VIEW
N.T.S.
2.0'
℄ PATH
2.0'
4" THICK MISC. CONCRETE, 3000 psi
2" CLEAR
6X6 D2.9/D2.9 WELDED WIRE REINFORCEMENT
SLOPE ¼" PER FT. TYP.
PROPOSED GROUND
EXISTING GROUND
PAVED DRAINAGE PATH DETAIL
N.T.S.
NOTE: 1. DRAINAGE PATH MUST BE LOCATED AT SURVEYED LOW POINT IN ASPHALT SHOULDER.
2. JOINTING PATTERN: SCORE JOINT ALONG THE DRAINAGE PATH CENTERLINE AND SCORE TRANSVERSE JOINTS EVERY 4 FEET.
EXISTING INLET
% VARIES *
250' FROM RUNWAY CL TO SAFETY AREA EDGE
* FIRST 10 FEET OF SAFETY AREA GRADE VARIES UP TO 5%. BEYOND 10 FEET SAFETY AREA VARIES 1.5% TO 3%
% VARIES
SHOULDER
35'
1.50%
50'
1.00%
25'
℄ RUNWAY
EXISTING ASPHALT SHOULDER
TYPICAL DRAINAGE PATH PROFILE AT RUNWAY GRADING SECTION
N.T.S.
FOR USE IN RELIEVING PONDING DUE TO TURF BUILD UP ON SHOULDER LOW POINTS
EXISTING INLET
PROP. CONC. FLUME
% VARIES *
107' FROM TAXIWAY CL TO SAFETY AREA EDGE
% VARIES
SHOULDER
35'
1.5%
VARIABLE 37.5' MIN
EXISTING ASPHALT SHOULDER
TYPICAL DRAINAGE PATH PROFILE AT TAXIWAY GRADING SECTION
N.T.S.
* FIRST 10 FEET OF SAFETY AREA GRADE VARIES UP TO 5%. BEYOND 10 FEET SAFETY AREA VARIES 1.5% TO 3%
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
1 08/2016 RFW REVISED
0 10/2014 RFW FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Paved Drainage Path Detail
STANDARD SHEET NUMBER: STD-01-504
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


UNIFORM PLANE
DUMMY GROOVED JOINTS
3'-0" (TYP.)
PLAN
CONC. APRON 4" THICK W/ #6 x 6-6" x 6" WELDED WIRE FABRIC
#6/6-6" x 6"
3'-0"
2-#4's CONTINUOUS
6"
8"
SECTION A-A
NOTES:
1. CONCRETE TO MEET SPECIFICATIONS OF SECTION D-751. PAYMENT WILL BE UNDER "MISCELLANEOUS CONCRETE".
TYPICAL CONCRETE APRON DETAIL FOR INLETS
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
FIRST ISSUE
REVISED
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Miscellaneous Drainage Details
STANDARD SHEET NUMBER
STD-01-505
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


SMOOTH DOWELED LONGITUDINAL CONSTRUCTION JOINT
SCALE: NTS
SMOOTH DOWELED TRANSVERSE CONTRACTION JOINT
SCALE: NTS
DEFORMED DOWELED LONGITUDINAL CONSTRUCTION JOINT
SCALE: NTS
DEFORMED DOWELED TRANSVERSE CONTRACTION JOINT
SCALE: NTS
LONGITUDINAL OR TRANSVERSE JOINT SEAL DETAIL "A"
SCALE: NTS
EXPANSION JOINT SEAL DETAIL "B"
SCALE: NTS
SKEWED DOWEL INSTALLATION
SCALE: NTS
THICKENED EDGE EXPANSION JOINT
SCALE: NTS
TYPICAL DOWEL BAR BASKET
SCALE: NTS
DETAIL FOR DOWEL SPACING AT JOINT CORNERS
SCALE: NTS
CONTRACTION / CONSTRUCTION JOINT CORE DETAIL
SCALE: NTS
EXPANSION JOINT CORE DETAIL
SCALE: NTS
GENERAL NOTES
1. FOR ALL JOINTS, BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
2. THE WIDTH OF THE JOINTS SHALL BE CORRECTED FOR 68°F.
3. JOINT CONFIGURATION SHALL MEET JOINT SEAL MANUFACTURER'S SPECIFICATIONS (EXCEPT AS NOTED ON PLANS OR SPECIFICATIONS).
4. ALL DOWEL BARS ARE TO BE INSTALLED WITH BASKETS FOR TRANSVERSE JOINTS.
DOWEL AND TIE BAR HOLE DRILLING AND INSTALLATION NOTES
1. DRILLING AND INSTALLATION METHOD SHALL BE CAPABLE OF MAINTAINING DRILL HOLES AND EMBEDDED BARS:
A. PARALLEL TO THE CONCRETE SURFACE, AND
B. NORMAL TO THE JOINT LINE, WITHIN 1/4" AT THE END OF THE DOWEL OR TIE BAR EXCEPT WHERE SPECIFIED OTHERWISE.
DRILL HOLES SHALL BE ACCURATELY LAID OUT SO THAT THE MAXIMUM DEVIATION DOES NOT EXCEED 1". DRILL HOLE DIAMETER TO BE APPROXIMATELY 1/8" CLEAR OF BAR ALL AROUND.
2. AFTER THE DRILLING IS COMPLETE AND PRIOR TO INSTALLATION OF THE DOWEL OR TIE BARS, THE HOLES SHALL BE THOROUGHLY CLEANED TO REMOVE DRILLING DUST, CONCRETE CHIPS, AND ANY MATERIAL ETRIMENTAL TO BONDING.
3. EPOXY GEL SHALL BE APPLIED TO THE DOWEL AND SUFFICIENT GEL INJECTED IN THE BACK OF THE TIE BAR HOLE BY A MECHANICAL MIXING/PUMP DEVICE, SO THAT A SLIGHT AMOUNT OF GEL WILL BE FORCED OUT WHEN THE DOWEL OR TIE BAR IS INSERTED AND TAPPED TO THE CORRECT POSITION. IT WILL BE NECESSARY TO TWIST THE BAR BACK AND FORTH SEVERAL TIMES TO ELIMINATE THE AIR ENTRAPPED IN THE HOLE. SMALL WEDGES MAY BE USED TO SUPPORT THE DOWEL OR TIE BAR IN CORRECT ALIGNMENT UNTIL THE GEL HARDENS.
4. EPOXY SHALL MEET THE GEORGIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, SECTION 886 FOR TYPE VIII EPOXY GEL.
5. REINFORCING WELDED WIRE FABRIC
DEFORMED WELDED WIRE FABRIC
(FOR IRREGULAR OR ODD SHAPED SLABS)
AS NOTED ON PLANS
LONGITUDINAL D6, 6" C. TO C.
TRANSVERSE D4, 12" C. TO C.
ALL STEEL TO BE DELIVERED IN FLAT SHEETS.
THIS REINFORCING DOES NOT APPLY TO 25' X 75' SLABS.
DOWEL BAR BASKET NOTES
1. WIRE USED IN BASKETS SHALL CONFORM TO ASTM–A82 COLD DRAWN WIRE.
2. DOWEL BAR ATTACHMENT MAY BE FABRICATED BY ARC OR RESISTANCE TYPE WELDING.
3. WIRE FRAME MEMBERS SHALL BE RESISTANCE WELDED EXCEPT FOR SPREADER WIRES WHICH MAY BE ARC WELDED.
4. DOWEL BASKETS SHALL BE TAPERED TO ACCOMMODATE THICKENED EDGE PAVEMENT.
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DOA CIVIL STANDARD DETAILS
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CHECKED BY: STAFF
APPROVED BY: STAFF
STANDARD SHEET NUMBER
STD-01-600
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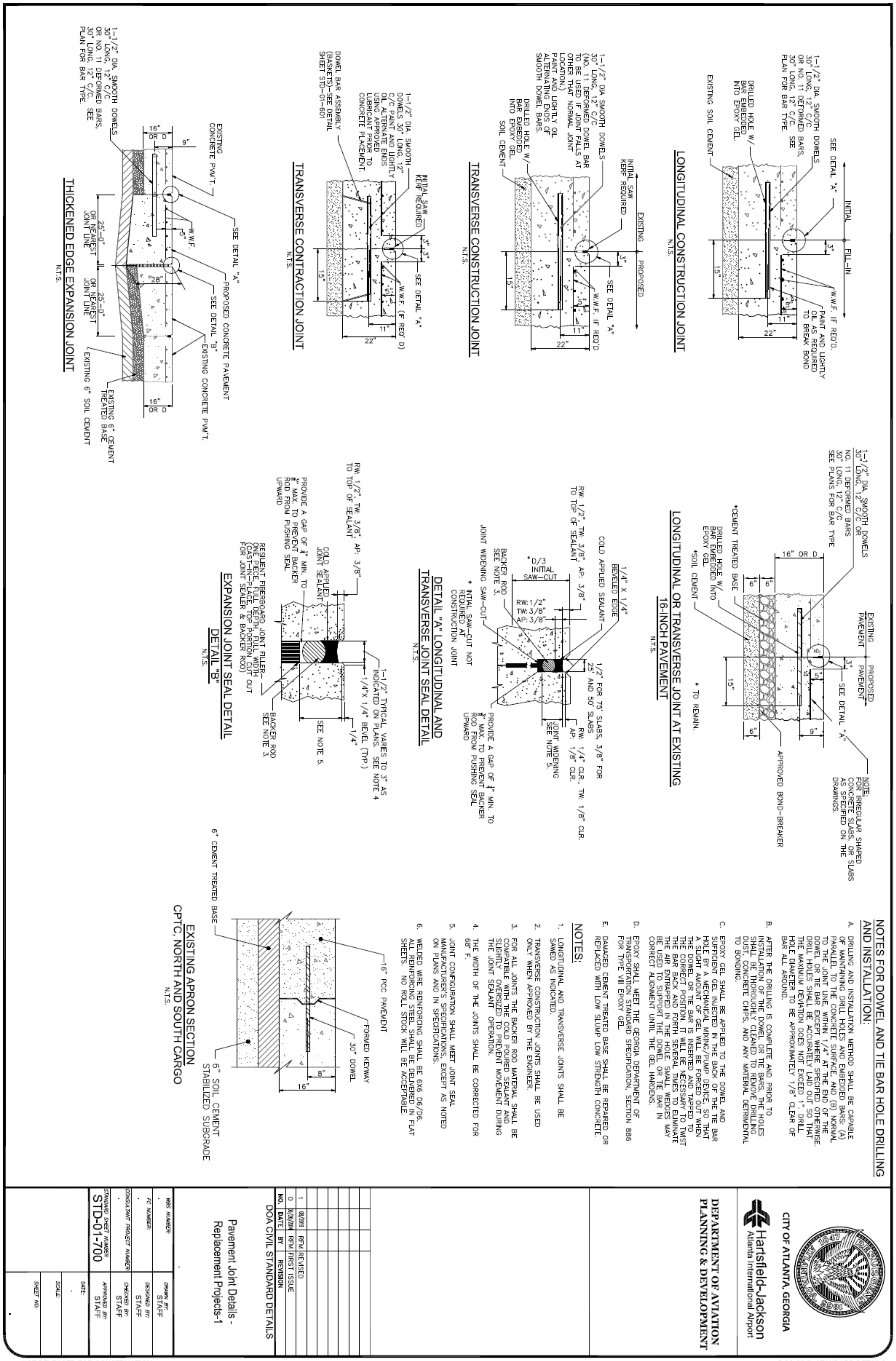
LONGITUDINAL CONSTRUCTION JOINT
N.T.S.
TRANSVERSE CONSTRUCTION JOINT
N.T.S.
TRANSVERSE CONTRACTION JOINT
N.T.S.
THICKENED EDGE EXPANSION JOINT
N.T.S.
LONGITUDINAL OR TRANSVERSE JOINT AT EXISTING 16-INCH PAVEMENT
N.T.S.
DETAIL "A" LONGITUDINAL AND TRANSVERSE JOINT SEAL DETAIL
N.T.S.
EXPANSION JOINT SEAL DETAIL
DETAIL "B"
N.T.S.
EXISTING APRON SECTION
CPTC, NORTH AND SOUTH CARGO
N.T.S.
NOTES FOR DOWEL AND TIE BAR HOLE DRILLING AND INSTALLATION:
NOTES:
CITY OF ATLANTA, GEORGIA
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Atlanta International Airport
DEPARTMENT OF AVIATION
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DOA CIVIL STANDARD DETAILS
Pavement Joint Details - Replacement Projects-1
STD-01-700
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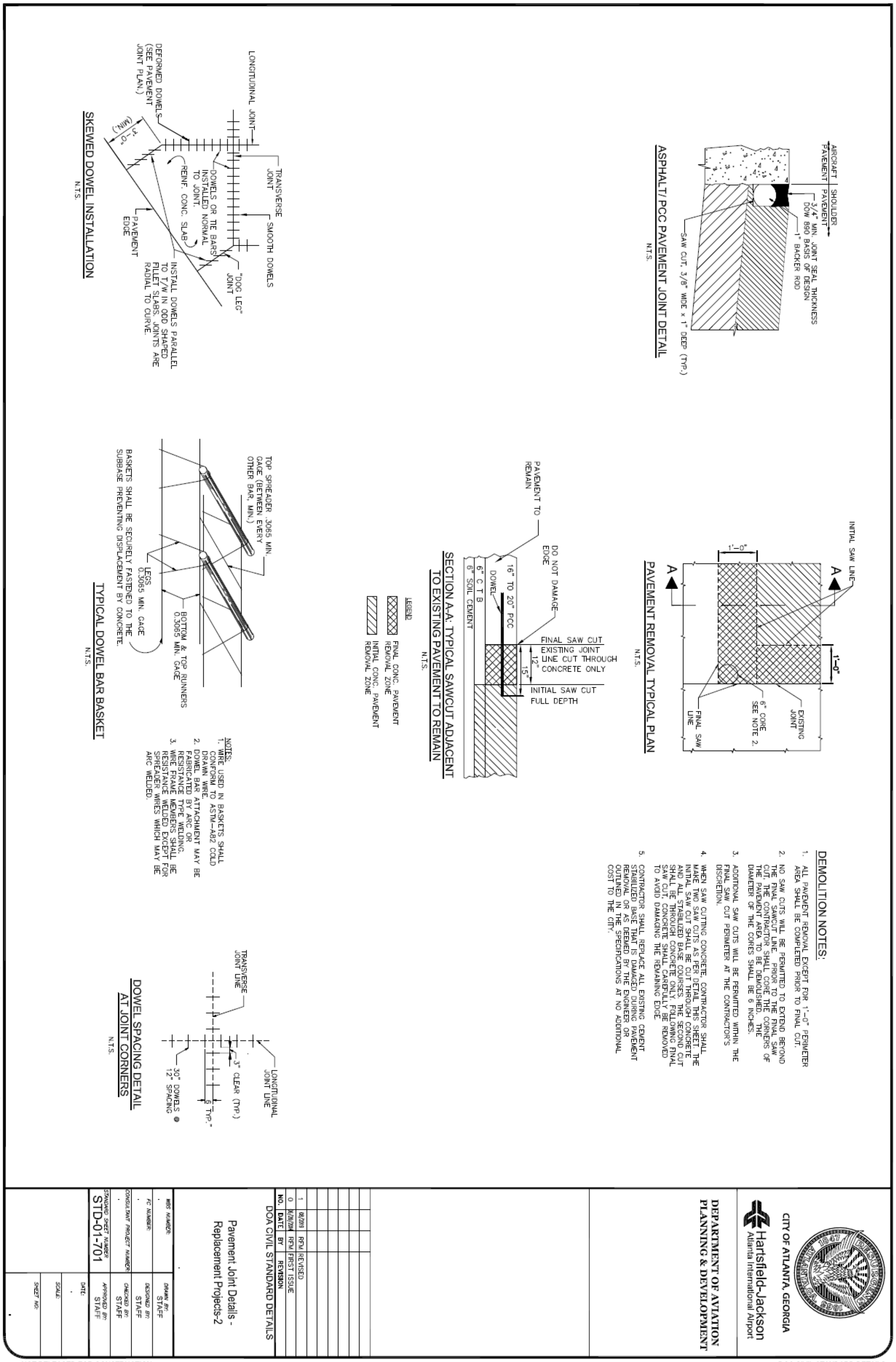
DOA CIVIL STANDARD DETAILS


AIRCRAFT PAVEMENT
SHOULDER PAVEMENT
3/4" MIN. JOINT SEAL THICKNESS DOW 890 BASIS OF DESIGN
1" BACKER ROD
SAW CUT, 3/8" WIDE x 1" DEEP (TYP.)
ASPHALT/ PCC PAVEMENT JOINT DETAIL
N.T.S.
INITIAL SAW LINE
A
1'–0"
EXISTING JOINT
6" CORE SEE NOTE 2.
FINAL SAW LINE
PAVEMENT REMOVAL TYPICAL PLAN
N.T.S.
DEMOLITION NOTES:
1. ALL PAVEMENT REMOVAL EXCEPT FOR 1'–0" PERIMETER AREA SHALL BE COMPLETED PRIOR TO FINAL CUT.
2. NO SAW CUTS WILL BE PERMITTED TO EXTEND BEYOND THE FINAL SAWCUT LINE. PRIOR TO THE FINAL SAW CUT, THE CONTRACTOR SHALL CORE THE CORNERS OF THE PAVEMENT AREA TO BE DEMOLISHED. THE DIAMETER OF THE CORES SHALL BE 6 INCHES.
3. ADDITIONAL SAW CUTS WILL BE PERMITTED WITHIN THE FINAL SAW CUT PERIMETER AT THE CONTRACTOR'S DISCRETION.
4. WHEN SAW CUTTING CONCRETE, CONTRACTOR SHALL MAKE TWO SAW CUTS AS PER DETAIL THIS SHEET. THE INITIAL SAW CUT SHALL BE CUT THROUGH CONCRETE AND ALL STABILIZED BASE COURSES. THE SECOND CUT SHALL BE THROUGH CONCRETE ONLY. FOLLOWING FINAL SAW CUT, CONCRETE SHALL CAREFULLY BE REMOVED TO AVOID DAMAGING THE REMAINING EDGE.
5. CONTRACTOR SHALL REPLACE ALL EXISTING CEMENT STABILIZED BASE THAT IS DAMAGED DURING PAVEMENT REMOVAL OR AS DEEMED BY THE ENGINEER OR OUTLINED IN THE SPECIFICATIONS AT NO ADDITIONAL COST TO THE CITY.
FINAL SAW CUT
EXISTING JOINT LINE CUT THROUGH CONCRETE ONLY
INITIAL SAW CUT FULL DEPTH
DO NOT DAMAGE EDGE
PAVEMENT TO REMAIN
12"
15"
16" TO 20" PCC
DOWEL
6" C T B
6" SOIL CEMENT
SECTION A-A: TYPICAL SAWCUT ADJACENT TO EXISTING PAVEMENT TO REMAIN
N.T.S.
LEGEND
FINAL CONC. PAVEMENT REMOVAL ZONE
INITIAL CONC. PAVEMENT REMOVAL ZONE
TRANSVERSE JOINT
SMOOTH DOWELS
LONGITUDINAL JOINT
"DOG LEG" JOINT
DOWELS OR TIE BARS INSTALLED NORMAL TO JOINT.
REINF. CONC. SLAB
INSTALL DOWELS PARALLEL TO T/W IN ODD SHAPED FILLET SLABS. JOINTS ARE RADIAL TO CURVE.
DEFORMED DOWELS (SEE PAVEMENT JOINT PLAN.)
3'–0" (MIN.)
PAVEMENT EDGE
SKEWED DOWEL INSTALLATION
N.T.S.
TOP SPREADER .3065 MIN. GAGE (BETWEEN EVERY OTHER BAR, MIN.)
BOTTOM & TOP RUNNERS 0.3065 MIN. GAGE
LEGS 0.3065 MIN. GAGE
BASKETS SHALL BE SECURELY FASTENED TO THE SUBBASE PREVENTING DISPLACEMENT BY CONCRETE.
TYPICAL DOWEL BAR BASKET
N.T.S.
NOTES:
1. WIRE USED IN BASKETS SHALL CONFORM TO ASTM–A82 COLD DRAWN WIRE.
2. DOWEL BAR ATTACHMENT MAY BE FABRICATED BY ARC OR RESISTANCE TYPE WELDING.
3. WIRE FRAME MEMBERS SHALL BE RESISTANCE WELDED EXCEPT FOR SPREADER WIRES WHICH MAY BE ARC WELDED.
LONGITUDINAL JOINT LINE
TRANSVERSE JOINT LINE
3" CLEAR (TYP.)
6" TYP.
30" DOWELS @ 12" SPACING
DOWEL SPACING DETAIL AT JOINT CORNERS
N.T.S.
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DOA CIVIL STANDARD DETAILS
Pavement Joint Details - Replacement Projects-2
WBS NUMBER:
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STANDARD SHEET NUMBER
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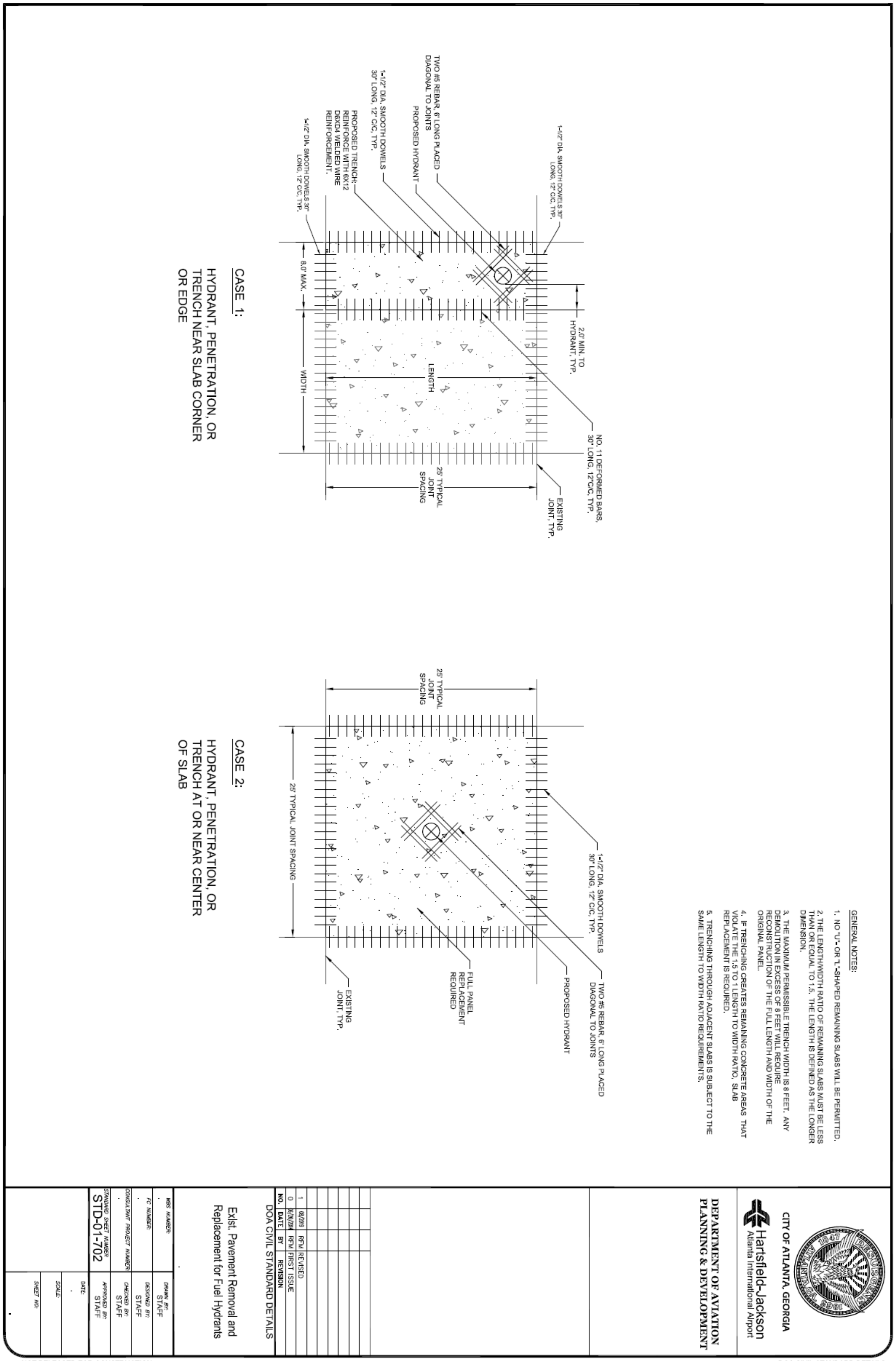
1-1/2" DIA. SMOOTH DOWELS 30" LONG, 12" C/C, TYP.
TWO #5 REBAR, 6' LONG PLACED DIAGONAL TO JOINTS
PROPOSED HYDRANT
1-1/2" DIA. SMOOTH DOWELS 30" LONG, 12" C/C, TYP.
PROPOSED TRENCH: REINFORCE WITH 6X12 D8XD4 WELDED WIRE REINFORCEMENT.
1-1/2" DIA. SMOOTH DOWELS 30" LONG, 12" C/C, TYP.
2.0' MIN. TO HYDRANT, TYP.
8.0' MAX.
LENGTH
WIDTH
NO. 11 DEFORMED BARS, 30" LONG, 12"C/C, TYP.
25' TYPICAL JOINT SPACING
EXISTING JOINT, TYP.
CASE 1:
HYDRANT, PENETRATION, OR TRENCH NEAR SLAB CORNER OR EDGE
25' TYPICAL JOINT SPACING
1-1/2" DIA. SMOOTH DOWELS 30" LONG, 12" C/C, TYP.
TWO #5 REBAR, 6' LONG PLACED DIAGONAL TO JOINTS
PROPOSED HYDRANT
FULL PANEL REPLACEMENT REQUIRED
EXISTING JOINT, TYP.
25' TYPICAL JOINT SPACING
CASE 2:
HYDRANT, PENETRATION, OR TRENCH AT OR NEAR CENTER OF SLAB
GENERAL NOTES:
1. NO "U"-OR "L"-SHAPED REMAINING SLABS WILL BE PERMITTED.
2. THE LENGTH/WIDTH RATIO OF REMAINING SLABS MUST BE LESS THAN OR EQUAL TO 1.5. THE LENGTH IS DEFINED AS THE LONGER DIMENSION.
3. THE MAXIMUM PERMISSIBLE TRENCH WIDTH IS 8 FEET. ANY DEMOLITION IN EXCESS OF 8 FEET WILL REQUIRE RECONSTRUCTION OF THE FULL LENGTH AND WIDTH OF THE ORIGINAL PANEL.
4. IF TRENCHING CREATES REMAINING CONCRETE AREAS THAT VIOLATE THE 1.5 TO 1 LENGTH TO WIDTH RATIO, SLAB REPLACEMENT IS REQUIRED.
5. TRENCHING THROUGH ADJACENT SLABS IS SUBJECT TO THE SAME LENGTH TO WIDTH RATIO REQUIREMENTS.
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DOA CIVIL STANDARD DETAILS
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CONSULTANT PROJECT NUMBER
STANDARD SHEET NUMBER
STD-01-702
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DESIGNED BY: STAFF
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APPROVED BY: STAFF
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SCALE:
SHEET NO:
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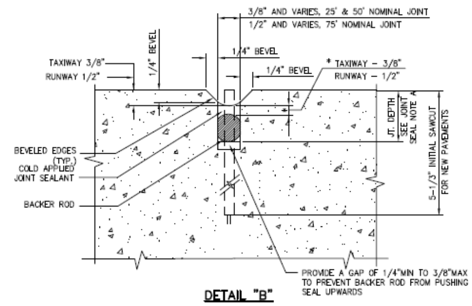
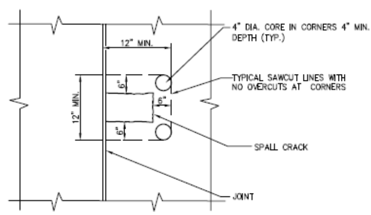
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS



DETAIL "B"

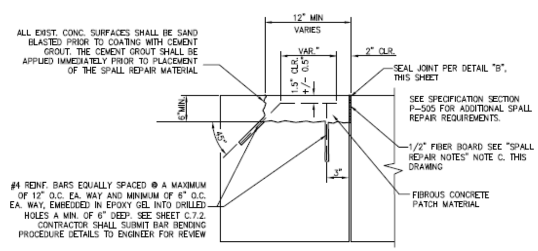
LONGITUDINAL AND TRANSVERSE JOINT SEAL

SCALE: NTS



TYPICAL REMOVAL PLAN FOR SPALL REPAIR

SCALE: NTS



TYPICAL SPALL REPAIR DETAIL

SCALE: NTS

JOINT SEAL PROCEDURE NOTES

IN GENERAL, THE PROCEDURE FOR RESEALING THE JOINT SHALL BE AS FOLLOWS: (ADDITIONAL REQUIREMENTS AND STEPS FOR RESEALING THE EXPANSION JOINTS ARE GIVEN IN SUBSEQUENT SECTIONS OF THE PLANS AND SPECIFICATIONS.)

A. THE CONTRACTOR SHALL REMOVE THE EXISTING SEALS, THE EXISTING JOINT SEAL AND SEALANT MUST BE REMOVED ENTIRELY TO ULTIMATELY PROVIDE A THOROUGHLY CLEANED SURFACE ON WHICH TO RESEAL. THE EXISTING SEAL IS TO BE REMOVED BY SAWCUTTING BOTH SIDES OF THE PAVEMENT EDGE TO WHICH THE SEAL IS ATTACHED TO THE FULL DEPTH OF THE SEAL AND APPROXIMATELY 1/16" INTO EACH PAVEMENT EDGE.

B. ALL SPALLED AND CRACKED SURFACES ADJACENT TO A JOINT WHICH ARE DEEMED UNSATISFACTORY FOR RESEALING BY THE ENGINEER SHALL BE REPAIRED BY THE CONTRACTOR PRIOR TO RESEALING. THE PATCH MATERIAL USED FOR SPALLING REPAIR SHALL BE AS SPECIFIED IN SPECIFICATIONS SECTION P-505, CONCRETE PAVEMENT SPALL REPAIR.

C. PAVEMENT JOINT EDGES ARE TO BE SAWCUT BEVELED ON A 1/4" X 1/4" SLOPE, AS SHOWN IN DETAIL B. NOTE, THE CONTRACTOR SHALL BE REQUIRED TO DEVELOP A MEANS TO CONTAIN THE SLURRY PRODUCED DURING THE BEVELING OPERATIONS. IMMEDIATELY FOLLOWING THE BEVELING THE JOINT OPENING IS TO BE CLEANED BY THE USE OF HIGH PRESSURE WATER BLASTING. THE AREA SHALL THEN BE SWEPT CLEAN BY USE OF A VACUUM SWEEPER. THE BEVELING AND SLURRY CLEANUP OPERATIONS IN CONJUNCTION WITH THE SEAL REMOVAL SHALL CONSTITUTE THE INITIAL CLEANING.

D. IMMEDIATELY PRECEDING APPLICATION OF THE JOINT SEAL, THE PAVEMENT EDGE WHICH WILL RECEIVE THE NEW JOINT MATERIAL SHALL BE THOROUGHLY CLEANED AND SAND BLASTED. THE CONTRACTOR SHALL BE REQUIRED TO ESTABLISH A MEANS TO CONTAIN THE SAND DURING THE SAND BLASTING OPERATION SINCE SAND OR ANY FOREIGN OBJECT ON AIRCRAFT PAVEMENT IS DETRIMENTAL TO AIRCRAFT SAFETY. THE METHODS ESTABLISHED TO CONTAIN THE SAND MUST BE APPROVED BY THE ENGINEER PRIOR TO ITS USE UPON COMPLETION OF THE SAND BLASTING OPERATION OR AT INTERVALS DIRECTED BY THE ENGINEER, PRIOR TO ITS USE. THE CONTRACTOR SHALL BE REQUIRED TO SWEEP THE SAND WITH A VACUUM SWEEPER.

E. BACKER ROD AS SPECIFIED IN THE SPECIFICATIONS SHALL BE INSTALLED AS CALLED FOR IN DETAIL B. THE INSTALLATION OF THE BACKER ROD IN CONJUNCTION WITH THE SANDBLASTING OPERATION SHALL CONSTITUTE THE FINAL JOINT PREPARATION.

F. THE JOINT SEAL AS CALLED FOR IN THE SPECIFICATIONS SHALL THEN BE APPLIED; SEE DETAIL B. AS A PRECAUTION TO ENSURE THAT PAVEMENT IS MOISTURE FREE, THE CONTRACTOR SHALL HAVE AT HIS DISPOSAL ON SITE, PRIOR TO THE ACTUAL SEALING OPERATION, A NONRESIDUAL HEATER/BLOWER UNIT PER SEALING CREW, TO DRY THE PAVEMENT EDGES.

JOINT SEAL NOTES:

A. THE JOINT SEAL MANUFACTURER'S SPECIFICATIONS SHALL BE COMPATIBLE WITH JOINT CONFIGURATION.

B. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE COLD POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.

C. SEE DRAWING C.7.3 FOR EXPANSION JOINT SEAL DETAIL. REPLACE EXISTING SEAL AND BACKER ROD. EXISTING EXPANSION BOARD TO REMAIN.

SPALL REPAIR NOTES:

A. SPALL REPAIR LIMITS SHALL BE APPROVED BY ENGINEER PRIOR TO ANY CUTTING OR REMOVAL. MINIMUM SPALL AREA IS ONE SQUARE FOOT. REPAIR DEPTH MAY VARY BEYOND 6 INCHES. EXISTING SPALLED CONCRETE SHALL BE REMOVED TO SOUND CONCRETE. WITH ENGINEER'S APPROVAL, PRE-SAWING MAY BE PERMITTED AS FOLLOWS:

1. TAXIWAYS MAY BE PRESAWED 48 HOURS IN ADVANCE OF SPALL REPAIR CONSTRUCTION.
2. RUNWAYS MAY BE PRESAWED 24 HOURS IN ADVANCE OF SPALL REPAIR CONSTRUCTION.

B. JOINT SEAL INSTALLATION AROUND SPALL REPAIRS SHALL BE ACCOMPLISHED IMMEDIATELY AFTER SPALL REPAIRS ARE COMPLETED AND CURED.

C. FIBER BOARD USED FOR SPALL PATCH IS FOR FORMING PURPOSES. THE TOP PORTION SHALL BE REMOVED PRIOR TO JOINT REPAIR SEAL INSTALLATION.

D. SPALL REPAIRS ALONG UTILITY CUTS CAN BE LESS THAN 12" WIDE.

E. SPALL REPAIR WORK WILL BE SCHEDULED NOT ONLY TO OBTAIN THE 450 PSI STRENGTH REQUIRED FOR OPENING TO AIRCRAFT TRAFFIC BUT ALSO TO PROVIDE SUFFICIENT TIME TO WATER CURE THE FIBROUS CONCRETE MIX AS REQUIRED BY THE TECHNICAL SPECIFICATIONS.

F. ELECTRICAL CONTRACTOR SHALL BE ON SITE DURING SAW CUTTING, REMOVAL, AND REPLACEMENT OF CONCRETE SPALLS WITHIN 3 FEET OF IN-PAVEMENT ELECTRICAL ITEMS.

G. CONTRACTOR SHALL BE REQUIRED TO COORDINATE WITH DOA MAINTENANCE TO LOCK OUT AFFECTED ELECTRICAL CIRCUITS AND RE-ENERGIZE CIRCUITS.

H. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

CRACK ROUTING AND SEALING

A. PREPARATION FOR CONCRETE PAVEMENT CRACK ROUTING AND SEALING SHALL BE BY PROPERLY ROUTING THE CRACK TO BE SLIGHTLY LOWER THAN THE EXISTING CRACK TO ENSURE PROPER ADHESION TO THE SIDEWALLS. THE CRACKS SHOULD BE ROUTED OUT TO PROVIDE A MINIMUM SEALANT RESERVOIR 3/8" WIDE WITH A MINIMUM DEPTH OF 3/8". THICKNESS AND DEPTH BELOW THE PAVEMENT SURFACE SHALL BE AS SPECIFIED FOR JOINT SEALANT.

B. CRACKS SHOULD BE FREE OF DIRT, DUST, AND MOISTURE, AND SHOULD BE FROST-FREE. WIRE BRUSHING OR COMPRESSED AIR SHOULD CLEAN THEM AND A HEAT LANCE MAY BE USED TO DRY THE SURFACES.

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DOA CIVIL STANDARD DETAILS

Spall and Joint Repair Details

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STANDARD SHEET NUMBER: STD-01-703	APPROVED BY: STAFF
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DOA CIVIL STANDARD DETAILS

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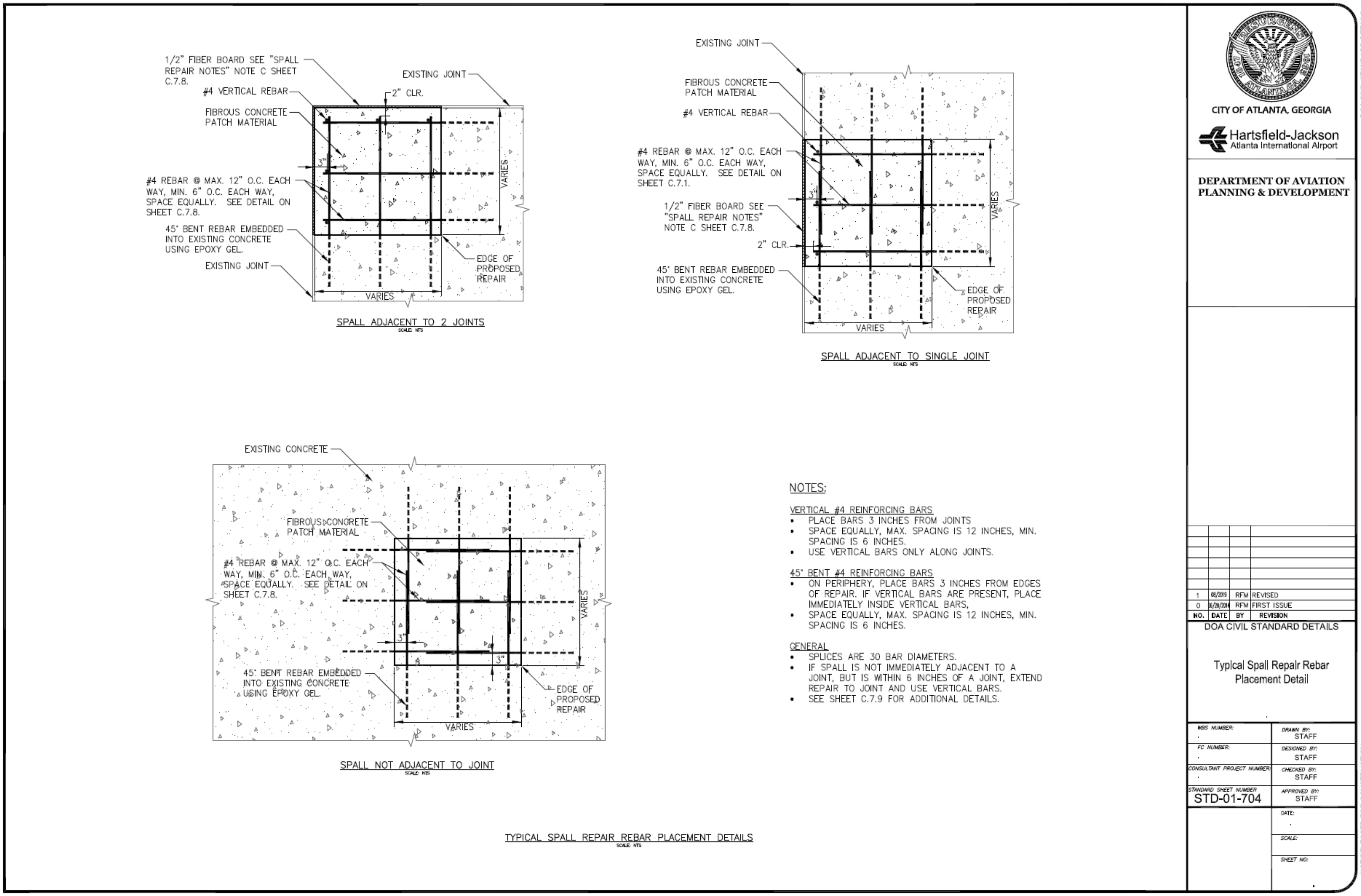
1/2" FIBER BOARD SEE "SPALL REPAIR NOTES" NOTE C SHEET C.7.8.
#4 VERTICAL REBAR
EXISTING JOINT
2" CLR.
FIBROUS CONCRETE PATCH MATERIAL
3"
#4 REBAR @ MAX. 12" O.C. EACH WAY, MIN. 6" O.C. EACH WAY, SPACE EQUALLY. SEE DETAIL ON SHEET C.7.8.
VARIES
45° BENT REBAR EMBEDDED INTO EXISTING CONCRETE USING EPOXY GEL.
EXISTING JOINT
EDGE OF PROPOSED REPAIR
VARIES
SPALL ADJACENT TO 2 JOINTS
SCALE: NTS
EXISTING JOINT
FIBROUS CONCRETE PATCH MATERIAL
#4 VERTICAL REBAR
#4 REBAR @ MAX. 12" O.C. EACH WAY, MIN. 6" O.C. EACH WAY, SPACE EQUALLY. SEE DETAIL ON SHEET C.7.1.
1/2" FIBER BOARD SEE "SPALL REPAIR NOTES" NOTE C SHEET C.7.8.
2" CLR.
45° BENT REBAR EMBEDDED INTO EXISTING CONCRETE USING EPOXY GEL.
EDGE OF PROPOSED REPAIR
VARIES
SPALL ADJACENT TO SINGLE JOINT
SCALE: NTS
EXISTING CONCRETE
FIBROUS CONCRETE PATCH MATERIAL
#4 REBAR @ MAX. 12" O.C. EACH WAY, MIN. 6" O.C. EACH WAY, SPACE EQUALLY. SEE DETAIL ON SHEET C.7.8.
45° BENT REBAR EMBEDDED INTO EXISTING CONCRETE USING EPOXY GEL.
EDGE OF PROPOSED REPAIR
VARIES
3"
SPALL NOT ADJACENT TO JOINT
SCALE: NTS
NOTES:
VERTICAL #4 REINFORCING BARS
• PLACE BARS 3 INCHES FROM JOINTS
• SPACE EQUALLY, MAX. SPACING IS 12 INCHES, MIN. SPACING IS 6 INCHES.
• USE VERTICAL BARS ONLY ALONG JOINTS.
45° BENT #4 REINFORCING BARS
• ON PERIPHERY, PLACE BARS 3 INCHES FROM EDGES OF REPAIR. IF VERTICAL BARS ARE PRESENT, PLACE IMMEDIATELY INSIDE VERTICAL BARS.
• SPACE EQUALLY, MAX. SPACING IS 12 INCHES, MIN. SPACING IS 6 INCHES.
GENERAL
• SPLICES ARE 30 BAR DIAMETERS.
• IF SPALL IS NOT IMMEDIATELY ADJACENT TO A JOINT, BUT IS WITHIN 6 INCHES OF A JOINT, EXTEND REPAIR TO JOINT AND USE VERTICAL BARS.
• SEE SHEET C.7.9 FOR ADDITIONAL DETAILS.
TYPICAL SPALL REPAIR REBAR PLACEMENT DETAILS
SCALE: NTS
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DEPARTMENT OF AVIATION
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DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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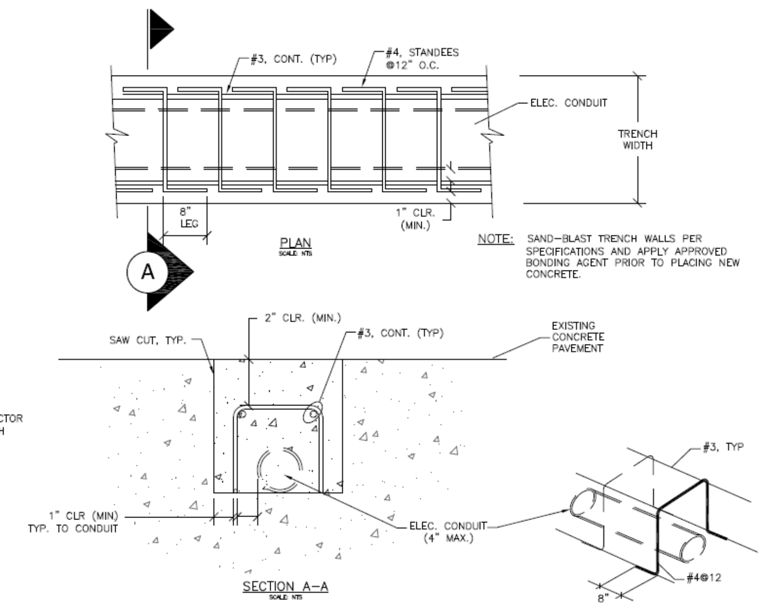

NOTE: SAND–BLAST TRENCH WALLS PER SPECIFICATIONS AND APPLY APPROVED BONDING AGENT PRIOR TO PLACING NEW CONCRETE.

NOTE: TRENCH DEPTH IS 8+/–". CONTRACTOR SHALL FIELD VERIFY ACTUAL TRENCH DEPTH.

GENERAL NOTES

1. ALL REINFORCEMENT TO CONFORM TO ASTM A–615, GRADE 60
2. ALL BAR BENDING DETAILS SHALL CONFORM TO REQ'TS OF ACI 318–05
3. ALL CONCRETE SHALL MEET THE REQUIREMENTS OF SPECIFICATION SECTION P–505.
4. ALL REINFORCEMENT SPLICES SHALL BE CLASS A, PER ACI 318–05
5. ALLOW FOR 5% OF THE TOTAL WEIGHT OF REINFORCING STEEL AS BARS TO BE PLACED AS DIRECTED BY THE ENGINEER.
6. SEE SPALL REPAIR NOTES ON SHEET STD–01–704 FOR ADDITIONAL REQUIREMENTS.
7. STANDEES AND LONGITUDINAL BARS SHALL NOT BE CONTINUOUS THROUGH EXISTING JOINTS. CLIP BARS AS REQUIRED. MAINTAIN 1–INCH CLEARANCE.
8. INSTALL EXPANSION/DEFLECTION FITTINGS ON CONDUITS AT PAVEMENT JOINTS.
9. WHERE TRENCH ENDS AT EXISTING CONCRETE, TIE–IN NEW #3 BARS BY EPOXY GROUTING INTO EXISTING CONCRETE 6". HILTI HIT RE 500 IS THE BASIS OF DESIGN.

TYPICAL REPAIR FOR RETROFIT CONDUIT TRENCH
SCALE: NTS

CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

Retrofit Conduit Trench Repair Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-705	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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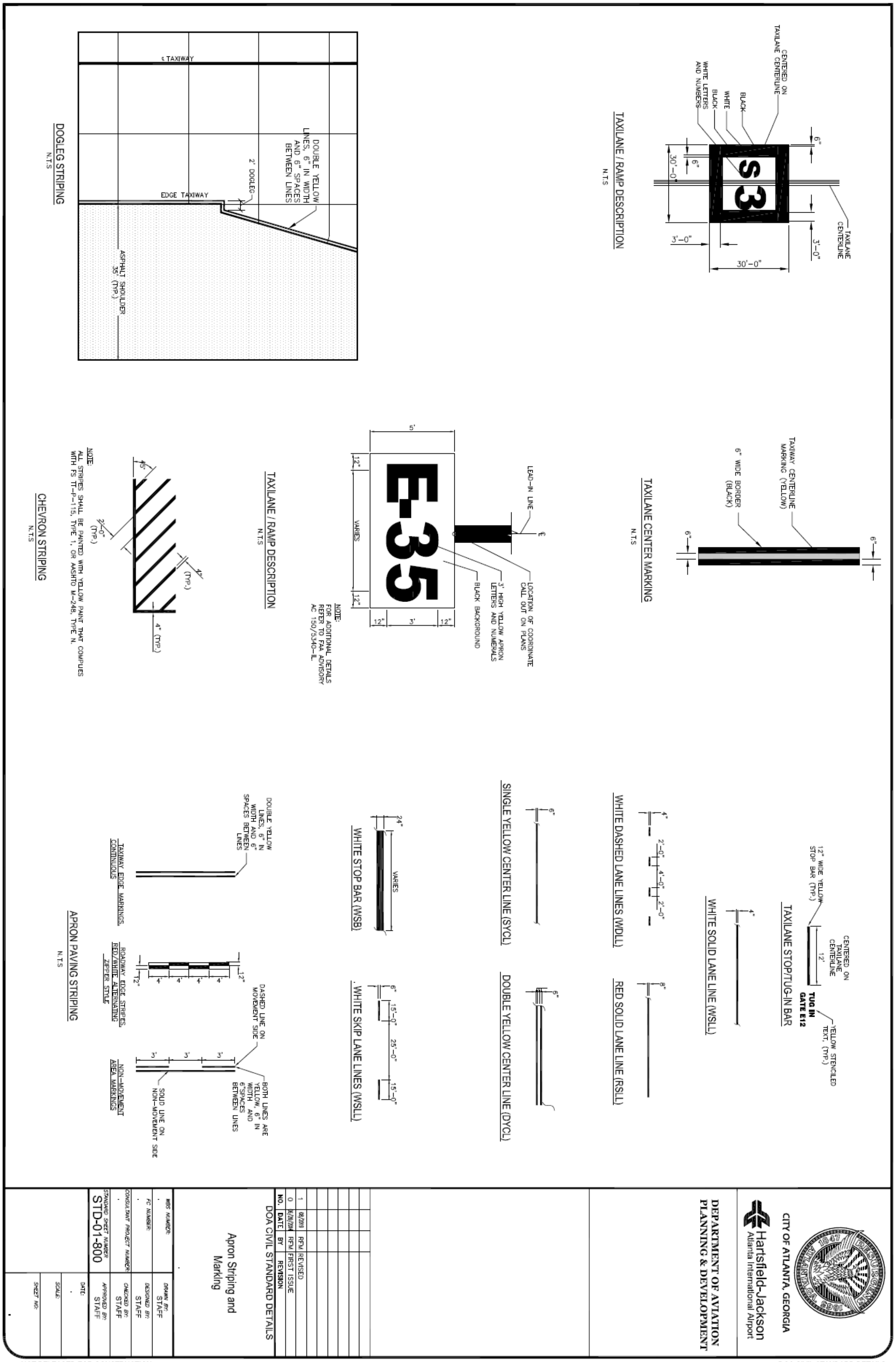
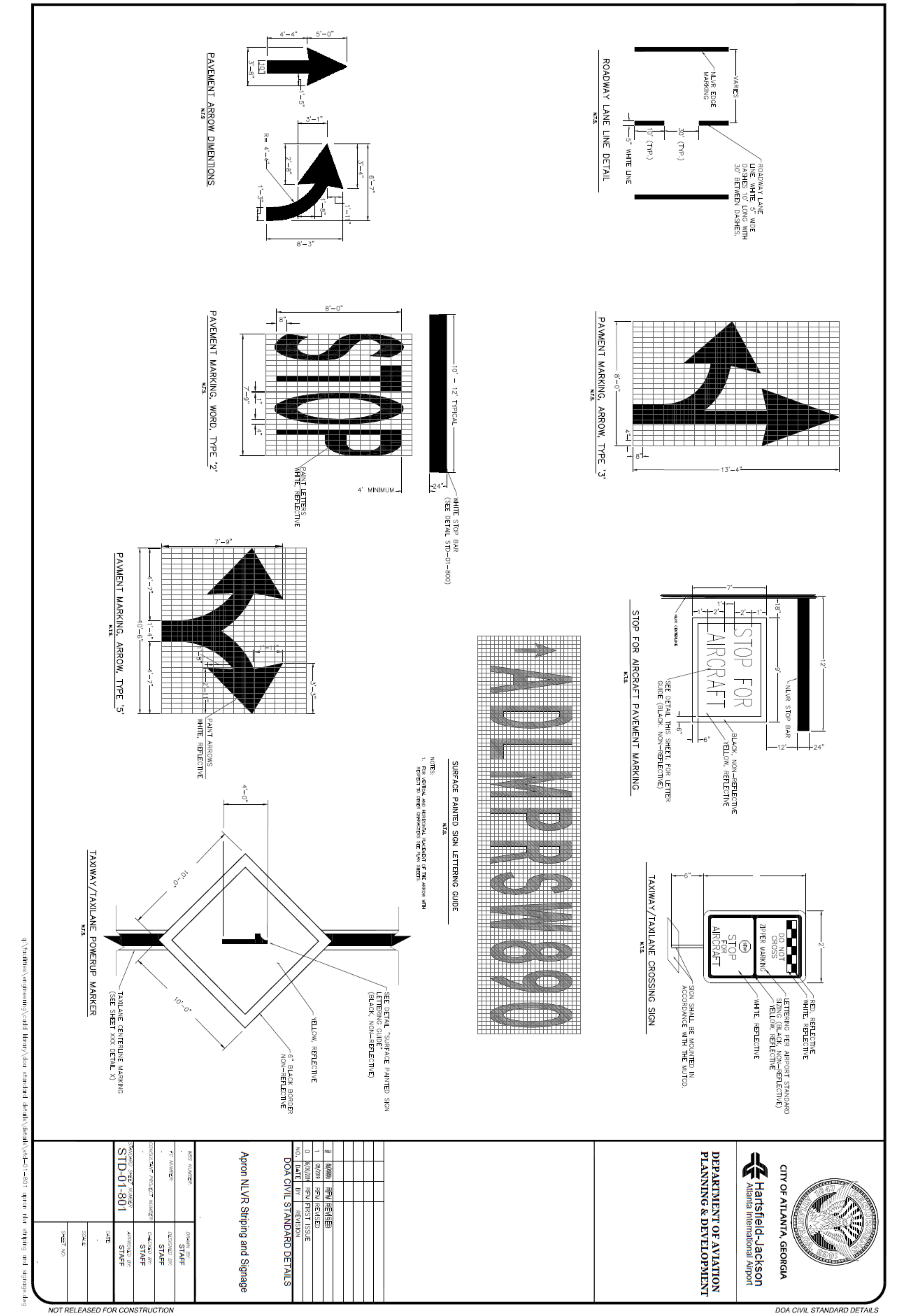
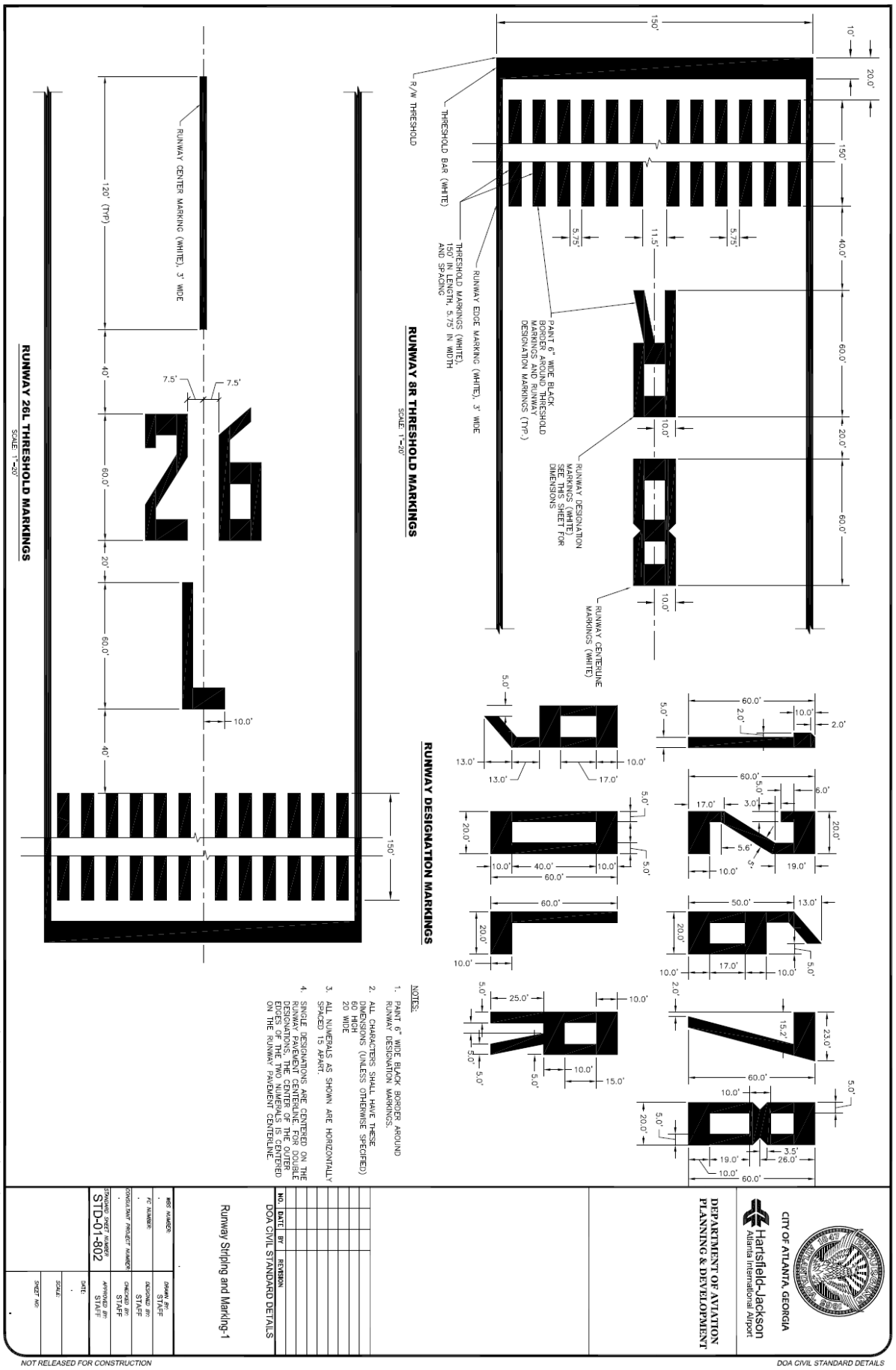
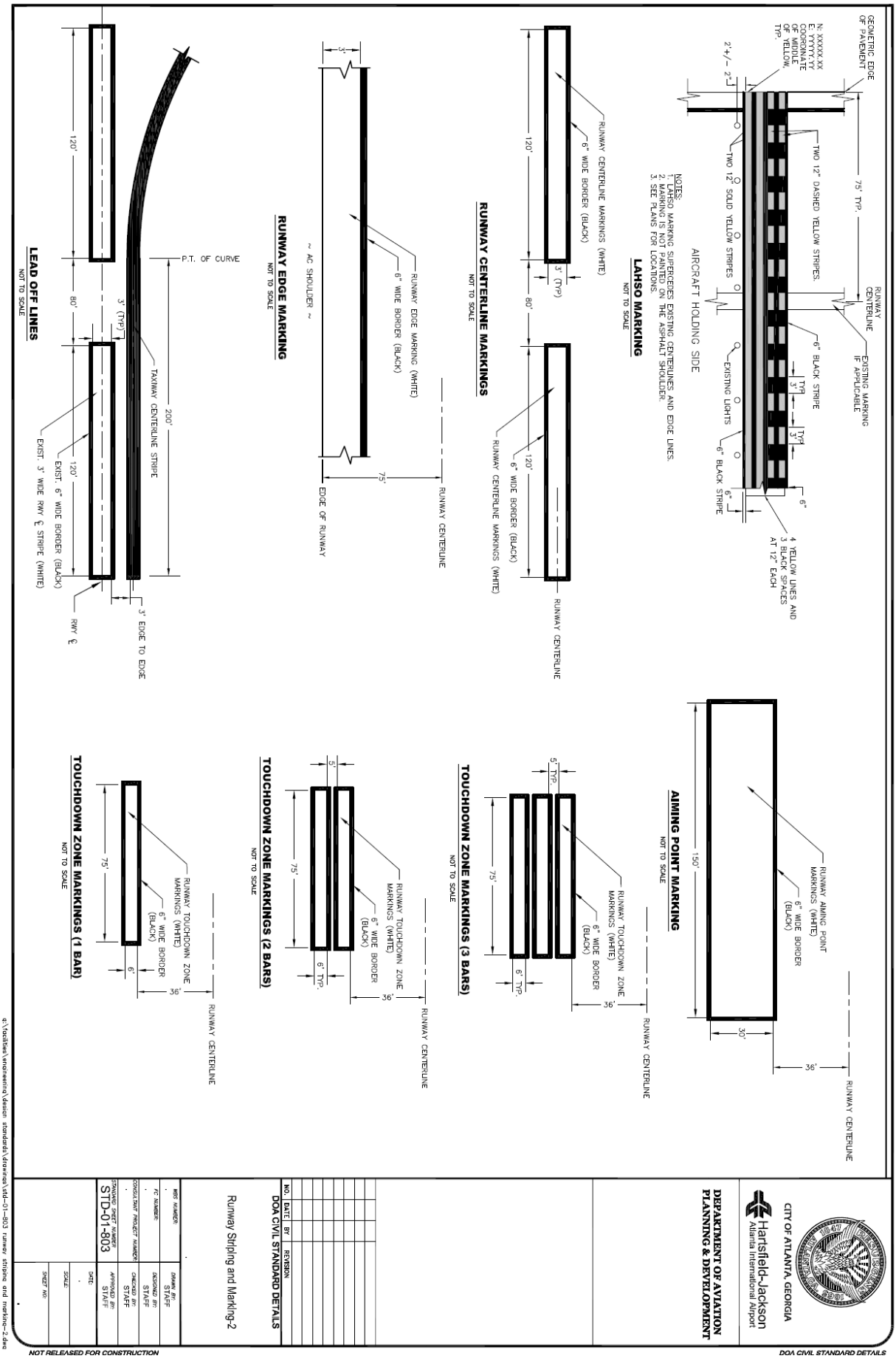
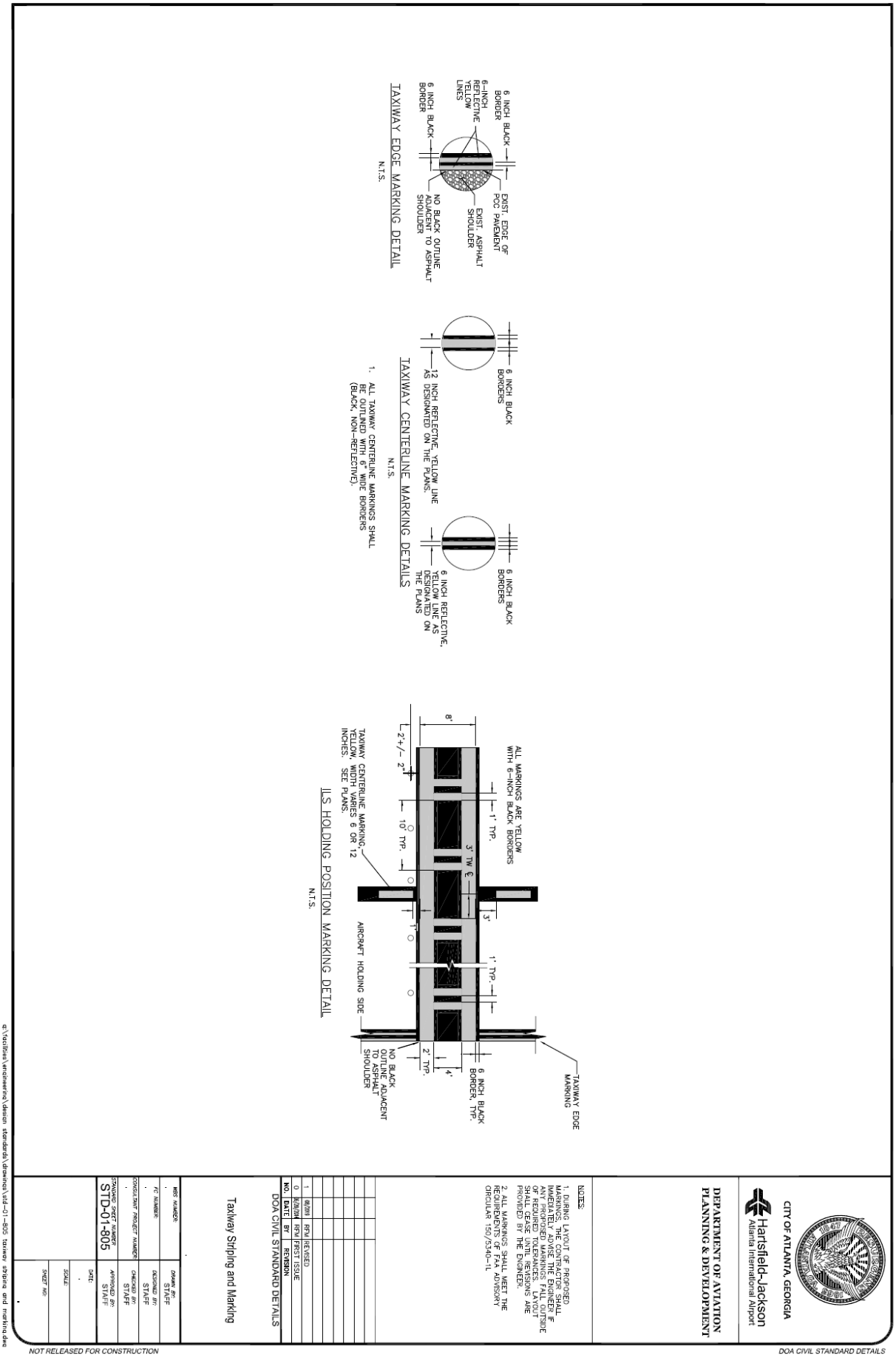

TAXILANE / RAMP DESCRIPTION
N.T.S
TAXILANE CENTER MARKING
N.T.S
TAXILANE / RAMP DESCRIPTION
N.T.S
DOGLEG STRIPING
N.T.S
CHEVRON STRIPING
N.T.S
APRON PAVING STRIPING
N.T.S
TAXILANE STOP/TUG-IN BAR
WHITE SOLID LANE LINE (WSLL)
RED SOLID LANE LINE (RSLL)
WHITE DASHED LANE LINES (WDLL)
SINGLE YELLOW CENTER LINE (SYCL)
DOUBLE YELLOW CENTER LINE (DYCL)
WHITE STOP BAR (WSB)
WHITE SKIP LANE LINES (WSLL)
TAXIWAY EDGE MARKINGS CONTINUOUS
ROADWAY EDGE STRIPES RED/WHITE ALTERNATING ZIPPER STYLE
NON-MOVEMENT AREA MARKINGS
NOTE: ALL STRIPES SHALL BE PAINTED WITH YELLOW PAINT THAT COMPLIES WITH FS TT-P-1152, TYPE 1, OR AASHTO M-248, TYPE N.
NOTE: FOR ADDITIONAL DETAILS REFER TO FAA ADVISORY AC 150/5340-1L
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Apron Striping and Marking
STD-01-800
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


ROADWAY LANE LINE DETAIL
PAVEMENT ARROW DIMENTIONS
PAVEMENT MARKING, ARROW, TYPE '3'
PAVEMENT MARKING, WORD, TYPE '2'
STOP
STOP FOR AIRCRAFT PAVEMENT MARKING
STOP FOR AIRCRAFT
PAVEMENT MARKING, ARROW, TYPE '5'
SURFACE PAINTED SIGN LETTERING GUIDE
TAXIWAY/TAXILANE CROSSING SIGN
TAXIWAY/TAXILANE POWERUP MARKER
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Apron NLVR Striping and Signage
STD-01-801
NOT RELEASED FOR CONSTRUCTION


RUNWAY 26L THRESHOLD MARKINGS
SCALE 1"=20'
RUNWAY CENTER MARKING (WHITE), 3' WIDE
120' (TYP)
40'
60.0'
20'
10.0'
7.5'
RUNWAY 8R THRESHOLD MARKINGS
SCALE 1"=20'
R/W THRESHOLD
THRESHOLD BAR (WHITE)
THRESHOLD MARKINGS (WHITE), 150' IN LENGTH, 5.75' IN WIDTH AND SPACING
RUNWAY EDGE MARKING (WHITE), 3' WIDE
PAINT 6" WIDE BLACK BORDER AROUND THRESHOLD MARKINGS AND RUNWAY DESIGNATION MARKINGS (TYP.)
RUNWAY DESIGNATION MARKINGS (WHITE) SEE SHEET FOR DIMENSIONS
RUNWAY CENTERLINE MARKINGS (WHITE)
RUNWAY DESIGNATION MARKINGS
NOTES:
1. PAINT 6" WIDE BLACK BORDER AROUND RUNWAY DESIGNATION MARKINGS.
2. ALL CHARACTERS SHALL HAVE THESE DIMENSIONS (UNLESS OTHERWISE SPECIFIED)
60' HIGH
20' WIDE
3. ALL NUMERALS AS SHOWN ARE HORIZONTALLY SPACED 13' APART.
4. SINGLE DESIGNATIONS ARE CENTERED ON THE RUNWAY PAVEMENT CENTERLINE FOR DOUBLE DESIGNATIONS, THE CENTER OF THE GAP BETWEEN THE NUMERALS IS CENTERED ON THE RUNWAY PAVEMENT CENTERLINE
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Runway Striping and Marking-1
STANDARD SHEET NUMBER
STD-01-802
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


LAHSO MARKING
NOT TO SCALE
AIRCRAFT HOLDING SIDE
RUNWAY CENTERLINE MARKINGS
NOT TO SCALE
RUNWAY EDGE MARKING
NOT TO SCALE
LEAD OFF LINES
NOT TO SCALE
AIMING POINT MARKING
NOT TO SCALE
TOUCHDOWN ZONE MARKINGS (3 BARS)
NOT TO SCALE
TOUCHDOWN ZONE MARKINGS (2 BARS)
NOT TO SCALE
TOUCHDOWN ZONE MARKINGS (1 BAR)
NOT TO SCALE
RUNWAY CENTERLINE
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DOA CIVIL STANDARD DETAILS
Runway Striping and Marking-2
STD-01-803
NOT RELEASED FOR CONSTRUCTION



NOTES:

1. DURING LAYOUT OF PROPOSED MARKINGS, THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER IF ANY PROPOSED MARKINGS FALL OUTSIDE OF REQUIRED TOLERANCES. FALLOUT SHALL CEASE UNTIL REVISIONS ARE PROVIDED BY THE ENGINEER.
2. ALL MARKINGS SHALL MEET THE REQUIREMENTS OF FAA ADVISORY CIRCULAR 150/5340-1L

CITY OF ATLANTA, GEORGIA
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PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
1	06/2025	RFW	REVISED
0	06/2024	RFW	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Taxiway Striping and Marking

ARE NUMBER: -	DRAWN BY: STAFF
P.C. NUMBER: -	DESIGNED BY: STAFF
COVQ/ALT PROJECT NUMBER: -	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-01-805	APPROVED BY: STAFF
	DATE: -
	SCALE: -
	SHEET NO: -

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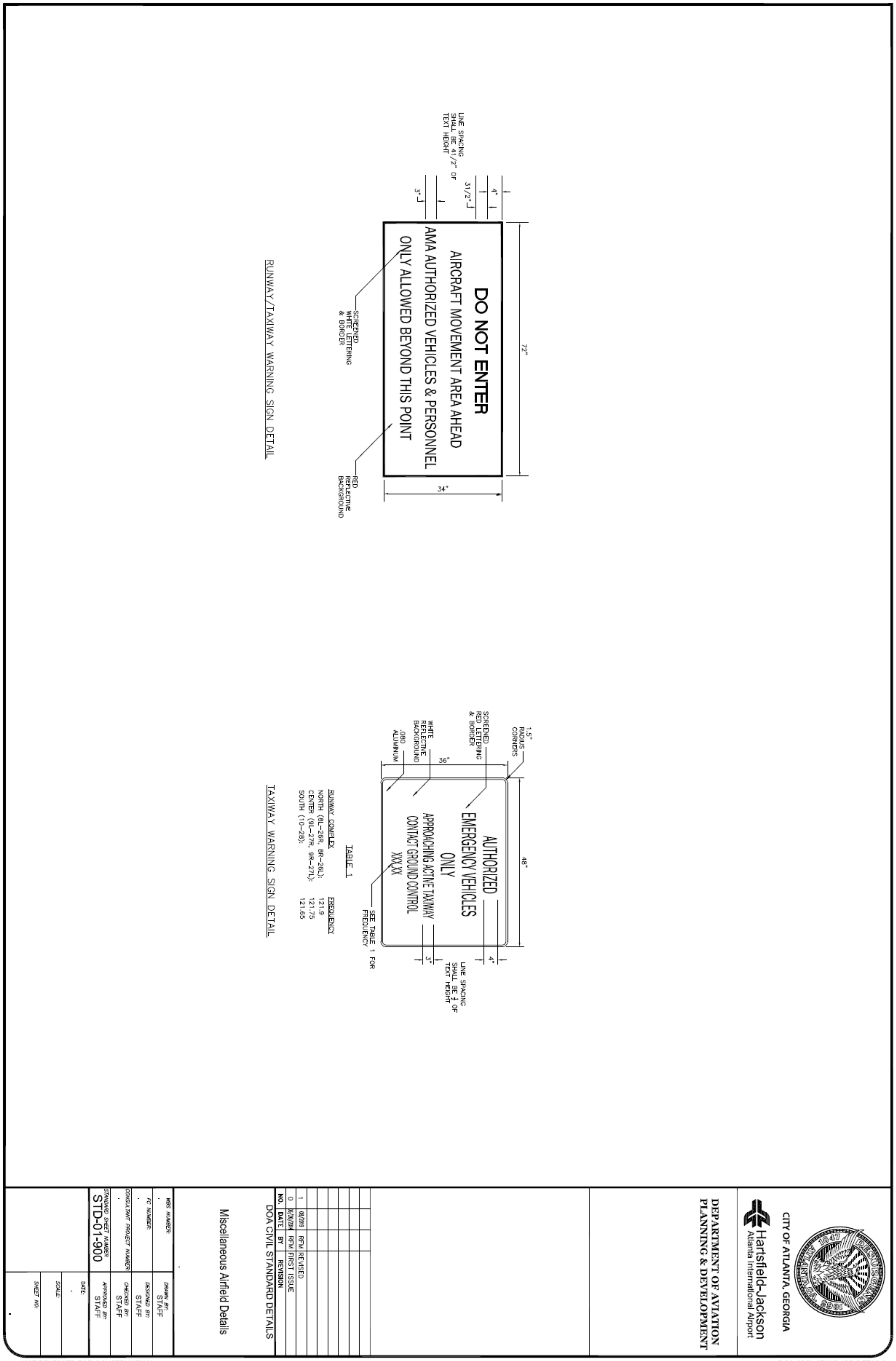
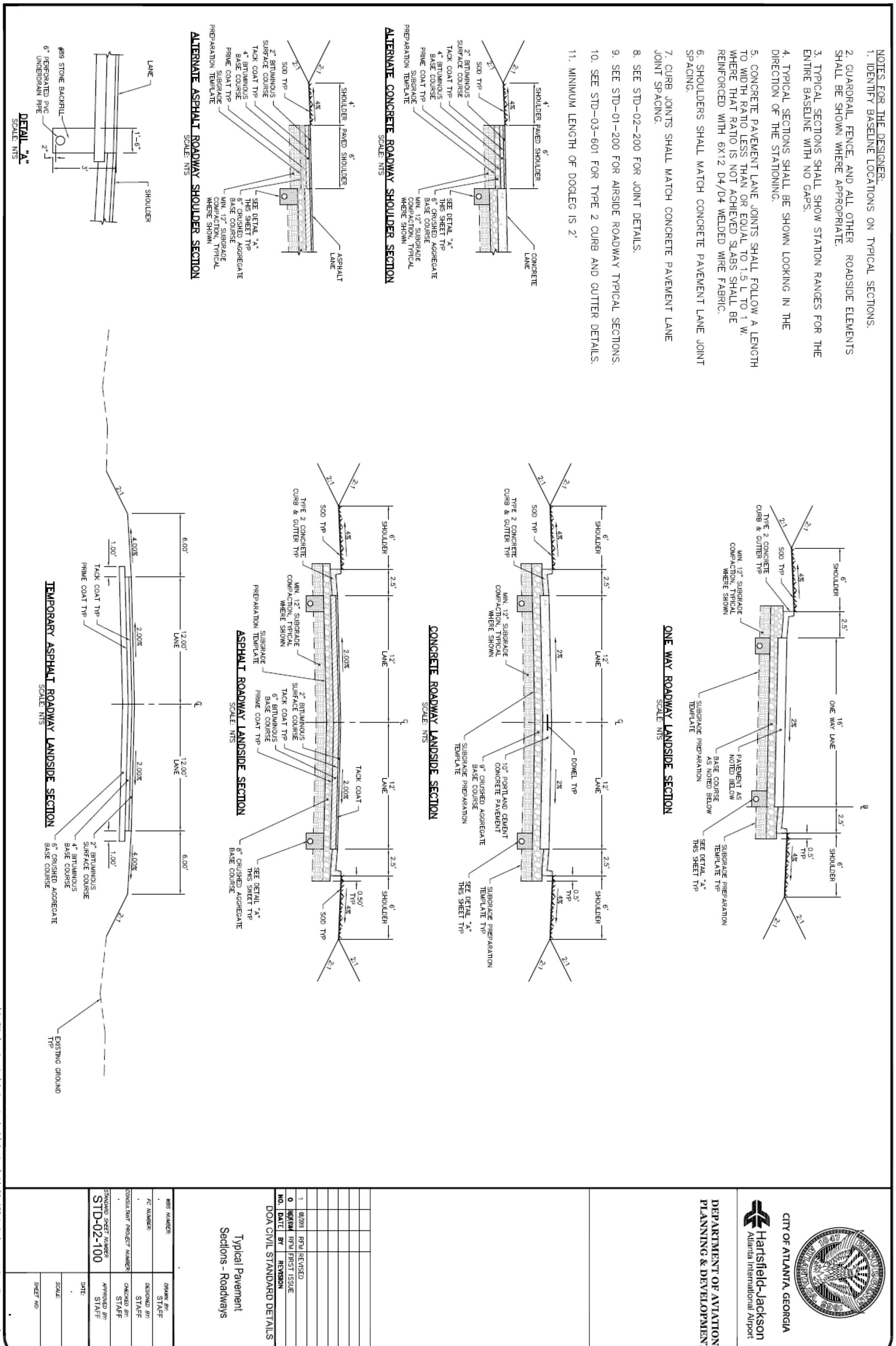
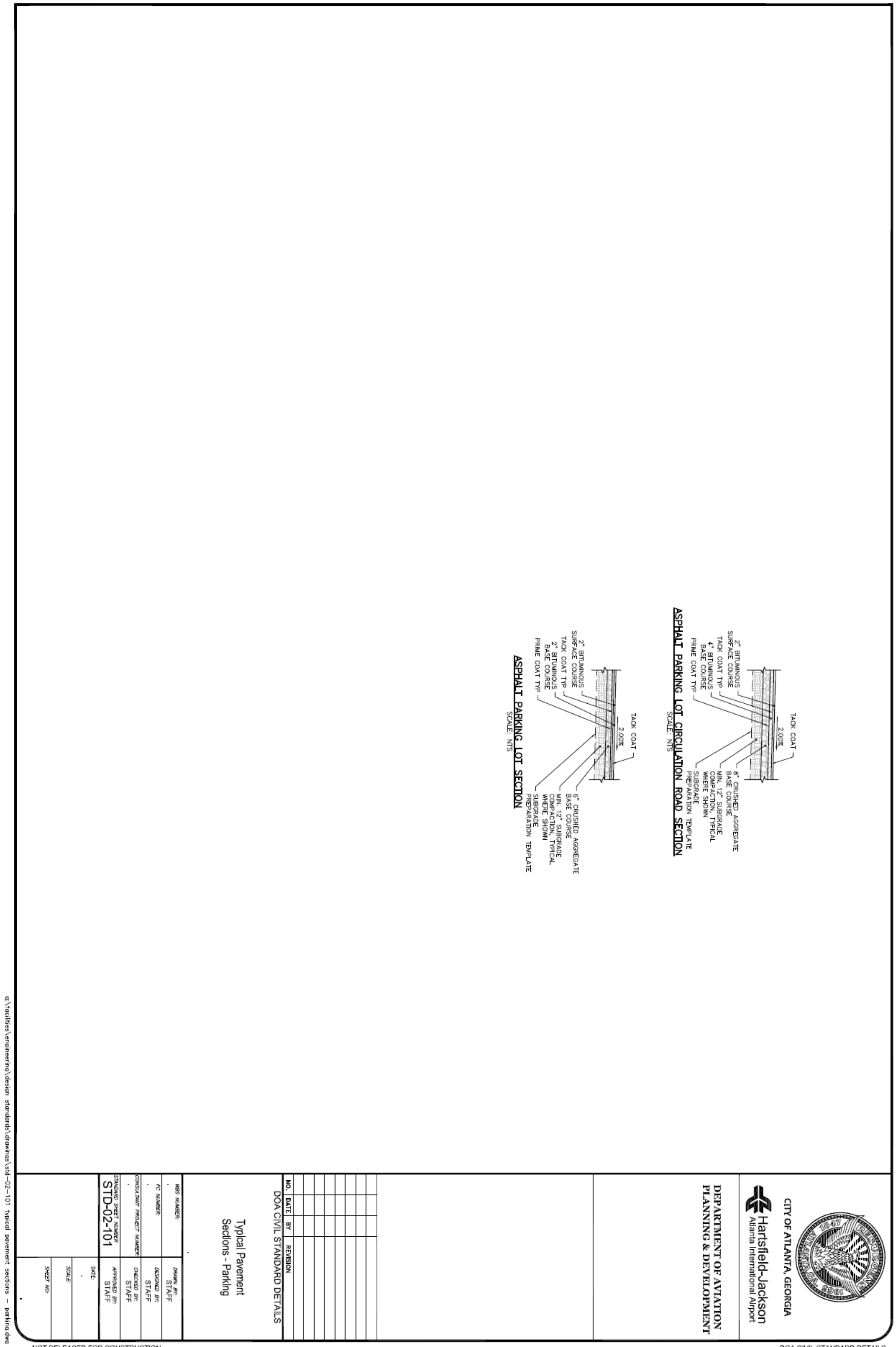
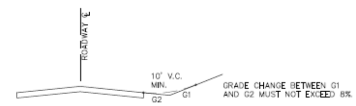
NOT RELEASED FOR CONSTRUCTION

DOA CIVIL STANDARD DETAILS

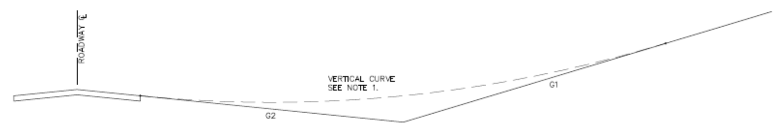

DO NOT ENTER
AIRCRAFT MOVEMENT AREA AHEAD
AMA AUTHORIZED VEHICLES & PERSONNEL
ONLY ALLOWED BEYOND THIS POINT
72"
34"
4"
3 1/2"
3"
LINE SPACING SHALL BE 4 1/2" OF TEXT HEIGHT
SCREENED WHITE LETTERING & BORDER
RED REFLECTIVE BACKGROUND
RUNWAY/TAXIWAY WARNING SIGN DETAIL
AUTHORIZED
EMERGENCY VEHICLES
ONLY
APPROACHING ACTIVE TAXIWAY
CONTACT GROUND CONTROL
XXX.XX
48"
36"
1.5" RADIUS CORNERS
SCREENED RED LETTERING & BORDER
WHITE REFLECTIVE BACKGROUND
.080 ALUMINUM
SEE TABLE 1 FOR FREQUENCY
TABLE 1
RUNWAY COMPLEX
FREQUENCY
NORTH (8L-26R, 8R-26L): 121.9
CENTER (9L-27R, 9R-27L): 121.75
SOUTH (10-28): 121.65
TAXIWAY WARNING SIGN DETAIL
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Miscellaneous Airfield Details
STD-01-900
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NO. DATE BY REVISION
0 RFM FIRST ISSUE
1 RFM REVISED
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


NOTES FOR THE DESIGNER:
1. IDENTIFY BASELINE LOCATIONS ON TYPICAL SECTIONS.
2. GUARDRAIL, FENCE, AND ALL OTHER ROADSIDE ELEMENTS SHALL BE SHOWN WHERE APPROPRIATE.
3. TYPICAL SECTIONS SHALL SHOW STATION RANGES FOR THE ENTIRE BASELINE WITH NO GAPS.
4. TYPICAL SECTIONS SHALL BE SHOWN LOOKING IN THE DIRECTION OF THE STATIONING.
5. CONCRETE PAVEMENT LANE JOINTS SHALL FOLLOW A LENGTH TO WIDTH RATIO LESS THAN OR EQUAL TO 1.5 L TO 1 W. WHERE THAT RATIO IS NOT ACHIEVED SLABS SHALL BE REINFORCED WITH 6X12 D4/D4 WELDED WIRE FABRIC.
6. SHOULDERS SHALL MATCH CONCRETE PAVEMENT LANE JOINT SPACING.
7. CURB JOINTS SHALL MATCH CONCRETE PAVEMENT LANE JOINT SPACING.
8. SEE STD-02-200 FOR JOINT DETAILS.
9. SEE STD-01-200 FOR AIRSIDE ROADWAY TYPICAL SECTIONS.
10. SEE STD-03-601 FOR TYPE 2 CURB AND GUTTER DETAILS.
11. MINIMUM LENGTH OF DOGLEG IS 2'
ALTERNATE CONCRETE ROADWAY SHOULDER SECTION
SCALE: NTS
ALTERNATE ASPHALT ROADWAY SHOULDER SECTION
SCALE: NTS
DETAIL "A"
SCALE: NTS
ONE WAY ROADWAY LANDSIDE SECTION
SCALE: NTS
CONCRETE ROADWAY LANDSIDE SECTION
SCALE: NTS
ASPHALT ROADWAY LANDSIDE SECTION
SCALE: NTS
TEMPORARY ASPHALT ROADWAY LANDSIDE SECTION
SCALE: NTS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
1 08/2019 RFM REVISED
0 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Typical Pavement Sections - Roadways
STANDARD SHEET NUMBER STD-02-100
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
q:\facilities\engineering\design standards\drawings\std-02-100 typical pavement sections - roadways.dwg
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


TACK COAT
2.00%
2" BITUMINOUS SURFACE COURSE
TACK COAT TYP
4" BITUMINOUS BASE COURSE
PRIME COAT TYP
8" CRUSHED AGGREGATE BASE COURSE
MIN. 12" SUBGRADE COMPACTION, TYPICAL WHERE SHOWN
SUBGRADE PREPARATION TEMPLATE
ASPHALT PARKING LOT CIRCULATION ROAD SECTION
SCALE: NTS
TACK COAT
2.00%
2" BITUMINOUS SURFACE COURSE
TACK COAT TYP
2" BITUMINOUS BASE COURSE
PRIME COAT TYP
6" CRUSHED AGGREGATE BASE COURSE
MIN. 12" SUBGRADE COMPACTION, TYPICAL WHERE SHOWN
SUBGRADE PREPARATION TEMPLATE
ASPHALT PARKING LOT SECTION
SCALE: NTS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO.
DATE
BY
REVISION
DOA CIVIL STANDARD DETAILS
Typical Pavement
Sections - Parking
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-02-101
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
q:\facilities\engineering\design standards\drawings\std-02-101 typical pavement sections - parking.dwg
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS



DRIVEWAY INTERSECTING ROADWAY



SIDE STREET INTERSECTING ROADWAY

NOTES:

1. VERTICAL CURVES AT CHANGES IN GRADE ARE ALWAYS PREFERRED. THE DESIGN FOR THESE CURVES SHOULD CONFORM TO AASHTO'S *A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS*. HOWEVER, IF A VERTICAL CURVE IS NOT PRACTICAL, A GRADE BREAK MAY BE USED IN ACCORDANCE WITH THE TABLE BELOW. FOR A GIVEN DESIGN SPEED, THIS TABLE LISTS THE MAXIMUM CHANGE IN GRADE THAT DOES NOT REQUIRE A VERTICAL CURVE.

	Maximum Change in Grade that Does Not Require a Vertical Curve										
	Design Speed (mph)										
	20	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**
Maximum Change in Grade (%)	1.2	1.1	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.2

CITY OF ATLANTA, GEORGIA
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DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
0	08/25/2020	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Grade Break Standard

WBS NUMBER: -
FC NUMBER: -
CONSULTANT PROJECT NUMBER: -
STANDARD SHEET NUMBER: STD-02-105

DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE: -
SCALE:
SHEET NO: -

DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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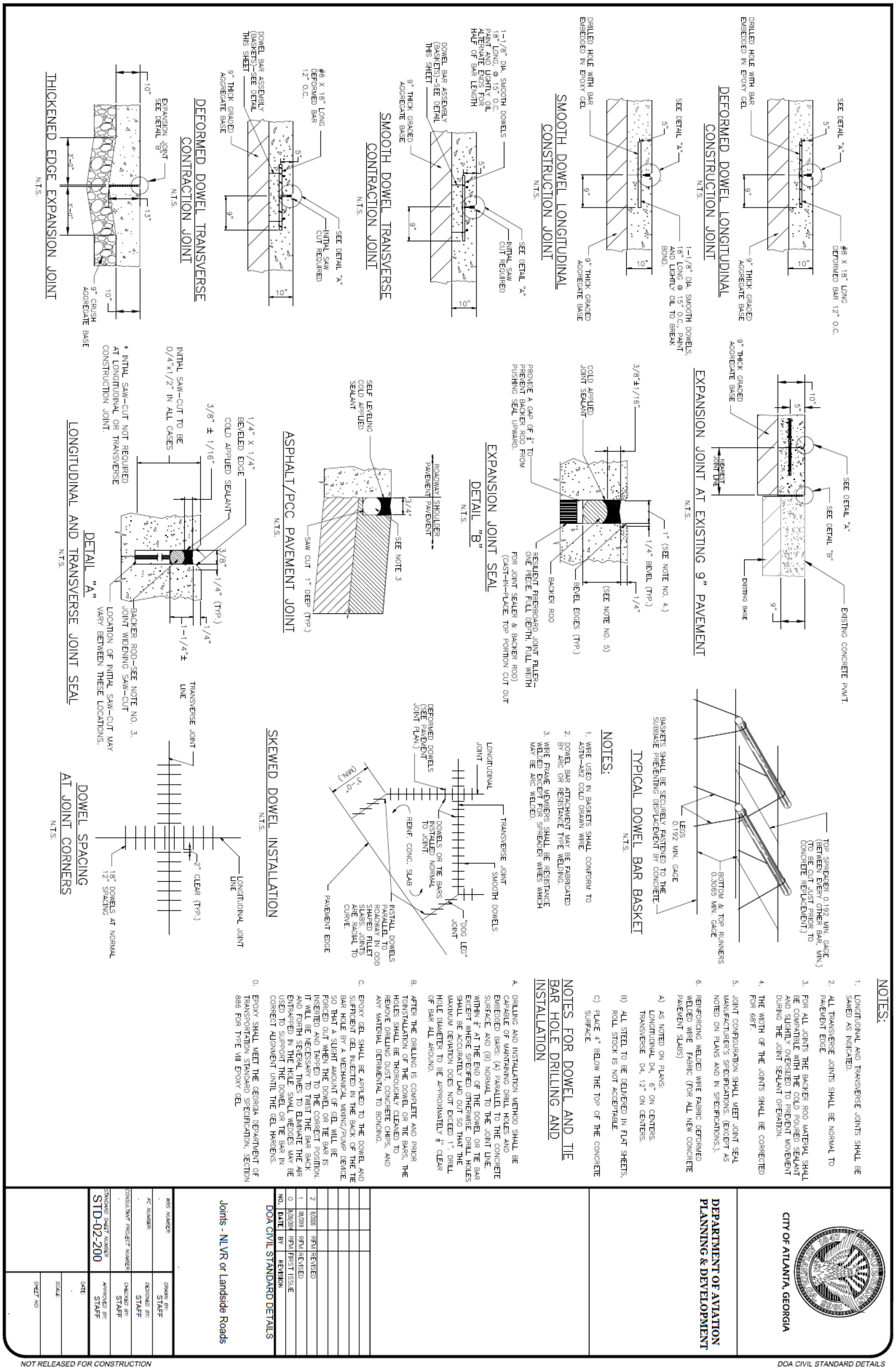
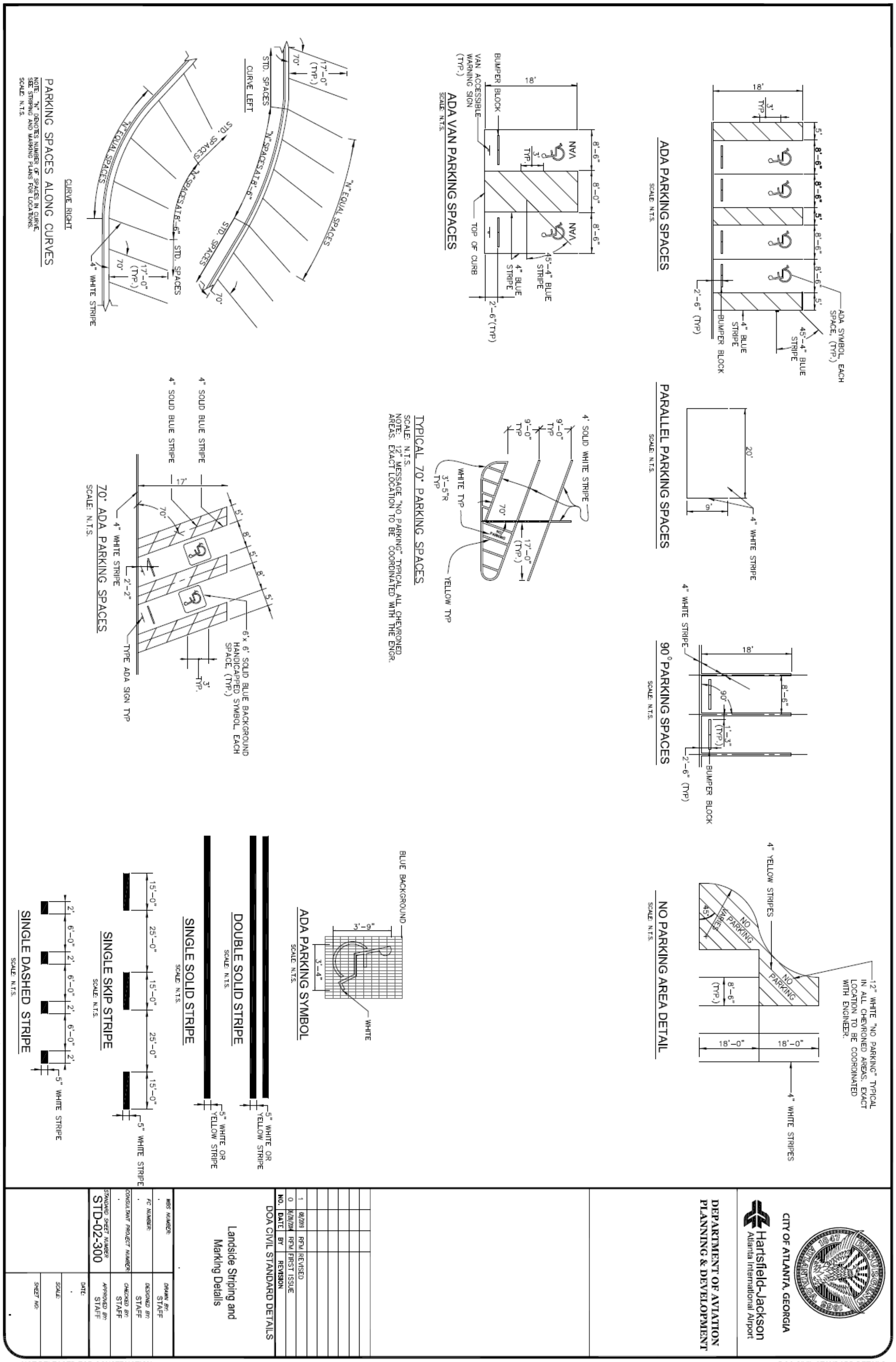
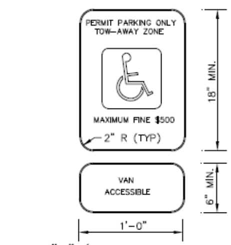

DEFORMED DOWEL LONGITUDINAL CONSTRUCTION JOINT
N.T.S.
SMOOTH DOWEL LONGITUDINAL CONSTRUCTION JOINT
N.T.S.
SMOOTH DOWEL TRANSVERSE CONTRACTION JOINT
N.T.S.
DEFORMED DOWEL TRANSVERSE CONTRACTION JOINT
N.T.S.
THICKENED EDGE EXPANSION JOINT
N.T.S.
EXPANSION JOINT AT EXISTING 9" PAVEMENT
N.T.S.
EXPANSION JOINT SEAL DETAIL "B"
N.T.S.
ASPHALT/PCC PAVEMENT JOINT
N.T.S.
DETAIL "A" LONGITUDINAL AND TRANSVERSE JOINT SEAL
N.T.S.
TYPICAL DOWEL BAR BASKET
N.T.S.
BASKETS SHALL BE SECURELY FASTENED TO THE SUBBASE PREVENTING DISPLACEMENT BY CONCRETE.
NOTES:
1. WIRE USED IN BASKETS SHALL CONFORM TO ASTM-A82 COLD DRAWN WIRE.
2. DOWEL BAR ATTACHMENT MAY BE FABRICATED BY ARC OR RESISTANCE TYPE WELDING.
3. WIRE FRAME MEMBERS SHALL BE RESISTANCE WELDED EXCEPT FOR SPREADER WIRES WHICH MAY BE ARC WELDED.
SKEWED DOWEL INSTALLATION
N.T.S.
DOWEL SPACING AT JOINT CORNERS
N.T.S.
NOTES:
1. LONGITUDINAL AND TRANSVERSE JOINTS SHALL BE SAWED AS INDICATED.
2. ALL TRANSVERSE JOINTS SHALL BE NORMAL TO PAVEMENT EDGE.
3. FOR ALL JOINTS THE BACKER ROD MATERIAL SHALL BE COMPATIBLE WITH THE COLD POURED SEALANT AND SLIGHTLY OVERSIZED TO PREVENT MOVEMENT DURING THE JOINT SEALANT OPERATION.
4. THE WIDTH OF THE JOINTS SHALL BE CORRECTED FOR 68°F.
5. JOINT CONFIGURATION SHALL MEET JOINT SEAL MANUFACTURER'S SPECIFICATIONS. (EXCEPT AS NOTED ON PLANS AND IN SPECIFICATIONS.).
6. REINFORCING WELDED WIRE FABRIC DEFORMED WELDED WIRE FABRIC (FOR ALL NEW CONCRETE PAVEMENT SLABS)
A) AS NOTED ON PLANS: LONGITUDINAL D4, 6" ON CENTERS. TRANSVERSE D4, 12" ON CENTERS.
B) ALL STEEL TO BE DELIVERED IN FLAT SHEETS, ROLL STOCK IS NOT ACCEPTABLE.
C) PLACE 4" BELOW THE TOP OF THE CONCRETE SURFACE.
NOTES FOR DOWEL AND TIE BAR HOLE DRILLING AND INSTALLATION
A. DRILLING AND INSTALLATION METHOD SHALL BE CAPABLE OF MAINTAINING DRILL HOLES AND EMBEDDED BARS: (A) PARALLEL TO THE CONCRETE SURFACE, AND (B) NORMAL TO THE JOINT LINE, WITHIN ⅛" AT THE END OF THE DOWEL OR TIE BAR EXCEPT WHERE SPECIFIED OTHERWISE. DRILL HOLES SHALL BE ACCURATELY LAID OUT SO THAT THE MAXIMUM DEVIATION DOES NOT EXCEED 1". DRILL HOLE DIAMETER TO BE APPROXIMATELY ⅛" CLEAR OF BAR ALL AROUND.
B. AFTER THE DRILLING IS COMPLETE AND PRIOR TOINSTALLATION OF THE DOWEL OR TIE BARS, THE HOLES SHALL BE THOROUGHLY CLEANED TO REMOVE DRILLING DUST, CONCRETE CHIPS, AND ANY MATERIAL DETRIMENTAL TO BONDING.
C. EPOXY GEL SHALL BE APPLIED TO THE DOWEL AND SUFFICIENT GEL INJECTED IN THE BACK OF THE TIE BAR HOLE BY A MECHANICAL MIXING/PUMP DEVICE, SO THAT A SLIGHT AMOUNT OF GEL WILL BE FORCED OUT WHEN THE DOWEL OR TIE BAR IS INSERTED AND TAPPED TO THE CORRECT POSITION. IT WILL BE NECESSARY TO TWIST THE BAR BACK AND FORTH SEVERAL TIMES TO ELIMINATE THE AIR ENTRAPPED IN THE HOLE. SMALL WEDGES MAY BE USED TO SUPPORT THE DOWEL OR TIE BAR IN CORRECT ALIGNMENT UNTIL THE GEL HARDENS.
D. EPOXY SHALL MEET THE GEORGIA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATION, SECTION 886 FOR TYPE VIII EPOXY GEL.
CITY OF ATLANTA, GEORGIA
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
2 8/2020 RFM REVISED
1 08/2019 RFM REVISED
0 06/20/2016 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Joints - NLVR or Landside Roads
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
STANDARD SHEET NUMBER STD-02-200
DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
q:\facilities\engineering\j rone\std-02-200 joints - nlvr or landside roads.dwg


ADA PARKING SPACES
SCALE: N.T.S.
ADA VAN PARKING SPACES
SCALE: N.T.S.
PARKING SPACES ALONG CURVES
NOTE: "N" DENOTES NUMBER OF SPACES IN CURVE. SEE STRIPING AND MARKING PLANS FOR LOCATIONS.
SCALE: N.T.S.
CURVE LEFT
CURVE RIGHT
PARALLEL PARKING SPACES
SCALE: N.T.S.
TYPICAL 70° PARKING SPACES
SCALE: N.T.S.
NOTE: 12" MESSAGE "NO PARKING" TYPICAL ALL CHEVRONED AREAS. EXACT LOCATION TO BE COORDINATED WITH THE ENGR.
70° ADA PARKING SPACES
SCALE: N.T.S.
90° PARKING SPACES
SCALE: N.T.S.
NO PARKING AREA DETAIL
SCALE: N.T.S.
ADA PARKING SYMBOL
SCALE: N.T.S.
DOUBLE SOLID STRIPE
SCALE: N.T.S.
SINGLE SOLID STRIPE
SCALE: N.T.S.
SINGLE SKIP STRIPE
SCALE: N.T.S.
SINGLE DASHED STRIPE
SCALE: N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Landside Striping and Marking Details
STD-02-300
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
1 RFM REVISED
0 RFM FIRST ISSUE
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS



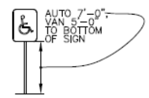
TYPE "A" (ADA WARNING SIGN)
N.T.S.

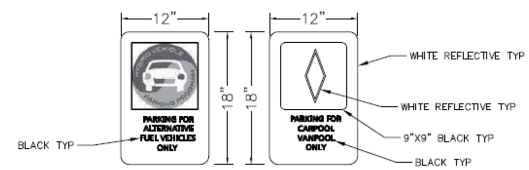
1. SIGNAGE. ACCESSIBLE PARKING SPACES SHALL BE DESIGNATED AS RESERVED BY A SIGN COMPLYING WITH AMERICAN DISABILITY ACT (ADA) RULE 120-3-20.41(7) AND THE FOLLOWING:

   O.C.G.A. 40-6-221
   PROVIDE A BLUE METAL REFLECTIVE SIGN WHICH IS AT LEAST 12" INCHES IN WIDTH AND 18" INCHES IN LENGTH AND IS ERECTED AT 60" FROM GROUND TO BOTTOM OF THE SIGN IN SUCH A MANNER THAT IT WILL NOT BE OBSCURED BY A VECHICLE PARKED IN THE SPACE AND BEARING THE INTERNATIONAL SYMBOL FOR ACCESSIBILITY. THE WARNING REQUIRED IN THIS SUBPARAGRAPH SHALL BE CENTERED ON THE SIGN, PRINTED IN WHITE, AND SHALL OCCUPY NOT LESS THAN 75% OF THE SIGN.

   SPACES COMPLYING WITH ADA RULE 120-3-20-07(E)(2) SHALL HAVE AN ADDITIONAL SIGN STATING "VAN-ACCESSIBLE" MOUNTED BELOW THE SYMBOL OF ACCESSIBILITY.

2. SIGN POSTS SHALL BE GALVANIZED STEEL POSTS, TYPE 7.





CARPOOL AND ALTERNATIVE FUEL VEHICLE SIGNS
NTS

NOTE: TEXT BELOW EACH SYMBOL IS FRUTIGER 65 BOLD.

CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
1	08/2019	RFM	REVISED
0	6/28/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Landside Signage

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-400	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION

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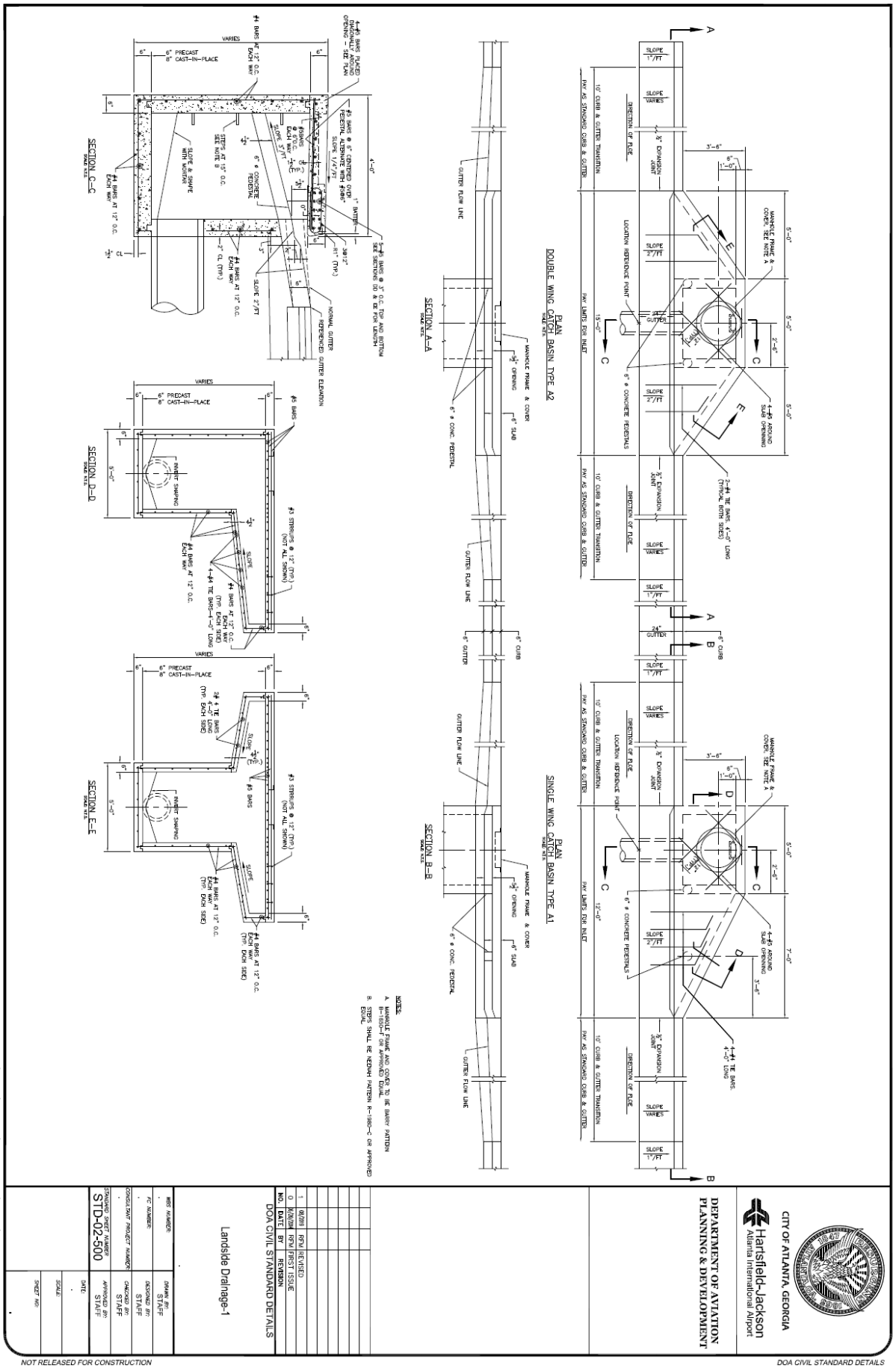
PLAN
DOUBLE WING CATCH BASIN TYPE A2
PLAN
SINGLE WING CATCH BASIN TYPE A1
SECTION A–A
SECTION B–B
SECTION C–C
SECTION D–D
SECTION E–E
NOTES:
A. MANHOLE FRAME AND COVER TO BE BARRY PATTERN M-1960-F OR APPROVED EQUAL
B. STEPS SHALL BE NEENAH PATTERN R-1980-C OR APPROVED EQUAL
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Landside Drainage-1
STD-02-500
NOT RELEASED FOR CONSTRUCTION
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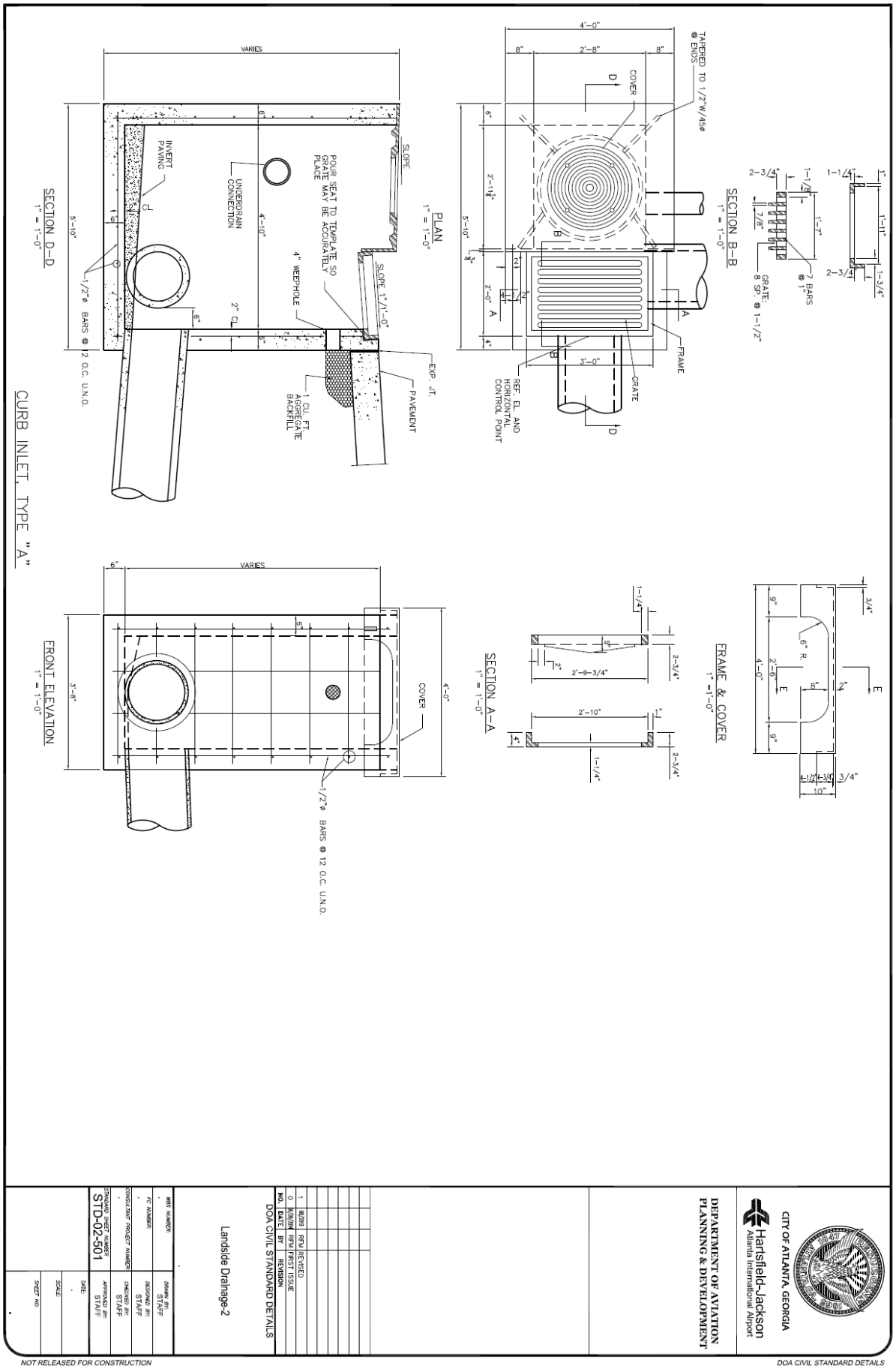
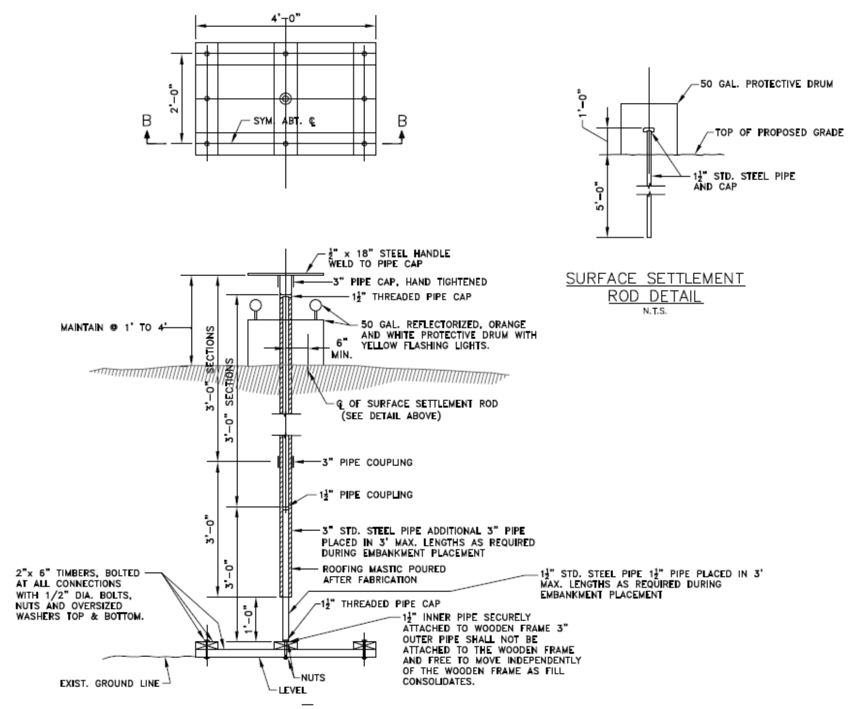

CURB INLET, TYPE "A"
SECTION D–D
PLAN
SECTION B–B
FRONT ELEVATION
SECTION A–A
FRAME & COVER
VARIES
INVERT PAVING
UNDERDRAIN CONNECTION
POUR SEAT TO TEMPLATE SO GRATE MAY BE ACCURATELY PLACE
SLOPE
4" WEEPHOLE
SLOPE 1"/1'-0"
EXP. JT.
PAVEMENT
1 CU. FT. AGGREGATE BACKFILL
1/2"ø BARS @ 12 O.C. U.N.O.
TAPERED TO 1/2" W/45ø ENDS
COVER
FRAME
GRATE
REF. EL. AND HORIZONTAL CONTROL POINT
GRATE: 8 SP. @ 1-1/2"
7 BARS @ 1"
NOT RELEASED FOR CONSTRUCTION
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Landside Drainage-2
STD-02-501
STAFF
DOA CIVIL STANDARD DETAILS



SURFACE SETTLEMENT ROD DETAIL
N.T.S.

SECTION B–B
SURFACE SETTLEMENT PLATFORM DETAIL
N.T.S.

SETTLEMENT PLATFORM AND ROD NOTES:

1. THIS CONSTRUCTION CONTROL DEVICE WILL BE USED AT LOCATIONS DIRECTED BY ENGINEER. INSTALLATION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND AS APPROVED BY THE ENGINEER.

2. CONTRACTOR SHALL TAKE APPROPRIATE PRECAUTIONS TO PROTECT SETTLEMENT PLATE INSTALLATION FROM DAMAGE.

3. ADDITIONAL CONTROL DEVICES (PLATFORMS AND SURFACE RODS) MAY BE INSTALLED AT LOCATIONS DETERMINED BY THE ENGINEER.

4. COORDINATE LOCATION OF CONTROL DEVICES WITH EXISTING AND PROPOSED UTILITIES AND DRAINAGE.

5. AT SUCH TIME AS SETTLEMENT PLATFORM PIPES ARE REQUIRED TO BE EXTENDED, THE INNER PIPE SHALL BE ACCURATELY SURVEYED IMMEDIATELY PRIOR TO REMOVING THE CAP AND AGAIN IMMEDIATELY AFTER EXTENDING THE 3" AND 1½" PIPES AND REPLACING THE CAP ON THE 1½" PIPE.

6. SETTLEMENT PLATFORMS AND RODS SHALL BE SURVEYED WEEKLY

7. CONTRACTOR IS TO COMPACT SOIL ADJACENT TO SETTLEMENT PLATFORMS WITH HAND TAMPS AS REQUIRED.

CITY OF ATLANTA, GEORGIA
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DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

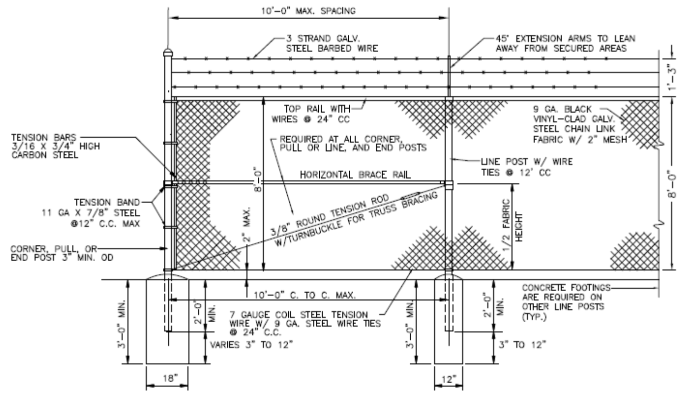
Settlement Platforms

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-100	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

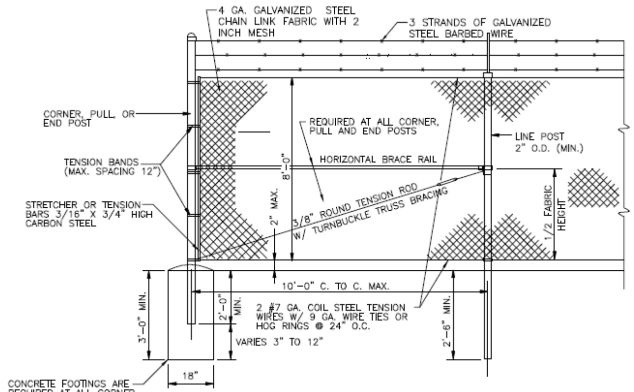
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

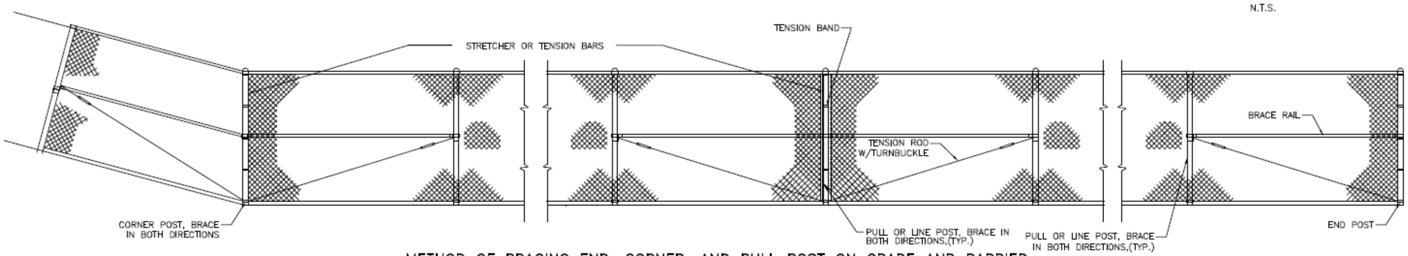
q:\facilities\engineering\design standards\drawings\std-03-100 settlement platforms.dwg



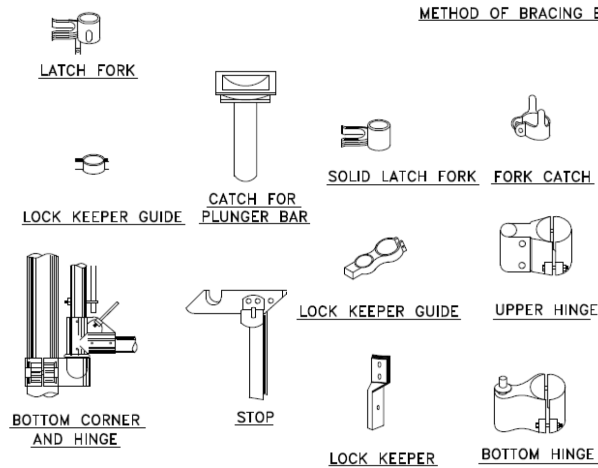
PROPERTY FENCE
N.T.S.



TEMPORARY PROPERTY FENCE
N.T.S.



METHOD OF BRACING END, CORNER, AND PULL POST ON GRADE AND BARRIER
N.T.S.



FENCING NOTES:

1. ALL FENCE FABRIC SHALL BE 9 GAUGE BLACK PVC COATED GALVANIZED CHAIN LINK FABRIC WITH 2" MESH (TEMPORARY FENCE NOT COATED. SEE SPECIFICATIONS AND DETAILS FOR FENCE MATERIALS AND FITTINGS).

2. ALL BARBED WIRE SHALL BE 2 STRAND, 12 ½ GAUGE BLACK PVC COATED GALVANIZED STEEL WITH 4 POINT BARBS AT 4" C.C. (TEMPORARY FENCE BARBED WIRE STRANDS NOT COATED).

3. ALL POSTS AND ACCESSORIES/FITTINGS SHALL BE BLACK PVC COATED GALVANIZED STEEL (TEMPORARY FENCE NOT COATED).

4. HORIZONTAL BRACE RAILS, TRUSS BRACING AND STRETCHER OR TENSION BARS ATTACHED TO POST BY MEANS OF BANDS, SHALL BE USED FOR END, CORNER, ANGLE, AND INTERMEDIATE BRACE POSTS AND WHERE REQUIRED BY THE ENGINEER.

5. FITTINGS SHOWN ARE SUGGESTED ONLY. SIMILAR DESIGNS MEETING THE APPROVAL OF THE ENGINEER MAY BE USED. ALL FITTINGS TO BE MALLEABLE IRON, CAST IRON, OR PRESSED STEEL. CONTRACTOR SHALL SUBMIT AND RECEIVE APPROVAL FOR APPROPRIATE SHOP DRAWINGS.

6. SWING GATE CONSTRUCTION VARIES WITH WIDTH. GATE FRAMES SHALL MEET CHAIN LINK FENCE MANUFACTURER'S INSTITUTE PRODUCT MANUAL INDUSTRIAL STEEL SPECIFICATIONS WITH RESPECT TO HORIZONTAL AND VERTICAL MEMBERS.

7. ALL CHAIN LINK FENCE MATERIALS AND FITTINGS SHALL BE OF HIGH GRADE DOMESTIC QUALITY STEEL AND SHALL BEAR MARKINGS AS BEING SUCH.

8. THE CHAIN LINK FABRIC SHALL BE PLACED ON THE OUTWARD FACE OF THE POSTS, TAUT AND SECURELY FASTENED.

9. MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH F.A.A. STANDARD SPECIFICATIONS AND THE SPECIAL PROVISIONS OF THIS CONTRACT.

10. ALL EXPOSED METALS SUCH AS NUTS AND BOLTS AND WELDED AREAS SHALL BE PAINTED WITH COLOR TO MATCH FENCE SYSTEM.

11. ALL SIZES AND GAUGES FOR PIPE POSTS, ROD AND WIRES ARE OUTSIDE DIAMETERS WHICH INCLUDES THE VINYL COATING THICKNESS.

12. CONTRACTOR SHALL PROVIDE CHAIN AND LOCK TO SECURE GATES.

13. INTERMEDIATE OR LINE POSTS SHALL BE REQUIRED AT 250FT. INTERVALS AND AT GRADE CHANGES EXCEEDING 5% FOR CORNER AND PULL POSTS. BRACE RAIL AND TENSION ROD PANEL TO JOIN POST IN BOTH DIRECTIONS.

14. 24" DIAMETER REINFORCED CONCERTINA BARBED TAPE SHALL HAVE .098' DIAMETER STAINLESS STEEL STRIP MATERIAL AND A .098' DIAMETER GALVANIZED STEEL CORE AND BE INSTALLED AT 14" SPACING ON CENTER.

15. 18" DIAMETER SINGLE LOOP BARBED WIRE SHALL HAVE .098' DIAMETER STAINLESS STEEL STRIP MATERIAL AND A .098' DIAMETER GALVANIZED STEEL CORE AND BE INSTALLED WITH A 6" OVERLAP SPACING.

16. 9 GAUGE TWIST VINYL COATED TIES MEET OR EXCEED ASTM F626.1.2.1. HIGH-SECURITY ROUND WIRE TIES (POWER-FASTENED ROUND WIRE TIES)

17. TOP AND BOTTOM TENSION WIRES WILL BE REQUIRED ON TEMPORARY FENCES.

18. FENCING ON CONCRETE BARRIER SHALL BE SIMILAR. CONTRACTOR SHALL PROVIDE APPROPRIATE TRANSITION SECTIONS.

19. SEE SHEET STD-03-206 FOR SIGNAGE REQUIREMENTS.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
⚠	10/2019	RFM	REVISED
0	6/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Chain Link Fences - 1

WBS NUMBER: -	DRAWN BY: STAFF
FC NUMBER: -	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: -	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-200	APPROVED BY: STAFF
	DATE: -
	SCALE:
	SHEET NO:

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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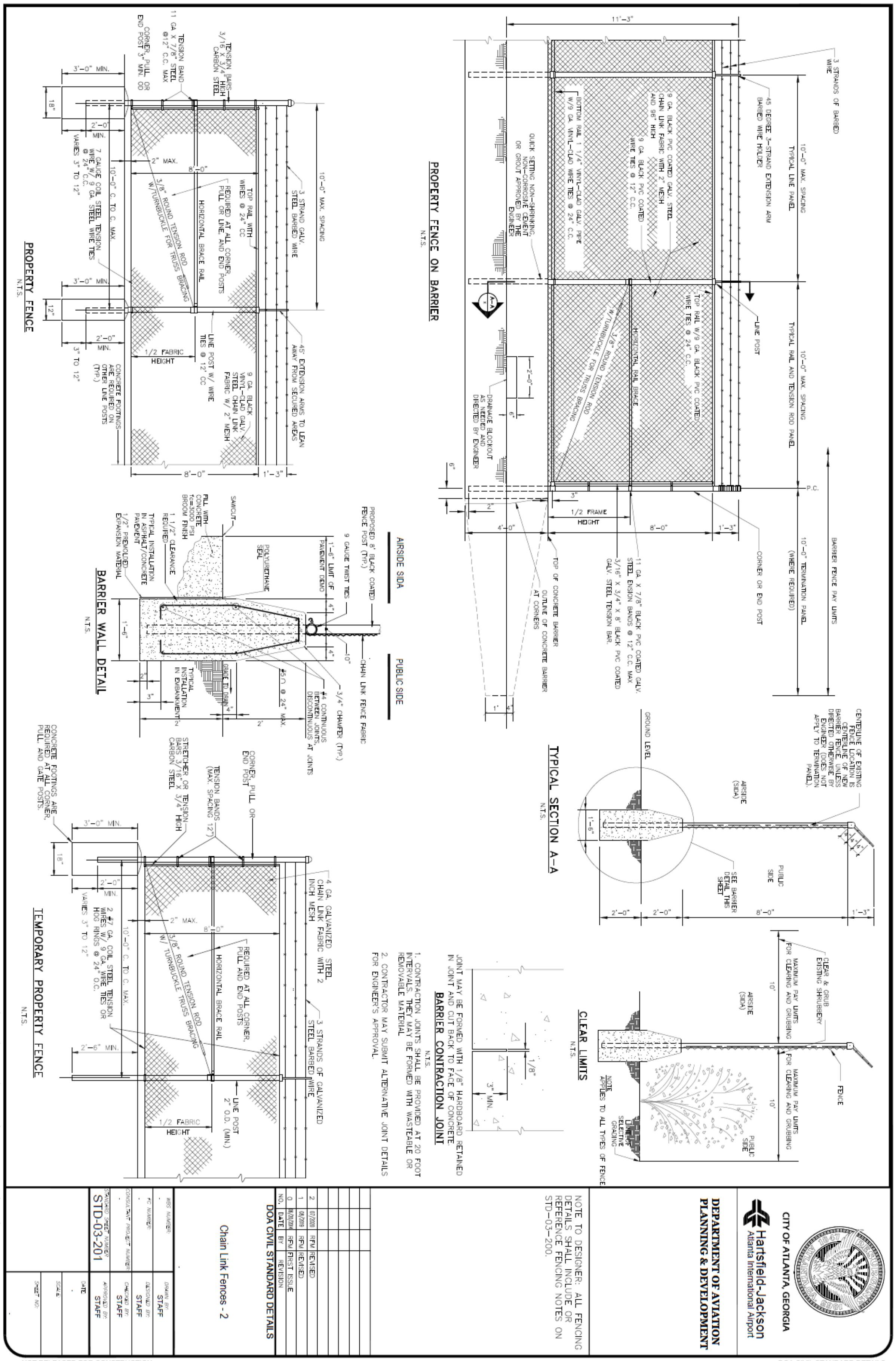
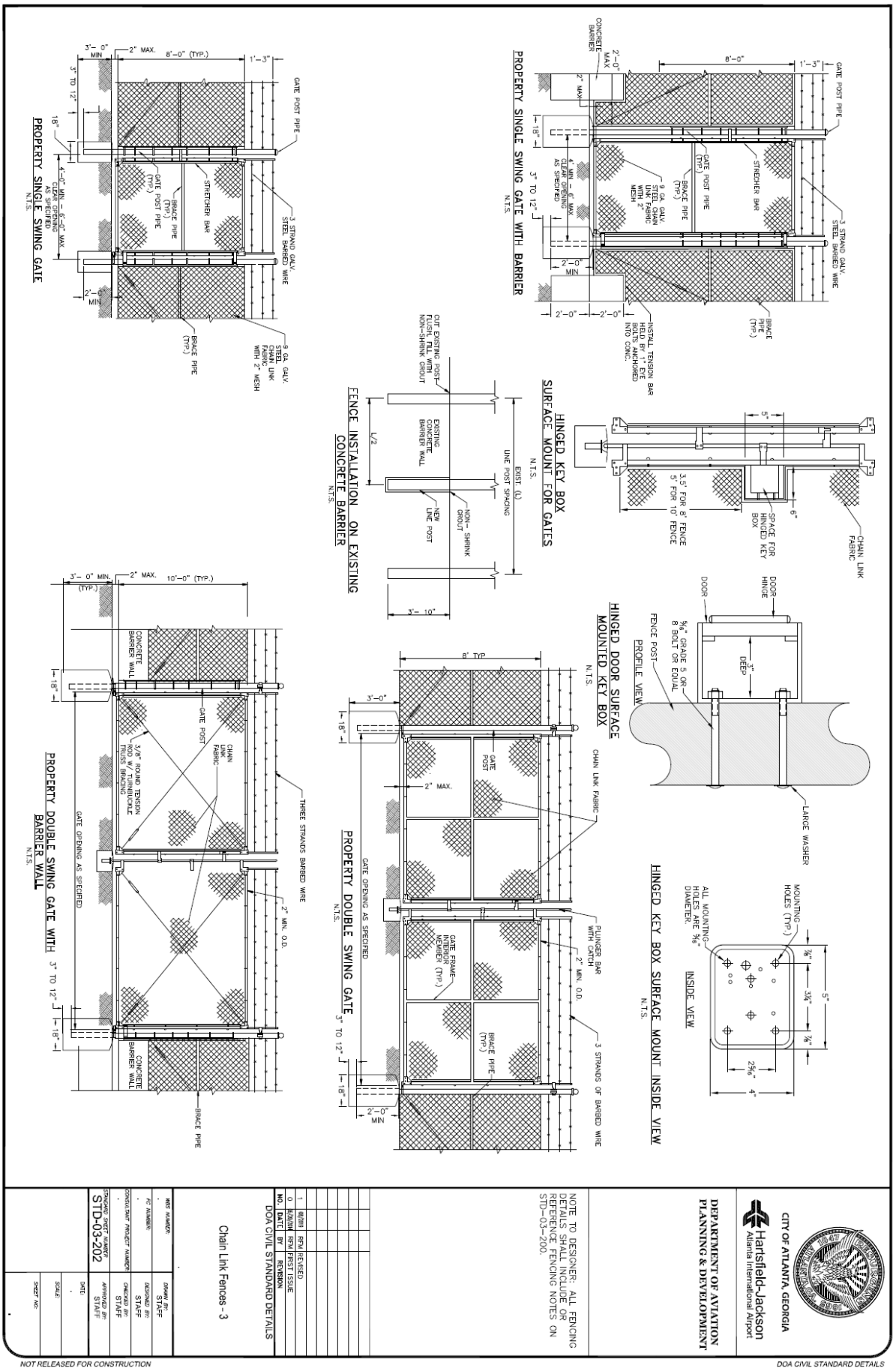

PROPERTY FENCE ON BARRIER
N.T.S.
PROPERTY FENCE
N.T.S.
BARRIER WALL DETAIL
N.T.S.
AIRSIDE SIDA
PUBLIC SIDE
TYPICAL SECTION A–A
N.T.S.
CLEAR LIMITS
N.T.S.
NOTE: APPLIES TO ALL TYPES OF FENCE
BARRIER CONTRACTION JOINT
N.T.S.
JOINT MAY BE FORMED WITH 1/8" HARDBOARD RETAINED IN JOINT AND CUT BACK TO FACE OF CONCRETE.
1. CONTRACTION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS. THEY MAY BE FORMED WITH WASTEABLE OR REMOVABLE MATERIAL.
2. CONTRACTOR MAY SUBMIT ALTERNATIVE JOINT DETAILS FOR ENGINEER'S APPROVAL.
TEMPORARY PROPERTY FENCE
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD-03-200.
Chain Link Fences - 2
DOA CIVIL STANDARD DETAILS
STD-03-201
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


PROPERTY SINGLE SWING GATE
PROPERTY SINGLE SWING GATE WITH BARRIER
HINGED KEY BOX SURFACE MOUNT FOR GATES
FENCE INSTALLATION ON EXISTING CONCRETE BARRIER
HINGED DOOR SURFACE MOUNTED KEY BOX
HINGED KEY BOX SURFACE MOUNT INSIDE VIEW
PROPERTY DOUBLE SWING GATE WITH BARRIER WALL
PROPERTY DOUBLE SWING GATE
CITY OF ATLANTA, GEORGIA
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DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD-03-200.
NO. DATE BY REVISION
0 MO/DD/YR RPM FIRST ISSUE
1 MO/DD/YR RPM REVISED
DOA CIVIL STANDARD DETAILS
Chain Link Fences - 3
WBS NUMBER
FC NUMBER
CONTRACT PROJECT NUMBER
DRAWING SHEET NUMBER
STD-03-202
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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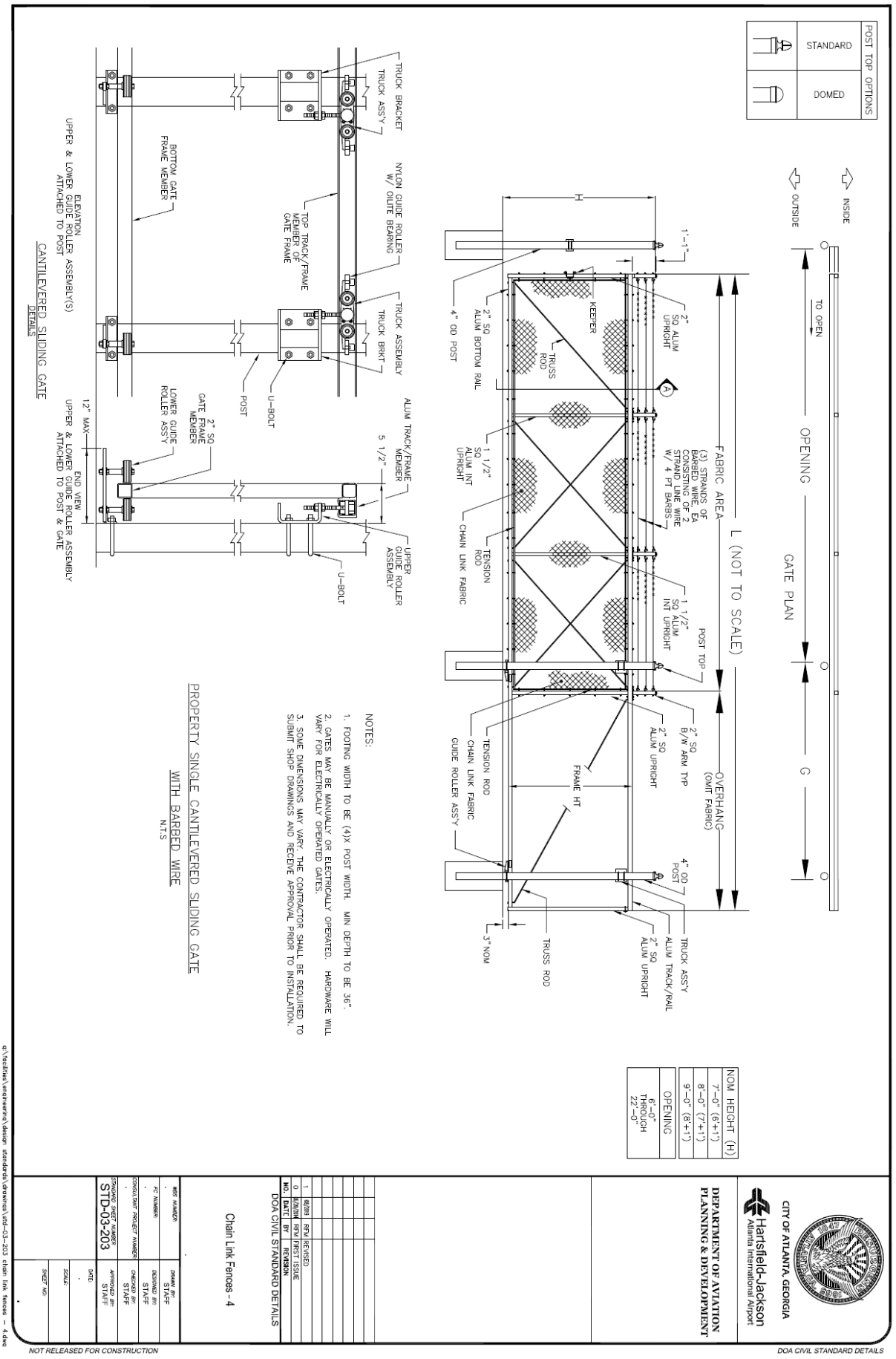

NOTES:

1. FOOTING WIDTH TO BE (4)X POST WIDTH. MIN DEPTH TO BE 36".
2. GATES MAY BE MANUALLY OR ELECTRICALLY OPERATED. HARDWARE WILL VARY FOR ELECTRICALLY OPERATED GATES.
3. SOME DIMENSIONS MAY VARY. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT SHOP DRAWINGS AND RECEIVE APPROVAL PRIOR TO INSTALLATION.

PROPERTY SINGLE CANTILEVERED SLIDING GATE
WITH BARBED WIRE
N.T.S

CITY OF ATLANTA, GEORGIA
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NO.	DATE	BY	REVISION
1	8/2/25	RFM	REVISED
0	6/30/25	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Chain Link Fences - 4

WBS NUMBER:	.
PC NUMBER:	.
CONSOL PART PROJECT NUMBER:	.
DRAWING SHEET NUMBER:	STD-03-203
DATE:	.
SCALE:	.
SHEET NO:	.
DRAWN BY:	STAFF
DESIGNED BY:	STAFF
CHECKED BY:	STAFF
APPROVED BY:	STAFF

NOT RELEASED FOR CONSTRUCTION

DOA CIVIL STANDARD DETAILS

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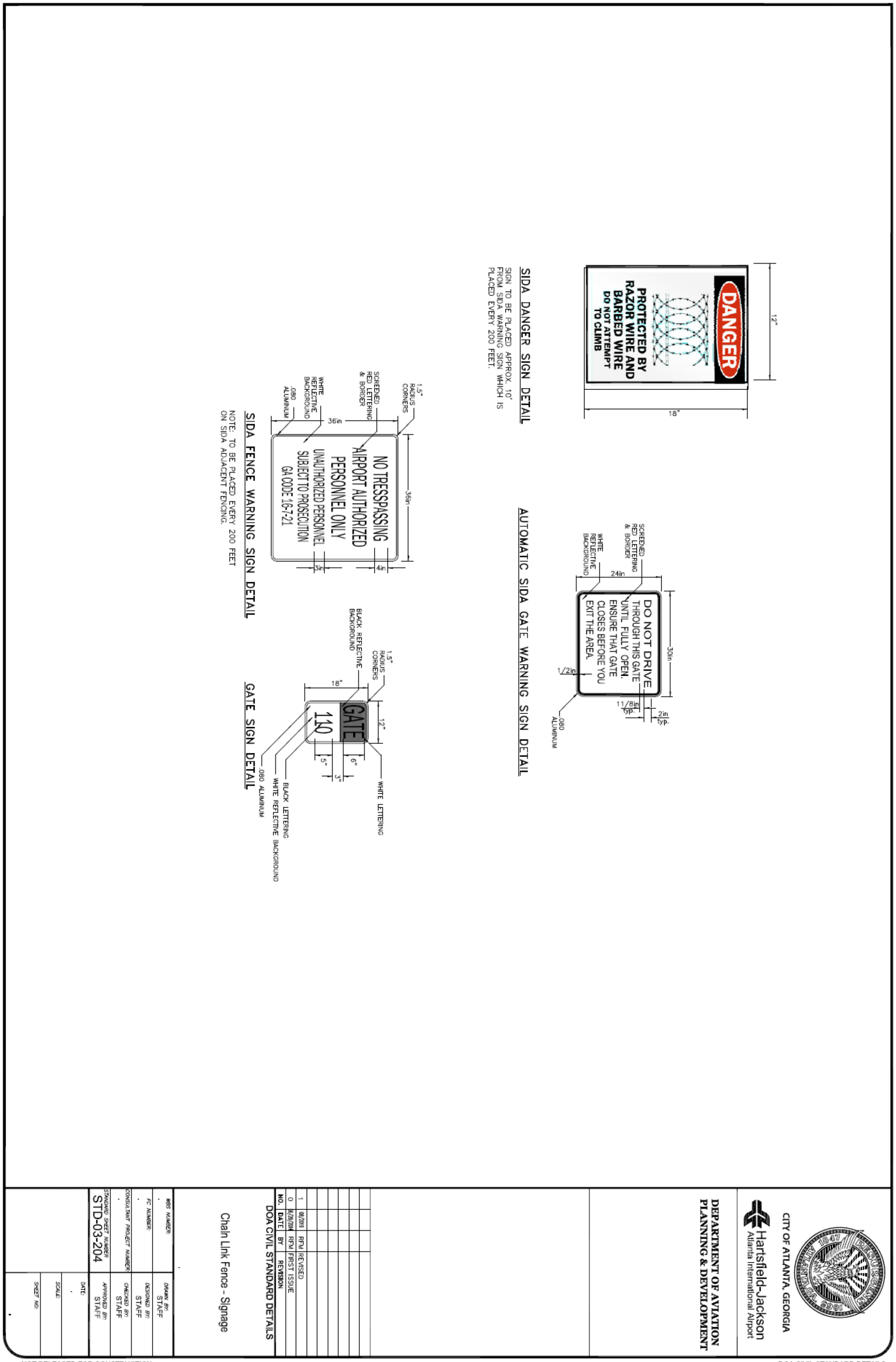
DANGER
PROTECTED BY RAZOR WIRE AND BARBED WIRE
DO NOT ATTEMPT TO CLIMB
12"
18"
SIDA DANGER SIGN DETAIL
SIGN TO BE PLACED APPROX. 10' FROM SIDA WARNING SIGN WHICH IS PLACED EVERY 200 FEET.
DO NOT DRIVE
THROUGH THIS GATE UNTIL FULLY OPEN. ENSURE THAT GATE CLOSES BEFORE YOU EXIT THE AREA.
30in
24in
SCREENED RED LETTERING & BORDER
WHITE REFLECTIVE BACKGROUND
.080 ALUMINUM
AUTOMATIC SIDA GATE WARNING SIGN DETAIL
NO TRESSPASSING
AIRPORT AUTHORIZED PERSONNEL ONLY
UNAUTHORIZED PERSONNEL SUBJECT TO PROSECUTION
GA CODE 16-7-21
1.5" RADIUS CORNERS
36in
4in
3in
SIDA FENCE WARNING SIGN DETAIL
NOTE: TO BE PLACED EVERY 200 FEET ON SIDA ADJACENT FENCING.
GATE
110
BLACK REFLECTIVE BACKGROUND
WHITE LETTERING
BLACK LETTERING
WHITE REFLECTIVE BACKGROUND
.080 ALUMINUM
GATE SIGN DETAIL
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
1 RFM REVISED
0 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Chain Link Fence - Signage
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
STANDARD SHEET NUMBER STD-03-204
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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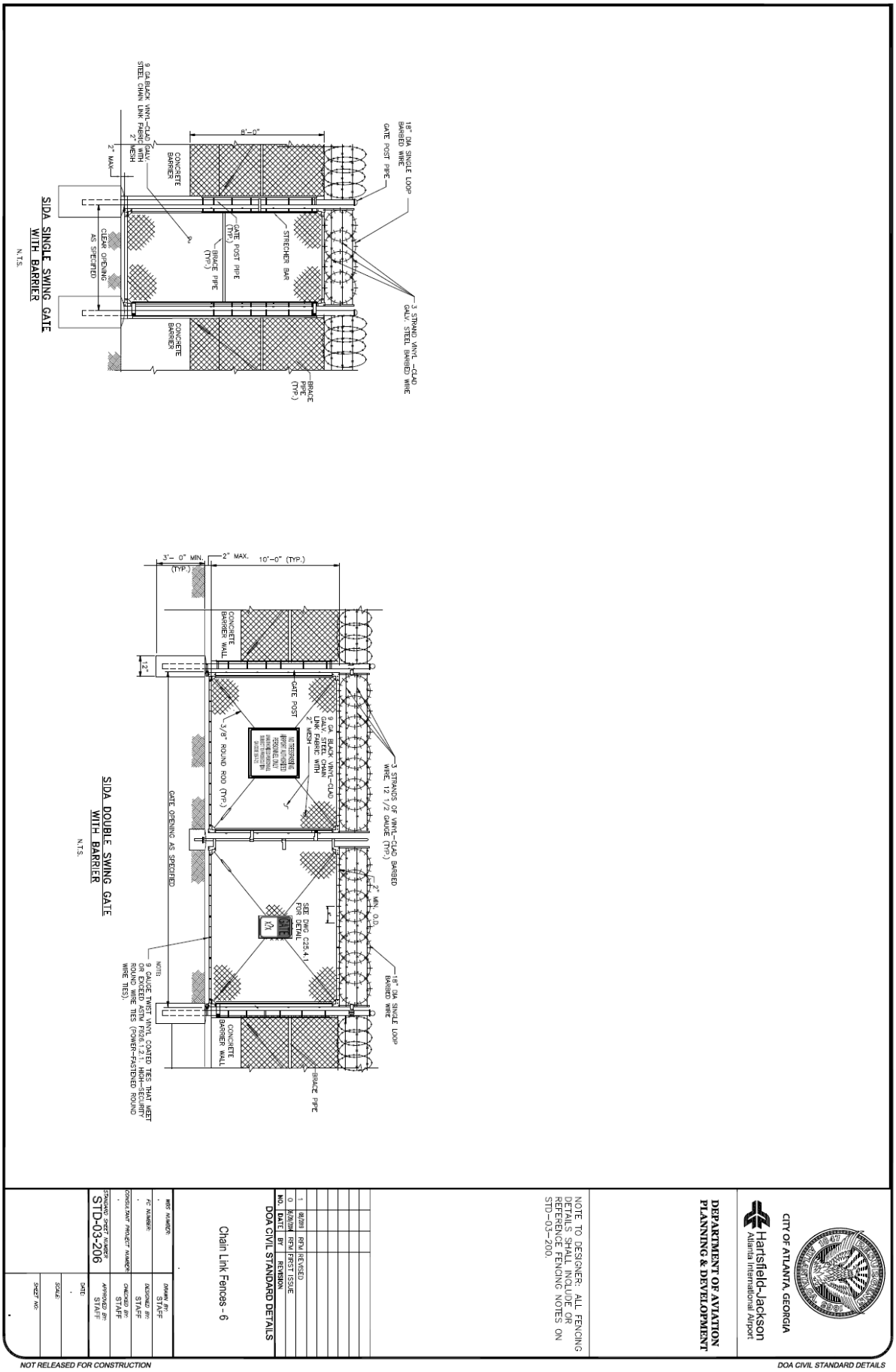
SIDA SINGLE SWING GATE WITH BARRIER
N.T.S.
9 GA BLACK VINYL-CLAD GALV. STEEL CHAIN LINK FABRIC WITH 2" MESH
2" MAX.
CONCRETE BARRIER
8'-0"
18" DIA SINGLE LOOP BARBED WIRE
GATE POST PIPE
CLEAR OPENING AS SPECIFIED
GATE POST PIPE (TYP.)
BRACE PIPE (TYP.)
STRETCHER BAR
3 STRAND VINYL-CLAD GALV. STEEL BARBED WIRE
BRACE PIPE (TYP.)
SIDA DOUBLE SWING GATE WITH BARRIER
N.T.S.
3'- 0" MIN. (TYP.)
2" MAX.
10'-0" (TYP.)
12"
CONCRETE BARRIER WALL
GATE POST
3/8" ROUND ROD (TYP.)
9 GA BLACK VINYL-CLAD GALV. STEEL CHAIN LINK FABRIC WITH 2" MESH
3 STRANDS OF VINYL-CLAD BARBED WIRE, 12 1/2 GAUGE (TYP.)
GATE OPENING AS SPECIFIED
2" MIN. O.D.
SEE DWG C25.4.1 FOR DETAIL
18" DIA SINGLE LOOP BARBED WIRE
CONCRETE BARRIER WALL
BRACE PIPE
NOTE:
9 GAUGE TWIST VINYL COATED TIES THAT MEET OR EXCEED ASTM F626 FOR CLASS 1 HIGH STRENGTH ROUND WIRE TIES (POWER-FASTENED ROUND WIRE TIES).
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD-03-200.
DOA CIVIL STANDARD DETAILS
NO. DATE BY REVISION
1 MM/DD/YY REVISED
0 MM/DD/YY FIRST ISSUE
Chain Link Fences - 6
STD-03-206
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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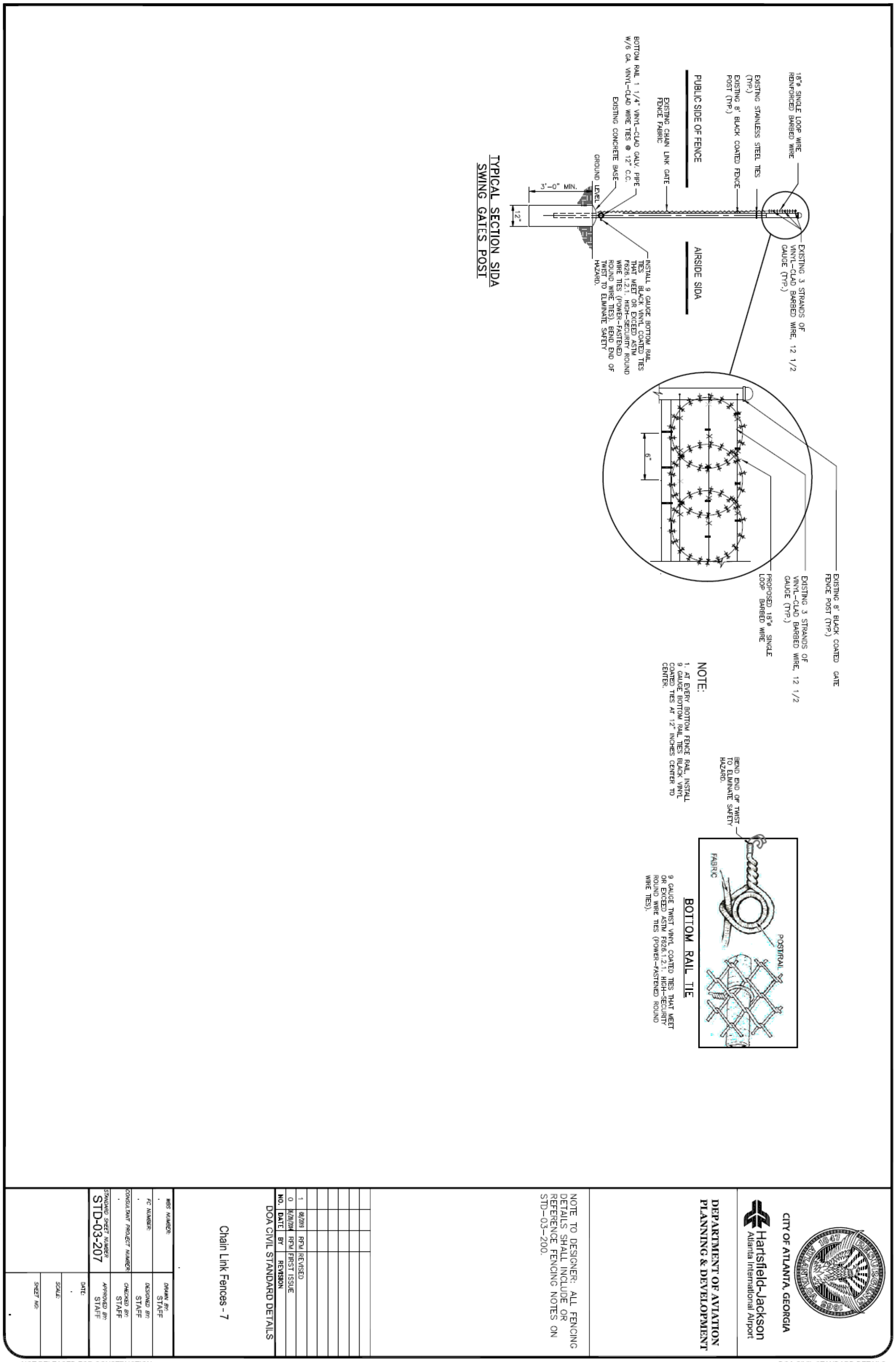
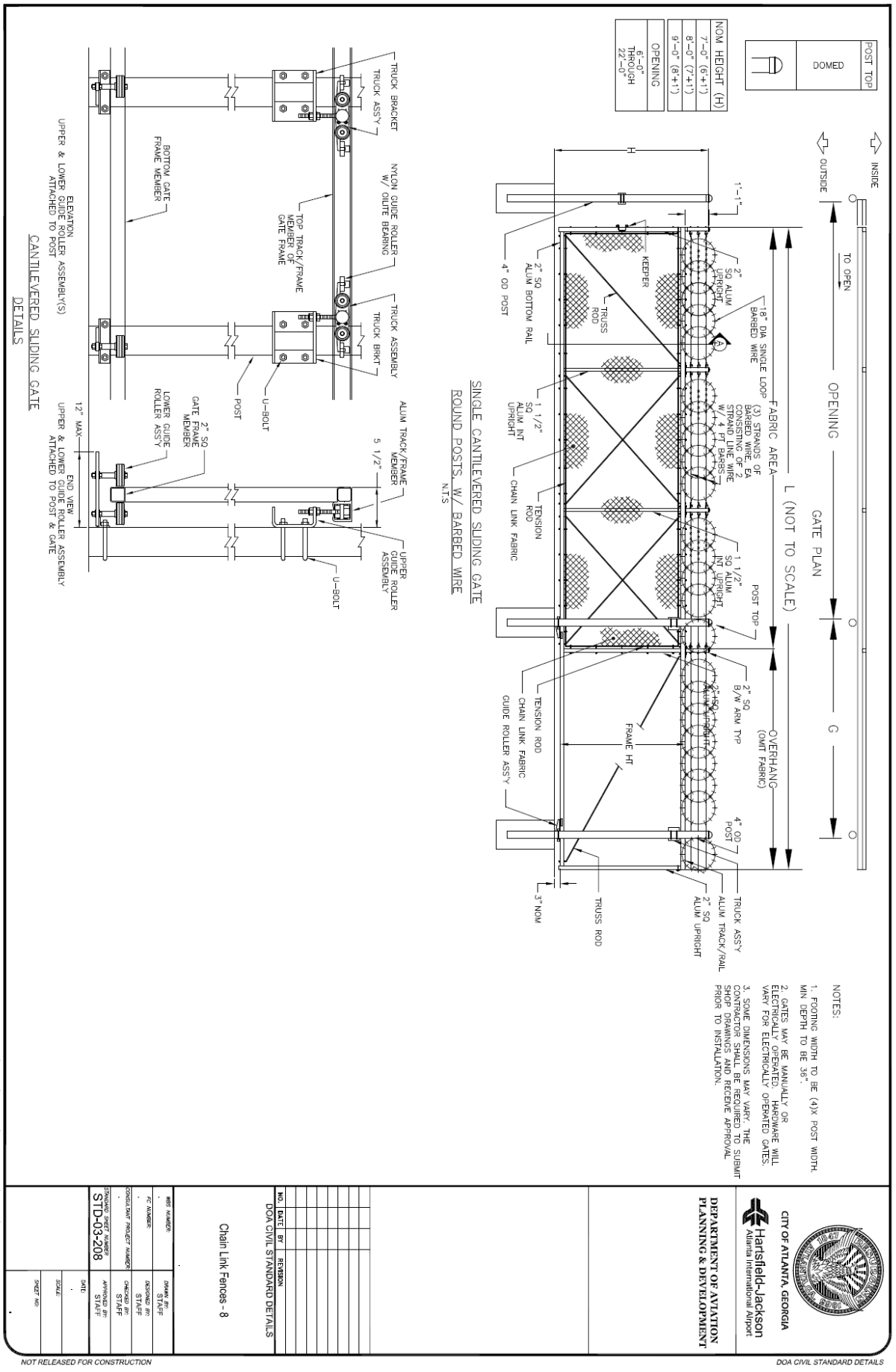
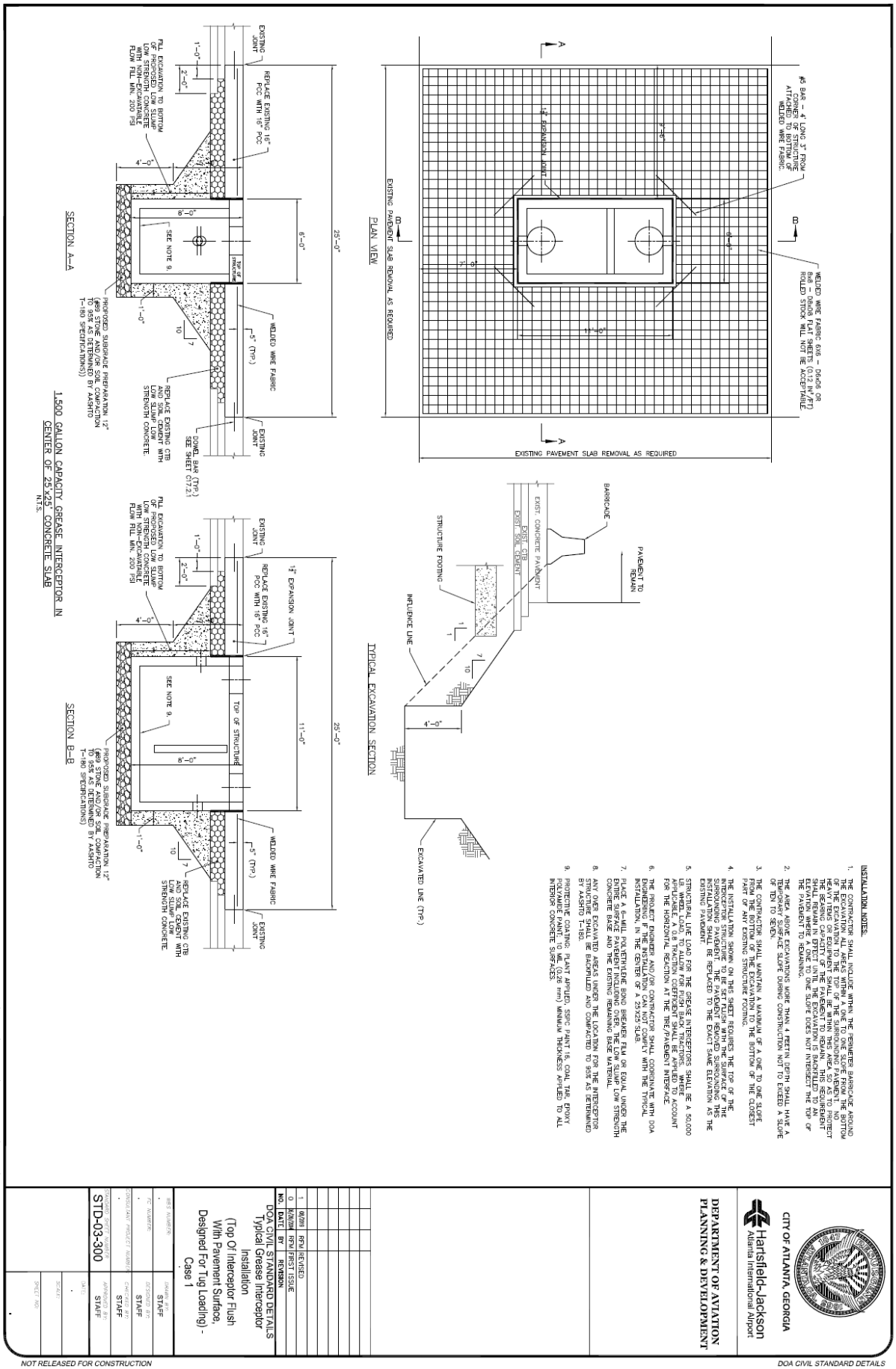
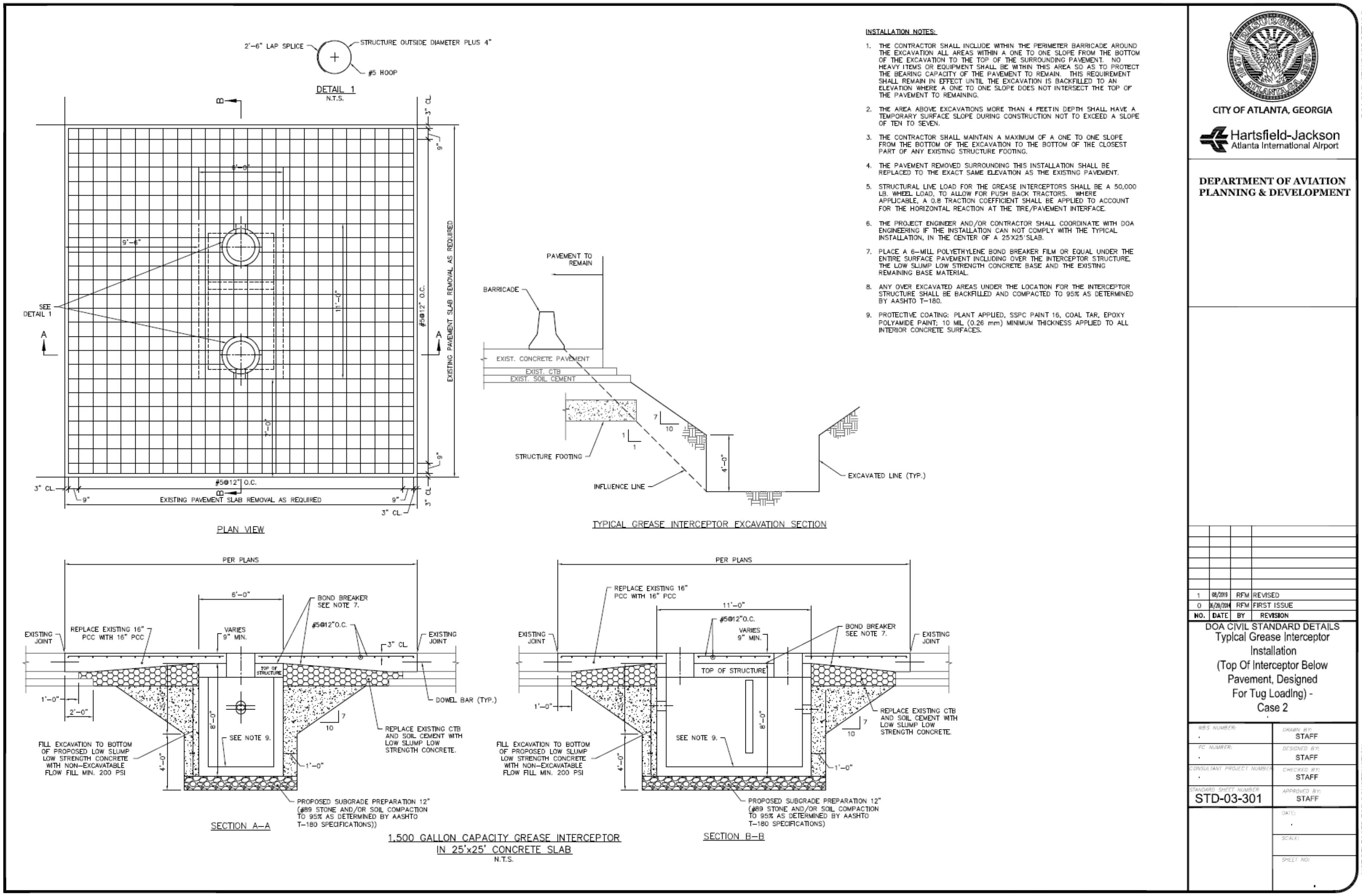
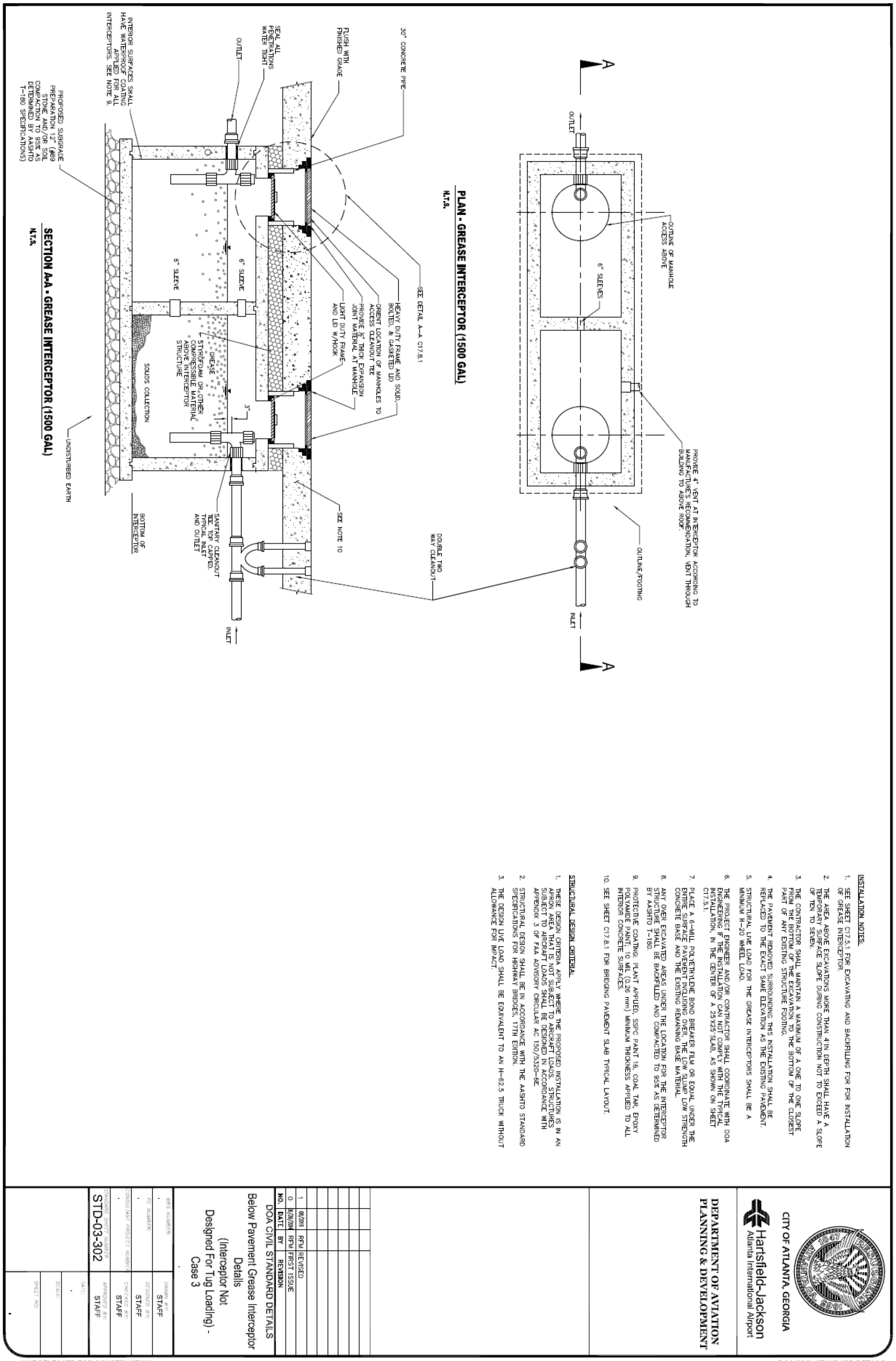
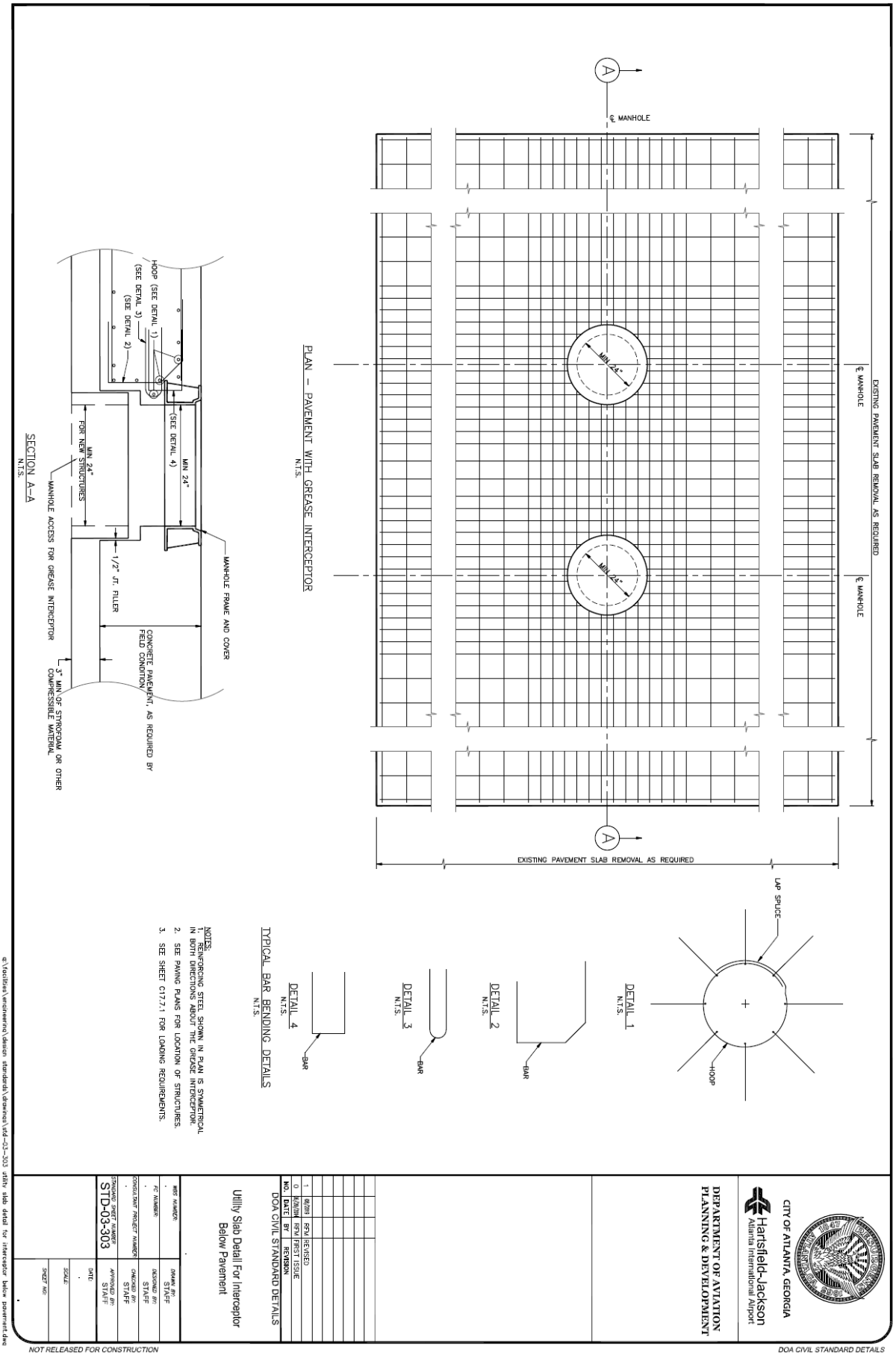

18"ø SINGLE LOOP WIRE REINFORCED BARBED WIRE
EXISTING 3 STRANDS OF VINYL–CLAD BARBED WIRE, 12 1/2 GAUGE (TYP.)
EXISTING STAINLESS STEEL TIES (TYP.)
EXISTING 8' BLACK COATED FENCE POST (TYP.)
PUBLIC SIDE OF FENCE
AIRSIDE SIDA
EXISTING CHAIN LINK GATE FENCE FABRIC
BOTTOM RAIL 1 1/4" VINYL–CLAD GALV. PIPE W/6 GA. VINYL–CLAD WIRE TIES @ 12" C.C.
EXISTING CONCRETE BASE
GROUND LEVEL
INSTALL 9 GAUGE BOTTOM RAIL TIES BLACK VINYL COATED TIES THAT MEET OR EXCEED ASTM F626.1.2.1. HIGH–SECURITY ROUND WIRE TIES (POWER–FASTENED ROUND WIRE TIES). BEND END OF TWIST TO ELIMINATE SAFETY HAZARD.
3'–0" MIN.
12"
TYPICAL SECTION SIDA
SWING GATES POST
EXISTING 8' BLACK COATED GATE FENCE POST (TYP.)
EXISTING 3 STRANDS OF VINYL–CLAD BARBED WIRE, 12 1/2 GAUGE (TYP.)
PROPOSED 18"ø SINGLE LOOP BARBED WIRE
6"
NOTE:
1. AT EVERY BOTTOM FENCE RAIL, INSTALL 9 GAUGE BOTTOM RAIL TIES BLACK VINYL COATED TIES AT 12" INCHES CENTER TO CENTER.
BEND END OF TWIST TO ELIMINATE SAFETY HAZARD.
POST/RAIL
FABRIC
BOTTOM RAIL TIE
9 GAUGE TWIST VINYL COATED TIES THAT MEET OR EXCEED ASTM F626.1.2.1. HIGH–SECURITY ROUND WIRE TIES (POWER–FASTENED ROUND WIRE TIES).
CITY OF ATLANTA, GEORGIA
Hartsfield–Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD–03–200.
1 08/2019 RFM REVISED
0 06/20/2014 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Chain Link Fences - 7
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER STD-03-207
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
q:\facilities\engineering\design standards\drawings\std–03–207 chain link fences – 7.dwg

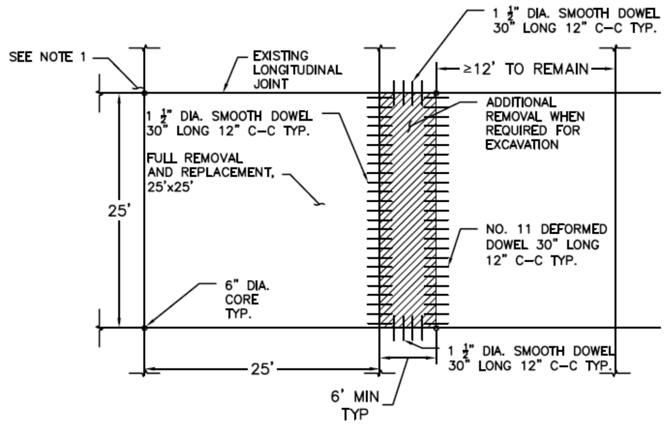

POST TOP
DOMED
NOM HEIGHT (H)
7'-0" (6'+1")
8'-0" (7'+1")
9'-0" (8'+1")
OPENING
6'-0" THROUGH 22'-0"
INSIDE
OUTSIDE
TO OPEN
OPENING
GATE PLAN
L (NOT TO SCALE)
G
H
1'-1"
FABRIC AREA
OVERHANG (OMIT FABRIC)
FRAME HT
2" SQ ALUM UPRIGHT
4" OD POST
2" SQ ALUM BOTTOM RAIL
KEEPER
TRUSS ROD
18" DIA SINGLE LOOP BARBED WIRE
CONSISTING OF (3) STRANDS OF BARBED WIRE EA CONSISTING OF 2 STRAND LINE WIRE W/ 4 PT BARBS
1 1/2" SQ ALUM INT UPRIGHT
TENSION ROD
CHAIN LINK FABRIC
POST TOP
2" SQ B/W ARM TYP
CHAIN LINK FABRIC GUIDE ROLLER ASS'Y
TENSION ROD
TRUSS ROD
3" NOM
TRUCK ASS'Y
ALUM TRACK/RAIL
2" SQ ALUM UPRIGHT
SINGLE CANTILEVERED SLIDING GATE
ROUND POSTS, W/ BARBED WIRE
N.T.S
NOTES:
1. FOOTING WIDTH TO BE (4)X POST WIDTH. MIN DEPTH TO BE 36".
2. GATES MAY BE MANUALLY OR ELECTRICALLY OPERATED. HARDWARE WILL VARY FOR ELECTRICALLY OPERATED GATES.
3. SOME DIMENSIONS MAY VARY. THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT SHOP DRAWINGS AND RECEIVE APPROVAL PRIOR TO INSTALLATION.
TRUCK BRACKET
TRUCK ASS'Y
NYLON GUIDE ROLLER W/ GILITE BEARING
TRUCK ASSEMBLY
TRUCK BRKT
BOTTOM GATE FRAME MEMBER
TOP TRACK/FRAME MEMBER OF GATE FRAME
ELEVATION
UPPER & LOWER GUIDE ROLLER ASSEMBLY(S) ATTACHED TO POST
POST
U-BOLT
ALUM TRACK/FRAME MEMBER
5 1/2"
2" SQ GATE FRAME MEMBER
LOWER ROLLER GUIDE ASS'Y
12" MAX
END VIEW
UPPER & LOWER GUIDE ROLLER ASSEMBLY ATTACHED TO POST & GATE
UPPER GUIDE ROLLER ASSEMBLY
U-BOLT
CANTILEVERED SLIDING GATE
DETAILS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
MBE/ WBE NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER:
STD-03-208
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NO. DATE: BY REVISION
DOA CIVIL STANDARD DETAILS
Chain Link Fences - 8
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
q:\localfiles\engineering\design standards\drawings\std-03-208 chain link fences - 8.dwg


INSTALLATION NOTES:
1. THE CONTRACTOR SHALL INCLUDE WITHIN THE PERIMETER BARRICADE AROUND THE EXCAVATION AREA, SUFFICIENT SPACE TO ACCOMMODATE THE BOTTOM OF THE EXCAVATION TO THE TOP OF THE SURROUNDING PAVEMENT. NO HEAVY ITEMS OR EQUIPMENT SHALL BE WITHIN THIS AREA SO AS TO PROTECT THE INTEGRITY OF THE EXCAVATION SLOPE. THE EXCAVATION SLOPE SHALL REMAIN IN PLACE UNTIL THE EXCAVATION IS BACKFILLED TO GRADE ELEVATION WHERE A ONE TO ONE SLOPE DOES NOT INTERSECT THE TOP OF THE PAVEMENT TO REMAINING.
2. THE AREA ABOVE EXCAVATIONS MORE THAN 4 FEETIN DEPTH SHALL HAVE A SURFACE SLOPE DURING CONSTRUCTION NOT TO EXCEED A SLOPE OF TEN TO SEVEN.
3. THE CONTRACTOR SHALL MAINTAIN A MINIMUM OF A ONE TO ONE SLOPE FROM THE BOTTOM OF THE EXCAVATION TO THE BOTTOM OF THE CLOSEST PART OF ANY EXISTING STRUCTURE FOOTING.
4. THE INSTALLATION SHOWN ON THIS SHEET REQUIRES THE TOP OF THE INTERCEPTOR STRUCTURE TO BE SET FLUSH WITH THE SURFACE OF THE SURROUNDING PAVEMENT. THE PAVEMENT REMOVED SURROUNDING THIS INSTALLATION SHALL BE REPLACED TO THE EXACT SAME ELEVATION AS THE EXISTING PAVEMENT.
5. STRUCTURAL LIVE LOAD FOR THE GREASE INTERCEPTORS SHALL BE A 50,000 LB. WHEEL LOAD, TO ALLOW FOR RUSH BACK TRACTORS, WHERE APPLICABLE. A 0.8 TRACTION COEFFICIENT SHALL BE APPLIED TO ACCOUNT FOR THE HORIZONTAL REACTION AT THE TIRE/PAVEMENT INTERFACE.
6. THE PROJECT ENGINEER AND/OR CONTRACTOR SHALL COORDINATE WITH DOA TO PROPERLY LOCATE THE GREASE INTERCEPTOR PRIOR TO INSTALLATION IN THE CENTER OF A 25'X25' SLAB.
7. PLACE A PLAIN POLYETHYLENE BOND BREAKER FILM OR EQUAL UNDER THE ENTIRE SURFACE PAVEMENT INCLUDING OVER THE LOW SLUMP LOW STRENGTH CONCRETE BASE AND THE EXISTING REMAINING BASE MATERIAL.
8. ANY OVER EXCAVATED AREAS UNDER THE LOCATION FOR THE INTERCEPTOR STRUCTURE SHALL BE BACKFILLED AND COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
9. PROTECTIVE COATING: PLANT APPLIED, SSPC PAINT 16, COAL TAR, EPOXY POLYAMIDE PAINT, 10 MIL (0.28 mm) MINIMUM THICKNESS APPLIED TO ALL INTERIOR CONCRETE SURFACES.
#5 BAR – 4' LONG 3' FROM CORNER OF STRUCTURE ATTACHED TO BOTTOM OF WELDED WIRE FABRIC.
WELDED WIRE FABRIC 6X6 – D6X06 OR 6x6 – D6x06 FLAT SHEETS (0.12 IN²/FT) ROLLED STOCK WILL NOT BE ACCEPTABLE
1" EXPANSION JOINT
EXISTING PAVEMENT SLAB REMOVAL AS REQUIRED
PLAN VIEW
EXISTING PAVEMENT SLAB REMOVAL AS REQUIRED
EXIST. CONCRETE PAVEMENT
EXIST. CTB
EXIST. SOIL CEMENT
BARRICADE
PAVEMENT TO REMAIN
STRUCTURE FOOTING
INFLUENCE LINE
EXCAVATED LINE (TYP.)
TYPICAL EXCAVATION SECTION
SECTION A–A
SECTION B–B
EXISTING JOINT
REPLACE EXISTING 16" PCC WITH 16" PCC
1'-0"
2'-0"
4'-0"
FILL EXCAVATION TO BOTTOM OF PAVEMENT WITH LOW STRENGTH CONCRETE WITH NON-EXCAVATABLE FLOW FILL MIN. 200 PSI
8'-0"
SEE NOTE 9.
TOP OF STRUCTURE
6'-0"
11'-0"
25'-0"
1'-0"
10
7
WELDED WIRE FABRIC
5" (TYP.)
REPLACE EXISTING CTB AND SOIL CEMENT WITH LOW SLUMP LOW STRENGTH CONCRETE
DOWEL BAR (TYP.) SEE SHEET C172.1
EXISTING JOINT
PROPOSED SUBGRADE PREPARATION 12" (#89 STONE AND/OR SOIL COMPACTION TO 95% AS DETERMINED BY AASHTO T-180 SPECIFICATIONS)
1,500 GALLON CAPACITY GREASE INTERCEPTOR IN CENTER OF 25'x25' CONCRETE SLAB
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE: BY: REVISION
0 XX/XX/XX RFP/FIRST ISSUE
1 XX/XX/XX RFP/REVISED
DOA CIVIL STANDARD DETAILS
Typical Grease Interceptor Installation
(Top Of Interceptor Flush With Pavement Surface, Designed For Tug Loading) - Case 1
STD-03-300
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS

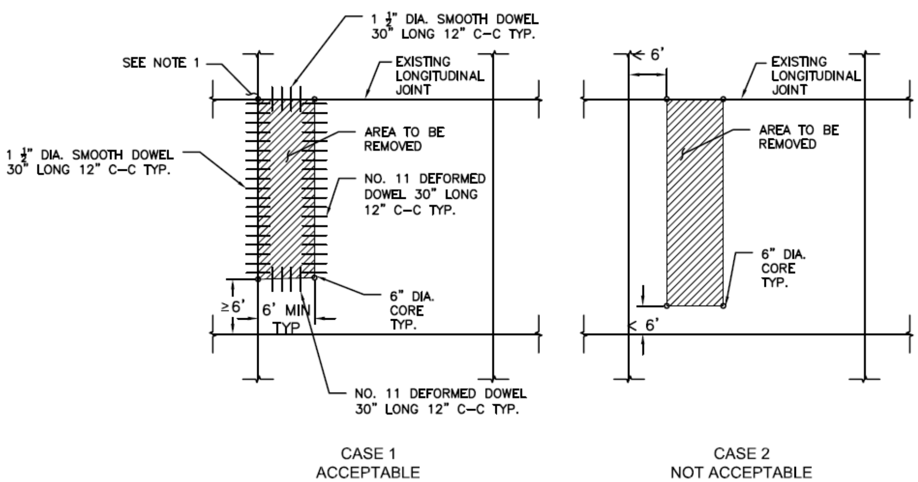

INSTALLATION NOTES:
1. THE CONTRACTOR SHALL INCLUDE WITHIN THE PERIMETER BARRICADE AROUND THE EXCAVATION ALL AREAS WITHIN A ONE TO ONE SLOPE FROM THE BOTTOM OF THE EXCAVATION TO THE TOP OF THE SURROUNDING PAVEMENT. NO HEAVY ITEMS OR EQUIPMENT SHALL BE WITHIN THIS AREA SO AS TO PROTECT THE BEARING CAPACITY OF THE PAVEMENT TO REMAIN. THIS REQUIREMENT SHALL REMAIN IN EFFECT UNTIL THE EXCAVATION IS BACKFILLED TO AN ELEVATION WHERE A ONE TO ONE SLOPE DOES NOT INTERSECT THE TOP OF THE PAVEMENT TO REMAINING.
2. THE AREA ABOVE EXCAVATIONS MORE THAN 4 FEETIN DEPTH SHALL HAVE A TEMPORARY SURFACE SLOPE DURING CONSTRUCTION NOT TO EXCEED A SLOPE OF TEN TO SEVEN.
3. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM OF A ONE TO ONE SLOPE FROM THE BOTTOM OF THE EXCAVATION TO THE BOTTOM OF THE CLOSEST PART OF ANY EXISTING STRUCTURE FOOTING.
4. THE PAVEMENT REMOVED SURROUNDING THIS INSTALLATION SHALL BE REPLACED TO THE EXACT SAME ELEVATION AS THE EXISTING PAVEMENT.
5. STRUCTURAL LIVE LOAD FOR THE GREASE INTERCEPTORS SHALL BE A 50,000 LB. WHEEL LOAD, TO ALLOW FOR PUSH BACK TRACTORS. WHERE APPLICABLE, A 0.8 TRACTION COEFFICIENT SHALL BE APPLIED TO ACCOUNT FOR THE HORIZONTAL REACTION AT THE TIRE/PAVEMENT INTERFACE.
6. THE PROJECT ENGINEER AND/OR CONTRACTOR SHALL COORDINATE WITH DOA ENGINEERING IF THE INSTALLATION CAN NOT COMPLY WITH THE TYPICAL INSTALLATION, IN THE CENTER OF A 25'X25' SLAB.
7. PLACE A 6-MILL POLYETHYLENE BOND BREAKER FILM OR EQUAL UNDER THE ENTIRE SURFACE PAVEMENT INCLUDING OVER THE INTERCEPTOR STRUCTURE, THE LOW SLUMP LOW STRENGTH CONCRETE BASE AND THE EXISTING REMAINING BASE MATERIAL.
8. ANY OVER EXCAVATED AREAS UNDER THE LOCATION FOR THE INTERCEPTOR STRUCTURE SHALL BE BACKFILLED AND COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
9. PROTECTIVE COATING: PLANT APPLIED, SSPC PAINT 16, COAL TAR, EPOXY POLYAMIDE PAINT; 10 MIL (0.26 mm) MINIMUM THICKNESS APPLIED TO ALL INTERIOR CONCRETE SURFACES.
DETAIL 1
N.T.S.
2'-6" LAP SPLICE
STRUCTURE OUTSIDE DIAMETER PLUS 4"
#5 HOOP
SEE DETAIL 1
EXISTING PAVEMENT SLAB REMOVAL AS REQUIRED
#5@12" O.C.
PLAN VIEW
PAVEMENT TO REMAIN
BARRICADE
EXIST. CONCRETE PAVEMENT
EXIST. CTB
EXIST. SOIL CEMENT
STRUCTURE FOOTING
INFLUENCE LINE
EXCAVATED LINE (TYP.)
TYPICAL GREASE INTERCEPTOR EXCAVATION SECTION
PER PLANS
EXISTING JOINT
REPLACE EXISTING 16" PCC WITH 16" PCC
BOND BREAKER SEE NOTE 7.
VARIES 9" MIN.
TOP OF STRUCTURE
DOWEL BAR (TYP.)
REPLACE EXISTING CTB AND SOIL CEMENT WITH LOW SLUMP LOW STRENGTH CONCRETE.
FILL EXCAVATION TO BOTTOM OF PROPOSED LOW SLUMP LOW STRENGTH CONCRETE WITH NON-EXCAVATABLE FLOW FILL MIN. 200 PSI
SEE NOTE 9.
PROPOSED SUBGRADE PREPARATION 12" (#89 STONE AND/OR SOIL COMPACTION TO 95% AS DETERMINED BY AASHTO T-180 SPECIFICATIONS))
SECTION A–A
SECTION B–B
1,500 GALLON CAPACITY GREASE INTERCEPTOR
IN 25'x25' CONCRETE SLAB
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
1 08/2019 RFM REVISED
0 6/20/2014 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Typical Grease Interceptor
Installation
(Top Of Interceptor Below
Pavement, Designed
For Tug Loading) -
Case 2
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
STANDARD SHEET NUMBER
STD-03-301
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


PLAN - GREASE INTERCEPTOR (1500 GAL)
N.T.S.
A
OUTLET
INLET
OUTLINE OF MANHOLE ACCESS ABOVE
6" SLEEVES
PROVIDE 4" VENT AT INTERCEPTOR ACCORDING TO MANUFACTURE'S RECOMMENDATION, VENT THROUGH BUILDING TO ABOVE ROOF.
OUTLINE/FOOTING
DOUBLE TWO WAY CLEANOUT
SECTION A-A - GREASE INTERCEPTOR (1500 GAL)
N.T.S.
SEE DETAIL A-A C17.8.1
30" CONCRETE PIPE
HEAVY DUTY FRAME AND SOLID, BOLTED, & GASKETED LID
ORIENT LOCATION OF MANHOLES TO ACCESS CLEANOUT TEE
PROVIDE ½" THICK EXPANSION JOINT MATERIAL AT MANHOLE
LIGHT DUTY FRAME AND LID W/HOOK
FLUSH WITH FINISHED GRADE
SEE NOTE 10
SEAL ALL PENETRATIONS WATER TIGHT
OUTLET
6" SLEEVE
3"
GREASE
STYROFOAM OR OTHER COMPRESSIBLE MATERIAL ABOVE INTERCEPTOR STRUCTURE
SANITARY CLEANOUT TEE, TOP CAPPED. TYPICAL INLET AND OUTLET
INLET
SOLIDS COLLECTION
BOTTOM OF INTERCEPTOR
INTERIOR SURFACES SHALL HAVE WATERPROOF COATING APPLIED FOR ALL INTERCEPTORS. SEE NOTE 9.
UNDISTURBED EARTH
PROPOSED SUBGRADE PREPARATION 12" (#89 STONE AND/OR SOIL COMPACTION TO 95% AS DETERMINED BY AASHTO T-180 SPECIFICATIONS)
INSTALLATION NOTES:
1. SEE SHEET C17.5.1 FOR EXCAVATING AND BACKFILLING FOR FOR INSTALLATION OF GREASE INTERCEPTOR.
2. THE AREA ABOVE EXCAVATIONS MORE THAN 4'IN DEPTH SHALL HAVE A TEMPORARY SURFACE SLOPE DURING CONSTRUCTION NOT TO EXCEED A SLOPE OF TEN TO SEVEN.
3. THE CONTRACTOR SHALL MAINTAIN A MAXIMUM OF A ONE TO ONE SLOPE FROM THE BOTTOM OF THE EXCAVATION TO THE BOTTOM OF THE CLOSEST PART OF ANY EXISTING STRUCTURE FOOTING.
4. THE PAVEMENT REMOVED SURROUNDING THIS INSTALLATION SHALL BE REPLACED TO THE EXACT SAME ELEVATION AS THE EXISTING PAVEMENT.
5. STRUCTURAL LIVE LOAD FOR THE GREASE INTERCEPTORS SHALL BE A MINIMUM H-20 WHEEL LOAD.
6. THE PROJECT ENGINEER AND/OR CONTRACTOR SHALL COORDINATE WITH DOA ENGINEERING IF THE INSTALLATION CAN NOT COMPLY WITH THE TYPICAL INSTALLATION, IN THE CENTER OF A 25'X25'SLAB, AS SHOWN ON SHEET C17.5.1.
7. PLACE A 6-MILL POLYETHYLENE BOND BREAKER FILM OR EQUAL UNDER THE ENTIRE SURFACE PAVEMENT INCLUDING OVER, THE LOW SLUMP LOW STRENGTH CONCRETE BASE AND THE EXISTING REMAINING BASE MATERIAL.
8. ANY OVER EXCAVATED AREAS UNDER THE LOCATION FOR THE INTERCEPTOR STRUCTURE SHALL BE BACKFILLED AND COMPACTED TO 95% AS DETERMINED BY AASHTO T-180.
9. PROTECTIVE COATING: PLANT APPLIED, SSPC PAINT 16, COAL TAR, EPOXY POLYAMIDE PAINT; 10 MIL (0.26 mm) MINIMUM THICKNESS APPLIED TO ALL INTERIOR CONCRETE SURFACES.
10. SEE SHEET C17.8.1 FOR BRIDGING PAVEMENT SLAB TYPICAL LAYOUT.
STRUCTURAL DESIGN CRITERIA:
1. THESE DESIGN CRITERIA APPLY WHERE THE PROPOSED INSTALLATION IS IN AN APRON AREA THAT IS NOT SUBJECT TO AIRCRAFT LOADS. STRUCTURES SUBJECT TO AIRCRAFT LOADS SHALL BE DESIGNED IN ACCORDANCE WITH APPENDIX 3 OF FAA ADVISORY CIRCULAR AC 150/5320-6E.
2. STRUCTURAL DESIGN SHALL BE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17TH EDITION.
3. THE DESIGN LIVE LOAD SHALL BE EQUIVALENT TO AN H-62.5 TRUCK WITHOUT ALLOWANCE FOR IMPACT.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
1 08/2019 RFM REVISED
0 RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Below Pavement Grease Interceptor Details (Interceptor Not Designed For Tug Loading) - Case 3
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
STANDARD SHEET NUMBER
STD-03-302
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS


℄ MANHOLE
EXISTING PAVEMENT SLAB REMOVAL AS REQUIRED
MIN 24"
PLAN – PAVEMENT WITH GREASE INTERCEPTOR
N.T.S.
HOOP (SEE DETAIL 1)
(SEE DETAIL 3)
(SEE DETAIL 2)
(SEE DETAIL 4)
MIN 24" FOR NEW STRUCTURES
MANHOLE ACCESS FOR GREASE INTERCEPTOR
MANHOLE FRAME AND COVER
1/2" JT. FILLER
CONCRETE PAVEMENT, AS REQUIRED BY FIELD CONDITION
3" MIN. OF STYROFOAM OR OTHER COMPRESSIBLE MATERIAL
SECTION A–A
N.T.S.
LAP SPLICE
HOOP
DETAIL 1
N.T.S.
BAR
DETAIL 2
N.T.S.
BAR
DETAIL 3
N.T.S.
BAR
DETAIL 4
N.T.S.
TYPICAL BAR BENDING DETAILS
N.T.S.
NOTES:
1. REINFORCING STEEL SHOWN IN PLAN IS SYMMETRICAL IN BOTH DIRECTIONS ABOUT THE GREASE INTERCEPTOR.
2. SEE PAVING PLANS FOR LOCATION OF STRUCTURES.
3. SEE SHEET C17.7.1 FOR LOADING REQUIREMENTS.
Utility Slab Detail For Interceptor Below Pavement
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
1 08/2025 RFI/ REVISED:
0 MONTH RFI/ FIRST ISSUE
NO. DATE: BY: REVISION
DOA CIVIL STANDARD DETAILS
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-03-303
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
e:\Vaultlive\environments\design standards\drawings\std-03-303 utility slab detail for interceptor below pavement.dwg



DETAIL FOR ADDITIONAL PAVEMENT REMOVAL
NTS



PAVEMENT REMOVAL AND REPLACEMENT LIMITS
(USE FOR PIPE TRENCHES)
NTS

NOTES:
1. SEE DOWEL SPACING DETAIL AT JOINT CORNERS DETAIL.

2. ONLY SAWCUTS MADE ALONG EXISTING JOINT LINES MAY BE OVERCUT. OTHER SAWCUTS WILL TERMINATE IN A 6" FULL DEPTH CORE TO PREVENT DAMAGE TO THE PAVEMENT TO BE RETAINED. SEE DETAIL.

3. DOWELS ALONG EXISTING JOINTS SHALL BE 1–1/2" X 30" SMOOTH DOWELS AT 12" NOMINAL SPACING. DOWELS THAT ARE ON SAWED FACES ONLY WILL BE #11 X 30" DEFORMED DOWELS AT 12" NOMINAL CENTERS. ALL DOWELS SHALL BE INSTALLED BY DRILLING AND EPOXYING.

4. CONTRACTOR SHALL LAY OUT REMOVAL AREA AS SPECIFIED IN THESE DOCUMENTS. PRIOR TO INITIATING REMOVAL, THE CONTRACTOR SHALL RECEIVE LAYOUT APPROVAL FROM THE ENGINEER.

5. SAWCUT AND REMOVE PAVEMENT CAREFULLY SO AS NOT TO DAMAGE/SPALL REMAINING CONCRETE EDGE. SAWCUTS MAY BE LEFT IN PLACE AHEAD OF REMOVAL OPERATION.

6. EXCAVATE SOIL TO THE REQUIRED DEPTH. REMOVE ALL DISTURBED MATERIAL UNTIL A FIRM FOUNDATION IS ACHIEVED.

7. INSTALL APPROPRIATE BEDDING AND UTILITY THEN BACKFILL TO REQUIRED DEPTH.

8. INSTALL DOWELS AND REBAR.

9. SAND BLAST THE SURFACE OF THE CONCRETE TO EXPOSE ROUGH AGGREGATE. COAT SAWCUT SURFACES WITH BONDING AGENT. EXISTING JOINT FACES DO NOT REQUIRE BONDING AGENT.

10. PLACE CONCRETE LEVEL WITH THE ADJACENT SURFACE. COMPLETELY CONSOLIDATE CONCRETE, FILL ALL VOIDS BY VIBRATING.

CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS
Additional Pavement Removal

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-03-304	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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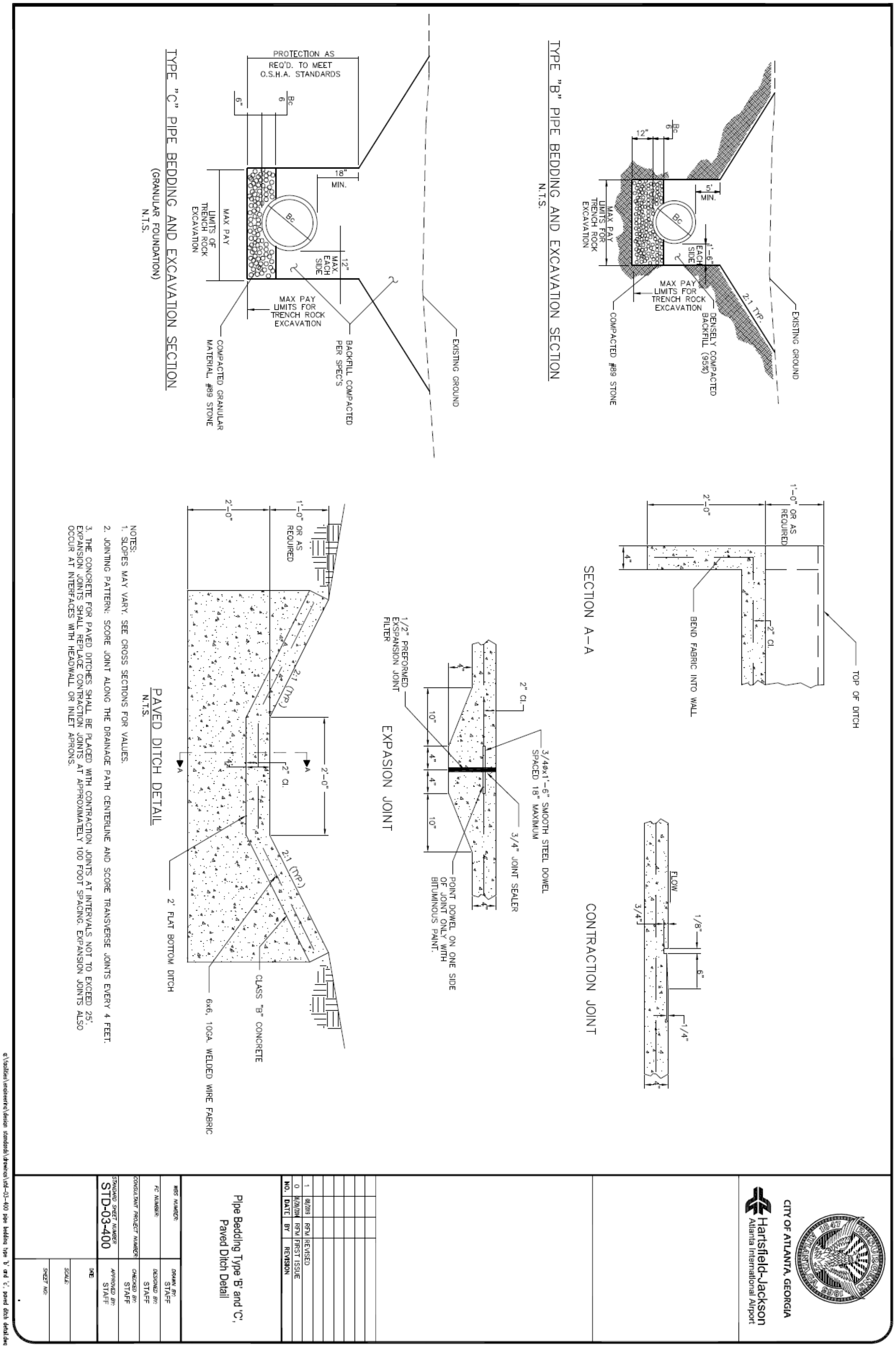
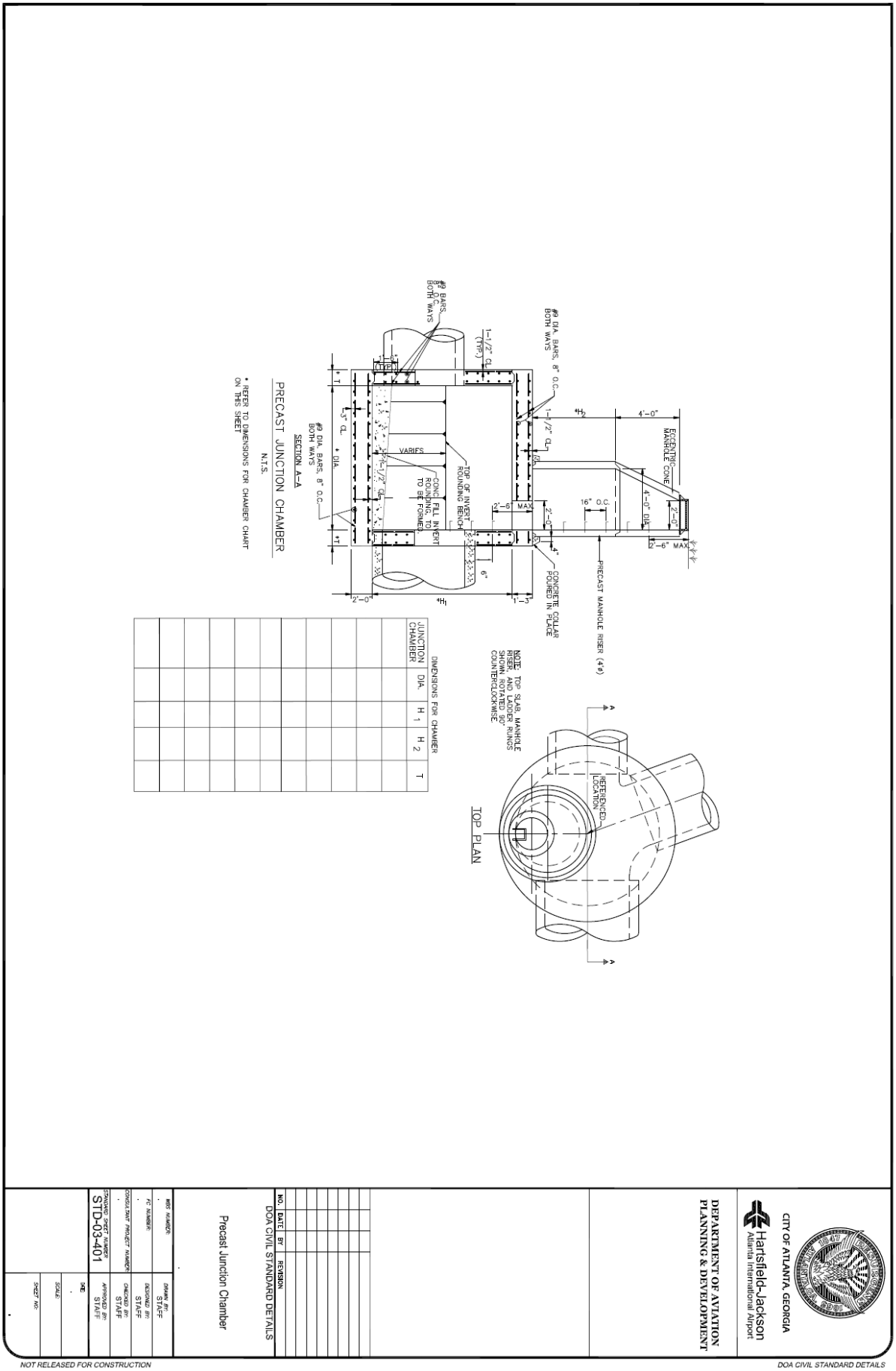
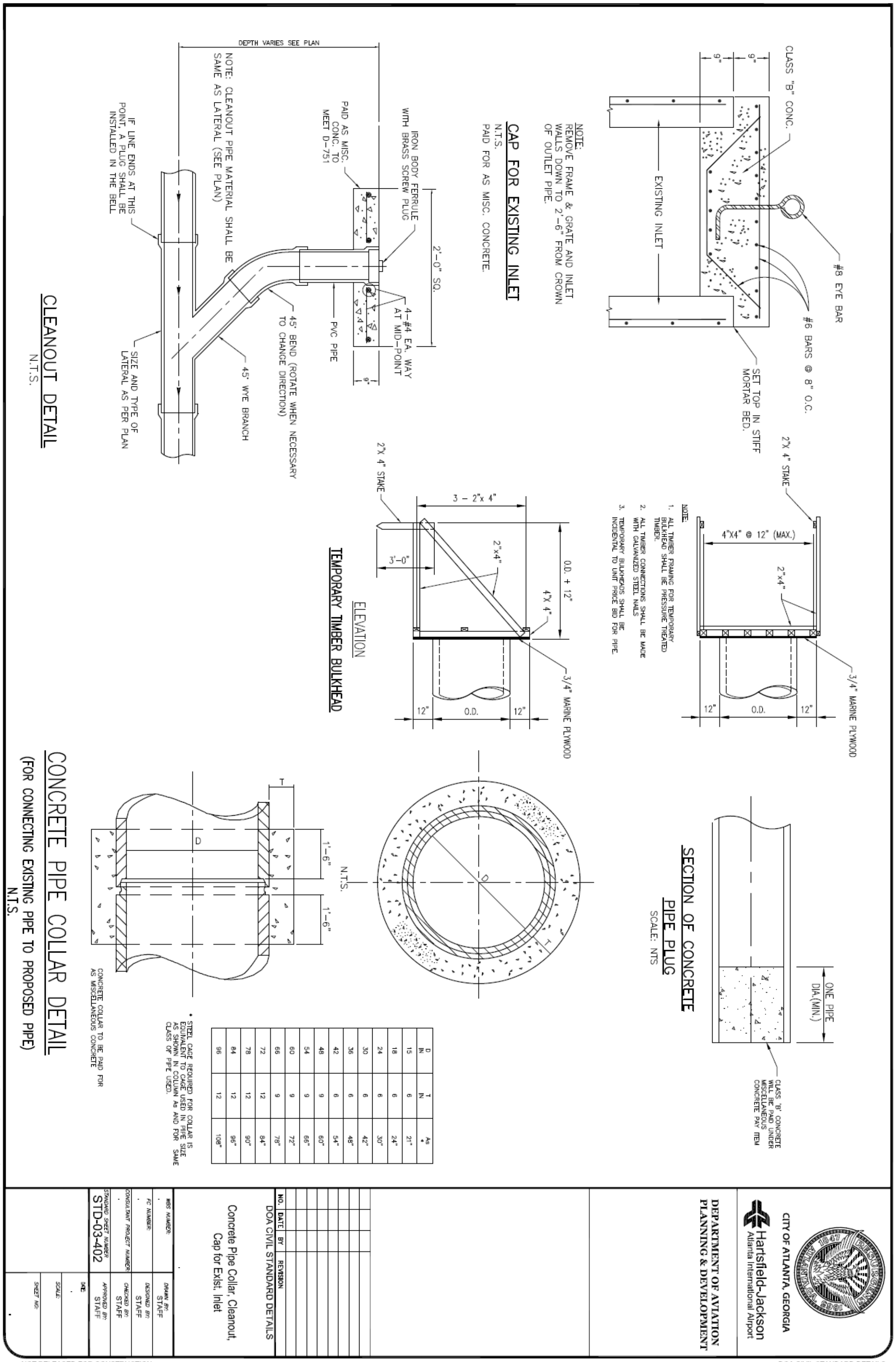
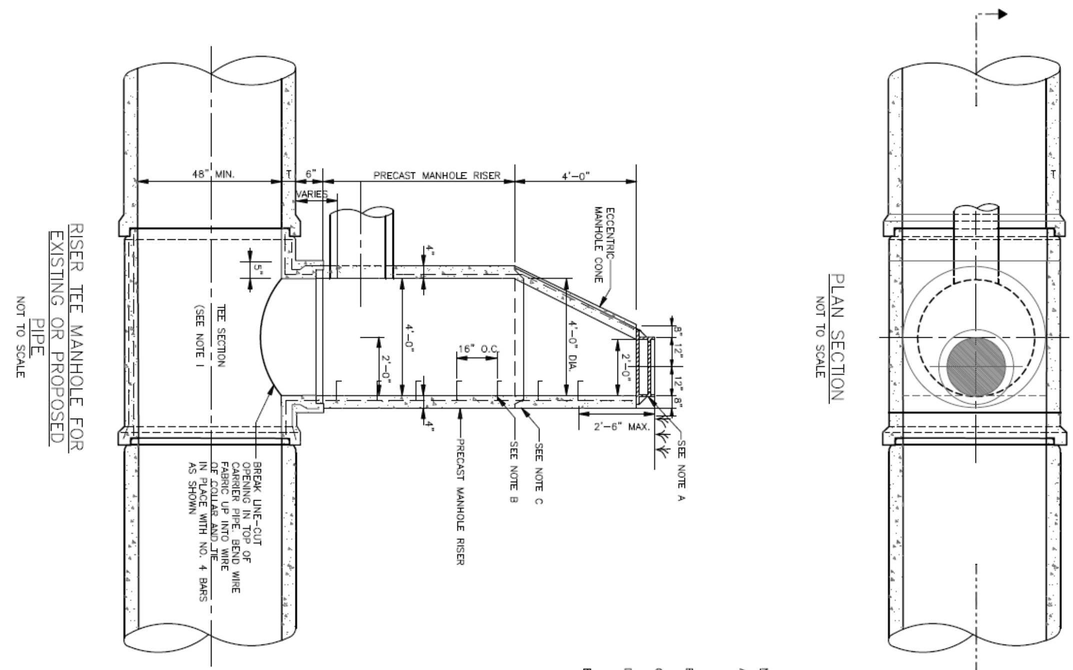

TYPE "B" PIPE BEDDING AND EXCAVATION SECTION
N.T.S.
EXISTING GROUND
2:1 TYP.
DENSELY COMPACTED BACKFILL (95%)
MAX PAY LIMITS FOR TRENCH ROCK EXCAVATION
COMPACTED #89 STONE
MAX PAY LIMITS FOR TRENCH ROCK EXCAVATION
5' MIN.
1'-6" EACH SIDE
12"
Bc
TYPE "C" PIPE BEDDING AND EXCAVATION SECTION
(GRANULAR FOUNDATION)
N.T.S.
PROTECTION AS REQ'D. TO MEET O.S.H.A. STANDARDS
18" MIN.
12" MAX. EACH SIDE
EXISTING GROUND
BACKFILL COMPACTED PER SPEC'S
MAX PAY LIMITS FOR TRENCH ROCK EXCAVATION
COMPACTED GRANULAR MATERIAL, #89 STONE
MAX PAY LIMITS OF TRENCH ROCK EXCAVATION
SECTION A–A
TOP OF DITCH
BEND FABRIC INTO WALL
1'-0" OR AS REQUIRED
2'-0"
2" Cl.
CONTRACTION JOINT
FLOW
1/8"
6"
1/4"
3/4"
EXPASION JOINT
1/2" PREFORMED EXSPANSION JOINT FILTER
3/4Øx1'-6" SMOOTH STEEL DOWEL SPACED 18" MAXIMUM
3/4" JOINT SEALER
POINT DOWEL ON ONE SIDE OF JOINT ONLY WITH BITUMINOUS PAINT.
PAVED DITCH DETAIL
N.T.S.
2:1 (TYP.)
2' FLAT BOTTOM DITCH
CLASS "B" CONCRETE
6x6, 10GA. WELDED WIRE FABRIC
NOTES:
1. SLOPES MAY VARY. SEE CROSS SECTIONS FOR VALUES.
2. JOINTING PATTERN: SCORE JOINT ALONG THE DRAINAGE PATH CENTERLINE AND SCORE TRANSVERSE JOINTS EVERY 4 FEET.
3. THE CONCRETE FOR PAVED DITCHES SHALL BE PLACED WITH CONTRACTION JOINTS AT INTERVALS NOT TO EXCEED 25'. EXPANSION JOINTS SHALL REPLACE CONTRACTION JOINTS AT APPROXIMATELY 100 FOOT SPACING. EXPANSION JOINTS ALSO OCCUR AT INTERFACES WITH HEADWALL OR INLET APRONS.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
NO. DATE BY REVISION
0 FIRST ISSUE
1 RFM REVISED
Pipe Bedding Type 'B' and 'C', Paved Ditch Detail
STANDARD SHEET NUMBER STD-03-400
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF


PRECAST JUNCTION CHAMBER
N.T.S.
* REFER TO DIMENSIONS FOR CHAMBER CHART ON THIS SHEET
SECTION A-A
#9 BARS, BOTH WAYS
#9 DIA. BARS, 8" O.C. BOTH WAYS
1-1/2" CL. (TYP.)
VARIES
TOP OF INVERT ROUNDING BENCH
CONCRETE FILL INVERT ROUNDING TO BE FORMED
4'-0" ECCENTRIC MANHOLE CONE
4'-0" DIA.
2'-0"
2'-6" MAX.
16" O.C.
2'-6" MAX.
4"
CONCRETE COLLAR POURED IN PLACE
PRECAST MANHOLE RISER (4'ø)
6"
1'-3"
2'-0"
NOTE TOP SLAB, MANHOLE RISER AND LADDER RUNGS SHOWN ROTATED 90° COUNTERCLOCKWISE
TOP PLAN
REFERENCED LOCATION
DIMENSIONS FOR CHAMBER
JUNCTION CHAMBER DIA.
H 1
H 2
T
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Precast Junction Chamber
WBS NUMBER
FC NUMBER
CONSTRUCT PROJECT NUMBER
STANDARD SHEET NUMBER
STD-03-401
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE
SCALE
SHEET NO.
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
q:\facilities\engineering\design standards\drawings\std-03-401 precast junction chamber.dwg


CAP FOR EXISTING INLET
N.T.S.
PAID FOR AS MISC. CONCRETE.
NOTE:
REMOVE FRAME & GRATE AND INLET WALLS DOWN TO 2'-6" FROM CROWN OF OUTLET PIPE.
CLASS "B" CONC.
#8 EYE BAR
#6 BARS @ 8" O.C.
EXISTING INLET
SET TOP IN STIFF MORTAR BED.
9"
9"
CLEANOUT DETAIL
N.T.S.
DEPTH VARIES SEE PLAN
NOTE: CLEANOUT PIPE MATERIAL SHALL BE SAME AS LATERAL (SEE PLAN)
IRON BODY FERRULE WITH BRASS SCREW PLUG
PAID AS MISC. CONC. TO MEET D-751
2'-0" SQ.
4-#4 EA. WAY AT MID-POINT
PVC PIPE
45° BEND (ROTATE WHEN NECESSARY TO CHANGE DIRECTION)
45° WYE BRANCH
IF LINE ENDS AT THIS POINT, A PLUG SHALL BE INSTALLED IN THE BELL
SIZE AND TYPE OF LATERAL AS PER PLAN
TEMPORARY TIMBER BULKHEAD
ELEVATION
2"X 4" STAKE
4"X4" @ 12" (MAX.)
2"x4"
3/4" MARINE PLYWOOD
12"
O.D.
12"
NOTE:
1. ALL TIMBER FRAMING FOR TEMPORARY BULKHEAD SHALL BE PRESSURE TREATED TIMBER.
2. ALL TIMBER CONNECTIONS SHALL BE MADE WITH GALVANIZED STEEL NAILS
3. TEMPORARY BULKHEADS SHALL BE INCIDENTAL TO UNIT PRICE BID FOR PIPE.
3 - 2"x 4"
O.D. + 12"
4"X 4"
3'-0"
SECTION OF CONCRETE PIPE PLUG
SCALE: NTS
ONE PIPE DIA.(MIN.)
CLASS "B" CONCRETE WILL BE PAID UNDER MISCELLANEOUS CONCRETE PAY ITEM
CONCRETE PIPE COLLAR DETAIL
(FOR CONNECTING EXISTING PIPE TO PROPOSED PIPE)
N.T.S.
T
D
1'-6"
1'-6"
N.T.S.
CONCRETE COLLAR TO BE PAID FOR AS MISCELLANEOUS CONCRETE

D IN	T IN	As *
15	6	21"
18	6	24"
24	6	30"
30	6	42"
36	6	48"
42	6	54"
48	9	60"
54	9	66"
60	9	72"
66	9	78"
72	12	84"
78	12	90"
84	12	96"
96	12	108"

* STEEL CAGE REQUIRED FOR COLLAR IS EQUIVALENT TO CAGE USED IN PIPE SIZE AS SHOWN IN COLUMN As AND FOR SAME CLASS OF PIPE USED.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Concrete Pipe Collar, Cleanout, Cap for Exist. Inlet
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-03-402
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS



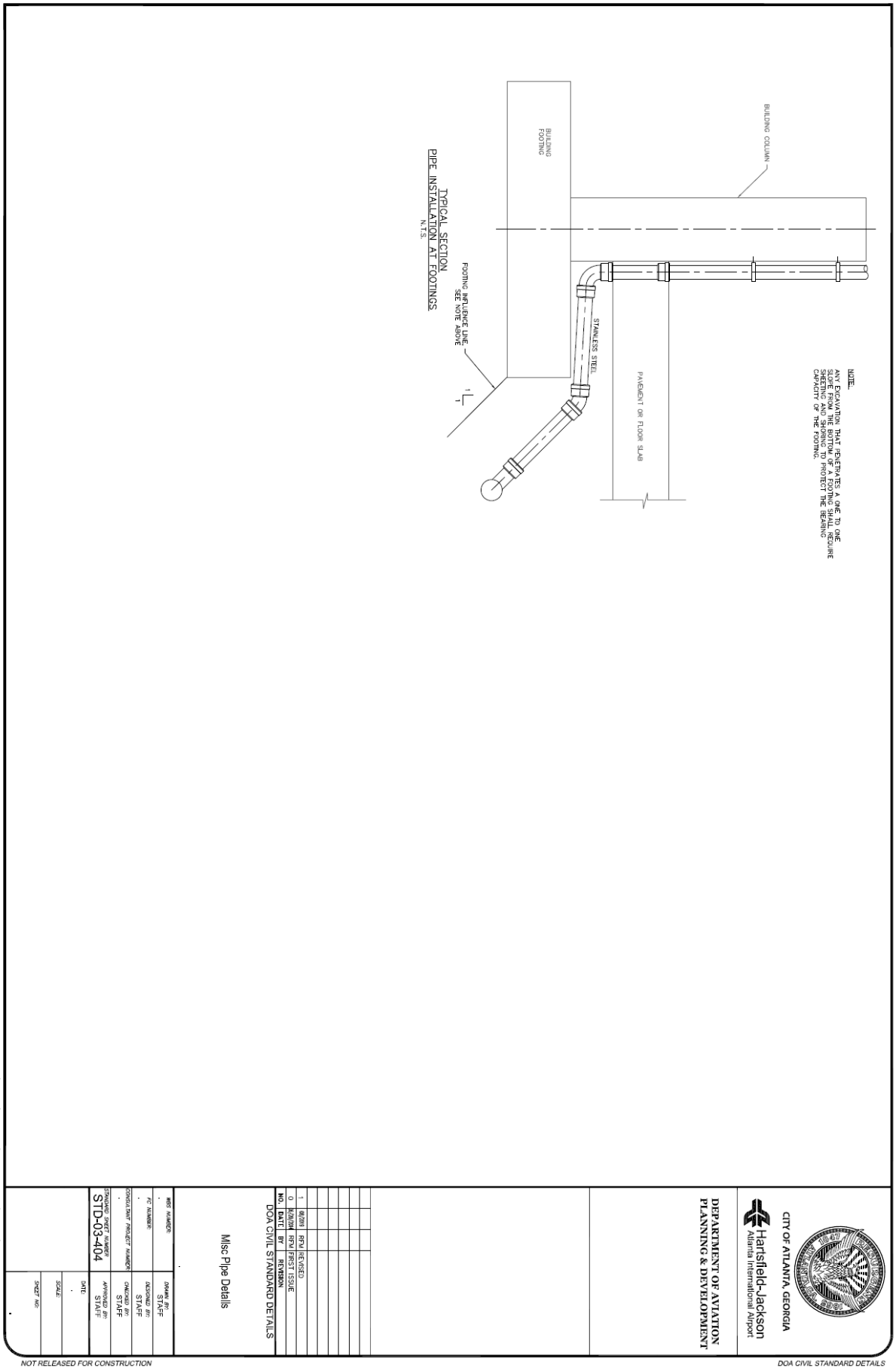
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS
Riser Tee Manhole for Existing or Proposed Pipe

WBS NUMBER:	DRAWN BY: STAFF
FC NUMBER:	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER:	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-03-403	APPROVED BY: STAFF
	DATE:
	SCALE:
	SHEET NO:

NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
q:\facilities\engineering\design standards\drawings\std-03-403 riser tee manhole for existing or proposed pipe.dwg


BUILDING COLUMN
BUILDING FOOTING
STAINLESS STEEL
PAVEMENT OR FLOOR SLAB
FOOTING INFLUENCE LINE SEE NOTE ABOVE
1
1
NOTE:
ANY EXCAVATION THAT PENETRATES A ONE TO ONE SLOPE FROM THE BOTTOM OF A FOOTING SHALL REQUIRE SHEETING AND SHORING TO PROTECT THE BEARING CAPACITY OF THE FOOTING.
TYPICAL SECTION
PIPE INSTALLATION AT FOOTINGS
N.T.S.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE BY REVISION
1 08/2011 RPM REVISED
0 08/2010 RPM FIRST ISSUE
DOA CIVIL STANDARD DETAILS
Misc Pipe Details
WBS NUMBER:
PC NUMBER:
CONSULTANT PROJECT NUMBER:
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
STANDARD SHEET NUMBER
STD-03-404
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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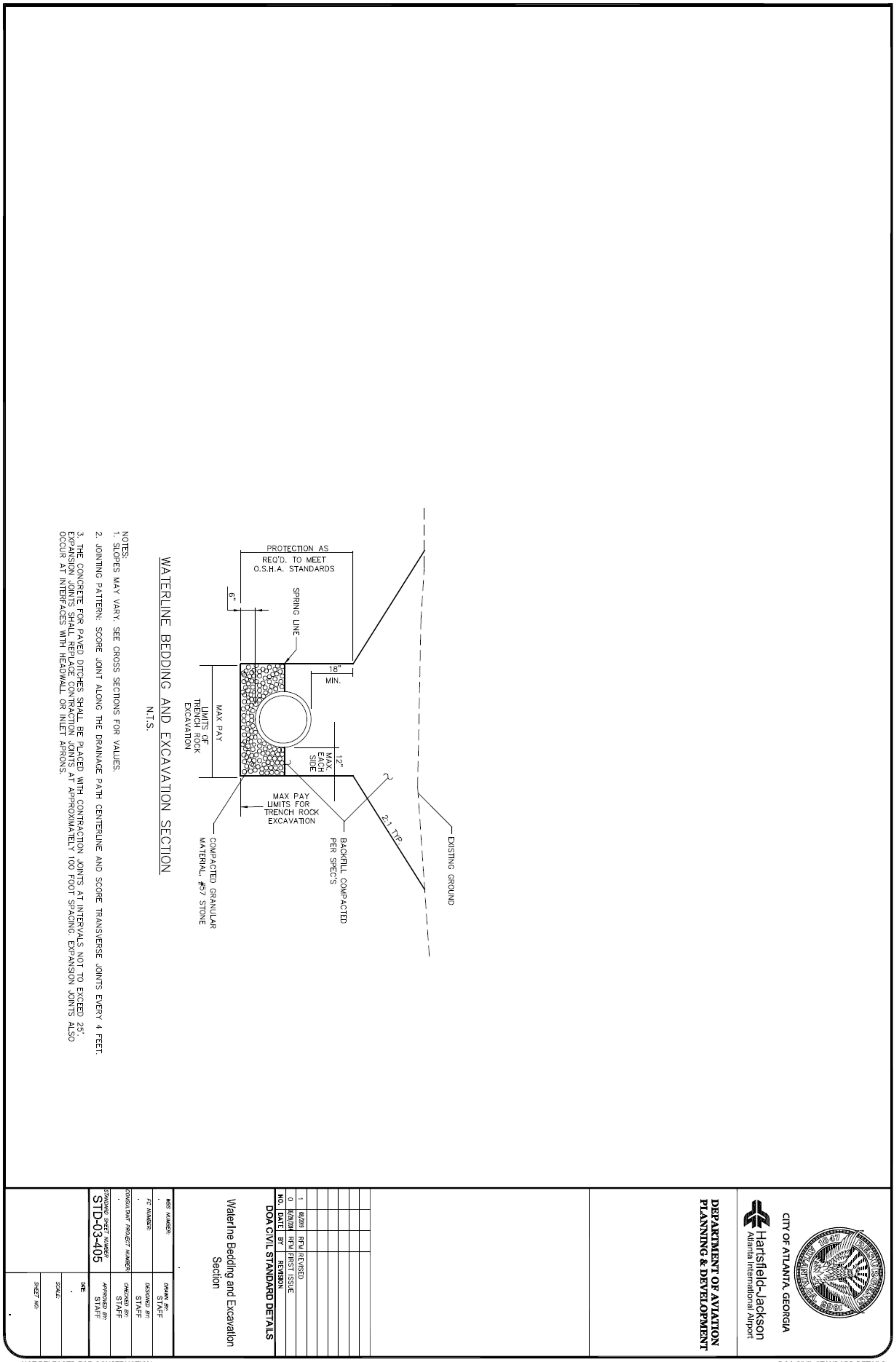
EXISTING GROUND
PROTECTION AS REQ'D. TO MEET O.S.H.A. STANDARDS
6"
SPRING LINE
18" MIN.
12" MAX. EACH SIDE
2:1 TYP.
BACKFILL COMPACTED PER SPEC'S
MAX PAY LIMITS OF TRENCH ROCK EXCAVATION
MAX PAY LIMITS FOR TRENCH ROCK EXCAVATION
COMPACTED GRANULAR MATERIAL, #57 STONE
WATERLINE BEDDING AND EXCAVATION SECTION
N.T.S.
NOTES:
1. SLOPES MAY VARY. SEE CROSS SECTIONS FOR VALUES.
2. JOINTING PATTERN: SCORE JOINT ALONG THE DRAINAGE PATH CENTERLINE AND SCORE TRANSVERSE JOINTS EVERY 4 FEET.
3. THE CONCRETE FOR PAVED DITCHES SHALL BE PLACED WITH CONTRACTION JOINTS AT INTERVALS NOT TO EXCEED 25'. EXPANSION JOINTS SHALL REPLACE CONTRACTION JOINTS AT APPROXIMATELY 100 FOOT SPACING. EXPANSION JOINTS ALSO OCCUR AT INTERFACES WITH HEADWALL OR INLET APRONS.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
1 08/2019 RFM REVISED
0 XX/XX/20XX RFM FIRST ISSUE
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Waterline Bedding and Excavation Section
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-03-405
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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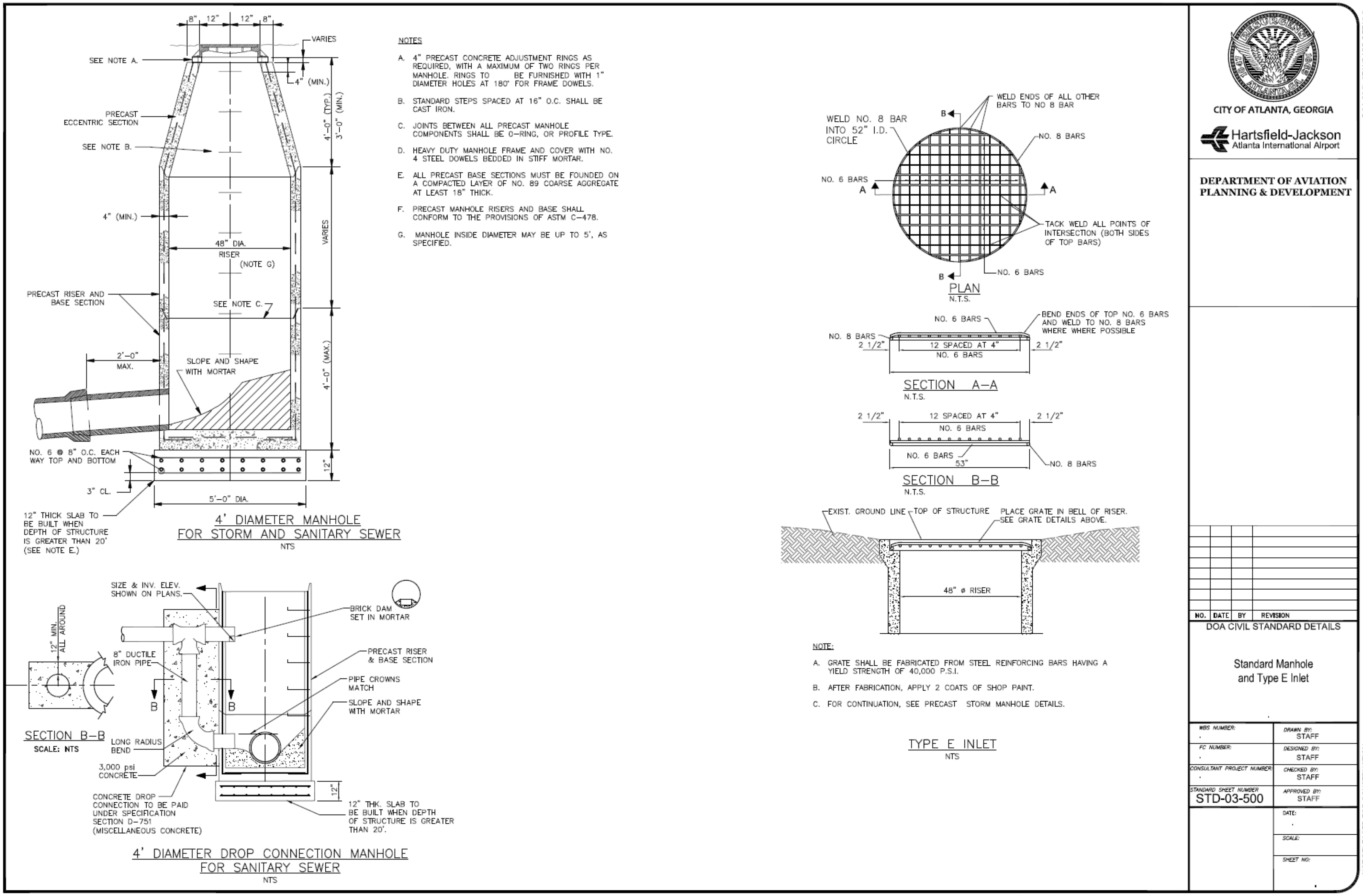
SEE NOTE A.
PRECAST ECCENTRIC SECTION
SEE NOTE B.
4" (MIN.)
48" DIA. RISER (NOTE G)
PRECAST RISER AND BASE SECTION
SEE NOTE C.
2'–0" MAX.
SLOPE AND SHAPE WITH MORTAR
NO. 6 @ 8" O.C. EACH WAY TOP AND BOTTOM
3" CL.
5'–0" DIA.
12" THICK SLAB TO BE BUILT WHEN DEPTH OF STRUCTURE IS GREATER THAN 20' (SEE NOTE E.)
8" 12" 12" 8"
VARIES
4" (MIN.)
4'–0" (TYP.)
3'–0" (MIN.)
VARIES
4'–0" (MAX.)
12"
4' DIAMETER MANHOLE
FOR STORM AND SANITARY SEWER
NTS
NOTES
A. 4" PRECAST CONCRETE ADJUSTMENT RINGS AS REQUIRED, WITH A MAXIMUM OF TWO RINGS PER MANHOLE. RINGS TO BE FURNISHED WITH 1" DIAMETER HOLES AT 180° FOR FRAME DOWELS.
B. STANDARD STEPS SPACED AT 16" O.C. SHALL BE CAST IRON.
C. JOINTS BETWEEN ALL PRECAST MANHOLE COMPONENTS SHALL BE O–RING, OR PROFILE TYPE.
D. HEAVY DUTY MANHOLE FRAME AND COVER WITH NO. 4 STEEL DOWELS BEDDED IN STIFF MORTAR.
E. ALL PRECAST BASE SECTIONS MUST BE FOUNDED ON A COMPACTED LAYER OF NO. 89 COARSE AGGREGATE AT LEAST 18" THICK.
F. PRECAST MANHOLE RISERS AND BASE SHALL CONFORM TO THE PROVISIONS OF ASTM C–478.
G. MANHOLE INSIDE DIAMETER MAY BE UP TO 5', AS SPECIFIED.
12" MIN. ALL AROUND
SECTION B–B
SCALE: NTS
SIZE & INV. ELEV. SHOWN ON PLANS.
8" DUCTILE IRON PIPE
LONG RADIUS BEND
3,000 psi CONCRETE
CONCRETE DROP CONNECTION TO BE PAID UNDER SPECIFICATION SECTION D–751 (MISCELLANEOUS CONCRETE)
BRICK DAM SET IN MORTAR
PRECAST RISER & BASE SECTION
PIPE CROWNS MATCH
SLOPE AND SHAPE WITH MORTAR
12" THK. SLAB TO BE BUILT WHEN DEPTH OF STRUCTURE IS GREATER THAN 20'.
12"
4' DIAMETER DROP CONNECTION MANHOLE
FOR SANITARY SEWER
NTS
WELD NO. 8 BAR INTO 52" I.D. CIRCLE
WELD ENDS OF ALL OTHER BARS TO NO 8 BAR
NO. 8 BARS
NO. 6 BARS
TACK WELD ALL POINTS OF INTERSECTION (BOTH SIDES OF TOP BARS)
NO. 6 BARS
PLAN
N.T.S.
NO. 6 BARS
BEND ENDS OF TOP NO. 6 BARS AND WELD TO NO. 8 BARS WHERE WHERE POSSIBLE
NO. 8 BARS
2 1/2"
12 SPACED AT 4"
NO. 6 BARS
2 1/2"
SECTION A–A
N.T.S.
2 1/2"
12 SPACED AT 4"
NO. 6 BARS
2 1/2"
NO. 6 BARS
53"
NO. 8 BARS
SECTION B–B
N.T.S.
EXIST. GROUND LINE
TOP OF STRUCTURE
PLACE GRATE IN BELL OF RISER. SEE GRATE DETAILS ABOVE.
48" ø RISER
NOTE:
A. GRATE SHALL BE FABRICATED FROM STEEL REINFORCING BARS HAVING A YIELD STRENGTH OF 40,000 P.S.I.
B. AFTER FABRICATION, APPLY 2 COATS OF SHOP PAINT.
C. FOR CONTINUATION, SEE PRECAST STORM MANHOLE DETAILS.
TYPE E INLET
NTS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson
Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE BY REVISION
DOA CIVIL STANDARD DETAILS
Standard Manhole
and Type E Inlet
WBS NUMBER:
FC NUMBER:
CONSULTANT PROJECT NUMBER:
STANDARD SHEET NUMBER
STD-03-500
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO:
DOA CIVIL STANDARD DETAILS
NOT RELEASED FOR CONSTRUCTION
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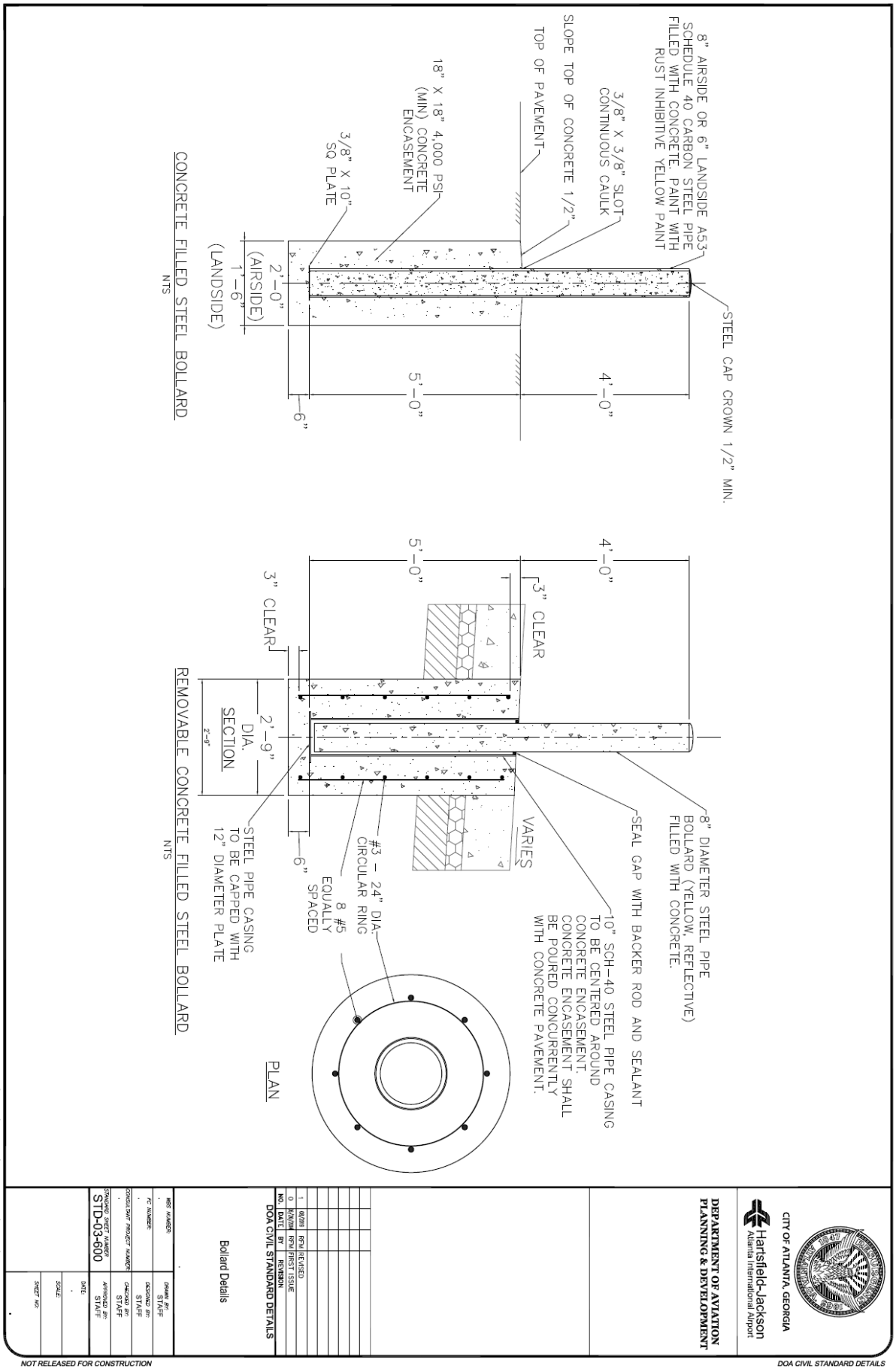
8" AIRSIDE OR 6" LANDSIDE A53 SCHEDULE 40 CARBON STEEL PIPE FILLED WITH CONCRETE. PAINT WITH RUST INHIBITIVE YELLOW PAINT
3/8" X 3/8" SLOT CONTINUOUS CAULK
SLOPE TOP OF CONCRETE 1/2"
TOP OF PAVEMENT
18" X 18" 4,000 PSI (MIN) CONCRETE ENCASEMENT
3/8" X 10" SQ PLATE
STEEL CAP CROWN 1/2" MIN.
2'-0" (AIRSIDE)
1'-6" (LANDSIDE)
6"
5'-0"
4'-0"
CONCRETE FILLED STEEL BOLLARD
NTS
3" CLEAR
VARIES
8" DIAMETER STEEL PIPE BOLLARD (YELLOW, REFLECTIVE) FILLED WITH CONCRETE.
SEAL GAP WITH BACKER ROD AND SEALANT
10" SCH-40 STEEL PIPE CASING TO BE CENTERED AROUND CONCRETE ENCASEMENT. CONCRETE ENCASEMENT SHALL BE POURED CONCURRENTLY WITH CONCRETE PAVEMENT.
#3 - 24" DIA CIRCULAR RING
8 #5 EQUALLY SPACED
STEEL PIPE CASING TO BE CAPPED WITH 12" DIAMETER PLATE
2'-9" DIA. SECTION
PLAN
REMOVABLE CONCRETE FILLED STEEL BOLLARD
NTS
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT
NO. DATE BY REVISION
0 M/D/YR RPM FIRST ISSUE
1 M/D/YR RPM REVISED
DOA CIVIL STANDARD DETAILS
Bollard Details
WBS NUMBER:
PC NUMBER:
CONSULTANT PROJECT NUMBER:
DRAWING NUMBER
STD-03-600
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
DATE:
SCALE:
SHEET NO.:
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS
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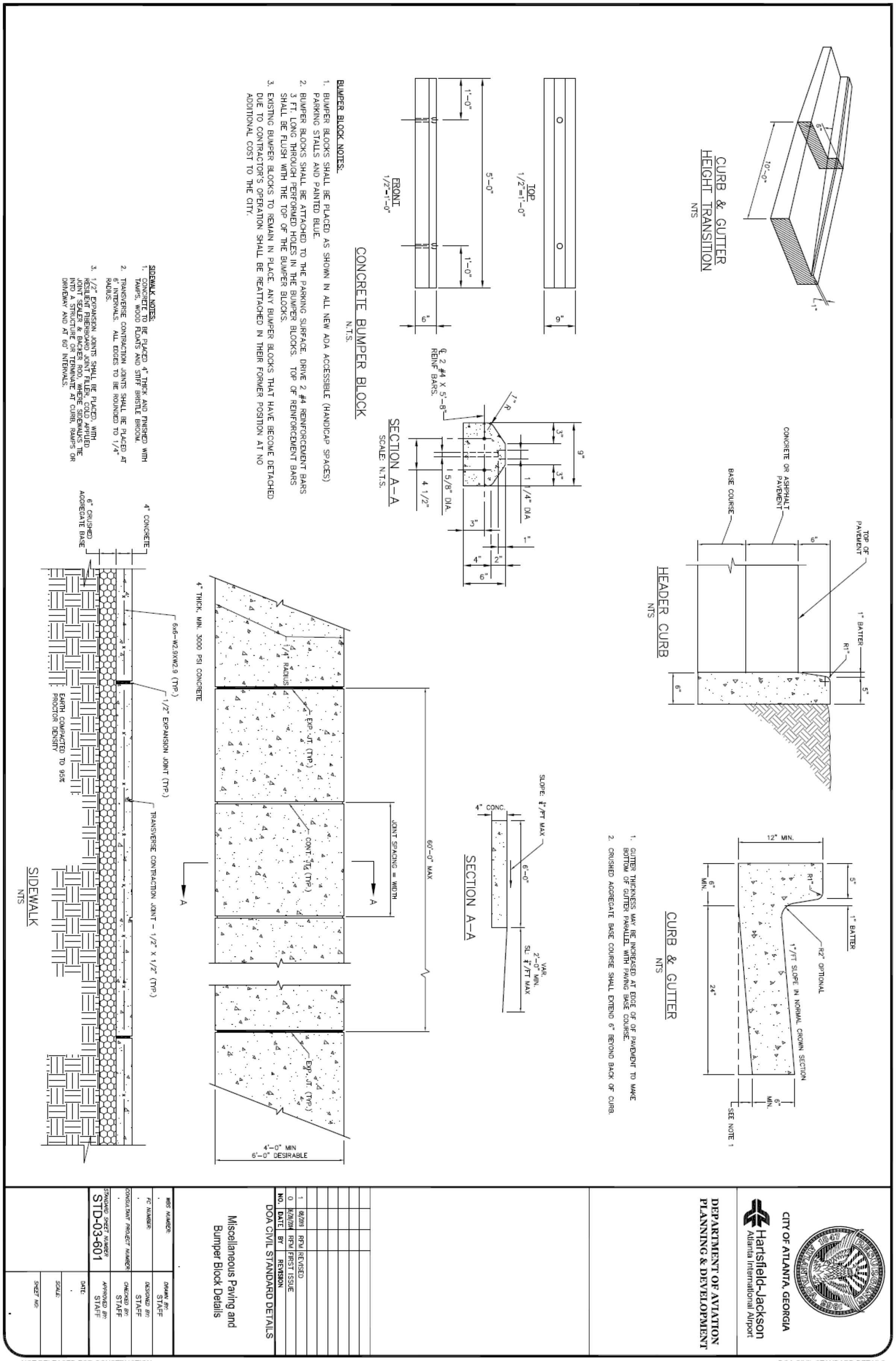
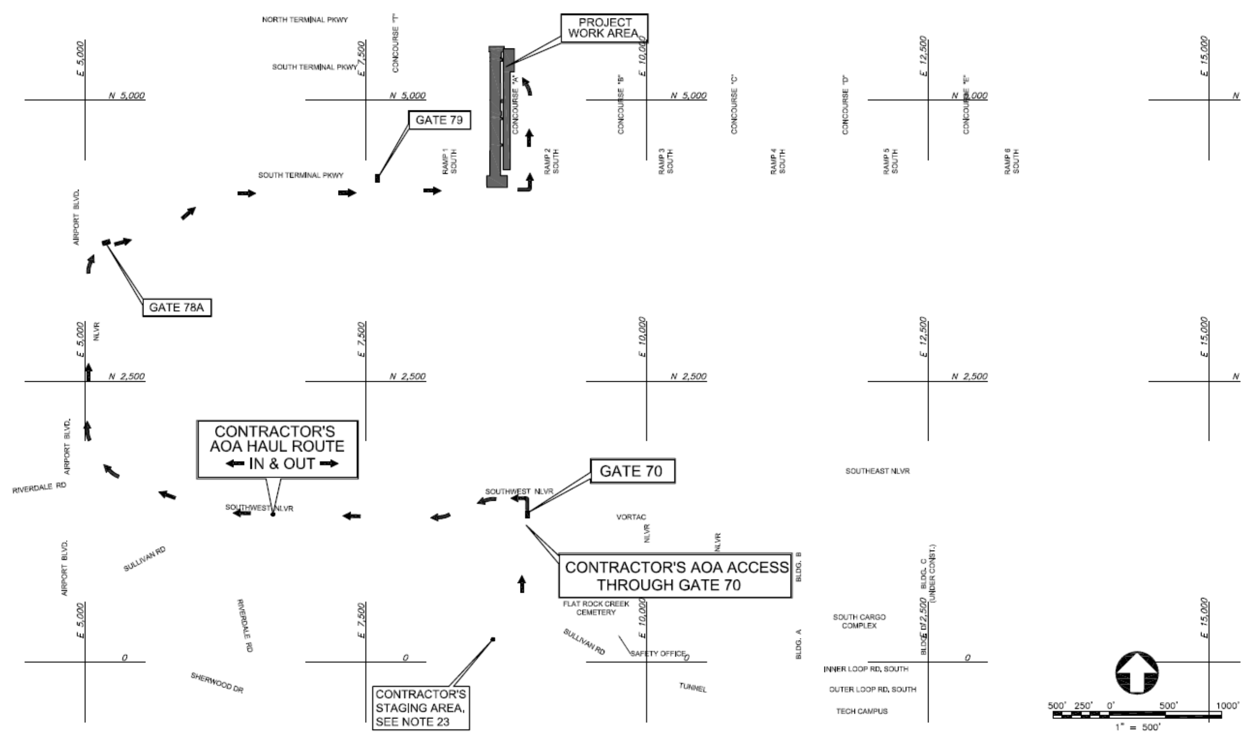

CURB & GUTTER HEIGHT TRANSITION
NTS
HEADER CURB
NTS
CONCRETE OR ASPHALT PAVEMENT
BASE COURSE
TOP OF PAVEMENT
1" BATTER
CURB & GUTTER
NTS
12" MIN.
R2" OPTIONAL
1"/FT SLOPE IN NORMAL CROWN SECTION
SEE NOTE 1
1. GUTTER THICKNESS MAY BE INCREASED AT EDGE OF OF PAVEMENT TO MAKE BOTTOM OF GUTTER PARALLEL WITH PAVING BASE COURSE.
2. CRUSHED AGGREGATE BASE COURSE SHALL EXTEND 6" BEYOND BACK OF CURB.
TOP
1/2"=1'-0"
FRONT
1/2"=1'-0"
SECTION A–A
SCALE: N.T.S.
CONCRETE BUMPER BLOCK
N.T.S.
BUMPER BLOCK NOTES:
1. BUMPER BLOCKS SHALL BE PLACED AS SHOWN IN ALL NEW ADA ACCESSIBLE (HANDICAP SPACES) PARKING STALLS AND PAINTED BLUE.
2. BUMPER BLOCKS SHALL BE ATTACHED TO THE PARKING SURFACE. DRIVE 2 #4 REINFORCEMENT BARS 3 FT. LONG THROUGH PERFORMED HOLES IN THE BUMPER BLOCKS. TOP OF REINFORCEMENT BARS SHALL BE FLUSH WITH THE TOP OF THE BUMPER BLOCKS.
3. EXISTING BUMPER BLOCKS TO REMAIN IN PLACE. ANY BUMPER BLOCKS THAT HAVE BECOME DETACHED DUE TO CONTRACTOR'S OPERATION SHALL BE REATTACHED IN THEIR FORMER POSITION AT NO ADDITIONAL COST TO THE CITY.
SECTION A–A
SLOPE: ¼"/FT MAX
60'-0" MAX
JOINT SPACING = WIDTH
4'-0" MIN
6'-0" DESIRABLE
4" THICK, MIN. 3000 PSI CONCRETE
6x6-W2.9xW2.9 (TYP.)
1/2" EXPANSION JOINT (TYP.)
TRANSVERSE CONTRACTION JOINT – 1/2" X 1/2" (TYP.)
4" CONCRETE
6" CRUSHED AGGREGATE BASE
EARTH COMPACTED TO 95% PROCTOR DENSITY
SIDEWALK
NTS
SIDEWALK NOTES:
1. CONCRETE TO BE PLACED 4" THICK AND FINISHED WITH TAMPS, WOOD FLOATS AND STIFF BRISTLE BROOM.
2. TRANSVERSE CONTRACTION JOINTS SHALL BE PLACED AT 6' INTERVALS. ALL EDGES TO BE ROUNDED TO 1/4" RADIUS.
3. 1/2" EXPANSION JOINTS SHALL BE PLACED WITH RESILIENT FIBERBOARD JOINT FILLER, COLD APPLIED JOINT SEALER & BACKER ROD, WHERE SIDEWALKS TIE INTO A STRUCTURE OR TERMINATE AT CURB, RAMPS OR DRIVEWAY AND AT 60' INTERVALS.
CITY OF ATLANTA, GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
Miscellaneous Paving and Bumper Block Details
STANDARD SHEET NUMBER STD-03-601
DRAWN BY: STAFF
DESIGNED BY: STAFF
CHECKED BY: STAFF
APPROVED BY: STAFF
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS



SCOPE OF WORK

1. CONSTRUCT NEW SEWER COLLECTOR LINE AND LATERALS IN THE AIRCRAFT RAMP.

2. RELOCATE PLUMBING WASTE LINES IN CONCOURSE A SOUTH TO CONNECT TO NEW APRON COLLECTOR.

3. ARCHITECTURAL FINISHES AS REQUIRED TO RESTORE FLOORS, WALLS AND ALL OTHERS DISTURBED AREAS IN THE BUILDING.

GENERAL NOTES:

1. ALL CONSTRUCTION WILL OCCUR WITHIN THE SECURITY IDENTIFICATION DISPLAY AREA (SIDA) AND AIRCRAFT OPERATIONS AREA (AOA). THIS IS A SECURE AREA WITH RESTRICTED ACCESS. THE CONTRACTOR WILL BE REQUIRED TO MEET ALL REQUIREMENTS FOR ENTERING AND OPERATING IN THIS AREA AT ALL TIMES. IT SHALL BE THE CONTRACT RESPONSIBILITY TO FAMILIARIZE THEMSELVES WITH ALL REQUIREMENTS FOR ENTERING AND OPERATING IN THE SIDA AND AOA. FURTHER, IT WILL REMAIN THE CONTRACTOR'S RESPONSIBILITY FOR KEEPING ADVISED OF ANY CHANGES IN REQUIREMENTS AND TO ADHERE TO THE CURRENT REGULATIONS INCLUDING CURRENT AND FUTURE REGULATIONS FOR SECURITY BADGING AND FINGERPRINTING OF CONTRACTOR PERSONNEL.

2. ALL CONTRACTOR PERSONNEL AND SUBCONTRACTORS WORKING WITHIN THE SIDA/AOA SHALL HAVE AIRPORT SECURITY BADGES OR BE ESCORTED BY APPROVED CONTRACTOR BADGED ESCORT PERSONNEL. SIDA INCLUDES ALL AREAS WITHIN THE AIRPORT SECURITY FENCE. THE AOA INCLUDES AREAS IN OR WITHIN CLOSE PROXIMITY TO AIRCRAFT MOVEMENT AREAS. ESCORT PERSONNEL SHALL BE APPROVED BY THE AIRPORT SECURITY OFFICE FOR WORKING WITHIN SIDA AND BY THE AIRPORT OPERATIONS OFFICE FOR WORKING WITHIN THE AOA. EACH ESCORT VEHICLE IS ALLOWED TO ESCORT A MAXIMUM OF TWO VEHICLES. ALL ESCORT PERSONNEL SHALL HAVE AIRPORT BADGES. DUE TO THE TIME NECESSARY TO COMPLETE THE BADGING AND FINGERPRINTING PROCESS, THE CONTRACTOR MAY START THE PROCESS AFTER CONTRACT AWARD AND BEFORE CONSTRUCTION NOTICE–TO–PROCEED.

3. ALL PERSONNEL DRIVING ON THE AOA ARE REQUIRED TO TAKE THE DOA DRIVER CLASS.

4. ALL CONTRACTOR PERSONNEL INCLUDING SUBCONTRACTORS ON THE PROJECT SHALL HAVE AND DISPLAY PROPERLY AN OWNER CONTROLLED INSURANCE PROGRAM (OCIP) SAFETY BADGE ISSUED BY THE DEPARTMENT OF AVIATION (DOA). THIS BADGE DISPLAYING A PHOTO OF THE EMPLOYEE SHALL BE WORN AT ALL TIMES WHILE ON THE AIRPORT. TO OBTAIN THIS BADGE EACH EMPLOYEE SHALL ATTEND A 2 HOUR SAFETY CLASS GIVEN A 7:00 AM EACH MORNING AT THE AIRPORT. THERE IS NOT A FEE FOR THE BADGE UNLESS A REPLACEMENT IS REQUIRED. FOR MORE INFORMATION ON SAFETY BADGES CONTACT EARL KELLER AT 404–569–0794.

5. THIS PROJECT IS WITHIN AN AREA OF CONTINUOUS LARGE JET AIRCRAFT OPERATIONS. ALL CONSTRUCTION ACTIVITIES WILL BE CONDUCTED IN A MANNER ACCEPTABLE TO THE CITY OF ATLANTA (CITY) AND THE FEDERAL AVIATION ADMINISTRATION (FAA) TO PROVIDE ACCEPTABLE LEVELS OF SAFETY FOR ALL AIRPORT OPERATIONS. PERIODIC MEETINGS WILL BE HELD TO COORDINATE THE ACTIVITIES OF THIS CONTRACT WITH OTHER AIRPORT OPERATIONS. ALSO THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PROTECT HIS EMPLOYEES, EQUIPMENT, AND WORK IN PROGRESS FROM AIRCRAFT NOISE AND JET ENGINE BLAST.

6. THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN AND MAINTAIN 2–WAY RADIOS EQUIPPED TO OPERATE ON THE CITY'S OPERATIONAL FREQUENCY. THIS FREQUENCY SHALL BE MONITORED AT ALL TIMES WHILE WORKING IN THE SIDA TO ASSURE PROPER COORDINATION AND SAFETY. THE CONTRACTOR SHALL SUPPLY ONE CITY OPERATIONAL RADIO PER CONSTRUCTION CREW AND ONE PER ESCORT VEHICLE. THESE RADIOS SHALL BECOME THE PROPERTY OF THE CITY UPON COMPLETION OF THE PROJECT.

7. CONTRACTOR SHALL CONFINE WORK AREA TO THE MINIMUM AMOUNT OF SPACE REQUIRED TO ACCOMPLISH THE ACTIVITY.

8. THE CONTRACTOR WILL BE REQUIRED TO PROVIDE AND MAINTAIN A MINIMUM OF TWO (2) NEW CELL PHONES OR HAND HELD 2–WAY RADIOS, COMPLETE WITH CARRYING CASE AND CHARGERS TO THE CITY. THIS EQUIPMENT SHALL BE MONITORED AT ALL TIMES TO ASSURE CONSTANT COMMUNICATION BETWEEN THE CITY AND THE CONTRACTOR. THE EQUIPMENT WILL BE RETURNED TO THE CONTRACTOR AT CONTRACT COMPLETION.

9. THE CONTRACTOR'S ACCESS ROUTES TO THE PROJECT SITES SHALL BE VIA GATE 70 AND THE NLVR AS SHOWN. VISITORS OR ANY INDIVIDUALS WHO ARE NOT BADGED SHALL BE ESCORTED AT ALL TIMES WHILE IN THE SIDA IN ACCORDANCE WITH AIRPORT SECURITY REQUIREMENTS.

10. ALL EXCESS MATERIAL PRODUCED BY THE CONTRACTOR'S OPERATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND DISPOSED OF OFF AIRPORT PROPERTY AT NO COST TO THE OWNER.

11. THE CONTRACTOR SHALL CONTROL DUST AND DEBRIS FROM HIS OPERATION TO A LEVEL ACCEPTABLE TO THE CITY AT ALL TIMES. THE CONTRACTOR SHALL MAINTAIN ACCESS TO VACUUM SWEEPERS, WATERING TRUCKS AND OTHER EQUIPMENT NECESSARY TO CONTROL DUST AT ALL TIMES AT THE PROJECT SITE. ALL METHODS FOR CONTROLLING DUST SHALL BE SUBJECT TO THE CITY'S APPROVAL. DUST CONTROL SHALL BE STRICTLY MONITORED DUE TO IT'S IMPACT ON AIRCRAFT SAFETY. FAILURE TO PROPERLY CONTROL DUST OR TO RESPOND TO ANY REQUESTED TO DO SO WILL RESULT IN CONSTRUCTION ACTIVITIES BEING STOPPED.

12. CONTRACTOR SHALL COOPERATE WITH EXISTING AND FUTURE CONTRACTORS WORKING IN THE AREA AND AT ALL TIMES WILL COORDINATE THEIR EFFORTS.

13. A DETAILED PLAN OF PROCEDURES OF INSTALLATION AND MAINTENANCE OF SECURITY THE CONTRACTOR PROPOSES TO USE WILL BE SUBMITTED TO THE CITY FOR APPROVAL PRIOR TO THE START OF ANY WORK UNDER THIS CONTRACT. COMPLIANCE WITH THE APPROVED PLAN WILL BE STRICTLY ENFORCED. THE CITY MAY REQUIRE CHANGES TO THE ESTABLISHED PLAN WHENEVER IT IS NECESSARY FOR THE PROTECTION OF AIRPORT SECURITY AND OPERATIONS.

14. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL STATE AND FEDERAL LAWS AND REGULATIONS THAT ARE PERTINENT TO THIS WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND PAY ALL COSTS ASSOCIATED WITH THE PERMITS AND LICENSES REQUIRED TO ACCOMPLISHED THIS WORK.

15. DURING ALL PHASES OF OPERATION THE CONTRACTOR'S FIRST RESPONSIBILITY SHALL BE SAFETY. THUS, HAUL TRUCKS MUST BE COVERED AND ANY SPILLAGE OR DEBRIS BUILDUP PROMPTLY REMOVED FROM ALL HAUL ROUTES ON AIRPORT OR ON PUBLIC ROADS. THE CONTRACTOR SHALL ALSO BE REQUIRED TO KEEP THE ROADWAYS FREE OF ALL EQUIPMENT, EXCEPT FOR THOSE EXCLUSIVELY REQUIRED IN THE CONTRACTOR'S WORK AREA.

16. FAA REGULATION FOR USE OF CRANES AND OTHER ELEVATED EQUIPMENT WILL BE STRICTLY ENFORCED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING ALL NECESSARY FORMS TO THE CITY AND OBTAINING FAA APPROVAL PRIOR TO CONTRACTOR'S USE OF ANY ELEVATED EQUIPMENT.

17. ALL COORDINATES SHOWN ON THE PLANS ARE IN THE H–JAIA GRID COORDINATE SYSTEM.

18. WORK AROUND THE EXISTING UNDERGROUND UTILITIES SHALL BE PERFORMED IN A MANNER THAT WILL AVOID DAMAGE TO THE UTILITIES. PRIOR TO COMMENCING WORK, CONTRACTOR SHALL ACCURATELY LOCATE ABOVE AND BELOW GROUND UTILITIES WHICH MAY BE AFFECTED BY THE WORK AND PROTECT ALL UTILITIES NOT DESIGNATED FOR REMOVAL, RELOCATION, OR REPLACEMENT IN THE COURSE OF CONSTRUCTION. PROVIDE 72 HOURS OF ADVANCE NOTICE TO THE UTILITY OWNERS INCLUDING DOA OPERATIONS (404–530–6620), DOA ENGINEERING (404–530–5500), AND FAA (404–669–1260) PRIOR TO BEGINNING CONSTRUCTION IN THE VICINITY TO THE EXISTING UTILITY LINE. FOR EXISTING PUBLIC UTILITY LOCATION ASSISTANCE CALL THE UNDERGROUND UTILITIES PROTECTION CENTER (UPC) AT 1–800–282–7411 AND FAA AT 404–689–1280.

19. IF NIGHT WORK IS PLANNED, THE CONTRACTOR SHALL COOPERATE WITH THE FAA, DOA, AND RAMP CONTROL WHEN ALIGNING HIS CONSTRUCTION FLOOD LIGHTS SO AS NOT TO INTERFERE WITH AIRCRAFT PILOTS OR AIR TRAFFIC CONTROLLERS VISION.

20. AT NO TIME SHALL EQUIPMENT BE LEFT UNATTENDED ON THE CONSTRUCTION SITE UNLESS APPROVED BY THE ENGINEER. EQUIPMENT SHALL BE KEPT IN DESIGNATED STAGING AREAS.

21. THE CONTRACTOR SHALL START AND COMPLETE ALL WORK INCLUDING CLEANUP OF FOREIGN OBJECT DEBRIS IN EACH AREA PRIOR TO MOVING TO THE NEXT AREA. CLEANUP DURING THE PROGRESS OF THE WORK IN AREAS CRITICAL TO AIRLINE OPERATIONS SHALL BE IMPLEMENTED AS DIRECTED BY THE ENGINEER.

22. UNINTENDED DAMAGE TO ANY EXISTING STRUCTURE SHALL BE REPAIRED IMMEDIATELY BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE CITY.

23. THE CONTRACTOR WITH THE APPROVAL OF THE CITY SHALL ESTABLISH THE EXACT LIMITS OF THE STAGING AREAS FOR MATERIAL STOCKPILING AND OFFICE TRAILERS IN THE AREA SHOWN. THIS IS A COMMON USE STAGING AREA, AND IS PUBLICLY ACCESSIBLE. ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S STAGING AREA SHALL BE ARRANGED AND PROMPTLY PAID FOR BY THE CONTRACTOR DIRECTLY WITH THE APPROPRIATE UTILITY AGENCY. UTILITY ARRANGEMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE CITY. NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ITEM REQUIRED FOR THE CONTRACTOR TO ENCLOSE AND SET UP HIS OPERATIONAL AREAS. THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION, TO THE SATISFACTION OF THE CITY, UPON COMPLETION OF THE CONTRACT WORK. GRASSING AND/OR REPLACEMENT OF GRAVEL IS PART OF THE SITE RESTORATION.

GENERAL WORK PERIODS

ALL CONSTRUCTION ON THIS PROJECT WILL OCCUR IN AREAS THAT MUST REMAIN IN FULL TIME AIRLINE OPERATION. FOLLOWING IS A LISTING OF CONSTRUCTION PHASING REQUIREMENTS THAT WILL ALLOW THE VARIOUS PARTS OF THE JOB TO PROCEED, WHILE MINIMIZING OPERATIONAL IMPACTS TO THE AIRLINES.

A. WORK ON THE RAMP

1. CONSTRUCTION WILL GENERALLY BE AT NIGHT, BETWEEN THE HOURS OF 11:30 P.M. TO 5:30A.M.

2. AT THE END OF THE WORK SHIFT, THE CONSTRUCTION SITE AT EACH GATE SHALL BE SURROUNDED WITH CONCRETE JERSEY BARRIERS, TO ENSURE SAFETY FOR AIRLINE/AIRPORT PERSONNEL AND EQUIPMENT.

3. WORK AT GATE A–17 WILL REQUIRE COMPLETE CLOSURE OF THIS GATE. THE WORK SHALL PROCEED, 24 HOURS PER DAY, UNTIL PAVEMENT IS RESTORED AND THE AREA TURNED BACK OVER TO THE AIRLINES.

4. TRENCHES FOR LATERAL SEWER CONNECTIONS SHALL BE PLATED OR OTHERWISE PROTECTED AS LONG AS THE TRENCH IS OPEN.

B. WORK INSIDE THE BUILDING FOOTPRINT

1. CONSTRUCTION WILL GENERALLY BE AT NIGHT, BETWEEN THE HOURS OF 11:30 P.M. TO 5:30 A.M.

2. OPEN TRENCHES THROUGH THE FLOOR MUST BE SAFELY PLATED OVER AT THE END OF A NIGHTLY WORK SHIFT.

3. SEE ARCHITECTURAL PLANS AND ADDITIONAL RESTRICTIONS ON WORK INSIDE THE BUILDING FOOTPRINT.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

General Notes and
Construction Control Plan
Airside

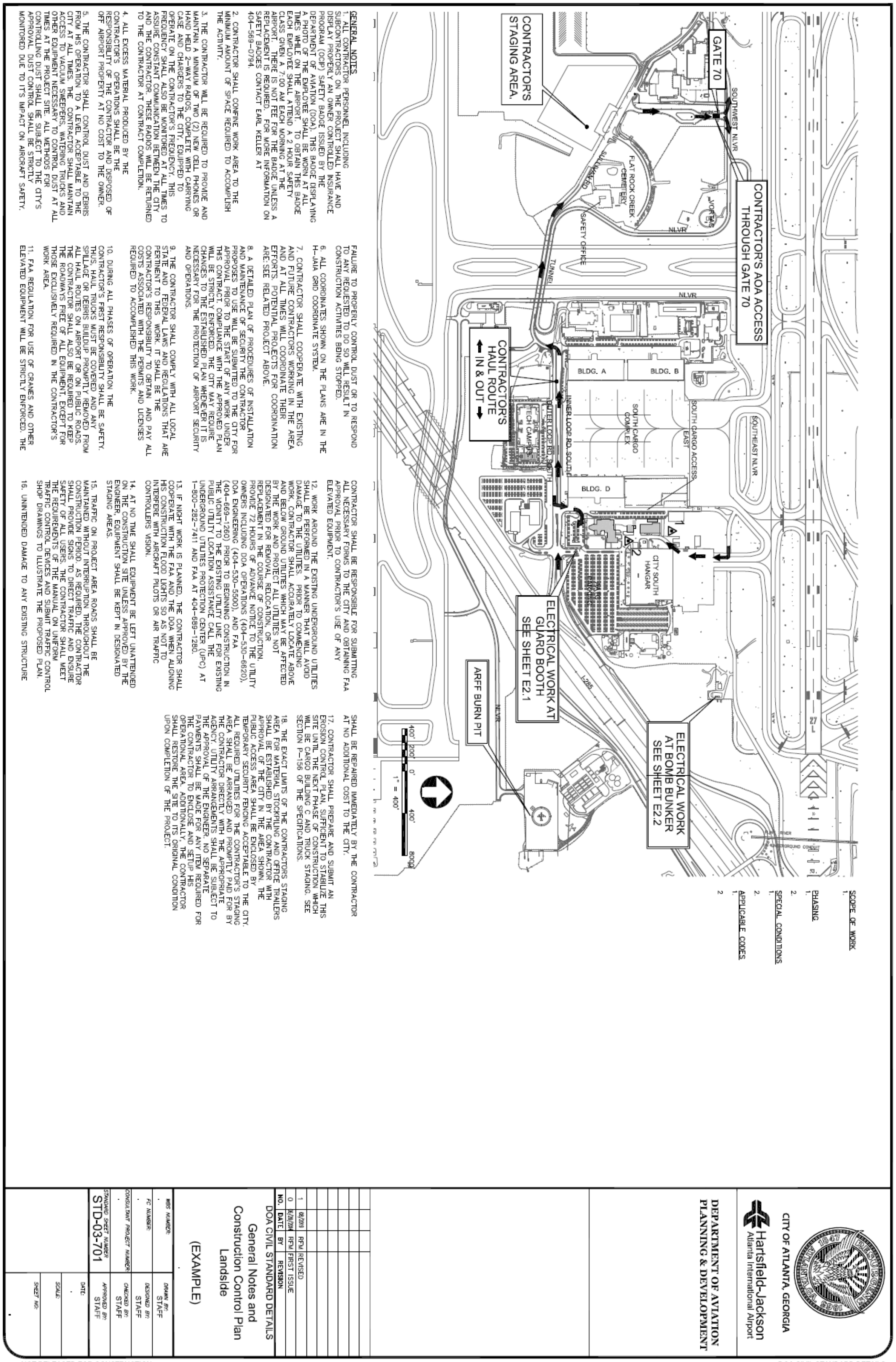
(EXAMPLE)

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-700	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

q:\facilities\engineering\design standards\drawings\std–03–700 general notes and construction control plan airside.dwg


CONTRACTOR'S STAGING AREA.
GATE 70
CONTRACTOR'S AOA ACCESS THROUGH GATE 70
CONTRACTOR'S HAUL ROUTE IN & OUT
ELECTRICAL WORK AT GUARD BOOTH SEE SHEET E2.1
ELECTRICAL WORK AT BOMB BUNKER SEE SHEET E2.2
ARFF BURN PIT
BLDG. A
BLDG. B
BLDG. D
CITY SOUTH HANGAR
GENERAL NOTES
SCOPE OF WORK
PHASING
SPECIAL CONDITIONS
APPLICABLE CODES
CITY OF ATLANTA GEORGIA
Hartsfield-Jackson Atlanta International Airport
DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT
DOA CIVIL STANDARD DETAILS
General Notes and Construction Control Plan Landside
(EXAMPLE)
STD-03-701
NOT RELEASED FOR CONSTRUCTION
DOA CIVIL STANDARD DETAILS

Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Structural Engineering

Design Standards
Structural

Table of Contents

Design Standards

Structural

1.0 Purpose

A. The purpose of this document is to outline the basic design intent for structural engineering work performed by, or on behalf of the Hartsfield-Jackson Atlanta International Airport (ATL), Department of Aviation (DOA).

B. All design work shall be performed in accordance with generally accepted professional principles and practices for structural engineering and in compliance with all applicable DOA Design Standards, Federal, State and City of Atlanta Design Codes, Standards and Regulations.

C. In some cases, certain generally acceptable design alternatives are restricted or excluded because of the special needs of the airport environment. Every attempt will be made to identify these situations in this document.

2.0 General

A. Applicable Codes

1. All design work shall be performed in accordance with generally accepted professional principles and practices for civil engineering and in compliance with all applicable Federal, State, and City of Atlanta Codes, Guidelines, Standards, and Regulations.

B. Design Narrative

1. All but the most minor structural engineering projects shall be summarized in a design narrative developed by the Structural Engineer of Record (SER). The design narrative shall describe the vertical and lateral load support strategies proposed for supporting anticipated loads.

C. Design Calculations

1. Basis-of-design calculations shall be prepared for all projects. The format and content of the calculations shall be as follows:

   a. Cover Sheet

   b. Table of Contents

   c. Design Narrative – Overview of the design approach including the vertical and lateral load resistance strategies and load paths as well as the

resolution of any unusual or atypical aspects of the design.

d. Design Information – Provide a summary of design criteria, applicable codes applied loads and any design assumptions.

e. Major Element Design – Actual design calculations or the preliminary design activities leading to the development of input data for structural analysis/design computer programs.

f. Foundation Designs – Actual design calculations or the preliminary design activities leading to the development of input data for structural analysis/design computer program(s).

g. Miscellaneous structural detail design calculations – Actual design calculations or the preliminary design activities leading to the development of input data for structural analysis/design computer programs

h. References

i. Appendix – the appendix (or appendices) shall include all pertinent design materials that cannot be incorporated into the categories identified above.

2. Calculations shall be neatly presented and include sketches proportioned to reflect relative scale, illustrating design intent. Provide linkage in the calculations for all primary structural members. All commercial computer software utilized in the production of the design shall be identified by name and version. All input files and corresponding output files (in native format), shall be recorded to DVD/CD optical media, suitably labeled and included with the submittal.

3. Any in-house proprietary computer software utilized in the design shall have the solution of verification problems documented in the appendix.

4. Calculations shall be coordinated with the current design phase and shall be purged of any superseded material.

5. All final calculations shall be sealed, signed and dated by the Structural Engineer of Record.

D. Loads and Loading Combinations

1. Load combinations used for the design of airport structures shall be in strict compliance with the requirements of the applicable provisions of ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures (current printing) and the structural codes identified in the general requirement section above.11

E. New Construction

1. The structural framing system for new construction shall be the most cost-effective based on a life-cycle cost analysis based on the required design life of the structure as agreed by the Department of Aviation.

F. Modifying Existing Structures

1. As-built and design data sources utilized in the design shall be identified. Where this data has been supplemented by field acquired data or where all data has been field acquired, the raw and reduced data shall be submitted in electronic format to the Department of Aviation in an approved format without limitation on future re-use.

G. Framing System Economics

1. Prepare a summary of the pre-analysis performed to justify the structural framing system proposed.

H. Foundation Systems

1. Foundation designs shall be based on the recommendations of an experienced geotechnical engineer, licensed to practice engineering in Georgia, unless the structure is deemed to be of minor significance with the concurrence of the Department of Aviation.
2. Where soldier pile or other types of lagged wall systems are approved for temporary excavation support, the plans shall require removal of the upper five feet of such systems where they occur within the building footprint and ten feet at exterior locations after permanent construction is put in place.
3. Where micro-piled or similar specialty contractor foundation system is proposed and accepted by the Department, the SER shall provide on the drawings, details such as pile caps etc., necessary for successful incorporation into the work.

I. Delegated Design

1. Where portions of the design are delegated to specialty engineers, the Structural Engineer of Record shall provide written design requirements detailing the requirements to be met by the delegated design.
2. The Structural Engineer of Record shall review the design documents prepared by the Specialty Design Engineer for conformance to the intent of the engineer of record, meets the written requirement and has been prepared by a licensed Georgia professional engineer.

3. The Structural Engineer of Record shall confirm in writing that the specialty engineer's work on the project conforms to the Structural Engineer of Record's intent.

J. Drawings

1. All structural drawing plan packages shall include at a minimum, the following sheets in addition to others that are necessary to clearly define the scope of work for the project.
    a. General Notes – General notes applicable to the overall design and structural materials proposed, abbreviations used within the structural drawings, symbol legend(s) as appropriate. The general notes shall include all the information required by section 1603 of IBC 2018
    b. Columns, foundation elements, concrete beams and concrete joists (conventional or prestressed) shall be summarized in schedules and presented within the project plans.
    c. Post-tensioning schedules shall indicate the required post-tensioning force and indicate the tendon drape variation in each span as well as the location of points of inflection.
    d. All prestressed concrete girder and major beam construction shall be bonded.
    e. Where deep foundations are proposed, estimated pile/drilled pier tip and bearing elevations shall be shown on appropriate schedules.
    f. Floor or bridge deck framing plans as appropriate as well as elevations, sections and details in sufficient number to adequately define the requirements of the work.
2. Final plans shall include one (1) plan set with manually affixed signature and date over the seal of the Engineer of Record.

K. Specifications

1. Specifications shall be prepared to define the quality of workmanship and materials that shall be incorporated into the work. They shall complement the structural design drawings.
2. The use of 'Sole source', 'Name brand' and/or 'Name brand or Equal' type references in the plans and specifications is not permitted without submitting a justification and receiving written approval from the City's Chief Procurement

Officer.

L. Design Milestones

1. Drawings and specifications for structural design items shall be submitted at all milestone delivery dates as required by contract. The level of completion shall reflect the percentage of completion represented by the milestone.

M. Quality Control Plan

1. All structural engineering document packages shall be vetted utilizing an approved Q/C plan submitted prior to commencing design activities. The plan will outline the effort and deliverables at each project review milestone for projects where such milestone reviews are required by contract. The Q/C deliverables plan shall be submitted and approved prior to submittal of the actual milestone design deliverables.

N. Miscellaneous

1. During the construction phase of projects, any changed condition, drawing deficiency or other circumstance that results in the issuance of an addendum, change order or bulletin that includes drawing modifications, supplemental sketches or deletions from the drawings shall be concurrently incorporated into the existing structural plans re-issued. The cost to make and to issue the updated drawing(s) shall be included in the base contract amount or any negotiated supplementary agreement.

3.0 Buildings

A. General

1. Building plans shall include sheet(s) indicating the various design loads (Live and Superimposed Dead) that have been used to develop the building structural system presented.
2. All reinforced concrete slabs within building footprints shall be detailed with bar steel reinforcement. Welded wire fabric shall not be permitted.
3. All building designs shall include summary reinforcement schedules for beam, column and foundation elements.
4. Design for temperature change shall be based on a mean temperature at construction of 62°F with a variation of ±50°F.

B. Steel Framed Structures

1. Provide criteria for vibration design. At a minimum, conform to the recommended criteria of AISC Design Guide 11, “Floor Vibrations Due to Human Activity.”
2. Where the slab overhang is 9 inches or less, SDI pour stop shall be specified to form the edge-of-slab unless this has been determined to be inadequate by the EOR.

C. Connections shall be designed by the SER or the Fabricator for actual end-actions determined by the EOR and not generically, based on member capacity. Concrete-Framed Structures

1. Cast-in-place conventional
    a. Lap splices between upper and lower columns shall be detailed as Class B splices under ACI 318, unless specifically agreed otherwise.
    b. Tolerances for concrete construction shall be in accord with the current edition of ACI 117, “Specifications for Tolerances for Concrete Construction and Materials and Commentary.”
    c. The potential incompatibility between different construction materials shall be anticipated and appropriate guidance provided on the contract drawings or in the specifications.
    d. Formed surface Class shall be indicated on the contract drawings or in the specifications but shall not be less than Class C as defined in ACI 347 – Guide to Formwork for Concrete.
    e. Provide specific guidance regarding the allowable placement of conduits and pipes within concrete slabs and other concrete members. Address maximum size, spacing and other structural requirements.
2. Cast-in-place post-tensioned
    a. Observe applicable provisions for cast-in-place conventional concrete construction presented above.
    b. Post-tensioned construction shall .be detailed with appropriate slip connections to prevent restraint cracking when members shorten due to the applied prestressing force or concrete volume changes.
    c. Prestressing tendons shall be detailed with adequate cover to meet the required fire rating for the structure being designed.

3. Precast

    a. The plans shall explicitly prohibit hard contact between adjacent precast concrete elements and include an absolute minimum separation inclusive of all tolerances.

    b. Unless explicitly agreed otherwise, precast concrete structures shall be designed and specified as Class U.

    c. Cracks in precast elements that are deemed to be structurally sound by the design professional of record, shall be sealed with a low-modulus epoxy repair material.

4.0 Bridges

A. Roadway

1. Georgia DOT standards, details and specifications may be used where they do not conflict with airport standards, details and requirements.
2. All bridge widening shall be accomplished through the use of a pour strip. Pour strip components shall be constructed of accelerated strength concrete.
3. All bridge decks shall have epoxy-coated reinforcing steel top mats.
4. Design for temperature change shall be based on a mean temperature at construction of 62°F with a variation of ±50°F.

B. Aircraft

1. All bridges, culverts and airfield structures shall be designed to support, at a minimum, FAA Group VI aircraft, current/anticipated airfield rescue and fire fighting vehicles and current/anticipated aircraft push-back tractors .

C. Pedestrian

1. Pedestrian bridges shall be designed for a live load of 100 psf.

D. Sign Bridges

1. Sign bridges and related structures shall be designed in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition.
2. Allowance shall be made in the design of sign bridges for a 10% increase in signage area over the life of the structure. The increased signage area shall configure so as to provide the maximum impact on the structure and foundations using multiple load

cases as necessary, to establish required structure and foundation design requirements.

5.0 Other Structures

A. Parking Garages

1. All airport parking structures shall be designed for an unreduced live load of 50 psf or the effects of a 3 kip concentrated load acting on an area of 4.5” x 4.5”, whichever is the more severe loading.
2. Parking structures shall also be designed to support a “mini-pumper” fire fighting vehicle with a 9000 lb axle and GVWR of 14,600 lbs. Minimum vehicle track considered in the design shall be 65 inches unless actual AFD equipment dimensions permit use of a greater value.
3. Cast-in-place, Post-tensioned Concrete
    a. Cast-in-place post-tensioned concrete construction is the preferred form for parking garage structures. A Class B form finish shall be specified unless otherwise instructed by the Department in writing.
4. Precast Concrete
    b. Precast prestressed concrete parking structures are permitted for airport construction where authorized by the Department in writing.
        i. Where precast prestressed construction is approved for a parking garage structure, a cast-in-place, reinforced
            [1.] concrete topping slab shall be required to provide proper surface drainage.
        ii. Precast concrete structures shall be designed and detailed such that deflecting members such as joists are not rigidly connected to stiff elements such as walls in a manner that restrains deflection of the joist.
        iii. All precast, prestressed concrete flexural members shall be designed as Class U per ACI 318.

B. Retaining Walls

1. In general, earth retaining structures shall be designed for lateral force parameters determined by a geotechnical investigation. The minimum factor of safety against overturning, sliding and global stability shall be 1.5. Additionally, for soil-reinforced

segmental retaining walls, internal component stability of 2.0 shall be provided.

2. Temporary earth retaining systems may be designed for such reduced factors of safety as the consultant typically employs in its practice, but in no event shall any factor of safety be less than 1.25.

3. Wall elevations shall feature, at a minimum, lines depicting the proposed top of wall, proposed grade in front of and behind the wall as well as the existing grade at the front of the wall.

C. Tunnels

2. Tunnel design and construction shall give due consideration, where appropriate, to potential soil heave at the bore and concrete shrinkage effects.

6.0 Construction Phase

A. Drawing Revisions

1. All bulletins, sketches and directives related to the structural drawings, issued during construction, shall be posted to the original electronic documents and provided to the Department of Aviation monthly.

Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Architectural

Design Standards - Architectural

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Design Standards

Architectural

1.0 Purpose

A. The purpose of this document is to outline the minimum Architectural standards related to Facilities/Landside/Airside New Construction and Modifications submitted projects at the City of Atlanta's Hartsfield-Jackson Atlanta International Airport (ATL).

2.0 General

A. Applicable Codes & Standards

1. All design work shall be performed in accordance with generally accepted professional principles and practices for architecture and in compliance with all applicable Department of Aviation (DOA), Planning & Development (P&D) Facilities/Landside/Airside New Construction and Modifications Standards included in this document and the latest Federal, State and City of Atlanta Codes, Standards and Regulations.

B. Art Program

1. Per City of Atlanta Ordinance, art must be included in all capital airport projects that serve the public such as Terminals, Concourses, Parking Decks, Rental Car Center and others. The City Ordinance states that 1% of the construction cost of each project shall be allocated for art. P&D's Art Group is responsible for the development of the art and Designers shall be responsible for coordinating the integration of art in their project(s) with P&D's Art Group.

C. Modifying Existing Structures

1. The installation or relocation of heavy equipment shall be evaluated and endorsed by a Structural Engineer.
2. Proposed improvements that require partial or complete, severing, altering or removal of structural members shall require evaluation and design by a Structural Engineer.
3. Walls proposed for partial or full demolition shall be evaluated by a Structural Engineer to determine whether they are load bearing. If they are, drawings shall indicate the sequence of operations required to avoid collapse
4. Modifications to existing structures shall not be made without prior approval by the Department of Aviation.

D. Floor, Wall and Roof Penetrations

1. Proposed penetrations and openings for existing floors, walls, and roofs shall be located where there are no impacts to existing concrete reinforcements.
2. Contractor shall be required to locate existing reinforcements prior to commencing coring operations.
3. If reinforcements must be severed due to the size of the opening or its required location, evaluation and design shall be made by a Structural Engineer.
4. Proposed rectangular openings in existing walls, floor slabs and roof shall be detailed with required core holes of sufficient diameter at each corner to prevent over cut upon installation.

5. Repair/filling of existing cores and/or openings for Concrete Floors, Concrete Floors on Steel Deck, Steel Deck Roof, Concrete on Steel Deck Roof and Concrete Deck Roof shall comply with Detail No.1 through No. 11 (Appendix No. 1).
6. Roof penetrations shall comply with existing TPO roof manufacturer's detail(s) recommendations in order to maintain integrity of roof system and its warranty.
7. Cabling, conduits and/or other appurtenant connectivity items are not allowed to be run and/or lay directly on top of the existing TPO roofing.

E. Ceilings

1. Replacement, demolition and/or removal of existing ceiling(s) and associated lighting and mechanical systems above any public or airport operational spaces, including security queues, screening areas, re-composure, venues, seating and circulation areas shall include the removal of all abandoned hangers, supports, electrical feeds, mechanical ducts and/or other appurtenant items above the ceiling.

F. Door Hardware

1. SACS & Security Hardware- Security Door Standards will be provided by DOA Security Department upon project reviews with Security to confirm openings to be controlled and monitored.
   a. Type of openings, approach, frame, door and electronic mechanisms for public or back-of-house will be provided based on new Security standards.
2. Non-Security Hardware- Von Duprin Panic Hardware. Hardware Cores to be Best Locks.

G. Floor Mounted Appurtenances

1. Any appurtenances such as luggage carts, luggage cart dispensing equipment, wheelchairs, wheelchair corrals, seating, advertisement, signage, directories, self-service kiosks and any other floor mounted equipment throughout the airport's interior and exterior public facilities, shall not be a safety hazard to public circulation, obstruct passenger flow or impede any emergency path of travel or exit. Locations shall be submitted to the DOA /P&D for review and acceptance.

3.0 Facilities

A. Domestic Terminal

1. Domestic Terminal Building Interior
   a. Floors: Terrazzo and Granite Tile 18"x18" (Luna Pearl)
   b. Walls : Granite Wainscot 36" and Painted Gypsum Board above
      - Stainless Steel Base
      - Stainless Steel Corner Guards
   c. Temporary Walls: Construction walls shall be painted using semi-gloss SHERWIN-WILLIAMS SW 6002 ESSENTIAL GRAY. If the walls are to be in place for a period of 30 days or more, provide full wall digital graphics to include a rendering of the future space and other vital information. Graphics shall be fabricated using 3M ControlTac with an over laminate.

d. Ceiling: Armstrong Metal Works Vector, 24” Solid Panels; LED Lighting

e. Column Covers: Stainless steel (Swirl Pattern) at lower section. Stainless Steel (Sand Finish) at upper section

f. Baggage Claim Barriers: Stainless Steel Rail & Base with Glass Infill (2 layers of low iron glass & clear PVB)

g. Arrivals Area Barries: Stainless Steel Rail and base with ½” tempered glass infill

h. Security Checkpoint Stanchions: Stainless Steel Post w/magnetic base with double row of retractable Belts. Safety Panels, 48”x48” Q-Guard Plexiglas by Lavi Industries.

i. Vestibules:

   i. Floor: Granite Tile 18”x18” (Honed Luna Pearl) & Stainless-Steel Walk mats

   ii. Walls: Stainless Steel Base/Glass Wainscot/ Gypsum Board Above

   iii. Ceiling: Gypsum Board; LED Lighting

   iv. Doors: Automatic Sliding Glass

j. Restrooms:

   i. Floor: Terrazzo and Quartz Tile

   ii. Walls: Terrazzo & Quarts Base/Quartz Tile/Stainless Steel Corners Guards

   iii. Ceilings: Painted Gypsum Board; LED Lighting

   iv. Countertops: Granite - Under bowls and openings for waste Disposal

   v. Toilet Partitions**:** Ceiling Mounted - Stainless Steel (Satin Finish) with Stainless Steel Privacy Closure Brackets at wall and doors, full height (Stainless Steel)

   vi. Urinal Screens: Wall Mounted with continuous mounting bracket Stainless Steel (Satin Finish)

   vii. Fixtures/Accessories:

      (1) Water Closets: Wall Mounted – automatic flush valves

      (2) Faucets: Hands Free

      (3) Soap Dispensers: Hands Free with central soap reservoir system

      (4) Paper Towel Dispenser: Hands Free

      (5) Shelves: Above toilets and urinals (Stainless Steel)

      (6) Corner Guards: Stainless Steel

      (7) Mirror: Continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8’-0” ceiling). Mirrors shall be sealed so water cannot weep between surfaces and cause deterioration of the mirror.

      (8) Baby Changing: Koala Kare Type

   viii. Vertical Circulation

      (1) Elevators: Stainless Steel walls and ceiling, granite floor. Kone.

      (2) Escalators: Stainless Steel 36” and 42”, Stainless Steel Handrails, Kone.

2. Domestic Terminal Building Exterior
    a. Roofing:
        i. Thermoplastic Polyvinyl Chloride Membrane Roof
            (1) Basis of Design-Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty.
            (2) Thickness 135 mils(80 mil TPO with 55 mils Fleecback), nominal, over rigid insulation with heat welded TPO sheet seams . Exposed Face color: White
    b. Facades:
        i. Non-Insulated Metal Panel /Vestibule Shafts
            (1) Centria Aluminum Wall Panels
            (2) Intercept Entyre
            (3) PPG, Duranar XL, UC124347XL, Pigmento Blue Paint System, three (3) coats
        ii. Non-Insulated Metal Panel /High Bay and parapet
            (1) Centria Aluminum wall Panels
            (2) Intercept Entyre
            (3) PPG, Duranar XL, UC5113XL, Silver Paint System, three (3) coats
        iii. Insulated Glass Systems
            (1) Window Walls: Insulated Viracon Low Iron Architectural Glass
            (2) Curtain Walls: Insulated Viracon Low Iron Architectural Glass
            (3) Spandrel Glass: Insulated Viracon Low Iron Architectural Glass
        iv. Non-insulated Glass Systems
            (1) Decorative Glass: QC Facades Opaque Glazing /PPG
            (2) Starphire Low iron Tempered Glass
            (3) Guardrails: Old Castle – ½” Tempered, PPG Starphire, Low iron glass
            (4) Background color: SW 7006 Extra White
    c. Entry Portals /Vestibules
            (1) Non-Insulated Metal Panel /Above wainscot
            (2) Centria Aluminum Wall Panels
            (3) Intercept Entyre
            (4) PPG, Duranar XL, UC124347XL, Pigmento Blue
            (5) Paint System, three (3) coats
    d. Entry Portals /Vestibules
            (1) Decorative Glass: QC Facades Opaque Glazing /PPG Starphire
            (2) Low iron Tempered Glass /Wainscot
            (3) Custom color to match Pigmento Blue

e. Stairwells & Other Exposed Steel:
    (1) Final coated with-PAINT, BENJAMIN MOORE IMPERVO
    (2) EXTERIOR GLOSS OIL - COLOR “PISMO DUNES” Black
f. Existing CMU Paint: Brown- BENJAMIN MOORE
    (1) BXK1182 or PPG Dark Granite 520-7
g. Curbside Sidewalk Coating: Sure-Crete SCR (with base coat and seal coat) Slip resistant epoxy coating-Gray color
h. Bollards: Embedded steel bollards, concrete filled (K rated) with Stainless Steel covers
i. Upper Roadway Canopies: Pressure-inflated ETFE (Ethylene-tetra-fluoroethylene) Foil /Transparent
j. Lower Roadway Canopies: Flame-retardant weather resistant fabric. Basis of design is Serge Ferrari – Precontraint 502.
k. Device Poles: Eaton-Cooper /40’ min. Ground- set
l. Electronic Displays: Daxtronics Galaxy exterior monitors
m. Site Furnishings:
    i. Benches: Petoskey features: (all complement each other) Backed Bench
        (1) Backless Perforated Bench Backless Metal Rod Bench 29”, 62”. 78” length
        (2) Durability of 3” tube support
    ii. Litter Receptacle:
        (1) 30-gallon capacity, polyethylene liner included 11-gauge steel
        (2) Perforated metal 20in dia. X 42in. h
    iii. Ash Urn:
        (1) 14-gauge steel Perforated metal 12in. dia. X 21in. h
n. Smoking Corrals: Defined space with signage, seating, and stanchions supporting Plexi panels. Refer to Signage Standards for details.
o. Vertical Circulation
    i. Elevators: Stainless Steel walls and ceiling, granite floor, Kone.
    ii. Escalators: Stainless Steel 36”, Stainless Steel Rails, Kone.

B. International Terminal/ Concourse F

1. International Terminal Building Interior
    a. Floors: 18”x18”, 9”x18” Granite Tiles /Various suppliers for various granites
    b. Walls : Quartz tile Wainscot 36”, Painted gypsum board above Wainscot
    c. Temporary Walls: Construction walls shall be painted using semi-gloss SHERWIN-WILLIAMS SW 6002 ESSENTIAL GRAY. If the walls are to be in place for a period of 30 days or more, provide full wall digital graphics to include a rendering of the future space and other vital information. Graphics shall be fabricated using 3M Control-Tac with an over laminate.

d. Ceiling: Lay-in Acoustical tile ceiling; LED Lighting. Ceilings Plus - Perforated metal panels with batt insulation laid in.

e. Column Covers: Stainless steel (Swirl Pattern) at lower section and Stainless Steel (Sand Finish) at upper section

f. Vestibules

i. Floor: Granite Tile 18”x18” (Honed Luna Pearl), Stainless Steel Walk mats

ii. Walls: Glass Wainscot/ Granite

iii. Ceiling: Gypsum Board; LED Lighting

iv. Doors: Automatic Sliding Glass

g. Security Checkpoint Stanchions: Stainless Steel Base/Post with retractable Belts.

h. Arrivals Area Barriers: 3” diameter Stainless Steel Rail with ½” tempered glass infill.

i. Restrooms

i. Floor: Quartz Tile

ii. Walls: Quartz Tile; Quartz Base; Stainless Steel Corners Guards

iii. Ceilings: Painted Gypsum Board; LED Lighting

iv. Countertops: Granite with under bowls and openings for waste Disposal.

v. Toilet Partitions**:** Ceiling Mounted - Stainless Steel (Satin Finish) with Stainless Steel Privacy Closure Brackets at wall and doors, full height (Stainless Steel)

vi. Urinal Screens: Wall Mounted – Stainless Steel (Satin Finish) with continuous mounting bracket

vii. Fixtures/Accessories:

(1) Water Closets: Wall Mounted – automatic flush valves Faucets: Hands Free

(2) Soap Dispensers: Hands Free with central soap reservoir system

(3) Paper Towel Dispenser: Hands Free

(4) Shelves: Above toilets and urinals – Stainless Steel Corner Guards: Stainless Steel

(5) Mirror: Continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8’-0” ceiling).

(6) Mirrors shall be sealed so water cannot weep between surfaces and cause deterioration of the mirror.

(7) Baby Changing: Koala Kare Type

j. Vertical Circulation

i. Elevators: Stainless Steel walls and ceiling, granite floor, Kone.

ii. Escalators: Stainless Steel 36”, Tempered Glass Rails, Kone.

2. International Terminal Building Exterior

a. Roofing: Thermoplastic Polyvinyl Chloride Membrane Roof

(1) Base of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

b. Facades:
   i. Landside: Non-Insulated ACM (aluminum composite material) Color System, three (3) coats, Silver
   ii. GLASS- Insulated, tinted.
c. Passenger Boarding Bridges:
   i. Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams
d. Curbside Floor Coating: None
e. Canopy: Tempered Glass and Stainless Steel
f. Electronic Displays: Samsung Digital monitors
g. Site Furnishings:
   i. Benches: Petoskey features: (all complement each other)
      (1) Backed Bench
      (2) Backless Perforated Bench
      (3) Backless Metal Rod Bench
      (4) 29”, 62”. 78” length
      (5) Durability of 3” tube support
   ii. Litter Receptacle:
      (1) 30-gallon capacity, polyethylene liner included
      (2) 11-gauge steel
      (3) Perforated metal
      (4) 20in dia. X 42in. h
   iii. Ash Urn:
      (1) 14-gauge steel
      (2) Perforated metal
      (3) 12in. dia. X 21in. h
h. Exit Stairs: Galvanized Steel, exposed

3. Concourse F Building Interior
   a. Floors: Granite Tile 18”x18” (Luna Pearl)
   b. Walls : Quartz tile Wainscot 36”, Painted gypsum board above Wainscot, Stainless steel base.
   c. Ceilings: Lay-in Acoustical tile ceiling; LED Lighting. Ceilings Plus - Perforated metal panels with batt insulation laid in, and gypsum ceilings.
   d. Column Covers: Stainless steel (Swirl Pattern) at lower section and Stainless Steel (Sand Finish) at the upper section

e. Hold Rooms:
   i. Floors: Carpet Tile
   ii. Walls : Quartz tile Wainscot 36”, Painted gypsum board above Wainscot.
   iii. Column cladding: Stainless Steel
   iv. Ceilings: Acoustical Tile, LED Lighting, metal and gypsum board.

f. Passenger Loading Bridges
   i. Floor : Carpet
   ii. Base: Rubber
   iii. Walls: Painted Metal Panels
   iv. Ceiling: Metal Tile
   v. Corner Guards: Stainless Steel

g. Restrooms
   i. Floor: Quartz Tile
   ii. Walls: Quartz Tile
      (1) Terrazzo and Quartz Base
      (2) Stainless Steel Corners Guards
   iii. Ceilings: Painted Gypsum Board and LED Lighting
   iv. Countertops: Granite - Under bowls and openings for waste disposal.
   v. Toilet Partitions:
      (1) Ceiling Mounted - Stainless Steel (Satin Finish) with Privacy Closure Brackets at wall and doors, full heigh, (Stainless Steel)
   vi. Urinal Screens:
      (1) Wall Mounted with continuous mounting bracket – Stainless Steel (Satin Finish)
   vii. Fixtures/Accessories:
      (1) Water Closets: Wall Mounted – automatic flush valves
      (2) Faucets: Hands Free
      (3) Soap Dispensers: Hands Free with central soap reservoir system.
      (4) Paper Towel Dispenser: Hands Free
      (5) Shelves: Above toilets and urinals (Stainless Steel) Corner Guards: Stainless Steel
      (6) Mirror: Continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8’-0” ceiling). Mirrors shall be sealed so water cannot weep between Surfaces and cause deterioration of the mirror.
      (7) Baby Changing: Koala Kare Type

h. Vertical Circulation
   i. Elevators: Stainless Steel walls and ceiling, granite floor, Kone.

ii. Escalators: Stainless Steel 36”, Tempered Glass Rails, Kone.

4. Concourses F Building Exterior
   a. Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof
      (1) Base of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White
   b. Facades:
      i. Airside: Insulated Metal Panels
         (1) Centria Versa-wall Industrial Panel Series
         (2) 3” thickness, flat panels embossed
         (3) Paint System, three (3) coat minimum
      ii. GLASS- Insulated, tinted.
   c. Passenger Boarding Bridges:
      i. Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams
   d. Exit Stairs: Stainless Steel and Aluminum
5. Concourse E to F Connector
   a. Floors: Granite Tile 18”x18” (Luna Pearl)
   b. Walls : Quartz tile Wainscot 36”, Painted gypsum board above Wainscot
   c. Ceilings: Lay-in Acoustical tile ceiling; LED Lighting, metal panels.
   d. Column Covers: Stainless Steel
   e. Vertical/ Horizontal Circulation
      i. Elevators: Stainless Steel walls and ceiling, Granite floor, Kone.
      ii. Escalators: Stainless Steel 36”, Tempered Glass Rails, Kone.
      iii. Moving Walks: Stainless Steel 36”, Tempered Glass Rails, Schindler.

C. Concourses T Through E (Departures & AGTS Levels)

1. Building Interiors
   a. Floors: Terrazzo at Concourse E APM Station; Granite and Quartz Tile 18”x18” at Boarding Levels; Porcelain Tile 18”x18” at all other AGTS Levels, Train Stations, and Roll Carpet at transition corridors between stations.
   b. Walls : Porcelain and Quartz tile Wainscot 36”; Painted gypsum board above Wainscot.
   c. Ceilings: Lay-in Acoustical tile ceiling, metal.
   d. Hold Rooms
      i. Floor: Carpet Tile
      ii. Base: Stainless Steel

iii. Interior Walls: Quartz tile Wainscot 36” Painted Gypsum board above wainscot.

e. Passenger Boarding Bridges:

i. Interior Floor: Carpet

ii. Base: Rubber

iii. Interior Walls: Painted Metal Panels

iv. Ceilings: Metal Tile

v. Corner Guards: Stainless Steel

f. Restrooms

i. Floor: Quartz Tile

ii. Walls: Quartz Tile

(1) Terrazzo and Quartz Base

(2) Stainless Steel Corners Guards

iii. Ceilings: Gypsum Board; LED Lighting

iv. Countertops: Granite - Under bowls and openings for waste Disposal.

v. Toilet Partitions**:** Ceiling Mounted - Stainless Steel (Satin Finish) with Privacy Closure Brackets at wall and doors, full height (Stainless Steel)

vi. Urinal Screens: Wall Mounted with continuous mounting bracket Stainless Steel (Satin Finish)

vii. Fixtures/Accessories

(1) Water Closets: Wall Mounted – automatic flush valves

(2) Faucets: Hands Free

(3) Soap Dispensers: Hands Free with central soap reservoir system

(4) Paper Towel Dispenser: Hands Free

(5) Shelves: Above toilets and urinals (Stainless Steel)

(6) Corner Guards: Stainless Steel

(7) Mirror: Continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8’-0” ceiling). Mirrors shall be sealed so water cannot weep between surfaces and cause deterioration of the mirror.

(8) Baby Changing: Koala Kare Type

g. Vertical/Horizontal Circulation

i. Elevators: Stainless Steel walls and ceiling, granite floor, Kone.

ii. Escalators: Stainless Steel 36”, Stainless Steel Rail, Kone.

iii. Moving Walks: Stainless Steel 36”, Tempered Glass Rail, Schindler

2. Building Exterior

a. Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof

(1) Basis of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135

Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

b. Building Facades:
    i. Concourses T South, A, B, C (North /South building orientations)
        (1) Insulated Metal panels
        (2) 2” thickness
        (3) Paint System, Medium Grey Metallic #9960
        (4) Existing Sheet steel (infill) panels with pencil rib
        (5) Painted to match new insulated metal panels system (AATC CONFIRM COLOR USED per Delta).
        (6) GLASS- Insulated, tinted.
    ii. Concourse Mid-Points T, C, F /East VCC (East /West Building orientations)
        (1) Insulated Metal Panels
        (2) Centria Form Wall Architectural Panel Series
        (3) 2” thickness, flat panels embossed
        (4) Paint System, three (3) coats, Bright Silver Metallic #9710
    iii. Concourse Mid-Point D (East /West Building orientations) Non-Insulated ACM (aluminum composite material)
        (1) Color System, three (3) coats, Silver
        (2) GLASS- Insulated, tinted.
c. Passenger Boarding Bridges:
    i. Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams
    ii. Exit Stairs: Stainless Steel

D. Rental Car Center

1. Building Interiors
    a. Floors: Terrazzo
    b. Walls : Gypsum panels with Stainless Steel base. Smooth finish colored block.
    c. Ceiling: Acoustic Ceiling Tile; LED Lighting, Gypsum Board.
    d. Columns: Stainless Steel
    e. Restrooms:
        i. Floor: Terrazzo
        ii. Walls: Quartz Tile
            (1) Terrazzo and Quartz Base
            (2) Stainless Steel Corners Guards
        iii. Ceilings: Gypsum Board and LED Lighting

iv. Countertops: Granite - Under bowls and openings for waste disposal.

v. Toilet Partitions**:** Ceiling Mounted - Stainless Steel (Satin Finish) with Privacy Closure Brackets at wall and doors, full height (Stainless Steel)

vi. Urinal Screens: Wall Mounted – Stainless Steel-Satin Finish) with continuous mounting bracket

vii. Fixtures/Accessories:

(1) Water Closets: Wall Mounted – automatic flush valves

(2) Faucets: Hands Free

(3) Soap Dispensers: Hands Free with central soap reservoir system

(4) Paper Towel Dispenser: Hands Free Corner Guards: Stainless Steel

(5) Shelves: Above toilets and urinals (Stainless Steel)

(6) Mirror: should be continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8’-0” ceiling). Mirrors shall be sealed so water cannot weep between Surfaces and cause deterioration of the mirror.

(7) Baby Changing: Koala Kare Type

a. Vertical Circulation

i. Elevators: Stainless Steel walls and ceiling, terrazzo floor. Kone.

ii. Escalators: Glass and Stainless Steel 36”, Glass Rail, Kone.

2. Building Exteriors

a. Roofing: Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof

vii. Base of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

b. Facades: Metal Panels

c. Bridges: Concrete floor, stainless handrails and glass walls, metal panel ceiling.

E. Sky Train Stations

1. Building Interiors

a. Floor: Terrazzo

b. Walls: Block or Painted Gypsum board

c. Ceilings: Acoustical Tile/Acoustical panels

d. Columns: Stainless Steel or Gypsum Wrapped

e. Vertical Circulation

i. Elevators: Stainless Steel walls and ceiling, granite floor, Kone.

ii. Escalators: Stainless Steel 36”, Tempered Glass Rail, Kone.

2. Building Exterior

a. Roofing: Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof.

viii. Basis of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

b. Facades: Metal Panels

F. Support Facilities

1. Cargo

a. Building Interiors

i. Cargo Operations Floor: Sealed Concrete

ii. Office Floor: Tile entry and restrooms, carpet in the offices.

iii. Base: Rubber

iv. Interior Walls: Precast, Block or Painted Gypsum board

v. Columns: Block or Gypsum board wrapped

vi. Ceilings: Acoustical Tile in offices. Exposed in Operations

vii. Corner Guards: Stainless Steel

viii. Levelers are required to be 6'-6" wide x 8'-0" long with a minimum 15" lip extension, and a 12" operational range above and below the dock level.

b. Restrooms:

i. Floor: Ceramic Tile

ii. Walls: Painted Gypsum Board, Ceramic Tile, Ceramic Base Stainless Steel Corners Guards

iii. Ceilings: Painted Gypsum Board and LED Lighting

iv. Countertops: Solid surfaces- Under bowls and openings for waste disposal.

v. Toilet Partition: Ceiling Mounted - Stainless Steel (Satin Finish) with Privacy Closure Brackets at wall and doors, full height (Stainless Steel)

vi. Urinal Screens: Wall Mounted with continuous mounting bracket – Stainless Steel (Satin Finish)

vii. Fixtures/Accessories:

(1) Water Closets: Wall Mounted – automatic flush valves

(2) Faucets: Hands Free

(3) Soap Dispensers: Hands Free with central soap reservoir system

(4) Paper Towel Dispenser: Hands Free Corner Guards: Stainless Steel

(5) Shelves: Above toilets and urinals – Stainless Steel

(6) Mirror: should be continuous mirror from top of backsplash to ceiling with stainless steel frame (for typical 8'-0" ceiling). Mirrors shall be sealed so water cannot weep between Surfaces and cause deterioration of the mirror.

(7) Baby Changing: Koala Kare Type

c. Building Exteriors

i. Roofing: Thermoplastic Polyvinyl Chloride Membrane Roof

(1) Base of Design- Firestone TPO fully adhered UltraPly TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

ii. Facades: Precast, CMU, and Metal Panels

2. Fire Stations:

a. Building Interiors

i. Floor: Sealed concrete/tile/carpet

ii. Base: Rubber

iii. Walls: Block or Painted Gypsum board

iv. Columns: Block or Gypsum board wrapped

v. Ceilings: Acoustical Tile

vi. Corner Guards: Stainless steel

b. Building Exteriors

i. Roofing: Thermoplastic Polyvinyl Chloride Membrane Roof

(1) Base of Design: Firestone TPO fully adheres UltraPly TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

c. Facades: Metal Panels, Split Face Concrete Block

3. Maintenance

a. Building Interiors

i. Floor: Sealed concrete/tile/carpet

ii. Walls: Block or Painted Gypsum board

iii. Ceilings: Acoustical Tile

iv. Corner Guards: Stainless steel

b. Building Exteriors

i. Roofing: Thermoplastic Polyvinyl Chloride Membrane Roof

(1) Base of Design- Firestone TPO fully adhered Ultra-Ply TPO XR 135 Platinum Membrane 30-year warranty. Thickness 135 mils (80 mil TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

c. Facades: Metal Panels, Split Face Concrete Block

G. Miscellaneous

1. AED's: Basis of Design: JL Industries, 22-gage CR steel or Mill Finish Stainless Steel- 1439F12 Surface Mounted or 1437F12 Semi Recessed with a full acrylic window, with Siren Strobe Alarm. Clamshell door pull. Provide power and data access to C-4. Coordinate with the Airport Fire Marshall. (The Defibrillator shall be provided as part of the AED)

2. Bleed Control Kit Cabinets**:** Basis of Design: JL Industries, 22-gage CR steel or Mill Finish Stainless Steel- 1439F12 Surface Mounted or 1437F12 Semi Recessed with a full acrylic window, with Siren Strobe Alarm. Clamshell door pull. Provide power and data access to C4. Coordinate with the Airport Fire Marshall. SAM Medical Kits. Reference #: KT901-V-EN (The Bleed Kits shall be provided as part of the cabinet).
3. Prefabricated Control Booths

   Guard Gates replacement parts (i.e. Gate #70)

   Porta King Building Systems

   4133 Shoreline Drive Earth City, MO 63045

   800.456.5464

   314.291.2857 fax

   http://www.portaking.com

4.0 Appendices

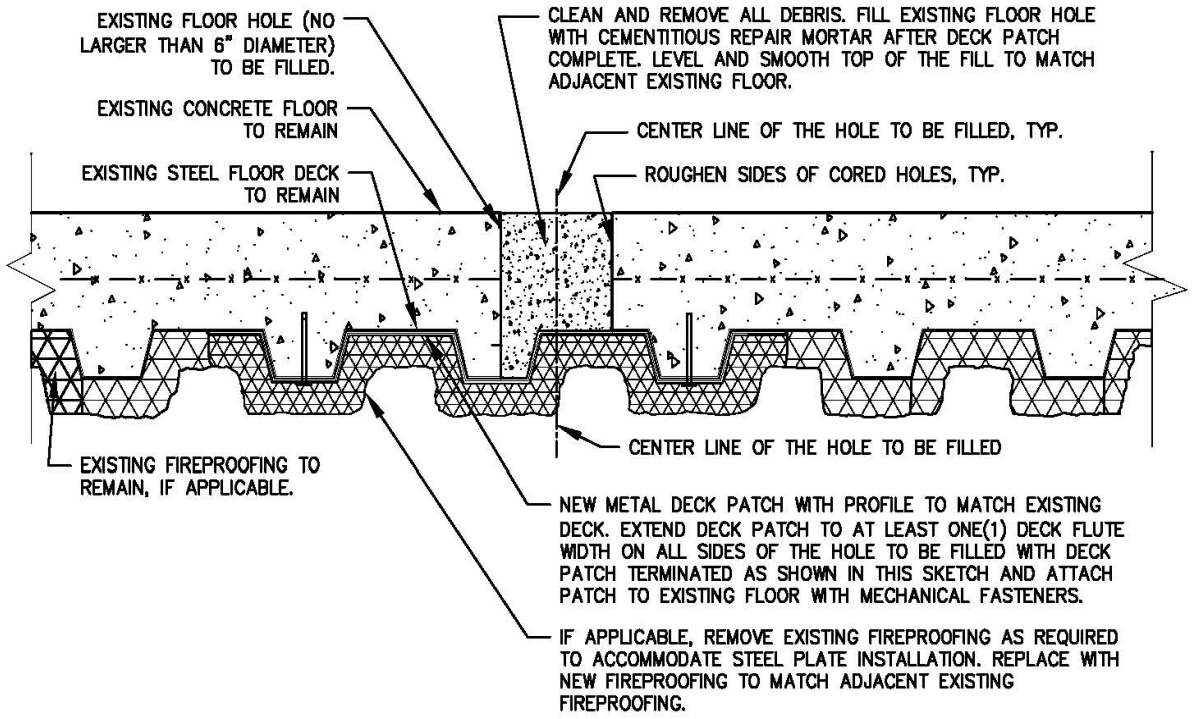
Detail No.1 Concrete on Steel Deck Floor Repair
Detail No.2 Concrete Floor Repair
Detail No.3 Steel Deck Roof Repair
Detail No.4 Concrete on Steel Deck Roof Repair
Detail No.5 Concrete Deck Roof Repair
Detail No.6 Pipe Thru System over Conc. On Steel Deck
Detail No.7 Pipe Thru Roofing System over Steel Deck
Detail No.8 Pipe Thru Roofing System over Conc. Slab
Detail No.9 Satellite Mast and Pad on Conc. Slab
Detail No.10 Satellite Mast on Concrete Detail No.11Satellite Mast on Metal Deck
Detail No.12 Tenant-Storefront Signage Guidelines

Requirements for Filling Penetrations in Existing Elevated Concrete Slabs

Proposed filling of cores or openings in existing elevated concrete slabs shall be evaluated by a Georgia registered structural design professional, who shall provide stamped requirements in the construction documents whenever either:

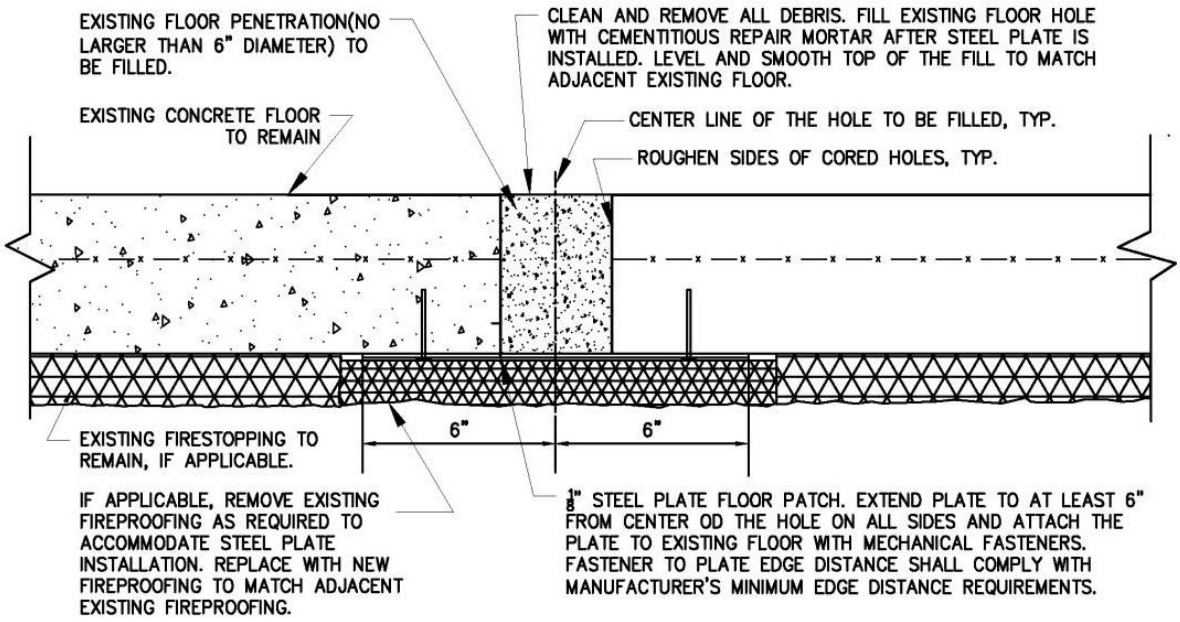
1. The clear spacing of adjacent cores or openings will be less than 3 inches; or
2. The core or opening is proposed for a concrete floor reinforced with prestressed reinforcement; or
3. The greatest dimension for the opening or core proposed exceeds 6 inches.

Cores or openings in concrete slabs, for which none of the above restrictions are applicable, shall be reinstated with a cementitious repair mortar in accordance with the manufacturer's written instructions for preparation, mixing, placement, finishing and curing. Also, see detail below for more information.



PROJECT: ELEVATED FLOOR REPAIR FOR OPENING 6" OR LESS			SKETCH NO.
DRAWING NAME: CONCRETE ON STEEL DECK FLOOR REPAIR		Hartsfield-Jackson Atlanta International Airport	1
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: CM	REFERENCE DWG. NO.
No.		DESIGNED BY: CM	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 08/20/2013	

Detail No.2 Concrete Floor Repair

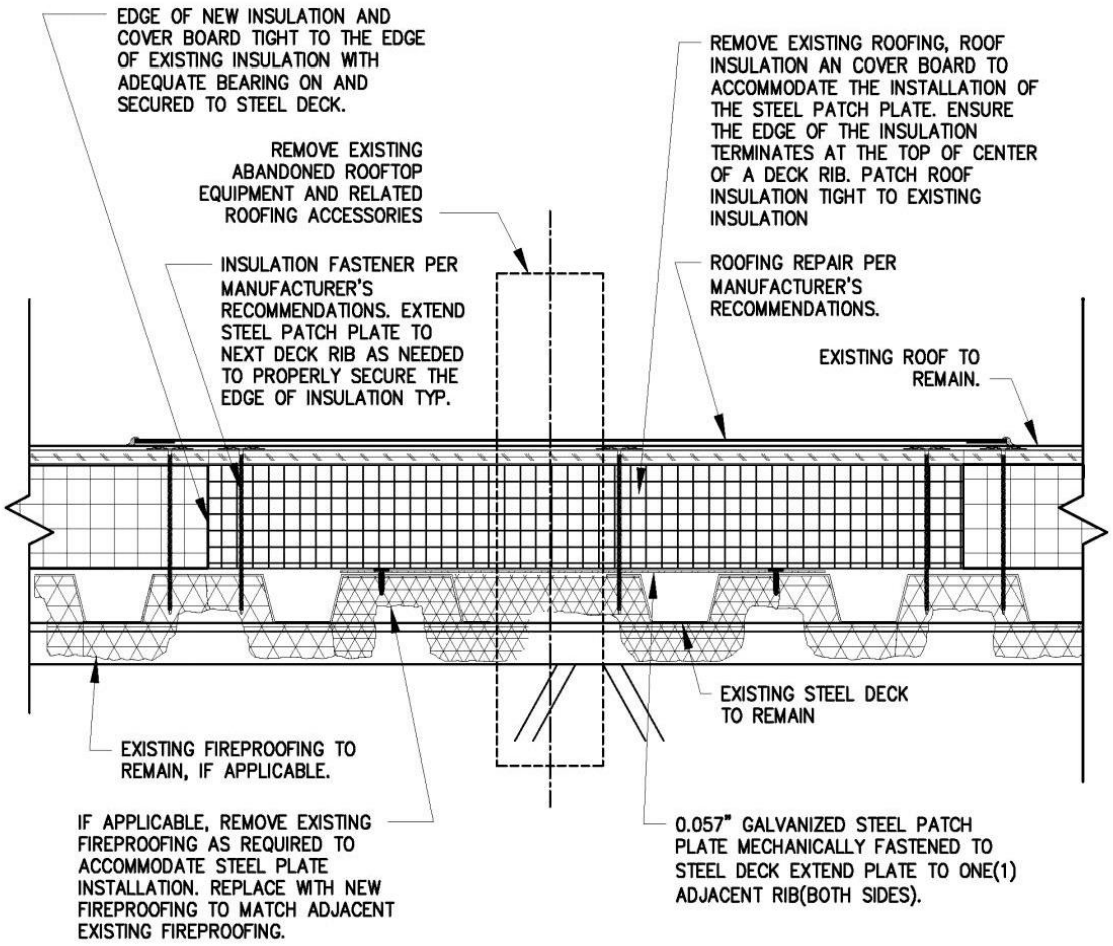


NOTES:

1. Proposed filling of new and existing cores and/or openings that fall under the following conditions shall be evaluated, engineered and stamped by a Structural Design Professional registered in the State of Georgia. :
   1.1 Penetrations larger than 6 inches; or
   1.2 The clear spacing of adjacent penetrations is less than 3 inches; or
   1.3 The concrete floor if reinforced with pre-stressed reinforcement.

PROJECT: **ELEVATED FLOOR PENETRATION REPAIR DETAIL**		Hartsfield-Jackson Atlanta International Airport	DETAIL NO. 2
DRAWING NAME: **CONCRETE FLOOR REPAIR**			
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: CM	REFERENCE DWG. NO.
No.		DESIGNED BY: CM	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 03/26/2014	

Detail No.3 Steel Deck Roof Repair

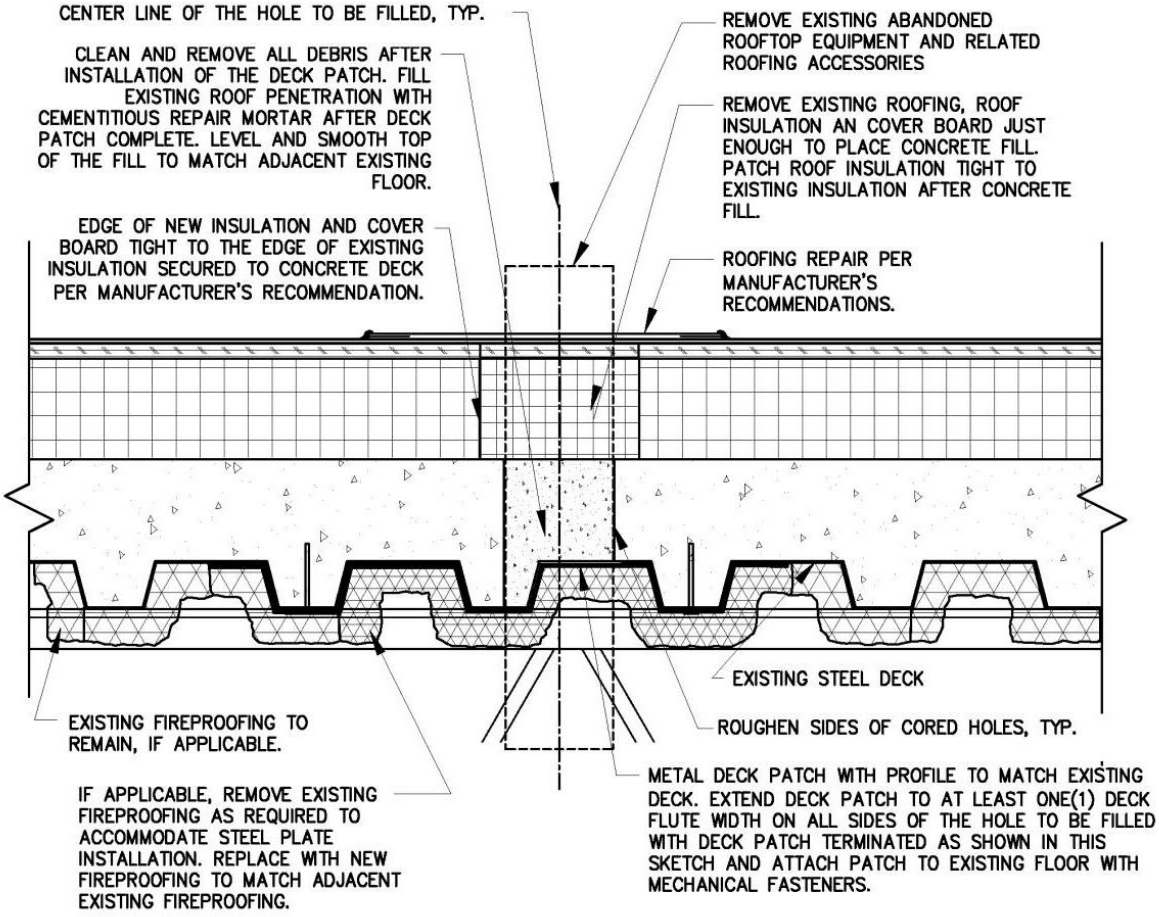


NOTES:

Proposed filling of new and existing penetrations larger than 13 inches shall be evaluated, engineered and stamped by a Structural Design Professional registered in the State of Georgia.

PROJECT: ROOF PENETRATION REPAIR DETAIL		Hartsfield-Jackson Atlanta International Airport	DETAIL NO. 3
DRAWING NAME: STEEL DECK ROOF REPAIR			
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: CM DESIGNED BY: CM CHECKED BY: CHECK CONTRACT: NONE WBS: NONE SCALE: NTS DATE: 03/26/2014	REFERENCE DWG. NO. NONE
No.			
No.			
No.			
No.			
No.			

Detail No.4 Concrete on Steel Deck Roof Repair

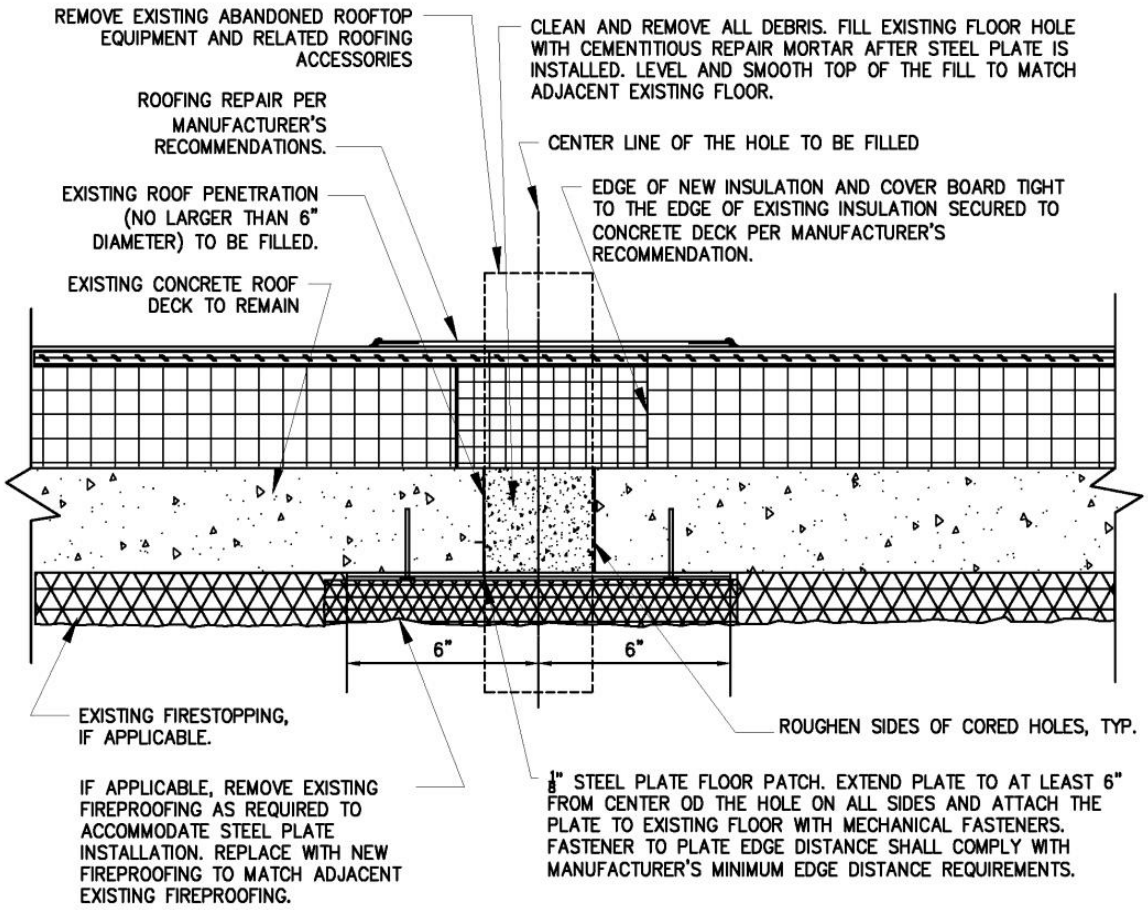


NOTES:

1. Proposed filling of new and existing cores and /or openings that fall under the following conditions shall be evaluated, engineered and stamped by a structural design professional registered in the State of Georgia: who shall provide stamped requirements in the construction documents whenever either:
   1.1 Penetration larger than 6 inches; or
   1.2 The clear spacing of adjacent penetrations is less than 3 inches.

PROJECT: ROOF PENETRATION REPAIR DETAIL			DETAIL NO.
DRAWING NAME: CONCRETE ON STEEL DECK ROOF REPAIR		Hartsfield-Jackson Atlanta International Airport	4
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: CM	REFERENCE DWG. NO.
No.		DESIGNED BY: CM	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 03/26/2014	

Detail No.5 Concrete Deck Roof Repair

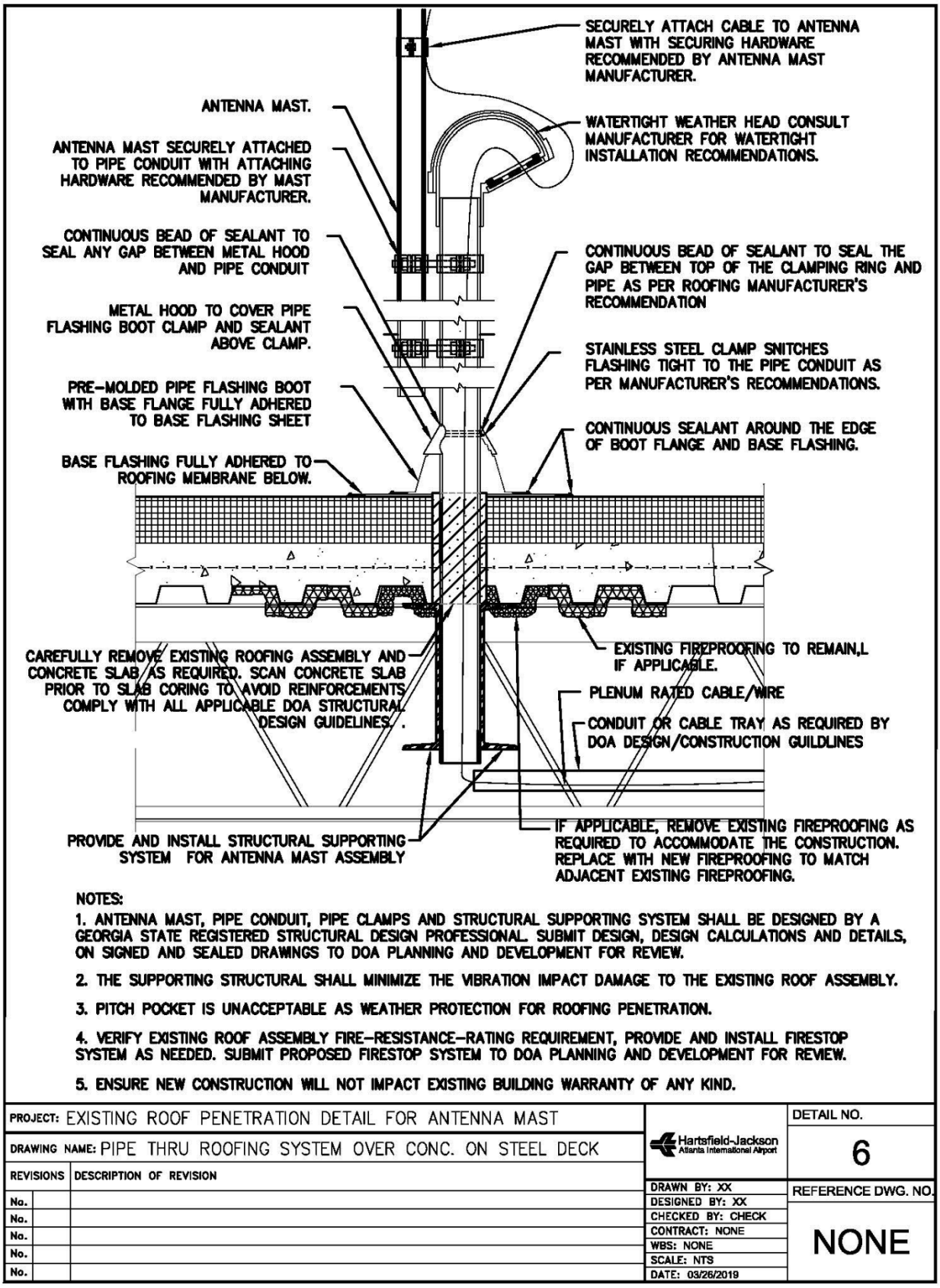


NOTES:

1. Proposed filling of new and existing cores and /or openings that fall under the following conditions shall be evaluated, engineered and stamped by a structural design professional registered in the State of Georgia: who shall provide stamped requirements in the construction documents whenever either:
   1.1 Penetration larger than 6 inches; or
   1.2 The clear spacing of adjacent penetrations is less than 3 inches.

PROJECT: ROOF PENETRATION REPAIR DETAIL			DETAIL NO.
DRAWING NAME: CONCRETE DECK ROOF REPAIR		Hartsfield-Jackson Atlanta International Airport	5
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: CM	REFERENCE DWG. NO.
No.		DESIGNED BY: CM	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 03/26/2014	

Detail No.6 Pipe Thru Roofing System Over Conc. On Steel Deck

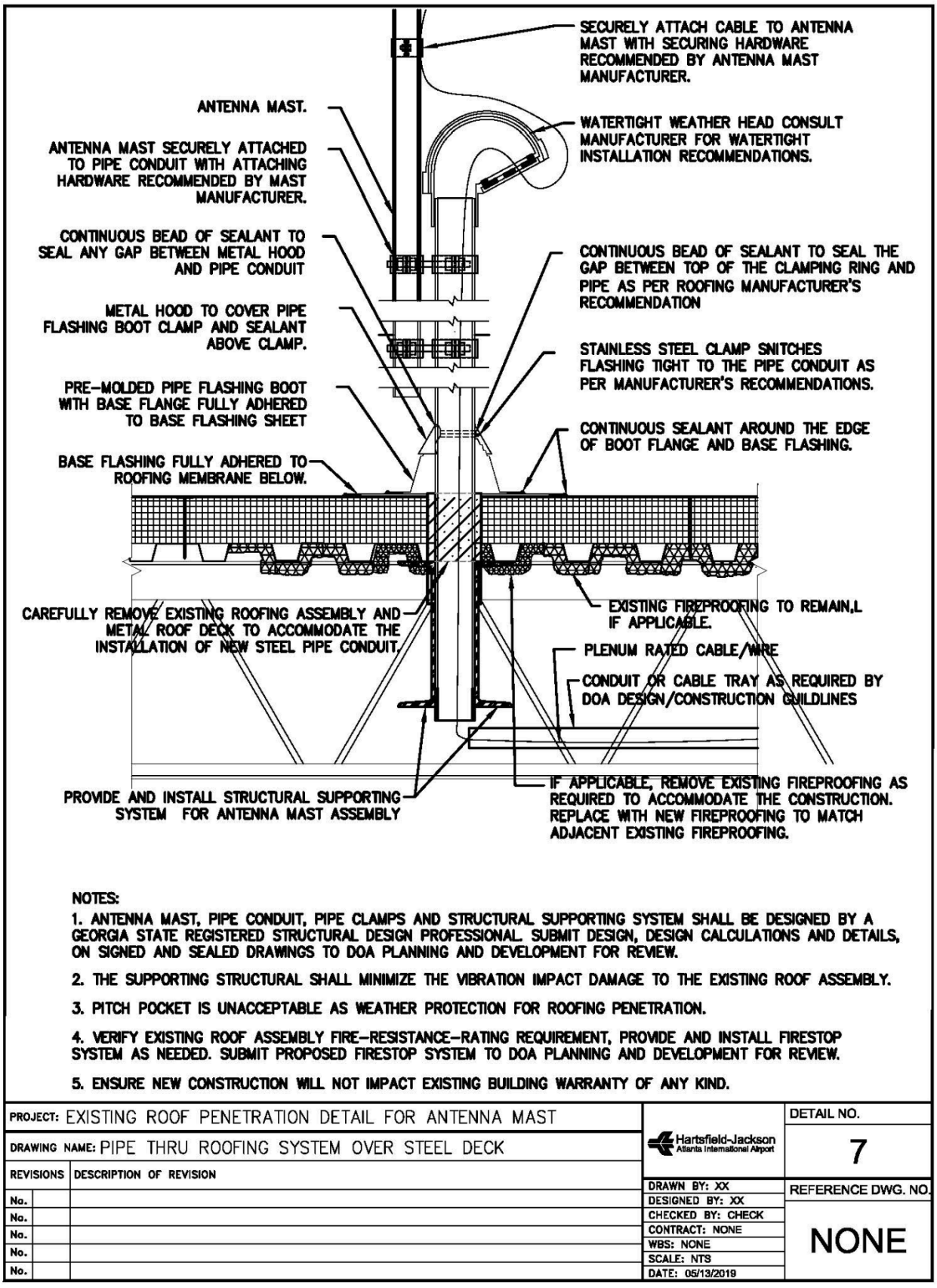


NOTES:

1. ANTENNA MAST, PIPE CONDUIT, PIPE CLAMPS AND STRUCTURAL SUPPORTING SYSTEM SHALL BE DESIGNED BY A GEORGIA STATE REGISTERED STRUCTURAL DESIGN PROFESSIONAL. SUBMIT DESIGN, DESIGN CALCULATIONS AND DETAILS, ON SIGNED AND SEALED DRAWINGS TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
2. THE SUPPORTING STRUCTURAL SHALL MINIMIZE THE VIBRATION IMPACT DAMAGE TO THE EXISTING ROOF ASSEMBLY.
3. PITCH POCKET IS UNACCEPTABLE AS WEATHER PROTECTION FOR ROOFING PENETRATION.
4. VERIFY EXISTING ROOF ASSEMBLY FIRE-RESISTANCE-RATING REQUIREMENT, PROVIDE AND INSTALL FIRESTOP SYSTEM AS NEEDED. SUBMIT PROPOSED FIRESTOP SYSTEM TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
5. ENSURE NEW CONSTRUCTION WILL NOT IMPACT EXISTING BUILDING WARRANTY OF ANY KIND.

PROJECT: EXISTING ROOF PENETRATION DETAIL FOR ANTENNA MAST		Hartsfield-Jackson Atlanta International Airport	DETAIL NO. 6
DRAWING NAME: PIPE THRU ROOFING SYSTEM OVER CONC. ON STEEL DECK			
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: XX	REFERENCE DWG. NO. NONE
No.		DESIGNED BY: XX	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 03/26/2019	

Detail No. 7 Pipe Thru Roofing System Over Steel Deck

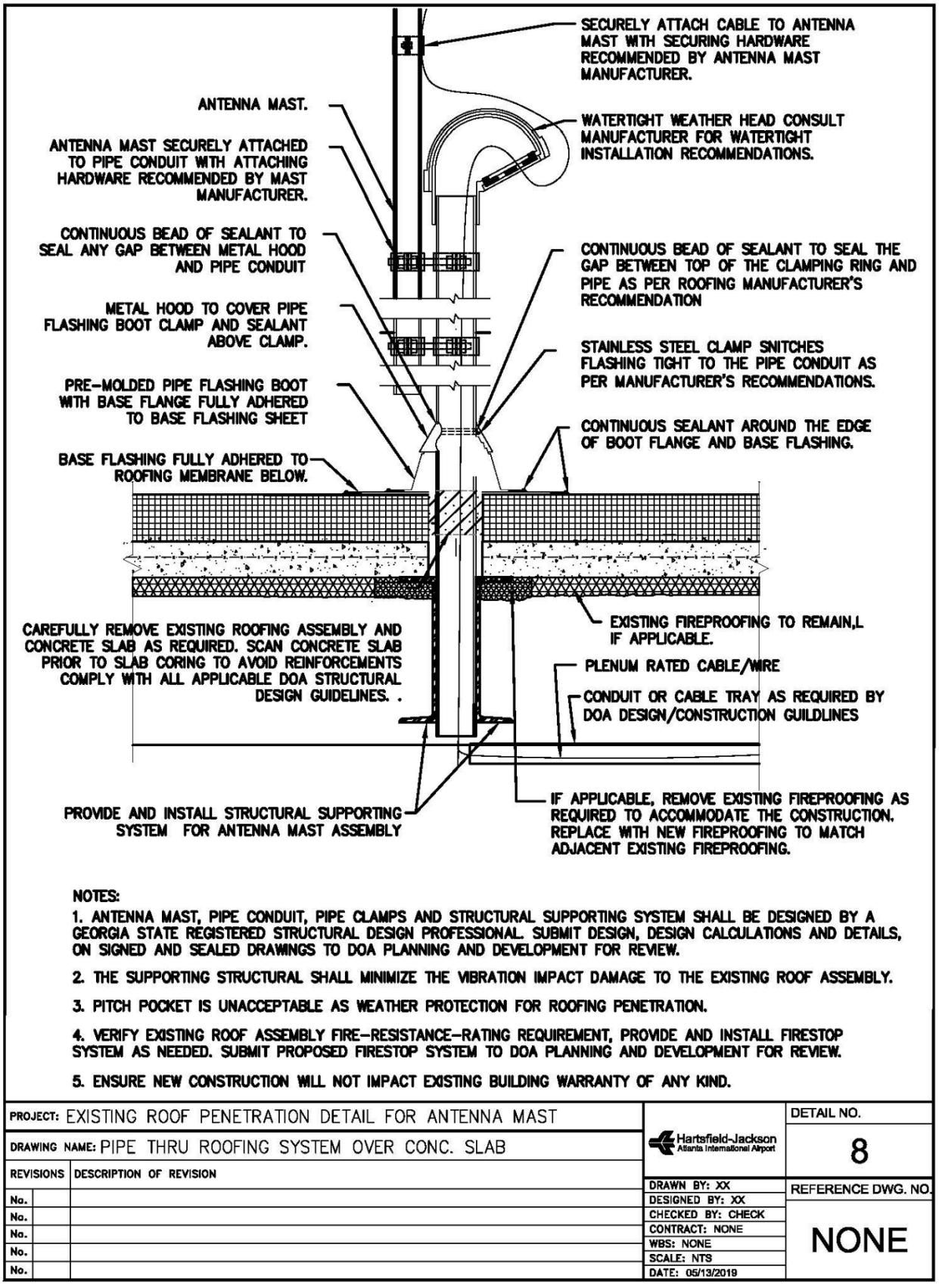


NOTES:

1. ANTENNA MAST, PIPE CONDUIT, PIPE CLAMPS AND STRUCTURAL SUPPORTING SYSTEM SHALL BE DESIGNED BY A GEORGIA STATE REGISTERED STRUCTURAL DESIGN PROFESSIONAL. SUBMIT DESIGN, DESIGN CALCULATIONS AND DETAILS, ON SIGNED AND SEALED DRAWINGS TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
2. THE SUPPORTING STRUCTURAL SHALL MINIMIZE THE VIBRATION IMPACT DAMAGE TO THE EXISTING ROOF ASSEMBLY.
3. PITCH POCKET IS UNACCEPTABLE AS WEATHER PROTECTION FOR ROOFING PENETRATION.
4. VERIFY EXISTING ROOF ASSEMBLY FIRE-RESISTANCE-RATING REQUIREMENT, PROVIDE AND INSTALL FIRESTOP SYSTEM AS NEEDED. SUBMIT PROPOSED FIRESTOP SYSTEM TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
5. ENSURE NEW CONSTRUCTION WILL NOT IMPACT EXISTING BUILDING WARRANTY OF ANY KIND.

PROJECT: EXISTING ROOF PENETRATION DETAIL FOR ANTENNA MAST			DETAIL NO.
DRAWING NAME: PIPE THRU ROOFING SYSTEM OVER STEEL DECK		Hartsfield-Jackson Atlanta International Airport	7
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: XX	REFERENCE DWG. NO.
No.		DESIGNED BY: XX	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 05/13/2019	

Detail No. 8 Pipe Thru Roofing System Over Conc. Slab

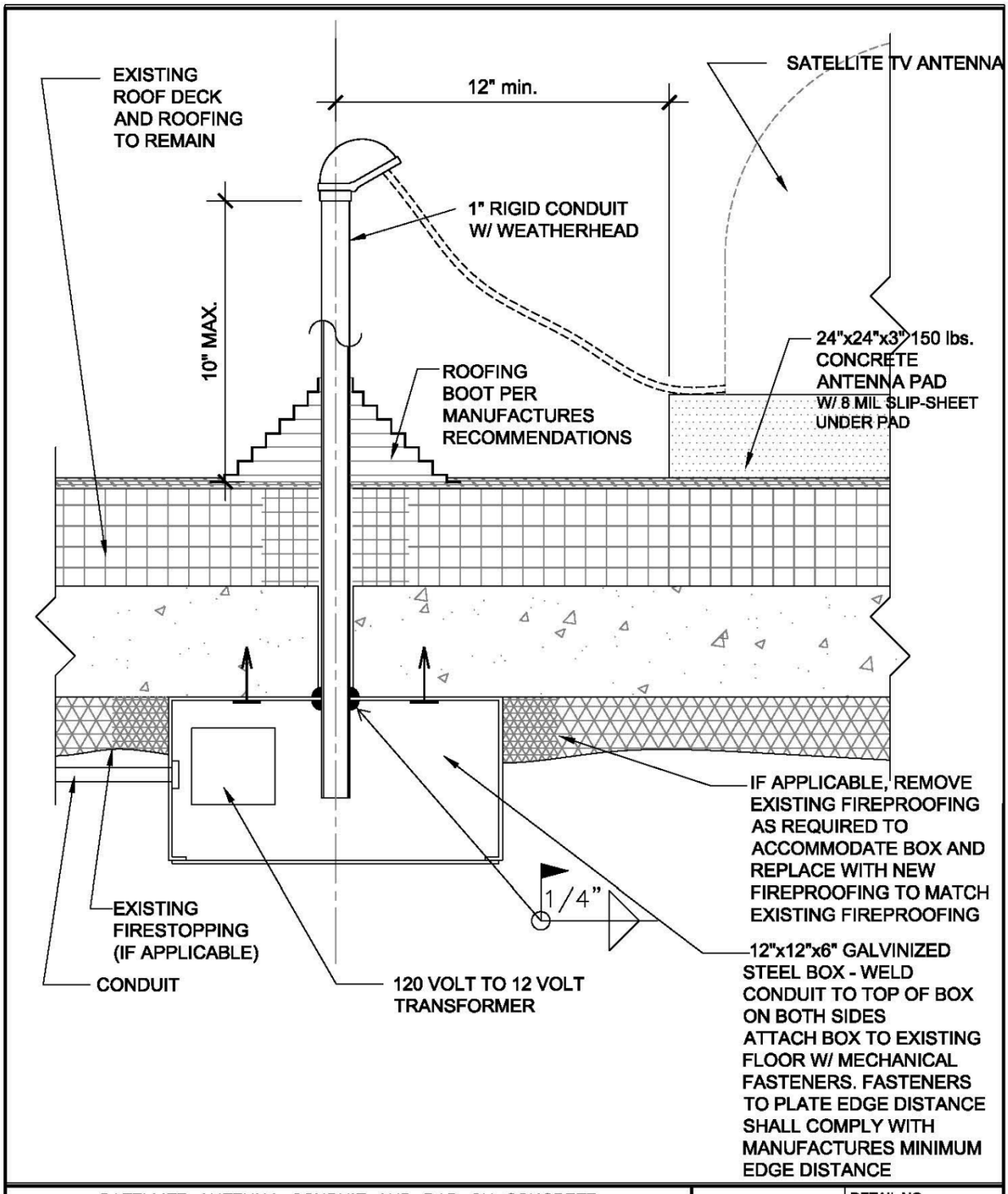


NOTES:

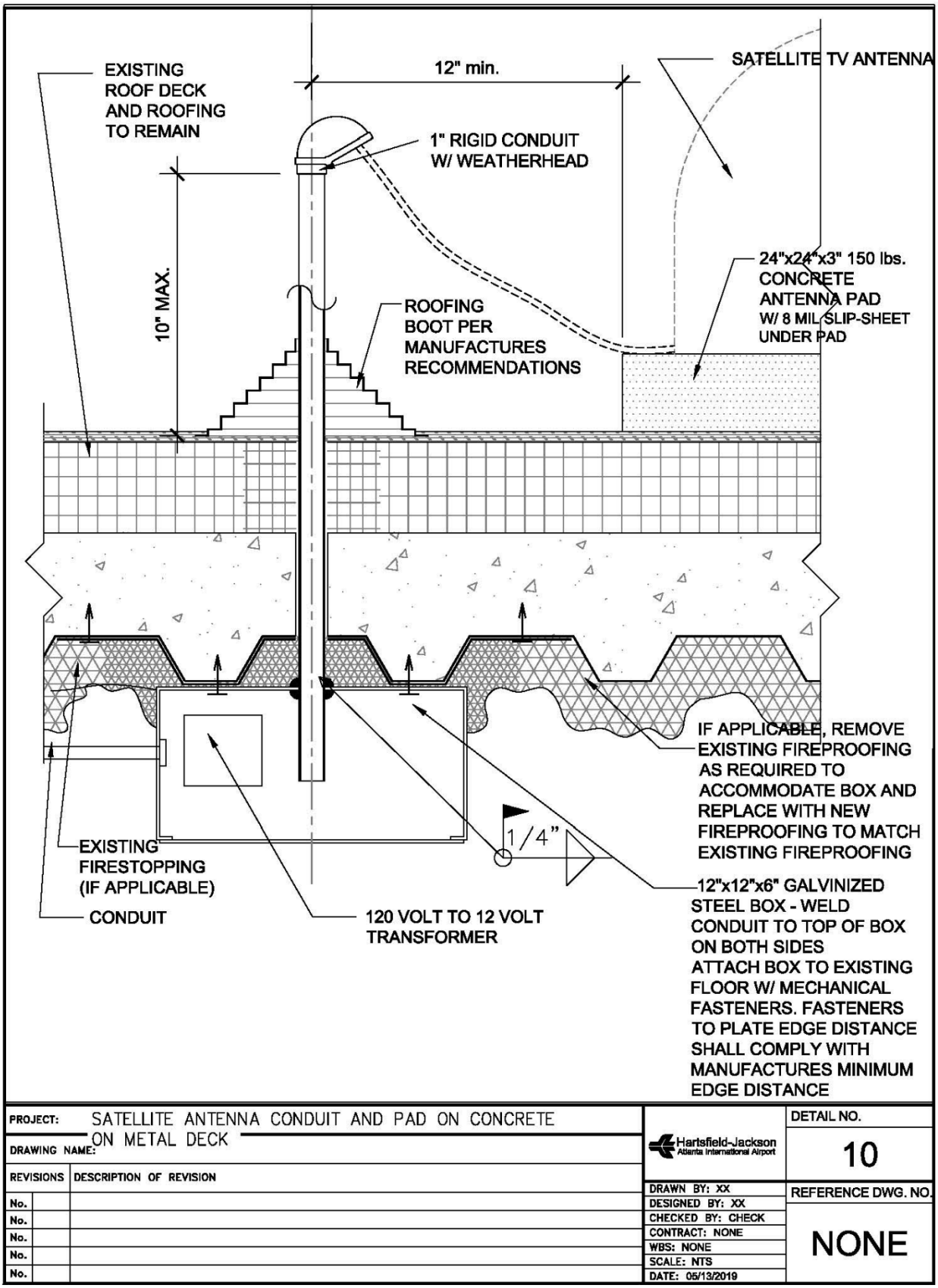
1. ANTENNA MAST, PIPE CONDUIT, PIPE CLAMPS AND STRUCTURAL SUPPORTING SYSTEM SHALL BE DESIGNED BY A GEORGIA STATE REGISTERED STRUCTURAL DESIGN PROFESSIONAL. SUBMIT DESIGN, DESIGN CALCULATIONS AND DETAILS, ON SIGNED AND SEALED DRAWINGS TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
2. THE SUPPORTING STRUCTURAL SHALL MINIMIZE THE VIBRATION IMPACT DAMAGE TO THE EXISTING ROOF ASSEMBLY.
3. PITCH POCKET IS UNACCEPTABLE AS WEATHER PROTECTION FOR ROOFING PENETRATION.
4. VERIFY EXISTING ROOF ASSEMBLY FIRE-RESISTANCE-RATING REQUIREMENT, PROVIDE AND INSTALL FIRESTOP SYSTEM AS NEEDED. SUBMIT PROPOSED FIRESTOP SYSTEM TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
5. ENSURE NEW CONSTRUCTION WILL NOT IMPACT EXISTING BUILDING WARRANTY OF ANY KIND.

PROJECT: EXISTING ROOF PENETRATION DETAIL FOR ANTENNA MAST			DETAIL NO.
DRAWING NAME: PIPE THRU ROOFING SYSTEM OVER CONC. SLAB		Hartsfield-Jackson Atlanta International Airport	8
REVISIONS	DESCRIPTION OF REVISION	DRAWN BY: XX	REFERENCE DWG. NO.
No.		DESIGNED BY: XX	
No.		CHECKED BY: CHECK	
No.		CONTRACT: NONE	NONE
No.		WBS: NONE	
No.		SCALE: NTS	
		DATE: 05/13/2019	

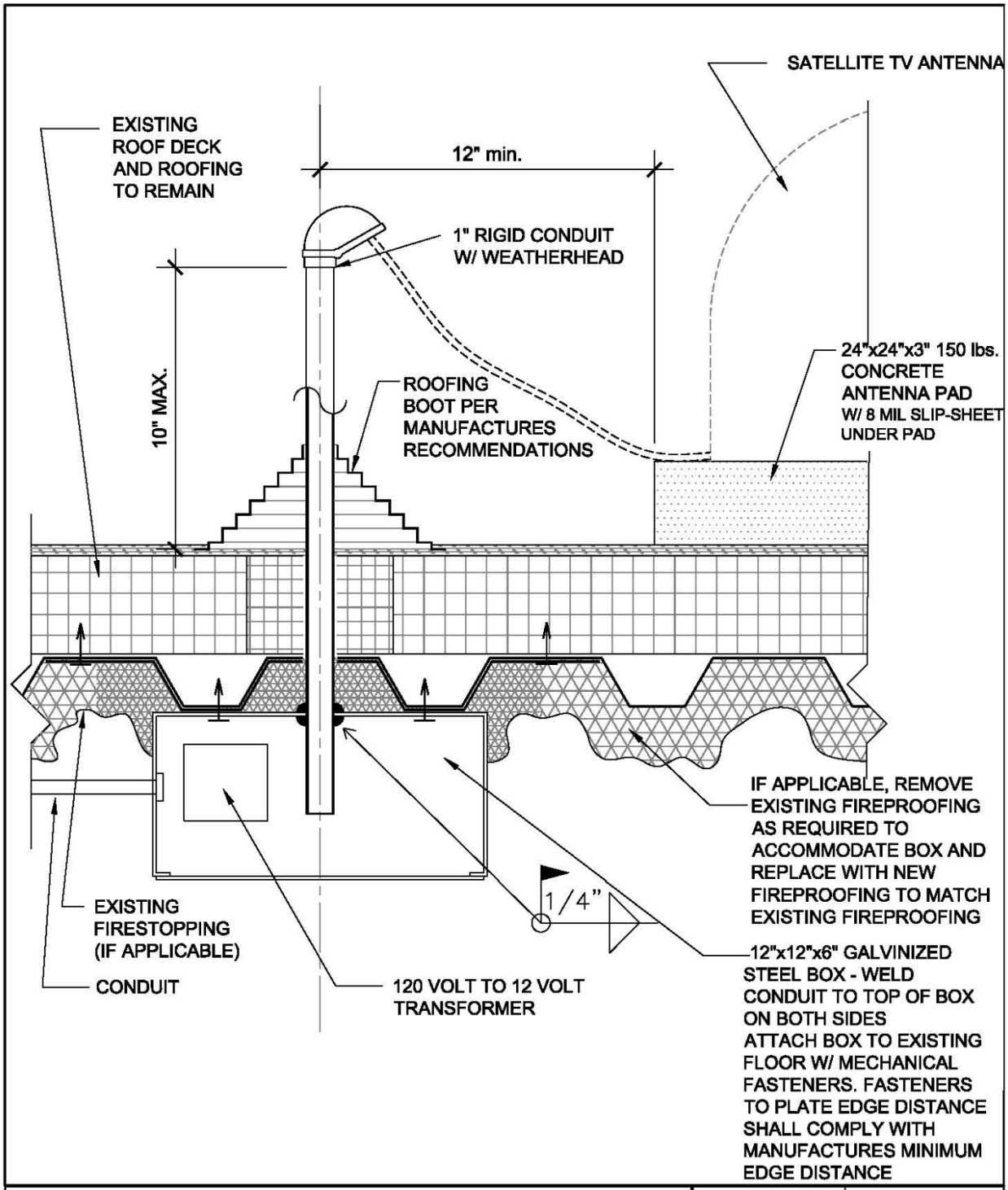
Detail No. 9 Satellite Antenna Conduit and Pad on Concrete Roof Slab



Detail No. 10 Satellite Antenna Conduit and Pad on Conc. on Metal Deck



Detail No. 11 Satellite Antenna Conduit and Pad on Metal Deck



PROJECT: SATELLITE MAST AND PAD DETAILS		DETAIL NO.
DRAWING NAME: SATELLITE ANTENNA CONDUIT AND PAD ON METAL DECK	Hartsfield-Jackson Atlanta International Airport	11
REVISIONS / DESCRIPTION OF REVISION	DRAWN BY: XX	REFERENCE DWG. NO.
No.	DESIGNED BY: XX	
No.	CHECKED BY: CHECK	
No.	CONTRACT: NONE	NONE
No.	WBS: NONE	
No.	SCALE: NTS	
	DATE: 05/13/2019	

Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Mechanical Engineering

Design Standards
Mechanical

Table of Contents

Appendices

Design Standards

Mechanical Engineering

1.0 Purpose

A. The purpose of this document is to outline the minimum design standards and installation requirements for mechanical systems (HVAC, plumbing and fire protection), which are installed to serve various spaces through the Central Passenger Terminal Complex (CPTC) at Hartsfield-Jackson Atlanta International Airport (H-JAIA or "Airport").

2.0 Codes and Standards

A. All construction documents shall be by professional engineers registered in the discipline specific to the trade work indicated on the contract drawings.

B. All governing codes and standards indicated in the trade sections of this document will be adhered to by the designers of record for all new construction and renovation projects initiated on any facility inside the bounds of H-JAIA or under the jurisdiction of DOA.

C. A&E firms shall design to the most current codes adopted by the City of Atlanta and State of Georgia. Code conflicts shall be resolved by using the more stringent applicable code. Notify DOA-P&D of any substantive discrepancies between various codes or with any of these standards.

D. Applicable Codes (Building Codes and regulations as adopted by the State of Georgia with amendments)

1. International Plumbing Code (With Amendments)
2. International Building Code (With Amendments)
3. International Fuel Gas Code (With Amendments)
4. International Mechanical Code (With Amendments)
5. International Energy Conservation Code
6. National Fire Protection Association (NFPA) Codes
7. NFPA 70 National Electrical Code
8. NFPA 90A Standard for the Installation of Air Conditioning and Ventilation Systems
9. NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems
10. NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
11. NFPA 101 Life Safety Code
12. NFPA 13 Standard for the installation of Sprinkler Systems
13. NFPA 14 Standpipe and hose systems
14. NFPA 20 Installation of stationary pumps
15. Standard Building Code

E. Standards

1. AATC Building Automation Systems Standard -- Version 2.0
2. ANSI American National Standards Institute

3. ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality
4. ASHRAE 90.1 Energy Standard for Buildings
5. ASME American Society of Mechanical Engineers
6. National Green Building Standards
7. Bureau of Watershed, Grease Interceptor design

3.0 General Drawing Requirements

A. Drawing layouts shall be neat, orderly and complete, showing all information required to convey the scope of work to general contractors or reviewing entities. Drawings will be prepared under the supervision of a Georgia state licensed professional engineer and shall bear his/her seal.

B. Mechanical plans, (HVAC, Plumbing, and Fire Protection) shall be consistent with the Architectural plans (e.g., same scale, match lines, common graphic standards) as the base set of documents. Part plans for mechanical equipment rooms, restrooms, kitchens and all rooms shall be provided where the density of support equipment prohibits clear documentation of the systems serving the space at the architectural base scale.

C. Provide all necessary drawing conventions to aid in the easy identification and location of spaces within the CPTC, Items shall include, but not be limited to project north indicators, column lines and call outs, room identification (rm number and/or function/name as space allows)

4.0 Trade Specific Drawing Requirements:

A. HVAC

1. Show all primary and secondary ductwork and major HHW/CHW piping using double line graphic standards. HVAC plan drawings shall be 1/8” or larger.
2. Provide sections as required to show inter-trade coordination in space restricted areas (i.e. ceiling plenums, mechanical chases, baggage handling areas, etc.)
3. Provide mechanical enlarged part plans as required to show equipment, ductwork, and piping in mechanical rooms. Enlarged plans shall be ¼" scale.
4. Provide riser diagrams for CHW, HHW, outside air, and exhaust air as required.
5. Provide HVAC installation details, as required, for major equipment and devices that have complex installation requirements.
6. Provide schedules for all HVAC equipment
7. Provide air flow balance summations for space (or building) as required to indicate/validate positive pressure relationship between critical building components.
8. Provide Control schematic diagrams for all equipment tied to DDC system or under stand-alone control. Provide I/O summary and written sequence of operation on drawings.
9. Provide HVAC calculations (Bldg. load, OA requirement, pump, fan, air flow balance, etc.) for review.
10. Provide specifications using standard division nomenclature with all sections required to describe all equipment and all construction methods utilized.
11. See Table 1 for Operating Parameters.

B. PLUMBING

1. Large scale plumbing plans shall be 1/16” scale plans. Coordinate with DOA if the project requires the use of a different scale. Use 1/8” scale plans (as a minimum) for all restrooms and food service areas.
2. Piping systems shall be shown on the plan background that corresponds to the level on which the piping is to be installed. (i.e- sanitary piping that serves a boarding level FD will show up on the apron level plan in the ceiling plenum)
    a. Backgrounds should clearly indicate where designated electrical rooms, communications rooms control rooms and IT (MDF/IDF) rooms are located. Piping should not route thru theses rooms. If piping must run thru theses spaces, show major equipment in the room(s) and indicate provisions to protect and critical equipment below.
    b. EOR must coordinate pipe routing with other major systems that support ramp services. Show systems like baggage handling conveyors and carousels, tug lanes, electrical gear and any item that needs O&M clearance to operate on plans and indicate provisions for maintenance.
3. Provide riser diagrams for all sanitary waste and vent, grease waste, domestic water systems, and natural gas systems.
4. Provide schedules for all major plumbing devices including but not limited to, water heaters, pumps, air compressors, etc. Example:
    a. Plumbing Fixture Schedule with Mark, description, pipe connection sizes, manufacturer, model number and description as a minimum.
    b. Water Heater Schedule with location, make and model number, gallons, number of elements Voltage and delivery temperature.
    c. Pump Schedule with Mark, manufacturer, model number electrical, RPMGPM, Head Description as a minimum.
    d. Drain Schedule with mark, manufacturer, model number, and description as a minimum.
    e. Equipment schedule, Mark description, manufacturer, model number, description, etc.
5. Indicate clearly locations and line sizes of all connections to existing systems. (coordinate with civil drawings and DOA master utility locations)
6. Provide detail sheets with detail that are edited for the specific project.
7. Indicate rainfall rate used for design and indicate roof square footage for each roof drain and pipe.
8. Calculations (Fire Protection)
    a. Provide Hydraulic calculations on all major designs and renovations.
9. Specifications using standard division nomenclature with all sections required to describe all equipment and all construction methods utilized.
10. Demolition Drawings
    a. Provide demo drawings as shown on architectural drawings. (Size, scale, area)
    b. Show existing utilities that are being demoed.
    c. Provide scope for provision to connect in future or remove abandoned piping.

C. FIRE PROTECTION

1. Provide design criteria drawings, 1/8” scale or larger with existing and new sprinkler head locations, lights and diffusers (for coordination), Hazard classification, including density and remote square footage and location of same for all spaces within a design.
2. Provide piping layout plans for major renovation projects and new construction.
3. Provide specifications including but not limited to, piping, sprinkler heads, equipment, ETC. Provide specifications using standard (xxx) division nomenclature with all sections required to describe all equipment and all construction methods utilized.
4. Provide hydraulic calculations with shop drawings done by a certified fire protection system designer. Sprinkler shop drawings and as-built drawings are to be submitted to DOA in an approved format.
5. Provide fully coordinated RCP’s showing sprinkler head locations and types. RCPs shall show ceiling types, light and diffuser locations for coordination.
6. Calculations

5.0 Primary Utilities Overview

A. Central Plant Configuration

1. The majority of the CPTC is served by two Central Utility Plants (CUP’s). The T-CUP plant is located at the east end of the Main Passenger Terminal on the Apron level between the center spine roads. The E-CUP plant is located at the west end of E concourse on the Pedestrian Mall (Plane-Train) level next to the Bombardier train maintenance shop.
2. Chilled Water (CHW) and Heating Hot Water (HHW) are distributed thru a traditional four pipe system. Because of environmental requirements we are not allowed to operate boilers during summer months (approx. May- September). As an energy savings measure, we shut down the chilled water system based on OA temp. (typically when OA temp falls below 60 degrees. Neither CUP has water side economization. EOR’s should consider the CUP’s as functioning as 2-pipe systems with the exception of limited periods during shoulder seasons when OA temperatures dictate the energization both chillers and boilers.

B. CHW Distribution

1. The CHW system is a Primary/Zoned Pumping system. With a cross connection that allows concourses loads (specifically C& D CON’s) to be feed from either CUP. T-CUP serves the North & South Terminal, the Atrium and CON’s T-D. The piping system in the main utility tunnel was originally designed to serve A-D Concourses from T-CUP and Concourses E & F from E-CUP. The cross connection is valved and sized to allow both C&D CON’s (as a pair) to be fed from either CUP.
2. Primary Pumps circulate CHW thru the chillers within the CUP. Primary Pumps are paired with the chillers and sized to pump the chiller and charge the main loop. Each plant typically has at least N+1 redundancy for major equipment.
3. Zone Pumps are located within each concourses’ individual pump room and are sized to circulate CHW thru the tunnel the full distance back to the CUP, for CON’s T-D. Main Terminal pumps are in T-CUP. Concourse E&F zone pumps are in E-CUP. There are typically 2 zone pumps per concourse sized at 50% of full load. (note: DOA usually requires the selection each zone pump to handle 60-

70% of full load by riding the curve) Consult with P&D whenever a Concourse addition adds a significant amount of load to the CHW system, as pump replacement will need to be evaluated by the EOR

C. HHW Distribution

1. The HHW system is a Primary/Secondary/Tertiary Pumping system. T-CUP serves the North & South Terminal and CON's T-D while HHW for Concourses E & F are served from E-CUP
2. Primary Pumps circulate HHW thru the boilers within the CUPs. Primary Pumps are paired with the boilers and sized to pump the boiler and charge the main loop. Each plant typically has at least N+1 redundancy for major equipment
3. Secondary Pumps are typically located in the CUPs and are sized to circulate HHW thru the facility loop
4. Tertiary Pumps are located within each concourses' individual pump room and are sized to circulate HHW thru the concourse, for CON's T-D. The pumps that serve the various Main Terminal tertiary loops are located in the T-CUP. Concourse E&F Tertiary pumps are in E-CUP. There are either 2 or 3 Tertiary pumps per concourse. For Concourses with 2 pumps each pump is sized at 100% of full load. For Concourses with 3 pumps, each pump is sized for 50% of full load flow. Consult with P&D whenever a Concourse addition adds a significant amount of load to the HHW system, as pump replacement will need to be evaluated

D. Domestic Water Configuration

1. Water is supplied from Hapeville and College Park. The airport is looped with water mains.
2. Each concourse is fed with one domestic water and a combination domestic and fire service.
3. The water pressure is at or above 80PSI and requires a PRV.

E. Sanitary Sewer Configuration

1. Sanitary sewers run North and South toward the center point
2. Each concourse has 4" and 6" laterals connecting the concourse waste to the mains.
3. Grease Waste from large food and Beverage areas require Grease Waste, (GW), to discharge into one or two 1,500-gallon underground grease interceptors or a 1,500 or a 3,000 gallon above-ground grease interceptor.

F. Natural Gas Distribution

1. Natural Gas is supplied by Atlanta Gas Light.
2. Gas piping is routed underground between the taxi way and the NLVR with a branch off to the south side of each concourse.
3. Piping is regulated to 5PSI or higher on the roof
4. Gas piping for Concourse E and F is routed inside each building and on the roof
5. Gas piping for T-CUP is fed from the 6" gas main on the roof of Concourse-T.
6. The Food & Beverage Concessions service to each space is metered

G. Fire Protection Configuration

1. Each concourse is equipped with a 750 GPM fire pump and jockey pump.

2. Each fire pump room is equipped with a double check valve assembly, alarm check valves, (Dry or wet), controllers, test headers, Fire and Jockey pumps, fire department connections, distribution piping and a fire hydrant in the area.
3. There are Fire Valve Rooms on the Apron Level with FDC and alarm valves, (Wet or Dry).
4. The existing sprinkler system is designed at a minimum design density of Ordinary Hazard Group I. (Any new systems are to be designed at a minimum of Ordinary Hazard Group I)
5. Critical Rooms and MDF rooms are to be protected with clean agent fire suppression systems.
6. Areas that are subject to freezing are protected with a dry sprinkler system or NFPA approved Heat Trace and insulation.
7. Parking Structures are protected with a manual dry standpipe system, and with wet sprinklers in any office areas.

6.0 Space Specific System Descriptions (HVAC)

A. Large CPTC Public Spaces HVAC

1. Spaces which fall under this heading are free of interior partitions, relatively large volumes which can either be interior zones or combination interior/exterior zones with the provision that both thermal and air diffusion through the space is relatively uniform and unencumbered. Spaces which generally fall under this category include (but are not limited to) Terminal ticketing and baggage claim areas, Large Terminal Atria, Public seating & Circulation areas, TSA and Concession Cue areas
2. Large CPTC Public spaces are to be served by medium and low pressure VAV Roof Mounted units RMU's (or RTU's) wherever possible. VAV indoor AHUs can be used as an alternate, when practical, provided a clean source for OA can be routed to the interior mechanical room. Sufficient space for 100% economizer and relief air must also be provided. Separated ductwork and motorized damper for minimum and economizer outside air shall be provided. Outside air and return air in mechanical rooms shall be ducted to AHUs.
3. Provide Single Zone VAV RMU's or AHUs for these large-open volume public spaces which have relatively uniform heating and cooling load distributions. These AHUs/RMU's will utilize chilled and hot water from the central plant water loops.
4. Distribution ductwork in these spaces need to ensure very good air circulation to minimize the chance of hot or cold spots.

B. Zoned CPTC Public Spaces HVAC

1. Spaces which fall under this heading are located adjacent to each other but have varying load profiles due to external heat gains, or differences in internal space utilization. Spaces which generally fall under this category include (but are not limited to) Concourse main circulation corridors, Hold Rooms, smaller Concourse Atria, Food Courts, and Concession, Tenant Cue areas, General Office and Back of House spaces.
2. Zoned CPTC Public spaces are to be served by medium and low pressure VAV Rooftop RTUs (RMU's) wherever possible. VAV indoor AHUs can be used as an alternate, when practical, provided a clean source for OA can be routed to the interior mechanical room. Sufficient space for economizer and relief air must also

be provided.

3. Provide VAV AHUs/RMU's for these spaces. These AHUs/RMU's will utilize chilled and hot water from the central water loops. Provide VAV terminal units with hydronic heating.
4. Use of Fan powered terminal units/powered induction units (PIUs) is discouraged in the CPTC base systems. Coordinate with DOA/AATC to receive prior approval before using PIUs in any special applications.

C. Computer Rooms

1. AIS has several server rooms located throughout the facility. Main server rooms utilize dedicated "Leibert Type" CRU's. The main train control server rooms are conditioned with similar CRU's.
2. In the future, on a case-by-case basis, we will have different types of equipment based on the critical nature of the equipment being cooled.
3. Typical systems run from DX cooling split systems or package thru-wall systems up to chilled water or air-cooled computer room units. Special care must be used for rooms conditioned from the base building system as the central plant is de-energized when the OA temp. is below 60 degrees F.

D. Transformer, Substation & Switchgear Room

At a minimum**,** provide ventilation as the load dictates, eight (8) to ten (10) air changes per hour is considered minimum ventilation for typical CPTC applications. Base building air conditioning can be used in lieu of ventilation where existing RTU's/ AHU's have sufficient AC spare capacity to all rooms, GA Power separate. No plumbing shall be run through these rooms whenever possible. If plumbing routing through the room is unavoidable, provisions shall be made to protect equipment from water. If plumbing routing through the room is unavoidable, provisions shall be made to protect equipment from water.

E. Apron Level Support Areas

1. Areas with heavy tug traffic that is exposed to outside air, (under the terminal) need to provide exhaust and fresh air (cross-ventilation) fan systems. Heated ventilating units may be required if large amounts of un-tempered outside air are needed to ventilate a given Apron level space.
2. In locations where baggage handling operators are located for extended periods of time, (i.e. make up stations) provide supplemental heating systems (typically, radiant heat) for operator comfort.

F. Communication Closets

1. Type of AC is dependent on location and critical nature of application. If base building AC is available, it is acceptable to use a dedicated VAV terminal unit.
2. If the application is critical, a backup fan may be required to provide ventilation in case of a system failure.
3. Where Base Building AC is not available, (typical on Apron level), provide DX unit or split system AC systems.
4. In critical spaces, two DX units or back up fan ventilation systems may be required.
5. Water source heat pump tied into domestic water system is not allowed under any circumstances.
6. AGT Level Communication Rooms: Due to the location of these communication rooms, heat rejection is problematic. Use DX split systems to condition space

Reject heat into the closest AGT Mechanical Room, only if a path to the apron level cannot be created.

G. Restrooms

1. Public Restrooms will be directly exhausted to the exterior of the building. Provide heating and cooling VAV terminal units to condition the space. Provide transfer air duct systems to allow make-up air into any restroom if required.
2. Back of House Restrooms will be directly exhausted to the exterior of the building. Provide heating and cooling VAV terminal units to condition the space as required. Provide transfer air duct systems, or door grilles, to allow make-up air into any restroom.

H. Hold Bag Screening Facilities

1. Screening Rooms: These spaces are where the large CTX automated baggage screening systems are located along with the associated baggage handling conveyer systems. These spaces are considered critical application spaces, with high heat output equipment.
2. These spaces are to be served by medium and low-pressure single zone AHUs. Provide a clean source for OA to the mechanical room. Sufficient space for economizer and relief air must also be provided.
3. Provide Single Zone VAV AHUs for these large-open volume spaces which have relatively uniform cooling load distributions. These AHUs will utilize chilled and hot water from the central water loops. Provide hot water pre-heat coils for freeze protection as required.

I. Spaces requiring Major Equipment Replacement

1. When a space requires a straight one for one replacement of a major piece of equipment, the EOR shall, at a minimum, be sure to coordinate the following:
   a. Current manufacturers can provide the same features as the original manufacturer.
   b. Equipment dimensions can be made to work in the existing space allocated for the original equipment.
   c. Existing structure can accommodate the new equipment weight.

7.0 Space Specific System Descriptions (Plumbing)

Water Service rooms for new development shall be sized to accommodate all required assets.

A. Infrastructure consists of domestic water supplied from the city water system at a pressure of 60 to 70 pounds. There is a sanitary sewer system at each concourse and terminals. There is natural gas supplied on the roof of concourse T, A, C, D, and inside E and F. Gas is routed to concourse B but not installed on the roof. The natural gas is for limited use mainly for cooking by concession with a separate meter. T CUP gas is supplied from piping routed from the south end of concourse t on the roof to the center point. E CUP gas is supplied from piping in the tunnel between concourse E and F.

B. Restrooms

1. Public restrooms shall be ADA accessible with touch free metering low flow fixtures (Per IPC).
2. All public restrooms shall have floor drains in each fixture area.

3. All accessible toilet chases will have floor drains.
4. All public restroom areas will be equipped with a janitor closet with an electric water heater with mixing valve, floor drain and a mop sink as a minimum.

C. Back of House Restrooms

1. Restrooms shall be ADA accessible with low flow fixtures (per IPC)
2. Restrooms shall have floor drains.

D. Back of House Break Rooms

1. Break rooms with sinks can use storage heaters or instant electric water heaters
2. If cooking is required or a dishwasher is required, a grease trap or interceptor may be required.

E. Apron Level Support Areas

1. If cooking is required or a dishwasher is required a grease trap or interceptor may be required.

F. Parking decks

1. Storm Drainage, Top Level and exterior ramps shall be designed per IPC Rainfall Criteria for City of Atlanta.
2. Lower levels are to be designed for minimum run-off from cars and blowing rain.
3. Elevator Penthouse and stair towers roofs are to be designed with primary, and overflow drains or scuppers.
4. Parking deck entrance will be designed to capture runoff from cars only unless exterior grade requires more rainfall rate.
5. Drainage and pipe calculations shall be noted on each deck drain and trench drain on top level, (Square footage, area and GPM), will be noted on each deck drain and trench drain on top level, all vertical and horizontal piping along with pipe size.
6. Domestic Water, (If required), entrance will be in heated space in a secure box or with heat trace and insulation, shut-off valve and drain. Hose bibbs will be equipped with a vacuum breaker. Maximum flow of 10GPM unless approved by DOA.

8.0 Space Specific Systems Descriptions (Fire Protection)

A. Infrastructure, Fire protection is supplied by a fire pump or pumps and jockey pump or pumps on each concourse and terminals. Dry pipe systems or heat trace and insulation are provided where fire protection is subject to freezing.

B. Design Criteria, all areas in the CPTC are to be designed to Ordinary Hazard Group I as a minimum.

C. Accessible toilet chases will have sprinklers.

D. Large CPTC Public spaces and zoned CPTC public spaces, including restrooms shall have All sprinkler heads be concealed type with color to match ceiling cover.

E. Back of House Areas Back of house areas will be protected with concealed heads or semi-recessed where lay-in ceiling is installed. Areas without ceiling will be protected with upright heads.

F. Freeze Protection Exposed Apron level spaces

1. Areas subject to freezing will be dry pipe system or be heat traced and insulated.

G. MDF/T-3 Das – Clean Agent Fire Protection System

1. MDF/T-3 DAS and other critical computer rooms will be protected with a Clean Agent Fire Suppression System.

9.0 HVAC Materials and Equipment

A. Roof-Mounted Air Handling Units (RMU)

1. Roof-Mounted air handling units shall be custom built and sized to meet the cooling, heating and ventilation needs of the spaces it will serve. The requirements are application specific and will be coordinated with P&D-E during the validation and /or early (30%) design phase. Typical features include:
2. RMU's shall be all aluminum construction including unit base rails.
3. RMU's shall include (as required by application) chilled water-cooling coil section, hot water pre- heat coil section, supply fan, mixing section with dampers, Return section, discharge section and access sections between coils and between filters. RMU's shall have interior access corridor (min 54" clear width). Outside air dampers shall be split into a section for minimum requirements and a section for economizer outside air. Minimum outside air sections shall be configured to allow MFG required installation and proper operation of the flow meter at all velocities.
4. Camfil Merv 14 high flow bag filters, 30% efficient pre-filters.
5. Provide UV light assemblies as a means of coil sterilization
6. Provide relief fan section for odor and (nonlife safety) smoke purge to be used after a fie event occurs on a given concourse.
7. Where required by extensive return air duct runs, units shall be provided with return fans and relief dampers.
8. Where possible RMU's will utilize fan array assemblies to increase reliability.
9. Provide variable frequency drives on all VAV RMU's, mounted inside the unit. Provide redundant variable frequency drives on all critical RMU's,
10. Interior lights and service receptacles shall be wired to a junction box for single-point 120-volt feed that can be powered when the main unit components is de-energized.

B. Interior Modular Air Handling Units (AHU)

1. Interior air handling units shall be modular, double-wall units and shall include (as required by application):
   - chilled water-cooling coil, hot water pre-heat coil,
   - Camfil Merv 14 high flow bag filters, 30% efficient pre-filters.
   - Provide UV light assemblies as a means of coil sterilization
   - Utilize Fan array or centrifugal supply fan, depending on unit size.
   - Mixing box section with dampers and interior lights.
   - Where required by extensive return air duct runs, units shall be provided with. return fans and relief dampers.
   - Variable air volume units shall be provided with variable frequency drive.
   - Interior lights and service receptacles shall be wired to a junction box for single-point 120-volt feed.
   - AHU shall be able to operate in 100% outside air economizer mode.

2. Outside air intake location shall be analyzed for requirement of including carbon filtration. Dedicated OA injection fan may be required to ensure minimum required OA is achieved if OA route pressure drop is larger than 0.75” W. C.’1.

C. Variable Air Volume Boxes (VAV)

1. VAV Boxes shall be single-duct terminal unit complete with modulating damper, airflow measuring sensor, and internally insulated casing. Reheat boxes shall be provided with hot water reheat coils. DDC controls and damper actuator will be provided by Controls contractor.

2. Power wiring for damper actuators shall be provided for in design.

10.0 Ductwork

A. Ductwork shall be galvanized steel sheet metal designed and constructed per SMACNA duct construction standards. Fiberboard duct is not permitted. Main duct trunks shall be located over common areas or corridors whenever possible. Balancing dampers shall be provided at proper locations to allow balancing of systems. Provide turning vanes to help system balance and minimize effect.

a. Flex duct run outs to diffusers shall not be longer than 6 feet. Flex duct shall not be used in exhaust systems.

b. Coordinate RCP to ensure access to all devices located above hard ceilings.

B. Duct Insulation

1. Duct insulation for supply air, return air, and outside air ducts above ceilings shall be fiberglass blanket wrap, 2” thick, 1.5 lb./cu.ft. density with a factory-applied FSK vapor barrier. Insulation thermal conductivity at 75^0F shall be 0.27 BTU-in./hr./sq.ft./^{0}F. On rectangular ducts 24 inches wide and larger, apply stick pins and washers on 18-inch centers on bottom side of duct.

2. Duct insulation for supply air, return air, and outside air ducts in exposed unconditioned spaces shall be rigid fiberglass board insulation, 2.5” thick, 3 lb./cu.ft. density with factory-applied FSK vapor barrier.

3. All insulation R-values shall meet the current energy code requirements.

C. Air Distribution Devices

1. Air distribution devices selected shall match the style of devices in existing areas and in new facilities. Devices shall be provided with dampers and shall be selected based on throw and noise criteria. Linear slot diffusers shall be used at large glass areas on exterior walls.

D. Controls

1. Controls for all new equipment installations and renovation of old systems shall be DDC and shall be fully BACnet IP compatible. Systems shall connect and be fully integrated with the existing Niagara system frontend. Maintained and operated by AATC. Graphics shall be seamlessly integrated into the Niagara front end for end user ease of use.

2. Multizone AHU programming shall comply with Multizone Standard Sequence (see appendix A). Single zone AHU programming shall comply with Single Zone Standard Sequence (see appendix B). Terminal Units shall comply with Terminal Unit Standard Sequence (see appendix C).

3. The BACnet points required for the BMS shall be configured, exposed, and viewable from the base building BMS front end and comply with the BMS Points. Standard List for naming conventions and descriptions (see appendix D).

4. Zone temperature thermostats shall be networked type sensors, communicating on either the SA or BACnet bus.

E. Test and Balance

1. All HVAC systems shall be tested and balanced upon completion of installation. The TAB services shall be performed by an AABC-certified contractor.

F. Utility Piping

1. Chilled Water and Heating Hot Water pipe shall be ASTM A-53 Grade B pipe carbon steel. Piping 2-1/2” and smaller shall be threaded and coupled with 150 lb. threaded fittings. Piping 3" and larger shall be plain end pipe with 150 lb. butt-welded fittings. *Welded or threaded fittings shall be used on all CHW & HHW piping in the following locations:*
    - *CUP’s*
    - *Utility tunnels*
    - *Ceiling plenums or chases that will be difficult to access*. Coordinate with DOA to evaluate accessibility thresholds.

2. Other piping materials and joining methods are allowed outside of these three specific areas as indicated below:
    a. Type L hard-drawn copper with solder joint fittings may be used for piping 2 - 1/2” and smaller. (This is typically for HHW distribution piping to TU’s and possibly on CHW & HHW in mechanical rooms)
    b. Mechanical joining systems pressed joint & grooved-joint systems may be used in mechanical spaces, (AHU rooms, RMU Piping vestibules, etc) exterior or exposed spaces and on distribution piping where reasonable access is assured.
    c. Mechanical joint systems may be used for piping 2 ½” thru 8”. Couplings 2 ½” through 8” to be of installation-ready design (requiring no disassembly to install)
    d. Gaskets for mechanical joint systems on hydronic services shall be EPDM. The gasket material shall be suitable for the fluid service type and temperature.
    e. Quality assurance- The EOR shall coordinate their specification with the mechanical joint manufacturer to ensure the performance of the system meets the products intended use. A factory-trained representative (direct-employee of the MFG) shall periodically visit the job site and review installation. The mechanical joint manufacturer will train the mechanical contractor’s field and fabrication shop installers in accordance with proper piping practices and manufacturer’s recommended installation methods. Mechanical Subcontractor shall use only manufacturer’s approved mechanical joining tools, equipment and methodology for all piping installed in a system.
    f. Mechanical Subcontractor shall use the same mechanical joining method for all piping installed in a system.
    g. Provide adequate valving to ensure major runs of mechanically joined piping can be isolated. *At a minimum, provide isolation valves on all CHW & HHW piping mains (regardless of joining method-welding included) where these systems cross a building expansion joint*.

h. Piping headers shall be routed over corridors or common areas for access where possible. Route piping as to not impede access to existing or new equipment that may be installed above. Minimize piping runs over escalator wells and other spaces that cannot be accessed from a standard scissor lift.

i. Cooling coil condensate will be routed to sanitary system (floor sinks, hub drains or mop sinks). Condensate piping shall be type L copper.

j. Refrigerant piping shall not be assembled using any mechanical pipe joining methods.

k. Pipe insulation shall be rigid fiberglass pipe insulation with all-service jacket vapor barrier. Piping located outside and in unconditioned areas (typically found on ramp, apron, baggage and train levels) shall be closed cell covered with aluminum jacketing.

l. New piping shall be thoroughly cleaned and flushed before placing into service.

m. Avoid routing CHW/HHW piping in electrical and MDF-IDF rooms. No mechanical joints on any piping that must run thru critical IT and electrical rooms

n. Labeling: Provide color coded labeling with directional arrows for all CHW & HHW piping

11.0 Plumbing Materials and Equipment

A. Sanitary, Storm and Kitchen Waste and Vent Piping

1. Sanitary waste and vent and storm piping shall be service weight cast iron pipe and fittings with factory asphalted coating.

a. Underground piping shall be hub and spigot with push-on compression joints with neoprene gaskets.

b. Above ground piping shall be no-hub joints with stainless steel bands and neoprene sealing sleeve.

B. Kitchen (greasy) waste, from dishwasher, floor drains, floor sinks, three compartment sink, mop sink and food grinder wastewater to exterior grease interceptor shall be stainless steel piping with hub and spigot DWV fittings with push on joints. Provide joint restraints as recommended by the manufacturer.

C. Domestic Water Piping

1. Potable water piping shall be type “L” copper.

2. Fittings 4” and smaller shall be solder using 95/5 lead free solder or press fittings with neoprene “0” ring.

3. Fittings larger than 4” shall be rolled groove.

4. Fittings 4” and less shall be press fitting with neoprene “0” ring.

D. Natural Gas Piping

1. Above ground gas piping shall be schedule 40 black steel.

a. Gas piping in return air plenum and larger than 2” shall be welded.

b. Gas piping 2" and smaller shall be threaded.

c. Above ground piping exposed outdoors shall be coated and wrapped or painted with a minimum two coats of yellow epoxy paint.

2. Underground gas piping.
    a. Outdoors at building entrance, schedule 40 black steel piping with threaded or socket welded fittings and coated with protective coating and wrapping.
    b. In concealed locations shall not have unions, fittings or couplings unless tubing is brazed, piping is welded, or fittings are listed for use in concealed spaces.
    c. Below slab piping shall be installed in a trench or be contained with containment piping vented to the exterior.

E. Insulation
1. Domestic cold water, 1” thick fiberglass pipe insulation
2. Domestic hot and hot water return, 1” thick fiberglass pipe insulation.
3. Domestic water piping exposed in kitchen or wash down areas shall be “1” for cold and 1" for hot and hot water return closed cell insulation with aluminum jacket.
4. Domestic water piping exposed outdoors will be heat traced and insulated with a minimum of 1” insulation and aluminum jacket.
5. Roof drain body and horizontal piping 1/2” duct wrap.6’
6. Sanitary drainage, p-trap and horizontal piping, serving HVAC condensate, ice machines and ice boxes, shall be insulated the same as roof drains and horizontal piping.
7. P-traps, sanitary piping, and kitchen piping, (GW), exposed to freezing shall be heat traces and insulated with aluminum jacket.

F. Water Heaters
1. Water Heaters shall be electric where possible or approved by DOA

12.0 Fire Protection Materials and Equipment

A. Fire Protection Piping
1. All components of the fire protection systems and installation shall meet NFPA 13 requirements.
2. Underground piping shall be ductile iron with mechanical joint fittings and thrust blocks or tie-rods.69
3. Above ground sprinkler piping shall be schedule 40 carbon steel with welded or threaded joints and schedule 10 rolled grooved. Fittings shall be UL-listed and FM-approved for fire protection service. Mechanical Grooved fittings and couplings which are UL-listed and FM-approved are permitted.
4. All dry pipe sprinkler systems shall be schedule 40 galvanized steel.

B. Fire Protection Equipment
1. Wet sprinkler systems shall be designed through an alarm check valve in lieu of a straight way check valve with flow switch.
2. Dry sprinkler system shall be designed through a dry alarm valve with air compressor.

C. Sprinkler heads
1. Concealed type sprinkler heads shall be in sheet rock ceilings and 2X4 lay-in

ceiling (at 1/2 points).

2. Semi-recessed heads shall be used in 2X4 lay-in ceiling (at 1/2 points)
3. Upright heads shall be used for areas without ceiling or for dry systems.
4. Concession can use any UL, FM approved head in their space, except sprinkler heads designated for residential applications

Appendix A - Standard Multizone Sequence

1.0 Standard Multizone Sequence

All setpoints, values, and time delays referenced are initial values that must adjustable

A. Occupied-unoccupied mode control:

1. Air handling unit (AHU) default is a 24/7 run schedule, where supply fan runs continuously.

B. Start-stop control:

1. Provide hand-off-auto switch. In auto position, the air handling unit shall start. Upon receiving a start command, the smoke damper shall open, and minimum outside air damper shall open to its minimum position. After the smoke damper and either the maximum outside air or return air damper are proven open via end switches, the supply fan shall start.

C. Warm up mode control:

1. The space temperatures shall be monitored and compared to the warmup setpoint (65 °F). The air handling unit will enter in warm up mode if more than 25% of zones are lower than warm up setpoint. It will remain in warm up mode until less than 15% of the boxes are less than warm up setpoint. In morning warm up mode. The air handling unit's minimum and maximum outside air dampers, relief air damper, and chilled water valve will be closed the return air damper and the preheat valves shall remain open.

D. Minimum outside air damper control:

1. Each AHU shall be provided with a minimum outside air flow (OAF) controller consisting of an air flow measuring station with active damper control.
2. Each AHU shall regulate OAF SP between two outside air cfm setpoints, from minimum occupancy/ building minimum ventilation up to maximum occupancy OAF cfm. Refer to the AHU schedule for the two minimum OAF cfm setpoints for each AHU.
3. When not in warm up or cool down mode, the minimum outside air control shall initially open to building minimum of scheduled outside air.
4. Upon a rise in any of the critical space or return CO2 sensors above setpoint (initially 900 ppm), the minimum OAF SP shall modulate between minimum and maximum values to maintain CO2 setpoint.
5. The minimum outside air damper modulates to maintain OAF at OAF SP.
6. The controls will have a building pressure control enable selector. Only if enabled, if building space static pressure falls to -0.02 in wc for more than 5 minutes, the minimum outside air flow setpoint shall be overridden between minimum and maximum OA cfm setpoint as required to maintain a positive building space static pressure setpoint of 0.02 in wc.

E. Discharge air temperature setpoint control (DAT SP):

1. The discharge air setpoint will be reset from a minimum of each unit's scheduled "duct supply temperature" (typically 52 F) to 65 F maximum based on the cooling demand of the associated terminal units.
2. If greater than 30 % of associated terminal units have flow set points that are within 95% of cooling maximum flow set point, then the discharge air setpoint will be decreased 1 deg. F every 10 minutes. If less than 20% of associated terminal

units have flow set points that are within 95% of cooling maximum flow set point, then the discharge air setpoint will be increased 1 deg. F every 10 minutes.

3. If outside air temperature (OAT) is greater than 75 F, DAT SP is set to minimum setpoint.
4. When counting terminal units, boxes serving exclusive or sensitive areas shall be given a weight of 1.5. Terminal units feeding open common areas shall be given a weight of 1.
5. If return air humidity rises above 60% for 10 minutes the discharge air setpoint will be overridden to minimum cooling temperature. When return air humidity is less than 58% for 10 minutes, the normal discharge air temperature control will resume.

F. Discharge air temperature control modes:

1. Economizer mode (maximum outside air damper):
   a. Whenever the OAT is below the economizer switchover setpoint of 65°F the unit shall operate under the economizer mode
   b. The economizer outside air damper modulates as the 1st stage of cooling control for discharge air temperature (DAT) to meet discharge air temperature setpoint (Econ mode). If the economizer damper is at 100% and the chilled water system is enabled, the chilled water valve will modulate as the 2nd stage of cooling if required (Econ + mech mode).
   c. A mixed air low limit program will modulate the maximum outside air damper to closed position on a fall in mixed air temperature below setpoint of 45 deg. F.
   d. The economizer damper shall be interlocked via hard wired connection with the freeze-stat to cut the power off for the spring return actuated damper in case temperature falls below 40°F.
2. Cooling mode
   a. When economizer is not enabled, economizer damper is closed and chilled water modulates for DAT to meet DAT SP.
1. Heating mode
   a. If economizer is active, but the damper is closed and discharge air falls below DAT SP, preheat valve will begin to control to DAT SP.
   b. The pre-heat coil hot water valve will be modulated as required to maintain a preheat discharge air setpoint above 45 deg. F. This control is always active, even during fan shutdown as a freeze protection measure.

G. Return damper and fan control:

1. Return damper position equals 100% minus the economizer damper position.
2. If a return fan exists, it will control to a plenum pressure determined at test and balance.

H. Discharge Air Pressure Setpoint Control (DAP SP)

1. Max duct pressure set point will be determined by test & balance and is the initial setpoint when the unit starts. The minimum duct pressure setpoint is 0.2 in wc.
2. The effective setpoint will modulate between the minimum and maximum to maintain all zones under 74 °F and no more than 3 zones “starved” (greater than 90% damper position).

a. If fewer than 3 zones are starved, and no zone is over 75 °F, then the duct pressure setpoint shall decrease by 0.05” every 2 minutes.

b. If greater than 3 zones are starved, or a single zone is over 75°F, than the duct pressure shall increase by 0.06” every two minutes.

c. If neither condition is true, setpoint remains unchanged.

d. Zone temperatures over 82°F are assumed to be bad readings and terminal unit is ignored in the count.

e. When counting terminal units, boxes serving exclusive or sensitive areas shall be given a weight of 1.5. Terminal units feeding open common areas shall be given a weight of 1.

I. AHU supply fan control:

1. Supply fan speed shall modulate for supply air pressure to meet DAP SP.

J. Relief fan and damper control:

1. If the building pressure control selector is enabled, upon a rise in building space static pressure above 0.05 in wc for more than 5 minutes, the relief damper shall open. After 10 minutes if space static pressure is still above 0.05 in wc and after limit switch proves the relief damper is open the relief fan shall start. The relief fan’s VSD will be modulated as required to maintain a positive static pressure discharge of 0.05 in wc. When the building space static pressure is less than 0.05-inch wc for 5 minutes, and the relief fan is at minimum speed, the relief fan will be stopped.

K. Purge mode control: (RMU units only)

1. The purge mode will be activated by a signal from the fire alarm system or manually commanded at the OWS. The minimum and maximum outside air dampers and the relief air damper will fully open, and the return air damper will fully close. Once the damper limit switches prove the OA and relief dampers are open, the supply and relief fans will be started and run at 100% speed. All VAV boxes will be open to 100%.

L. Fan shutdown:

1. The DDC controller shall verify the status of the supply fan and the relief fan via current sensing switches. Upon sensing that the supply fan is off, the DDC controller shall close the minimum and maximum outside air dampers, close the relief air damper, open the return air damper, close the chilled water valve, and send a 0% command to the supply and relief fan variable minimum and maximum outside air dampers, close the relief air damper, open the return air damper speed drives. The heating valve will continue to modulate as required to maintain a preheat discharge air setpoint of 45 deg. F.

M. Safeties:

1. A fire alarm shutdown relay will stop the unit upon receiving a signal from the fire alarm system.

2. A temperature low limit will stop the unit and open the hot water and chilled water valves upon sensing a fall in temperature below setpoint.

3. Static pressure high limit switches mounted in the supply and relief fa discharges shall stop the unit upon a rise in discharge static pressure above set point.

N. Hard wired interlocks:

1. The smoke detectors freeze protection thermostat; float switch and duct over-pressure switch shall be hard wired in the fan motor control circuit. These hardwire devices shall send a signal from an auxiliary contact to the DDC control system.
2. The smoke detectors and fire thermostat shall send a signal to the building fire alarm system. The smoke detector on the relief fan shall be hard wired to the fan motor control circuit.

O. Shutdown alarms:

The control system shall turn off the air handling unit supply fan and alarm the user interface whenever any of the following conditions occurs:

1. Motor current plus or minus 10% of full load amps for 2 minutes or longer. Full load current shall be as determined during test and balance.
2. No air flow for 2 minutes or longer.
3. Smoke or heat detected in the air handling unit.
4. Drain pan filled with condensate.
5. Freeze protection thermostat indicating freezing temperatures in air handling unit.
    a. The freeze stat should stop the supply fan, close all outside air dampers, open the hot water valve and chiller water valve.
6. Supply duct pressure exceeds 3.0 inches w.c. high limit

P. Non-shutdown alarms:

The control system shall alarm the user interface whenever any of the following conditions occurs:

1. Discharge air temperature +/- 5 deg F of setpoint for five minutes or longer.
2. Supply duct static pressure +/- 0.5 in w.c. of setpoint for 5 minutes or longer.
3. When the supply fan is operating in manual override as determined by fan operation outside the control of the control system.
4. Supply fan alarm

Appendix B - Single Zone AHU Standard Sequence

1.0 Single Zone AHU Standard Sequence

All setpoints, values, and time delays referenced are initial values that must adjustable

A. Start-stop control:

1. Provide hand-off-auto switch. In auto position, the air handling unit shall start. Upon receiving a start command, the smoke damper shall open, and minimum outside air damper shall open to its minimum position. After the smoke damper and either the maximum outside air or return air damper are proven open via end switches, the supply fan shall start.

B. Warm up mode control:

1. The space temperature shall be monitored and compared to the warmup setpoint (65 °F). The air handling unit will enter in warm up mode if the space temperature is below the warmup setpoint. The air handling unit's minimum and maximum outside air dampers, relief air damper, and chilled water valve will be closed the return air damper and the preheat valves shall remain open.

C. Minimum outside air damper control:

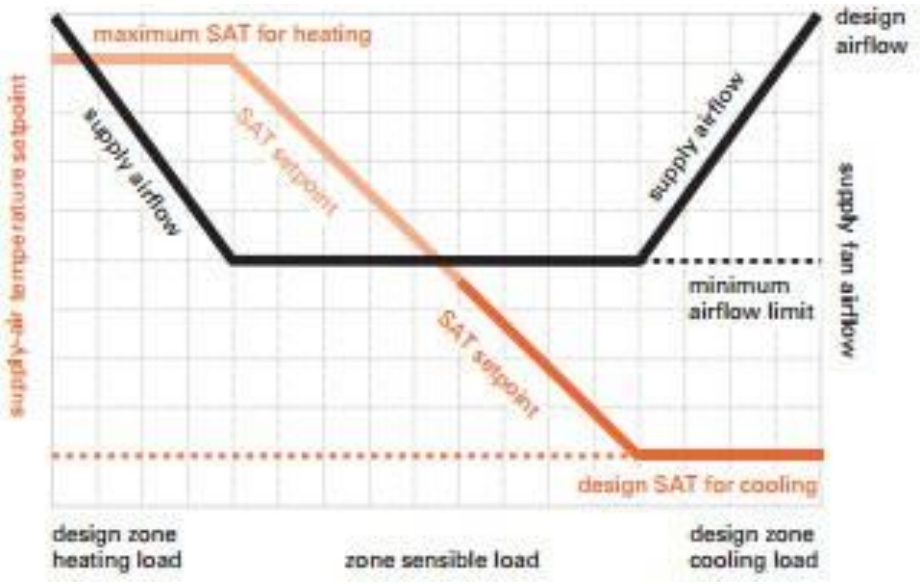
1. Each AHU shall be provided with a minimum outside air flow (OAF) controller consisting of an air flow measuring station with active damper control.
2. Each AHU shall regulate OAF SP between two outside air cfm setpoints, from minimum occupancy/ building minimum ventilation up to maximum occupancy OAF cfm. Refer to the AHU schedule for the two minimum OAF cfm setpoints for each AHU.
3. When not in warm up or cool down mode, the minimum outside air control shall initially open to building minimum of scheduled outside air.
4. Upon a rise in the return CO2 sensor above setpoint (initially 900 ppm), the minimum OAF SP shall modulate between minimum and maximum values to maintain CO2 setpoint.
5. The minimum outside air damper modulates to maintain OAF at OAF SP.
6. The controls will have a building pressure control enable selector. Only if enabled, if building space static pressure falls to -0.02 in wc for more than 5 minutes, the minimum outside air flow setpoint shall be overridden between minimum and maximum OA cfm setpoint as required to maintain a positive building space static pressure setpoint of 0.02 in wc.

D. Return damper and fan control:

1. Return damper position equals 100% minus the economizer damper position.
2. If a return fan exists, it will control to a plenum pressure determined at test and balance.

E. Zone temperature control (heating/cooling valves and fan speed)

1. In this sequence, zone temperature can refer to return temperature OR zone temperature depending on the operator selection.
2. Graphically, the zone temperature control will operate per the below diagram and as described in this section:



F. Mode Selection and Operation:

1. Cooling Mode: The AHU will operate in cooling mode, when zone temperature is greater than cooling mode enable setpoint (73 °F).

   a. Discharge Air Temperature Setpoint:

      i. At minimum fan speed, the discharge air temperature setpoint will modulate between cooling minimum setpoint (52 °F) and heating maximum setpoint (90 °F) to maintain zone temperature at zone cooling effective setpoint (74 °F).

   b. Discharge Air Temperature Control:

      i. Whenever the outside air temperature is below the economizer switchover setpoint of 65°F the unit shall operate under the economizer mode.

      ii. The economizer outside air damper modulates as the 1st stage of cooling control for discharge air temperature (DAT) to meet discharge air temperature setpoint (Econ mode). If the economizer damper is at 100% and the chilled water system is enabled, the chilled water valve will modulate as the 2nd stage of cooling if required (Econ + mech mode).

      iii. A mixed air low limit program will modulate the maximum outside air damper to closed position on a fall in mixed air temperature below setpoint of 45 deg. F.

      iv. The economizer damper shall be interlocked via hard wired connection with the freeze-stat to cut the power off for the spring return actuated damper in case temperature falls below 40°F.

      v. When economizer is not enabled (mech mode), economizer damper is closed and chilled water modulates for discharge air temperature to meet setpoint.

      vi. The preheat valve discharge air temperature control is deactivated in cooling mode. However, the preheat valve control to maintain mixed air temperature above 45 °F always remains active in all modes.

c. Supply Fan Speed:

i. In cooling mode, the fan speed starts at minimum fan speed (50%). If the discharge air temperature setpoint has been at minimum (52°F) for 10 minutes, it will hold that minimum setpoint, and supply fan speed control will become primary control. It will modulate fan speed to maintain zone cooling effective setpoint (74°F).

ii. If load drops and fan speed remains at minimum for 10 minutes, fan speed control will return to being held at minimum speed, and discharge air temperature setpoint will return to the primary zone temperature control, modulating for zone temperature to equal 74 °F cooling setpoint.

iii. If a supply air flow station exists, the minimum and maximum fan speeds referenced in this sequence can instead be % of maximum air flow. In this case, the fan speed modulates to control actual supply flow to meet supply flow setpoint.

2. Heating Mode:

The AHU will operate in heating mode, when zone temperature is less than heating mode enable setpoint (69°F).

a. Discharge Air Temperature Setpoint:

i. At minimum fan speed, the discharge air temperature setpoint will modulate between cooling minimum setpoint (52 °F) and heating maximum setpoint (90 °F) to maintain zone temperature at zone heating effective setpoint (68 °F).

b. Discharge Air Temperature Control:

i. The economizer damper and chilled water valves are closed, and the return damper is open in heating mode.

ii. The preheat valve controls discharge air temperature to setpoint.

c. Supply Fan Speed:

i. In heating mode, the fan speed starts at minimum fan speed (50%). If the discharge air temperature setpoint has been at maximum (90°F) for 10 minutes, it will hold that maximum setpoint, and supply fan speed control will become primary control. It will modulate fan speed to maintain zone heating effective setpoint (68°F).

ii. If heating load drops and fan speed remains at minimum for 10 minutes, fan speed control will return to being held at minimum speed, and discharge air temperature setpoint will return to the primary zone temperature control, modulating for zone temperature to equal 69 °F heating setpoint.

3. Satisfied mode: The AHU will operate in satisfied mode if zone temperature is in between heating (69 °F) and cooling enable (73°F) setpoints.

a. In satisfied mode, the economizer damper, hot water valve, chilled water valve all remains closed. The return damper opens, and the fan runs at minimum speed setpoint (50%).

G. Unoccupied mode control

1. Unoccupied mode is scheduled during lower occupancy times of 11 PM to 4 AM.

2. Fan continuously runs with same sequence as occupied. Only difference is new set points:

a. Unoccupied cooling enable setpoint = 76 °F
b. Unoccupied effective cooling setpoint = 77 °F
c. Unoccupied heating enable setpoint = 68 °F
d. Unoccupied effective heating setpoints = 67 °F
e. Unoccupied minimum fan speed = 25%

H. Relief fan and damper control:

1. If the building pressure control selector is enabled (operator can adjust disable/enable mode), upon a rise in building space static pressure above 0.05 in wc. for more than 5 minutes, the relief damper shall open. After 10 minutes if space static pressure is still above 0.05 in wc. and after limit switch proves the relief damper is open the relief fan shall start. The relief fan's VSD will be modulated as required to maintain a positive static pressure discharge of 0.02 in wc. When the building space static pressure is less than 0.05 in wc, the relief fan is at minimum speed, the relief fan will be stopped. The relief air damper will be modulated as required to maintain the building space static pressure setpoint determined by the test and balance contractor.

I. Purge mode control: (RMU units only)

1. The purge mode will be activated by a signal from the fire alarm system or manually commanded at the OWS. The minimum and maximum outside air dampers and the relief air damper will fully open, and the return air damper will fully close. Once the damper limit switches prove the OA and relief dampers are open, the supply and relief fans will be started and run at 100% speed.

J. Fan shutdown:

1. The DDC controller shall verify the status of the supply fan and the relief fan via current sensing switches. Upon sensing that the supply fan is off, the DDC controller shall close the minimum and maximum outside air dampers, close the relief air damper, open the return air damper, close the chilled water valve, and send a 0% command to the supply and relief fan variable minimum and maximum outside air dampers, close the relief air damper, open the return air damper speed drives. The heating valve will continue to modulate as required to maintain a preheat discharge air setpoint of 45 deg. F.

K. Safeties:

1. A fire alarm shutdown relay will stop the unit upon receiving a signal from the fire alarm system.
2. A temperature low limit will stop the unit and open the hot water and chilled water valves upon sensing a fall in temperature below setpoint.
3. Static pressure high limit switches mounted in the supply and relief fa discharges shall stop the unit upon a rise in discharge static pressure above set point.

L. Hard wired interlocks:

1. The smoke detectors freeze protection thermostat; float switch and duct over-pressure switch shall be hard wired in the fan motor control circuit. These hardwire devices shall send a signal from an auxiliary contact to the DDC control system.
2. The smoke detectors and fire thermostat shall send a signal to the building fire alarm system. The smoke detector on the relief fan shall be hard wired to the fan motor control circuit.

M. Shutdown alarms: the control system shall turn off the air handling unit supply fan and alarm the user interface whenever any of the following conditions occurs:

1. Motor current plus or minus 10% of full load amps for 2 minutes or longer. Full load current shall be as determined during test and balance.
2. No air flow for 2 minutes or longer.
3. Smoke or heat detected in the air handling unit.
4. Drain pan filled with condensate.
5. Freeze protection thermostat indicating freezing temperatures in air handling unit.
    a. The freeze stat should stop the supply fan, close all outside air dampers, open the hot water valve and chiller water valve.
6. Supply duct pressure exceeds 3.0 inches w.c. high limit

N. Non-shutdown alarms:

The control system shall alarm the user interface whenever any of the following conditions occurs:

1. manual override as determined by fan operation outside the control of the control system.
2. Supply fan alarm
3. Zone temperature +/- 3 deg F of setpoint.

Appendix C - Standard Terminal Unit Control Sequence

1.0 Standard Terminal Unit Control Sequence

2.0 Zone temperature sensor shall modulate terminal unit air damper between scheduled maximum and minimum primary cooling air flow in response to space cooling setpoint, initially 74 °F.

3.0 On fall in space temperature below 68 °F after minimum cooling air flow has been reached, the terminal unit hot water valve shall modulate open to maintain heating setpoint (initially 68 °F). If scheduled minimum heating cfm is greater than scheduled minimum cooling cfm, increase VAV box cfm to minimum heating cfm setpoint after heating valve is activated.

4.0 DDC system will prevent the terminal unit from going to heating flow or opening the hot water valve if secondary hot water system is not enabled.

5.0 The zones will be scheduled unoccupied between 11 pm and 4 am. They will follow the same sequence but control to unoccupied cooling SP (77 °F) and unoccupied heating SP (67 °F) and separate unoccupied cooling min cooling air flow and unoccupied heating air flow.

A. Note:

   In order for the air handlers to properly respond to terminal units, there are several air handler logic tables and interlock programming that must be updated on the Johnson Controls NAEs even if one terminal unit is installed or upgraded. The corresponding terminal unit points must be added to the below:

B. VAV Counts LCT

C. Purge-INT

D. HTGMODE (Interlock)

E. Warmup-LCT

F. Schedule-INT

G. Zone temp warnings for 2.5 deg above effective cooling setpoint or below effective heating setpoint

H. Delete any no longer in service boxes from the system

I. Update all graphics including floor plans

J. Ensure that key flow and temperature setpoints for occupied and unoccupied are exposed. Refer to typical points list and naming convention.

K. All terminal unit point names must have the air handler and box number included. For example:

   1. RMU-95A-BL-V04.ZN-T or RMU-95A-BL-V04.EFFCLG-SP

      a. Points labeled as only ZN-T and EFFCLG-SP without the prefix is not acceptable.

Appendix D - BMS Points Standard Lid Details

Naming convention example	Description	Additional Parameters
VVR-MT-01-2-01-AL.HTG-EN	Box Heating Enable Command	
VVR-MT-01-2-01-AL.CLG-MAXFLOW	Cooling Max Flow Setpoint	
VVR-MT-01-2-01-AL.SA-F	Supply Air Flow	
VVR-MT-01-2-01-AL.ZN-T	Zone Temperature	
VVR-MT-01-2-01-AL.EFFHTG-SP	Effective Heating Temp Calc Setpoint	
VVR-MT-01-2-01-AL.DA-T	Discharge Air Temperature	
VVR-MT-01-2-01-AL.DPR-O	Supply Air Damper Output	
VVR-MT-01-2-01-AL.SAFLOW-SP	Supply Air Flow Calculated Setpoint	
VVR-MT-01-2-01-AL.EFFCLG-SP	Effective Cooling Temp Calc Setpoint	
VVR-MT-01-2-01-AL.OCC-SCHEDULE	Occupancy Schedule	
VVR-MT-01-2-01-AL.SYSTEM-MODE	System Mode	Cool only, heat only, purge, etc.
VVR-MT-01-2-01-AL.ZNT-SP	Common Setpoint	
VVR-MT-01-2-01-AL.ZN-Q	Zone Quality	CO2
VVR-MT-01-2-01-AL.ZNQ-ALMSP	Zone Quality Alarm Setpoint	
VVR-MT-01-2-01-AL.HTG-O	Heating Output	
VVR-MT-01-2-01-AL.CLGOCC-SP	Occ Cooling Setpoint	
VVR-MT-01-2-01-AL.CLGUNOCC-SP	Unocc Cooling Setpoint	
VVR-MT-01-2-01-AL.HTGOCC-SP	Occ Heating Setpoint	

VVR-MT-01-2-01-AL.HTGUNOCC-SP	Unocc Heating Setpoint	
VVR-MT-01-2-01-AL.CLGOCC-MINFLOW	Occ Cooling Min Flow Setpoint	
VVR-MT-01-2-01-AL.HTGOCC-MINFLOW	Occ Heating Min Flow Setpoint	
VVR-MT-01-2-01-AL.WC-C	Warmup Cooldown Status	
VVR-MT-01-2-01-AL.TUNING-RESET	Application Tuning Reset	
VVR-MT-01-2-01-AL.AUTOCAL-C	Autocalibrate Commnad	
VVR-MT-01-2-01-AL.UNITEN-MODE	Unit Enable Mode	
VVR-MT-01-2-01-AL.ZNT-STATE	Zone Temperature Status	Cooling, heating, satisfied, etc.
VVR-MT-01-2-01-AL.CLGUNOCC-MINFLOW	UnOcc Cooling Min Flow Setpoint	
VVR-MT-01-2-01-AL.HTGUNOCC- MINFLOW	UnOcc Heating Min Flow Setpoint	
VVR-MT-01-2-01-AL.WC-ADJ	Warm Cool Adjust	

Table 1 – Passenger Terminals – HVAC Operating Parameters

Table 1 – Passenger Facilities – HVAC Operating Parameters

Passenger Facilities
HVAC Operating Parameters

Space/Function	Indoor Design Condition				HVAC Load Data			
					People	Outside Air	Lights	Equipment
	Summer- ^{0}F	% RH	Winter- ^{0}F	% RH	FT^2/PPL	CFM/PPL	Watts/FT^2	Watts/FT^2
Hold Rooms	74	50	70	-	200 PPL/Gate	10	1.5	2.0
Interior Corridors	74	50	70	-	100 FT^2/PPL	10	1.5	1.5
Concessions (Restaurant)	74	50	70	-	30 FT^2/PPL or Count	10	3.0	10.0
Concessions (Retail Store)	74	50	70	-	45 FT^2/PPL or Count	10	6.0	3.0
Crown Room	74	50	70	-	45 FT^2/PPL or Count	20	3.0	3.0
Break Room/ Group Room	74	50	70	-	100 FT^2/PPL or Count	10	1.5	1.5
Office/ Administration	74	50	70	-	100 FT^2/PPL or Count	20	1.5	1.5
Third Level Tenant Space	74	50	70	-	100 FT^2/PPL	20	2.5	2.5
Smoking Room	74	50	70	-	15 FT^2/PPL	60	1.5	1.5
Apron Level (Air Conditioned Spaces)	74	50	70	-	100 FT^2/PPL or Count	20	2.5	1.5
Classroom/Training/Conference	74	50	70	-	30 FT^2/PPL or Count	20	2.5	1.5
Toilet Room/Locker Room	74	50	70	-	0	0	1.5	0.0
Storage Area	74	50	70	-	0	0	1.5	1.0

OUTDOOR DESIGN CONDITIONS

Summer 94 ^{0}F DB/ 74 ^{0}F WB

Winter 17 ^{0}F DB

Cooling Supply Air Design

Supply air Delta T (Space Temp- Leaving Coil Temp): 23 ^{0} F

Chilled & Hot Water Design: Supply- Return Delta T

Secondary CHW: 16 ^{0}F

Air Handling Unit CHW: 18 ^{0}F

Secondary HW: 40 ^{0}F

Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Electrical Engineering

Electrical Design Standards

Table of Contents

Figure Index:

Electrical Design Standards

1.0 Purpose

A. Purpose of Design Standard – Electrical

The purpose of this document is to outline the minimum design standards and installation requirements for systems (electrical power, control, fire detection and others), which are installed to serve various spaces throughout the Central Passenger Terminal Complex (CPTC) and other DOA facilities to include Landside/Airside New Construction, Modifications, Concession and Tenant spaces at Hartsfield-Jackson Atlanta International Airport (H-JAIA or "Airport").

2.0 Codes and Standards

A. Applicable Codes, Standards & Circulars

All design work shall be performed "In Accordance With" (IAW) generally accepted, professional principles and practices for electrical engineering and in compliance with all applicable Department of Aviation (DOA), Planning & Development (P&D) Facilities/Landside/Airside New Construction and Modification Standards included in this document. Compliance with the latest Federal, State and City of Atlanta Codes, Standards and Regulations along with the latest Advisory Circular (AC) for Airport Projects is required. The codes, standards and practices listed herein generally apply to airport projects. Other codes, standards or practices that are more specific will be referenced within a specific section (the list below is for reference and not all inclusive).

1. Codes
    a. National Fire Protection Association (NFPA) 70 National Electrical Code
    b. NFPA 72 National Fire Alarm Code
    c. NFPA 101 Life Safety Code
    d. NFPA-110 Emergency and Standby Power Systems
    e. Standard Building Code
    f. NFPA 780 Standard for the installation of Lightning Protection System
    g. Georgia State Minimum Standard Electrical Code
    h. Occupational Safety and Health Administration (OSHA)
2. Standards
    a. American National Standards Institute (ANSI)
    b. Institute of Electrical and Electronics Engineers (IEEE)
    c. Underwriters Laboratories (UL)
    d. Illuminating Engineering Society (IES) Lighting Handbook

e. National Electrical Manufacturers Association (NEMA)
f. Hartsfield Jackson Atlanta International Airport, City of Atlanta, Department of Aviation – Aviation Information systems, (AIS) Infrastructure Standards (latest revision)
g. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

3. Circulars
   a. Federal Aviation Administration (FAA), Series - 150 Advisory Circular (AC) for Airport Projects (only AC numbers are indicated in this standard)

3.0 General Drawing Requirements

A. Facilities Electrical Drawings and Master Drawings (including systems)

Table 1: is a recommended list of "Drawing Types" required to illustrate the design scope and to be issued as acceptable DOA construction "As-Built" project deliverables.

Master drawing deliverables are designated below

Table 1 - Drawings			
Project Electrical/System As-Built Drawing Types	**Scale**	**Master Deliverables**	**Deliverable Format**
Legend	NTS		**Acceptable Electronic Formats for drawings:** AutoCAD (.dwg) Revit (.rvt) Adobe (.pdf) BIMS (contact DOA BIMs manager for specific details). Early coordination with the DOA Project Manager is required to establish the acceptable
Electrical Site Plan	1 inch = 20 feet		
Lightning Protection and Counterpoise Composite Plan	1 inch = 20 feet		
Lightning Protection Details	NTS		
Grounding Site Plan	1 inch = 20 feet		
Grounding Riser diagram(s)	NTS		
Grounding Details	As required		
Primary Electrical System: One-line/Single-line and/or Riser Diagrams -Full and partial	NTS	**Master Drawing (3.B.2.d)**	
Power Electrical riser diagram (for multi-story buildings)	NTS	**Master Drawing (3.B.2.d)**	
Power Layout floor plans	¼ inch = 1.0 feet 1/8 inch=large spaces	**Master Drawing (3.B.2.d)**	
Power layout enlarged floor plans, specifically electrical vaults, electrical rooms, electrical closets	¼ inch = 1.0 feet All plans listed shall be drawn to scale	**Master Drawing (3.B.2.d)**	

Panelboard schedules and Directories	NTS	**Master Drawing (3.B.2.d)**	drawing format for project deliverables. **Acceptable Hard Copy Formats for drawings:** Full and/or Half size drawings shall be printed to scale when requested.
Site Lighting Plans	1 inch = 20 feet		
Site Lighting Photometrics Plans (when required)	1 inch = 40 feet		
Interior Lighting Plans	¼ inch = 1 feet 1/8 inch=large spaces		
Interior Lighting Photometric Plans (when required)	As required		
Lighting fixture schedule	NTS		
Special Systems layout Floor Plans (Fire Alarm,)	¼ inch = 1.0 feet 1/8 inch=large spaces		
Special Systems Details	As required		
Low Voltage Switchgear, Switchboard and Motor Control Center Elevation and Details	As required	**Master Drawing (3.B.2.d)**	
Miscellaneous Elementary and Wiring Diagrams (when required)	NTS		
Electrical Equipment List for (EPMS)	NTS	**Master Drawing (3.B.2.d)**	
Electrical Power Monitoring System (EPMS) user interactive graphic screen/input lists	NTS	**Master Drawing (3.B.2.d)**	
Electrical Power Monitoring System (EPMS) One-line and/or Riser Diagrams	NTS	**Master Drawing (3.B.2.d)**	
Power Duct Bank Plan and Profile (Civil Work Drawing)	1 inch = 50 feet horizontal		
Equipment Pad details for Switchgear, Switchboard, Transformer, Motor Control Center and floor mounted equipment	As required		
Electric Manhole Plan, Details and Sections	As required		

Note: electrical symbols and equipment placed on drawings shall match the layout plan drawing scale.

B. Electrical and System Drawing Updates

1. The Design Service Providers (DSP) shall request and update the Department of Aviation's Facilities Master Electrical/System Drawings along with prepare and deliver stand-alone Final Project Electrical/System "As-Built" drawings whenever a project is performed at the Central Passenger Terminal Complex (CPTC) and a DOA property. Facilities Master Electrical/System Drawings (shown on Table 1), and the required stand-alone Final Project Electrical/ System "As-Built" drawings shall be developed and updated for each concourse/building located within the CPTC and DOA property as described within this design standard and IAW the contract project Scope of Work (SOW)

documents. All document requested for check-out/check-in shall be through the PMWeb web-based Project Management software system, IAW P&D Policies and Procedure 02-002 “Document Control” (latest revision).

2. Definitions:

   a. **CPTC**: The area within the Hartsfield-Jackson Atlanta International Airport (HJAIA) referred to as the Central Passenger Terminal Complex (CPTC) to include all Concourse’s and Terminal buildings.

   b. **Design Service Provider (DSP):** is a service organization contracted to provide electrical system design solutions and services starting at the design initiation phase and ending at a successful system turn over. The Design Service Provider is responsible for the project design as stipulated in the Design Contract and Task Orders.

   c. **Electrical Construction Drawings**: designated as working drawings issued before actual construction begins. Construction drawings are also known as Issued for Construction (IFC) drawings during the last phase of the design effort.

   d. **Facilities Master Electrical/System Drawings**: Facilities Master Electrical/Systems drawings are revised drawings which reflect ALL changes created by every project performed at the CPTC and a DOA property. Drawings considered “Master Drawings” to be incorporated into the Facilities Master Electrical/Systems are defined on Table 1. Drawings are DSP contract deliverables and independent of the Final Project Electrical/System “As-Built” drawings.

   e. **Final Project Electrical/System As-Built drawings:** Final project Electrical/System “As-built” drawings are independent of the Facilities Master Electrical/System Drawings and are project specific. The project “As-Built” drawings shall reflect all changes made during the construction process and provide an exact rendering of the finished project. Final project “As-Built” drawings are contract deliverable documents and shall be prepared and managed IAW, P&D Policies and Procedure 08-008 “Project As-Built Documentation” (latest revision). Drawings are DSP contract deliverables and independent of the Facilities Master Electrical/System Drawings.

   f. **Progress Electrical As-Built drawings**: progress electrical “As-built” drawings (also denoted as marked up-to-date or red-line drawings) are the revised sets of paper copy drawings on the Jobsite which provides an accurate record of all deviations between work as shown and work as installed during construction. All “As-Built” drawings shall be prepared and managed IAW, P&D Policies and Procedure 08-008 “Project As-Built

Documentation" (latest revision).

C. Drawing Request and Revision Process

1. Project Initialization:
   a. Upon a project initialization, the DSP shall contact the DOA's Document Control Specialist (DCS) IAW, P&D Policies and Procedure 02-001 "Document Control" (latest revision) who is responsible for managing all project related documents during the project life cycle.
   b. The DSP is responsible for identifying all Facilities Master Electrical/Special Systems drawings required for project and Master Drawing revisions during project initialization.
2. Facilities Drawing Request:
   a. The DSP shall request from the DCS the Facilities Master Electrical/System Drawings pertinent to the design modification or new construction project.
   b. The DCS shall forward the drawing request to the DOA Electrical Department Design Manager (or designee) for review and approval when required.
   c. The revision number on the issued drawing shall be the current revision number or in general, revision X (such as revision 1).
3. Drawing Revisions
   a. The DSP shall establish revision completion dates to issue the Final Project Electrical/System "As-Built" drawings, and the revised Facilities Master Electrical/System Drawing(s). The DSP shall contact the Electrical Engineering Department Design Manager (or designee) on the established completion dates for both and provide progress status updates.
   b. Upon completion of a new construction or modification projects, the DSP shall revise the Progress Electrical "As-Built" drawings to reflect all changes made during construction which will become the official signed-off "Final Project Electrical/System "As-Built" drawing submittal.
   c. Final Project Electrical/System "As-Built" Drawings shall be delivered to DOA through the PMWeb web-based Project Management software system IAW, P&D Policies and Procedure 02-001 "Document Control". The drawing(s) shall be in the software format identified on Table 1 with (1) one hard copy sealed and signed by a P.E. (Electrical) registered in Georgia. Drawings shall be stamped "As Built".

d. After completion and submittal of the Final project Electrical/System "As-Built" drawing deliverables the DSP shall request and check-out the Facilities Master Electrical/System Drawings to be revised IAW the details outlined in this design standard and as described in the contract project Scope of Work (SOW) document. The DOA Electrical Design Manager (or designee) shall follow up with the DSP during the check-out period (predetermined time) to assess if the procedural requirements are being adequately implemented. The requested check-out period shall include adequate time to perform a quality review of the updated Facilities Master Electrical/System Drawings prior to the revised documents being check-in to the document control system.

e. The Final Project Electrical/System "As Built" Drawings and revised Facilities Master Electrical/System Drawings shall include the following information in the revision blocks:

   i. New revision number, generally Revision number enclosed in a triangle (revision number shall increase with each submittal),

   ii. Revision date,

   iii. Engineer's initials,

   iv. A brief description of the revision such as project name and WSB number,

   v. Sealed and signed by a P.E. (Electrical) registered in Georgia.

4. Facilities "As Built" and Master Electrical Drawings Deliverables

   a. The required Final Project Electrical/System "As Built" and Facilities Master Electrical/System drawing deliverables identified on Table 1 shall be officially transmitted to the DOA through the PMWeb web-based Project Management software system IAW, P&D Policies and Procedure 02-001 "Document Control. The project "As-Built" Drawings shall be comprised at a minimum all Electrical/System Drawings included in the issued for construction set along with the Facilities Master Electrical/System Drawings identified in Table 1.

4.0 Design Requirements

A. General Design Requirements

1. Keep abbreviations to a minimum.
2. Use only standard technical abbreviations from the American National Standards Institute (ANSI) and the Institute of Electrical and Electronics Engineers (IEEE) on all drawings.
3. When “In Accordance With” (IAW) is annotated, it is referring to an agreement or conformity with an authority, code, standards, rules, procedures, etc.
4. All Electrical Components, Devices, and Accessories used as the basis of design shall be Underwriters Laboratories (UL) Listed as defined in NFPA 70, NEC, Article 100. The contract specifications shall identify the UL listed requirements for all electrical components, devices, and accessories.

B. Administrative Design Requirements

1. The DSP shall resolve code conflicts found during design and construction. The more stringent applicable portion of conflicting codes shall be used unless a written waiver letter with concise details and supporting evidence is submitted to the DOA Assistant Director (or designee) through the PMWeb web-based Project Management software system IAW, P&D Policies and Procedure 02-001 “Document Control” (approval shall be granted prior to performing any work).
2. The DSP shall provide details on the design contract documents to include raceways, wires, cables, equipment, controls, grounding, wiring diagrams and other details required to make complete electrical, control and all ancillary systems operational.
3. Design drawings are generally diagrammatic and are not intended to show exact locations of all raceways runs, outlet boxes, junction boxes, pull boxes, etc. In general, exact locations shall be determined and coordinated in the field which shall be illustrated on the “As-Built” construction documents. The locations of equipment, appliances, fixtures, raceways (conduit, cable tray, busduct, junction boxes, wireways, outlets boxes, and similar devices) shown on the drawings are approximately located to obtain accurate cost estimates unless “to-scale” placement is specifically required by the design to illustrate and avoid constructability design conflicts with the following exception:
   Exception: All electrical rooms, electrical closets and major equipment placed within these electrical rooms such as switchgear, switchboards, distribution panelboards, panelboards, etc. shall be drawn “to scale”.
4. Where circuits are shown as "homeruns" on drawings, place notes on contract

documents indicating that all necessary fittings, supports, and boxes shall be provided to make complete raceway installations IAW code requirements.

5. The DSP shall show circuit layouts on drawings; however, layouts are not required to show all fittings, or all installation details. Details illustrating connections to equipment shall be shown as required, and IAW the accepted shop and manufacturer's design drawings.

C. Landside Technical Design Requirements

1. Raceway

a. This Design Standard considers a Raceway System to consist primarily of cable tray, conduit and necessary hardware used to support cable runs between electrical equipment and physical protection to the cables. IEEE 422 is considered a valid reference when designing/installing a similar raceway system as described in this standard.

b. Electrical metallic tubing (EMT) may generally be used for dry accessible concealed installations; however, Rigid metal conduit (type RMC) shall be used in most cases for exposed installations with the following exception:

Exception: When raceway is not subject to any physical or mechanical damage EMT can be used for exposed installations. When specified, EMT shall be used with compression fittings (coupling) and installed in accordance with the NEC.

c. EMT couplings with set screws are not allowed.

d. EMT shall be installed with appropriate fittings if used as an equipment grounding conductor IAW NEC and IEEE 422.

e. Surface nonmetallic raceways shall not be permitted.

f. Only cast metal boxes shall be used for exposed installation.

g. Minimum conduit size to route electrical cables shall be ¾". This criterion applies to all HJAIA CPTC and DOA facilities. See FAA circulars for airside requirements.

h. Signal cables may be installed in cable tray; however, J-hooks, D-rings and Bridal Rings are not allowed.

i. Each three-phase circuit shall be run in a separate Raceway unless otherwise shown on the contract drawings.

j. When PVC is specified, the schedule type shall be provided.

k. Supporting raceways from cable trays/supports, wireways/ supports, and from

another raceway including supports is not allowed.

l. Underground Raceway: All underground, direct buried, encased conduits, duct banks and other underground raceways installed at HJAIA CPTC and DOA facilities to include abandoned conduits capped in place, shall be equipped with “Electronic Utility Markers”. The DSP shall recommend to DOA the type of “Electronic Utility Markers” which will offer the best accuracy for locating underground utilities, complies with local codes/standards, industry color codes and are UL certified. Prior DOA approval is required before installation.

2. Wiring & Cables

a. Conductor/Wiring: All wire and cables shall be Underwriter’s Laboratories (UL) listed and shall meet all national, state, and local code requirements for their application. Insulated wire and cables shall conform to the minimum requirements of the Insulated Cable Engineer Association (ICEA) Standards. Conductivity shall be IAW the standardization rules of the Institute of Electrical and Electronics Engineers, Inc. (IEEE).

b. Cable Definitions

i. **Power**: cables are used to send energy from its source to downstream equipment.

ii. **Control and Instrumentation:** cable terminology may be used interchangeably to refer to the same cable. However, control and instrumentation cables have related functions and are used for sending signals that control equipment, as well as for measurement.

iii. **Signal:** include coaxial cables, twisted pair cables, and fiber optic cables which are used to transmit data.

c. All power, control, instrumentation and signal cables to include the following systems at a minimum: Power Systems, Fire Alarm (FA), Heating, Ventilation, Air Conditioning (HVAC), Lighting, Communication, Video Surveillance Cameras (CCTV), Access Control, Information Technology (IT), phone (data or voice) shall be routed in NEC raceways. Coordination with the project design specifications is required.

d. Branch circuit power cables (conductors) shall be minimum #12 American Wire Gauge (AWG) and shall be copper, type THHN/THWN unless otherwise noted on design documents and approved by DOA electrical.

e. Control and instrumentation cables (signal wiring) for all systems identified shall be minimum #14 American Wire Gauge (AWG) unless otherwise noted on design

documents and approved by DOA.

f. Communications Installation: Fiber Optic cabling, copper data cabling, communications conduit, pathways, grounding/bonding, firestopping, testing, and all associated task involved in communications installation, shall be designed and specified IAW Aviation Information Systems (AIS) infrastructure Standards and Telecommunications Industry Association (TIA) Standards (latest version).

g. Metal Clad (MC) cable shall only be used for final connections to light fixtures from ceiling junction boxes (less than 72 inches) or inside existing walls where concealed. MC cable is not allowed for feeder and branch circuits.

h. Feeders and service wiring shall be copper.

i. Aluminum feeders shall only be allowed for 400 Hz feeders/ branch circuits.

j. No abandoned cable or raceway due to demolition shall be allowed. Remove all the wiring, conduit, and other associated raceways back to the source. Requirements apply to interior and exterior building installations.

k. Where existing switchgear, switchboards, panelboards and other electrical components are being replaced, the associated feeders shall also be replaced.

l. No reduced sized neutrals will be allowed. Each single pole overcurrent device shall have its own separate neutral conductor.

m. Neutral conductor sizes shall not be less than the respective feeder or phase conductor sizes.

n. Multi-wire branch circuits are not allowed.

o. Include equipment grounding conductors sized per NEC with all power and control circuits over 50 volts.

p. Install computer-related circuits and receptacles separate from motor load circuits. If required by the manufacturer to minimize noise, provide a separate grounding conductor back to the branch circuit breaker for each circuit, consistent with NEC grounding criteria. Provide an isolated ground receptacle as needed.

q. All underground wirings shall be protected by conduit and concrete encasement for areas with heavy vehicle traffic such as roadways, parking lots, etc.. The minimum burial depth cover shall be IAW NEC (latest version).

r. Wiring in light pole handholes: Provide at least 18” of slack at handholes or as otherwise defined in specifications. The type of cable splicing used shall be detailed

in the project specifications and shall comply with the NEC and industry standards. See section titled “Splices” for additional details.

3. Voltage Drop Assessments
    a. The DSP shall perform voltage drop calculation (s) IAW Section 8.G and increase the conductor and conduit sizes as required. This increase shall compensate for any voltage drop concerns which will reduce the operating efficiency of motors, lights or other electrical equipment. If during construction a cable voltage drop concern is identified due to unforeseen circumstances, the electrical DSP shall re-analyze to determine a new cable size and provide results to the contractor for installation.
    b. Mid to large projects: If a substantial quantity of cables is specified, the electrical DSP shall provide a “Voltage Drop Table” and place details on the contract drawings. This table shall specify the conductor’s maximum allowable length and amperage to ensure that the electrical components can operate efficiently.
    c. Small projects: the DSP may provide voltage drop notes on drawings to identify acceptable cable sizes.
4. Splices
    a. If it is determined by the DSP construction team that a cable splice may be required or a cable replacement is more practical, this occurrence shall be brought to the attention of the DOA Design Manager (or designee) for all normal and emergency branch circuits. Splices in handholes near spouts or other water sources shall be waterproof and approval is required prior to any work being performed.
    b. Cables for life safety branch circuits shall not be splices, cable replacement is required.
5. Circuiting
    a. A shared neutral wire is not allowed.
    b. Branch circuit design for general use power receptacle outlets shall be limited as identified in section 6.B.8.
    c. Only “Life Safety” (S) circuits shall be connected to the emergency power system.
    d. Emergency Feeder Circuit Wiring: Wiring for emergency systems shall meet the requirements of NEC 700.10 (D).
    e. Maintain a minimum of four spare circuit breakers and/or spaces in existing panel boards when practical. Provide new panel boards to accommodate the circuit

excess.

f. Main circuit breakers shall be sized 25% above connected load as a minimum.

g. Provide and install dedicated electrical circuits fed from local panels (when required) to power loads for general office spaces, data centers, communications complexes that use electrically sensitive equipment (computers), data processing equipment and other similar devices.

h. Dedicated panel boards should be fed from separate feeders to the service entrance if possible.

i. For small loads explore the possibility of using existing circuits vs. proposing new circuits.

j. Circuit Loading and Metering: The following requirements shall apply to all electrical designs to include HJAIA Capitol, DOA facilities, Concessions and Tenant projects. The requirements for electrical load calculations for Criteria 1 and 2 shown below are described in section 8.C titled “Load Calculations”. The metering requirements are identified in Criteria 2 below.

   i. Criteria 1: for minor load additions provide a load calculation with conclusions and any recommendations shown on a contract drawing panelboard schedule or in a stand-alone load calculation.

   ii. Criteria 2: If Criteria 1 is not practical due to the complexity of projects, then a) obtain metered load measurement data which validates the maximum demand load for a 1-year period for input into a load calculation. If data is not available, then b) obtain services from a certified electrical contractor to place meters on equipment in question and record existing load data over a 30-day period. Either scenario a) or b) can be used when adding loads to the existing switchboards and panelboards. Once load data measurements are successfully captured and analyzed the output shall then be used as the design basis input for a formal load calculation.

   iii. The load analysis for Criteria 1 and Criteria 2 shall be performed IAW the latest edition of the NEC, article 220.87 which is a requirement for the City of Atlanta permitting department.

6. Exclusions

   a. No welding or cutting of structural steel for electrical systems is allowed unless it is specifically approved by DOA structural engineering in writing.

   b. No saw cutting of flooring to install raceway (conduits) used to route cables is allowed

for new circuits.

7. Miscellaneous Requirements

   a. Conduit Color Coding: All electrical conduits shall be identified by color-coding. Apply color-coded identification on electrical conduit in a neat and workmanlike manner and as specified in the project specifications.

   b. Conduit Labeling requirements: include requirement for the contractor to provide and install labeling for all new conduits that are connected to switchgears, switchboards, motor control centers, panelboards, junction boxes and wireways, located inside each electrical room.

      i. Labels shall be (1) inch wide, Self-Adhesive, vinyl, laminating, (waterproof when required), fade resistant black letters, "normal" font size 36 on yellow continuous tape.

      ii. Apply bands 50 feet on center along the raceway system and at each side of walls or floors, and at branches from mains.

      iii. Instructions shall be provided to the contractor that before applying any identification products to the raceway systems, components shall be cleaned of any foreign substances that could prevent permanent bonding. Attachment methods and material recommended by the manufacturer shall be followed.

      iv. Labeling shall include power source (name of switchgear, switchboard, distribution panelboard or panelboard), voltage level, circuit number and load serving.

      v. The contractor shall provide label samples to DSP and construction manager for approval prior to installation.

   c. Equipment Mounting Detail requirements:

      Prepare elevations and details to show the mounting method for all equipment such as large transformers, large junction boxes and large control cabinets. Any large equipment (example: transformer) when allowed by the NEC to be suspended from a ceiling structure, shall have an approved installation detail signed by a registered Professional Engineer (structural). Structural Mounting details are not necessary for small simple wall mounted devices, however details for the mounting height above the finished floor or above finished grade is required.

   d. Floor mounted equipment to include electrical emergency generators:

All floor mounted equipment shall be placed on housekeeping pads with details shown on the electrical layout plan drawings. Provide reinforced concrete pads for floor mounted electrical equipment or unless otherwise noted (for electrical equipment installed in the Airfield Lighting Vaults see AC 150/5340-30J). The DOA recommendation: housekeeping pads shall be nominally four (4) inches high and shall exceed the dimensions of equipment being set on them, including future sections, by six (6) inches on all sides, except when equipment is flush against a wall, then the side or sides against the wall shall be flush with the equipment. Concrete pads shall also be provided and installed for all electrical emergency generators. The DSP structural engineer shall be responsible for all housekeeping and generator pad structural calculations, elements and details.

e. Surface mounted equipment:

   Surface-mounted fixtures, outlets, cabinets, panels, etc. shall have a factory-applied finish or shall be painted as accepted by the DSP. The mounting and anchorage for surface mounted equipment to building structural elements shall be specified in project specifications and approved by the DSP structural engineer.

f. Surface mounted raceway:

   Raceways and fittings, where allowed to be installed surface mounted, shall be painted to match the finish on which it was installed. Paint and details for raceway and conduit supports shall be IAW specific project specifications.

g. Fire Barriers:

   Indicate all fire barrier penetrations on electrical plan drawing; specification shall show how the wall/barrier will be labeled.

h. Fire Stops and penetrations:

   Specify fire stopping rated sealant for electrical penetrations in fire-resistance rated walls, partitions, floors, and ceilings to maintain the fire-resistance rating. Specifically, seal all conduit penetrations at fire-rated partitions. Coordinate all conduit penetrations with architectural and structural drawings, field conditions and other trades. Provide sealing fitting to prohibit condensation and passage of gases or vapors and coordinate with the project architect and or consult with the method of sealing and sealant type.

i. Sleeves and Forms:

Provide sleeves for Raceways penetrating floors, walls, partitions, etc. Locate necessary slots for electrical work and form before concrete is poured. Provide boxed out forms for raceway penetrations only were allowed by the Architect. Fill opening after raceway installation, with equivalent material. DSP Structural engineer shall be responsible for all design details.

j. Leadership in Energy and Environmental Design (LEED) Efficiency:

Electrical equipment specified must meet energy efficiency requirements to align with LEED certification.

k. Modifications:

Electrical equipment being added to an existing electrical system requires a circuit load calculation or metering to determine the suitability of any equipment's ability to accommodate new loads and perform as intended. See sections titled "Circuit Loading and Metering" and "Load Calculations" for requirements. In addition the DSP shall analyze the Form, Fit, and Function (FFF) for all new proposed electrical equipment to ascertain the integration with existing infrastructure. FFF refers to the identification and description as follows: Form: the shape, size, dimensions, weight, and other physical parameters that uniquely characterize an item; Fit: the ability of an item to physically interface or interconnect with or become an integral part of another item and Function: the action or actions that an item is designed to perform.

l. Field verification:

Site walkdown's of facilities and equipment shall be performed prior to any additions or modifications to verify and validate existing field conditions.

m. Electrical Rooms and Electrical Closets:

i. Provide notes on electrical drawings to instruct the contractor to efficiently use wall and floor space in electrical rooms when installing new electrical equipment to maintain and reserve space for future electrical work.

ii. See section "Building Grounding System Design" for electrical room grounding.

iii. See section "Power Receptacles System Design" for requirements in or around electrical rooms and electrical closets.

iv. Electrical rooms (wall and ceilings) shall be two-hour rated. The DSP shall coordinate with the "Architectural" and "Structural" drawings for validation.

v. Smoke detectors shall be provided and installed in HJAIA electrical rooms, closets if space is not provided with sprinkler protection as defined by the Georgia State

Minimum Standard Building Code.

vi. Information Technology (IT) Telecommunication system equipment to include cabling shall not be installed in any HJAIA - CPTC and DOA property electrical rooms, except if electrical equipment is served. Electrical rooms shall not be used as an IT telecommunication room.

vii. Exit and exit access doors serving electrical rooms and working spaces shall swing in the direction of egress travel and shall be equipped with panic hardware or fire exit hardware where such rooms or working spaces contain one or more of the following: equipment operating at more than 600 volts, nominal.

viii. Electrical rooms in the CPTC shall be fitted with CyberKeys in coordination with AATC requirements.

n. MDF and IDF rooms:

The details for the HJAIA – CPTC, Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) rooms are designed IAW, “AIS Infrastructure Standards” latest version. This standard also applies to the HJAIA - DOA external facility building telecommunication rooms. A review of this standard during all phases of design is required to ensure compliance.

8. Generators

a. The DSP shall install permanent diesel generators when required to meet the requirements of NFPA 110, Emergency and Standby Power Systems”, NEC Articles 700 “Emergency Systems”, 701 “Legally Required Standby Systems” or 702 “Optional Standby Systems.

b. Diesel generators installed shall meet EPA Tier 2 NOx emission Levels unless otherwise exempt. See DOA “Sustainability Standards” for additional EPA requirements.

c. All generators shall be installed on a generator pad. See section 4.C.7.d titled “Floor mounted equipment to include electrical emergency generators”.

d. See section 4.D.1.o for Airfield- “Emergency Generator” requirements.

D. Airfield Technical Design Requirements

1. The following sections include design standards for systems and items specific to the airfield, but Airfield Lighting Systems designs are not limited to the design standards

listed in this section. There are other sections contained within this Electrical Design Standard that will provide design standards for items that are common to both Airfield Lighting Systems Design and other facility designs. Where duplicate design standard sections common to both Airfield Lighting Systems and other facilities are covered within this design standard, the Advisory Circulars listed in this section shall govern airfield related items.

a. Airfield lighting vaults:

   Are designed to include equipment that complies with the appropriate Advisory Circulars for that equipment. Equipment designed to be installed shall also comply with AC 150/5345-53D “Airport Lighting Equipment Certification Program” (or latest revision). The configuration for electrical power feeding the Airfield Lighting Vault Facility shall be designed to meet the standards of a Continuous Power Facility as defined in AC 150/5340-30J section 13.2.1 “Continuous Load” (or latest revision). The electrical power configuration for the existing North and South Airfield Lighting Vaults and structures were sized for both equipment needs at the time of design, and potential future developments based on information provided by HJAIA Planning & Development Department.

b. Airfield Lighting Vault design details:

   The building shall be climate controlled and shall have a separately climate-controlled computer room exclusively for the ALCMS equipment. This room must have a window between the equipment area and the computer room. The vault shall have a workroom and a uni-sex restroom facility. Housekeeping pads were not previously provided for existing vault equipment locations, however, validation with the latest AC 150/5340-30J and others ACs shall take place to ensure compliance for current or future designs. The Vault shall have 10’ X 10’ roll up doors with electric operators. The roll up doors shall be aligned with inside movement areas which will allow for easy equipment installation and manipulation. The Vault shall have a paved parking area and an apron around the entire building. The Vault building shall have photocell-controlled area lighting. The Vault must have access and turn-around capability for large vehicles. See AC 150/5340-30J, section 12.13 “Vault” and AC 150/5370-10H for specific Vault requirements.

c. Airfield Lighting Vault Equipment**:**

   All switchboards, panel boards and all other electrical equipment, except Airport lighting equipment items requiring FAA Approved, shall have UL approvals. See AC

150/5345-53D “Airport Lighting Equipment Certification Program” (or latest revision).

d. Conduit/Wiring:

Wiring for airfield lighting shall be in polyvinyl chloride (PVC) conduit schedule 80 or as described in AC 150/5370-10H (or latest revision). The circuit conductors for lighting shall be L-824 Type C Underground Electrical Cable for Airport Lighting Circuits. Lighting circuits for taxiway lighting shall be 8 AWG and 6 AWG for runway lighting. Cable size is not dependent on whether it is a runway or taxiway circuit but is based on the size Constant Current Regulator that is energizing the circuit. L-824C cables (6# AWG) are used for 50KW CCRs. See AC 150/5345-7F (or latest revision) for airport lighting circuit requirements to include L-824.

e. Exposed Conduits:

All exposed conduits shall be galvanized rigid. Flexible connections shall be of the “Sealtite” type flex. All surface mounted boxes shall be cast metal. All conduits and other steel shapes shall be properly cleaned, treated, primed and painted. All wall mounted devices and equipment shall be mounted on steel supports attached to the walls. See 150/5370-10H (or latest revision) for additional requirements.

f. Under Floor Conduits:

All under floor conduits shall be 1” minimum size PVC conduit. At every location where the under-floor conduit turns up to the surface, for extension, a rigid steel conduit coupling shall be installed with the top end flush with the finished floor. All wiring for control, monitoring, FAA RVR and CCR output circuits shall be installed in under-floor conduit. Spare 4” under floor conduits shall be installed from the quarter-points of each wall, or wall section, to the Break-out Boxes. See 150/5370-10H (or latest revision) for additional requirements.

g. Constant Current Regulators (CCRs):

Primary power distribution to the 2400-volt primary CCRs shall be by a totally enclosed and properly ventilated overhead 4160 Volt bus system. CCR Primary connections to the 4160 Volt bus shall be fully enclosed, hook-stick installable and operable fuses of the proper size for each CCR. All Constant Current Regulators (CCRs) above 15 KW shall have a 2400 Volt primary and all 15 KW CCRs or below shall have a 480-volt single-phase primary. Where possible all regulators will be either 15 KW or 30 KW with a 6.6-amp output to match existing equipment and utilize internal control equipment that is interchangeable with existing similar components.

See AC 150/5345-10H (or latest revision) for specification details.

h. Regulator Junction Box/meters:

All CCRs shall have cabinet front mounted digital input voltage, output amp and lapsed time meters. All regulators shall have a 10” X 18” X 8” deep junction box, with thumbscrew closed hinged cover, attachment installed in the field circuit conduit, for the installation of FAA L-823 connector kits specified in AC 150/5345-26E (or latest revision).

i. Runway lighting circuit:

Existing CCRs shall have a second 10” X 18” X 12” deep junction box attached and connected to provide for the installation of FAA RVR monitoring equipment. All Constant Current Regulators at HJAIA are manufactured by MANAIRCO (justification letter dated 02/05/2003) and have 5 intensity step settings. All CCRS shall have taps to allow 30KW CCRs to be taped down to a minimum of 15KW; 15 KW CCRs shall have taps to allow CCRs to be tapped down to a minimum of 7.5 KW. The DSP shall review “As-Built” drawings and perform a field survey prior to performing any new airfield modifications**.**

j. Break-Out Boxes:

Existing airfield lighting vaults currently have field circuits passing through a wall mounted “Break-Out Box” which was properly sized to allow alignment, support, identification, manipulation and splicing of each conductor with an FAA L-823 connector kit specified in AC 150/5345-26E (or latest revision). Existing duct banks consisting of 4” PVC duct, number as specified on drawings are installed from Break-Out Boxes to a manhole located on the outside of the existing airfield lighting Vault building. Duct banks are extended to the field locations as required to connect into airfield circuitry locations or the existing manhole/duct bank system. The DSP shall review “As-Built” drawings and perform a field survey prior to performing any new airfield modifications.

k. Duct bank:

Existing duct banks consisting of 4” PVC duct, number as specified, are installed from the computer room to a manhole located on the outside of the airfield lighting Vault buildings. Duct banks are extended to the field locations as required and connected into existing control and communications manhole / duct bank systems. The DSP shall review “As-Built” drawings and perform a field survey prior to

performing any new airfield modifications. and compliance with AC 150/5370-10H (or latest revision) is required for Duct Bank specification details.

l. Electrical Manhole:

Electrical manholes shall be equipped with spring assist, aircraft rated manhole covers. The cover shall be clearly identified as ELECTRICAL, COMMUNICATION or FAA with proper designation being cast into the cover. See AC 150/5370-10H (or latest revision) for manhole details.

m. Grounding:

All CCRs and other equipment shall be connected to a properly sized building ground loop using ground lugs bolted to pre-drilled and threaded ground brackets which are installed flush with the finished floor. Ground brackets must be installed at each location identified for future equipment installation. ¼" X 2" Ground bus shall be mounted along to the Vault walls to provide for grounding of future equipment. See FAA-STD-019F (or latest revision) for grounding requirements and details.

n. Lightning Arrestors:

All fields lighting circuitry shall have properly sized lightning arrestors connected to the circuit conductors immediately prior to the "Break-Out Boxes". See AC 150/5345-10H (or latest revision) for lightning arrestor details.

o. Emergency Generator:

A minimum of one emergency generator, meeting the requirements of AC 150/5340-17B Section 4.a.1, for a Continuous Power Facility, must be furnished. The generator must be properly sized to energize the entire connected load of the Vault. Additional capacity shall be provided to allow additional future loads to be added as needed. Each generator must be provided with a minimum of a 5000-gallon fuel tank. See AC 150/5340-30J and AC 150/5340-30H (or latest revision) for fuel storage tanks and any FAA generator details

p. Standby Generators:

The design for standby power system shall provide automatic changeover from commercial power to the engine generator within 15 seconds of loss of commercial power. The design must comply with the requirements for a "Configuration A" power system as described in AC 150/5340-30J, section 9.4.1.2.1 "Configuration A" which provides for ATCT activation of the generators(s) during low visibility conditions. Provide for a one second power transfer from generator to utility if the generator

should fail during low visibility operations. The generator shall be sized to power the entire airfield lighting vault with all existing connected loads. Refer to AC 150/5340-30J, section 9.12 for engine generator performance requirements.

q. Airfield Signage:

The signage guidance system provides the ability to easily determine the designation or name of the taxiway in which the aircraft is located, identify routes, indicate mandatory holding positions and identify boundaries. Signs are placed strategically to deter confusion among aircraft and to lessen the probability of accidents. General signage conventions, signage size and signage location requirements shall comply with FAA Circular AC 150/5340-18H D (or latest revision).

r. Monitoring Systems:

CCRs and all other controlled equipment must be equipped with or modified to accept Distributed Control and Monitoring Units (DCMU) that will be totally compatible with the existing Siemens Control and Monitoring System (ALCMS). Each field circuit or sub-circuit shall be equipped with individual circuit megging (IRMS) equipment and DCMU compatible with the existing ALCMS. Refer to FAA Circular AC 150/5340-30J, Chapter 13 and Appendix F (or latest revision). Compliance to AC 150/5345-53D (or latest revision) is also applicable.

s. Security:

The vault must be furnished with security entry control and CCTV monitoring capability. DSP shall coordinate with HJAIA - AIS and Security departments for any design modifications.

t. Miscellaneous Utilities:

The Vault must be furnished with potable water, sewer, and a minimum of 4 telephone lines. The DSP shall coordinate with HJAIA -AIS department for any modification requirements.

5.0 Lighting Systems Design

A. Interior Lighting Systems Design

1. Design Philosophy: Provide adequate, comfortable, and reliable indoor illumination levels appropriate for the tasks to be performed by using the most common unit of measure for quantifying light levels as follows:

a. DOA's design lighting levels measured in footcandles (fc) shall conform to the latest recommended average maintained footcandle levels established by the Illuminating Engineering Society (IES) Lighting Handbook published standards (latest revision) unless otherwise indicated.

2. Minimum to Maximum (brightness) ratio: The lighting minimum to maximum ratio, or uniformity ratio, is the ratio of the maximum illumination level to the minimum illumination level in a space. The uniformity ratio is a measure of how evenly the lighting is distributed throughout a space as perceived by our customers at HJAIA and DOA facilities.
   a. Lighting designs shall be modified accordingly when dark spots (low uniformity ratios which are NOT allowed by DOA) are identified with a photometric analysis.
   b. On occasion the electrical DOA Assistant Director (or designee) may request placement of additional lighting fixtures due to airport knowledge which is not readily accessible to the DSP. DOA recognizes that additional lighting fixtures may contribute to footcandle levels exceeding the IES recommendations, however, compliance is required unless an alternative lighting design solution is proposed to meet DOA concerns. If there are compelling circumstances which prevent meeting the requirements a consultation with the DOA electrical Assistant Director Electrical (or designee) is required. The DSP shall demonstrate that the alternate solution is adequate with a new photometric calculation design.
3. All interior lighting shall be Light Emitting Diode (LED) luminaires to save energy, reduce maintenance cost and to align with LEED certification requirements.
4. Lamp Color: Different color temperatures create different lighting effects and ambiance. Coordination with the DOA Architect shall take place during design to determine the ideal recommended lamp color temperature for the various interior spaces.
5. Small Rooms: If the lighted area contains small rooms enclosed by fixed partitions and/or is occupied by fixed structures or equipment, follow a nonsymmetrical pattern according to the IES Lighting Handbook, using the recommended practice for office lighting.
6. Large Bay Area: If the lighted area is a large bay and a suggested layout is not present in the Electrical Design Criteria, use a modular system so a bay or sectional area can be cut into equal sections without disturbing the fixture pattern.
7. Use natural or day lighting as much as possible, both for energy management and for architectural aesthetics.
8. Provide photo sensitive lighting controls to extinguish selected fixtures or lamps in

response to daylight contributions to space.

9. Utilize task lighting in workstations and consider day lighting from windows and skylights when determining lighting levels for the space.
10. Employ energy management tools such as occupancy sensors, time of day controls or other appropriate means. Energy management should be considered for all spaces. When a Lighting Control Management system is designed with zones, relays and other miscellaneous components provide a detail legend to describe the unique lighting circuit naming methodology and a lighting control wiring diagram for complex systems when required.
11. Lighting fixture maintenance and repair is an important design consideration and can supersede architectural considerations when life cycle cost is considered.
12. Do not locate light fixtures where they cannot be safely reached by ladders.
13. Coordinate fixture locations with other disciplines to ensure that equipment or other work will not occupy space below the fixture mounting planes.
14. Coordinate with other disciplines in the reflected ceiling plans to avoid equipment interference.
15. Air handling type light fixtures listed for installation in plenum (environmental air) space may be utilized in coordination with the mechanical design.
16. Proactively determine the programmatic use of the space, and do not locate fixtures where later installation of programmatic equipment will block fixture access. If this cannot be avoided or fully anticipated during the design phase, provide alternative access such as catwalks.
17. In areas subject to vibration (for example, equipment rooms and rooms near large motors), evaluate the need for a suitable adhesive for all nuts and screwed fittings involved in the fixture mounting. Proper seismic bracing shall be supplied for all fixture types.
18. In general battery packs for emergency egress lighting are not allowed. Where generator power is available, unswitched fixtures shall be utilized for emergency lighting and may also be designated as ‘night lights. Keyed switches are not allowed. The requirements of the NFPA Life Safety Code states “Emergency generators used to provide power to emergency lighting systems shall be installed, tested, and maintained in accordance with NFPA 110, Emergency and Standby Power Systems”. Compliance is required.
19. Where generator power is unavailable, provide a UPS for emergency egress lighting.

20. Provide interior photometric lighting calculations (normal and emergency) as described in the “Design Calculation” section of this Design Standard -Electrical.

B. Exterior Parking Lot Lighting System Designs to include Electric Vehicle Areas

1. In general, all exterior building wall and pole mounted light fixtures shall be switched by photocell with an override switch accessible to qualified maintenance personnel.
2. Emergency Generators, automatic transfer switches and all required components necessary for a complete and operational emergency lighting system shall be provided for parking decks and parking lots. See section “Engine Generator” for details.
3. Parking lot lighting shall be LED luminaires which can efficiently direct light to where it is needed on the parking lot surface when required.
4. Parking lot lighting shall satisfy visibility requirements while providing a sense of safety and security, comfort and aesthetic appeal. Coordination with the DOA Architects is required with the fixture selection.
5. Parking lot light pole locations shall be shown on the site plan drawings with light pole details shown on associated drawings. Details such as round vs. square vs. tapered light pole, pole height, material of pole (DOA preference is Aluminum) and light fixture mounting details shall be specified. Light pole bases shall be shown on design drawings with the DSP structural discipline providing technical pole base requirements and details.
6. Each light pole shown on a site lighting plan shall be assigned a unique pole identification number.
7. Electric vehicle (EV) charging stations: Adequate footcandle levels for Electric vehicle (EV) charging stations shall be provided as recommended by the Illuminating Engineering Society (IES) to ensure safety and visibility. Based on industry data, the recommended lighting levels for outdoor parking areas, which can be applied to EV charging stations, are: 5-10 foot-candles for general parking areas, 10-20 foot-candles for areas with higher activity or where enhanced security is needed. Footcandle levels shall also consider any Americans with Disabilities Act (ADA) requirements.
8. Exterior Lamp Color: Different color temperatures create different lighting effects. Based on published industry data, DOA determined that the ideal recommended color temperature for parking lots, parking deck, and exterior lighting is 4,000 Kelvins (K) which is a natural white color with a low color rendering index (CRI) and good for visibility. Confirmation with the DOA Architect during the exterior lighting system designs is required.

9. Provide the following illumination levels in areas shown below, measured at grade with all fixtures at full brightness, zero sky contribution, 15% variance permissible:

   Design Footcandle Levels (fc):

   a. 10 fc at building entrances, with 5 fc for night emergency egress.
   b. 5 fc at gates and perimeter fences where security assessment is an issue; maintain 3:1 ratio between maxima and minima.
   c. 10 fc in parking lots, maintain 3:1 ratio, with 5 fc for emergency lighting.
   d. 2 fc along illuminated HJAIA roadways. Coordination with other stakeholders may be required for non HJAIA roadways.
   e. The illuminance for Roadway Tunnel lighting shall IAW the IES requirements. However, coordination with other stakeholders may be required for non HJAIA roadway tunnels.
   f. 5 fc at major street intersections.
   g. Dark spots are NOT allowed. Modify lighting designs accordingly to ensure compliance.
   h. Provide exterior photometric lighting calculations (normal and emergency) as described in the “Design Calculations” section of this Design Standard.

C. Parking Deck Lighting System Design
   1. Parking deck lighting shall satisfy visibility requirements while providing a sense of safety and security, comfort and aesthetic appeal. Coordination with the DOA Architects is required with the fixture selection.
   2. Parking deck light levels shall conform to the latest recommended average maintained footcandle levels established by the Illuminating Engineering Society (IES) Lighting Handbook published standards.
      a. Dark spots are NOT allowed. Lighting designs shall be modified accordingly to ensure compliance.
      b. Adequate lighting levels shall be provided for parking deck’s basic areas, ramps (Day/Night), entrance (Day/Night), stairwells, and roofs.
   3. Designs shall consider all factors to ensure the drivers and pedestrians’ safety while providing consideration of columns and other obstacles.
   4. All parking deck lighting shall be LED luminaires to save energy, reduce maintenance costs and to align with LEED certification requirements.

5. Light fixture selections shall consider installation, maintenance, energy consumption, efficacy and lifespan.
6. See section 5.B.7 for Electric vehicle (EV) charging stations and 5.B.8 for exterior lamp color requirements.
7. Do not locate light fixtures where they cannot be safely reached by ladders for maintenance.
8. Provide parking deck photometric lighting calculations (normal and emergency) as described in the “Design Calculation” section of this Design Standard. Also provide photometrics lighting calculations specifically for the Electric vehicle (EV) charging station areas to include considerations to meet any ADA requirements.

D. Airfield Lighting Systems (150/5340-30J or latest revision)

1. Specific Details: The following sections include details specific to the HJAIA, Airfield Lighting Systems designs. AC 150/5340-30J (or latest revision) shall govern all airfield related designs and shall take president over this electrical design standard unless otherwise noted or if any conflicts are identified. Other sections of this Electrical Design Standard are applicable to the airfield designs so the DSP shall perform a review to determine applicability and a field walkdown shall take place to determine all existing systems.
2. Edge Lights: Edge lights are employed to outline usable operational areas of the airport during periods of darkness and low visibility weather conditions. The FAA approves airports for certain types of aircraft traffic. Based on an airport’s approved FAA rating, AC 150/5340-30J (or latest revision) is used to determine whether lights shall have low, medium or high intensity light levels. Hartsfield-Jackson Atlanta International Airport (H-JAIA) uses high intensity elevated L-862T runway edge lights with L-850C semi-flush lights in paved exits and LED L-852T semi-flush taxiway edge lights. See AC 150/5340-30J (or latest revision), Chapter 2 for specific light spacing based on the pavement geometry and to confirm the latest lighting types. This includes required spacing on curved taxiway sections and taxiway radii.
3. Runway and Taxiway Centerline and Touchdown Lighting Systems
    a. General: Runway centerline and touchdown zone lighting systems are designed to facilitate landings, rollouts, and takeoffs. The touchdown zone lights are primarily a landing aid while the centerline lights are used for both landing and takeoff operations. See AC 150/5340-30J, Chapter 3 for specific information regarding

runway centerline, touchdown zone lights and spacing criteria.

b. Runway Centerline lights: The line of lights is offset at a maximum of 2'-6" to either the right or left side of the runway centerline and should be to the opposite side of the centerline marking from the major taxiway turnoffs. Centerline lights must be installed with a 1" maximum deviation from perfect alignment and with a + 0" – 1/16" maximum deviation from finished pavement grade. HJAIA utilizes a 2'-6" spacing from the joint line to the center of the light fixture or light base. See AC 150/5340-30J for Runway Centerline light details.

c. Taxiway Centerline lights are installed on taxiways at H-JAIA. Taxiway centerlines lead off lights for runway exit taxiways emit alternating green and yellow lights to the first light past the runway holding position. In general, lead-off lights on high-speed exits are unidirectional. All taxiway centerline lights shall be equipped with LED lamps. See AC 150/5340-30J, Chapter 3, to obtain specific spacing criteria.

d. touchdown zone lights are used to show where aircraft wheels should touch ground to ensure a safe landing. They emit a white light. The lights consist of 2 rows of transverse light bars located symmetrically about the runway centerline. Each light bar consists of 3 unidirectional lights facing the landing threshold. The rows of light bars extend to 3,000 ft. or half the runway length for runways less than 6,000 ft. from the threshold, with the first light bars located 100 ft. from the threshold. See AC 150/5340-30J Chapter 3 for more specific information regarding runway touchdown zone lights.

4. Miscellaneous Lighting Visual Aids

a. Beacons serve as indicators to locate lighted airports. The type of beacon used is dependent upon its function. They can be used at airports that have a high or medium intensity lighting system or when it is necessary to warn airmen of an obstruct ion which presents a hazard to air commerce during periods of darkness or limited visibility. See AC 150/5340-30J, Chapter 6 for guidelines to determine which beacon would best serve HJAIA and the mounting method for the beacons.

5. Airfield Lighting Control System:

The existing airfield lighting control system at H-JAIA is/was a Siemens Airfield Solutions system, however, confirmation is required to determine if system is currently installed. All future controlled equipment, either in the lighting vault or individual fixture control and monitoring devices must be designed with equipment that is compatible with this system, or the current system installed. The system uses a Distributed Control and Monitor Unit

connected to each piece of controlled equipment and an integrated circuit megging unit for each circuit. All individual fixture control and monitoring equipment must be designed using power line carrier equipment that is compatible with the Siemens ALCMS. See AC 150/5340-30J, Chapter 13, Appendix F and other sections for details.

6.0 Power Receptacle System Design

A. Definition

The term outlet refers to the actual box where receptacles are present, receptacles are opening in the box which you plug your device into.

B. Location / Minimum Requirements

Locate receptacle symbols on power plan layout drawings. The minimum requirements for the receptacle system design shall include the following:

1. In general, flush mount receptacles shall be installed in all areas.
2. Surface mounted receptacles are allowed in spaces such as warehouses, equipment chases and electrical/mechanical rooms.
3. Provide dedicated receptacles for janitorial equipment in hallways and aisles maximum 50 feet apart; mount at 36 inches above the finished floor, and segregate from other receptacles.
4. Mounting heights for general duplex receptacles shall be mounted at 48” AFF unless noted otherwise.
5. Provide general-purpose receptacles in electrical and mechanical rooms; receptacles shall be Ground Fault Circuit Interrupter (GFCI) type. See reference 2.A.1.g, section 210.63 (B) for additional receptacle location requirements.
6. Only where specified on design drawings provide duplex receptacle, 20 AMP, 120V with USB-A and USB-C charging ports.
7. Avoid back-to-back receptacle installations.
8. Branch circuit design for general use power outlets shall be limited to no more than six receptacles per circuit.
9. Provide general-purpose receptacles adjacent to each exterior door; receptacles shall be weatherproof and GFCI type.
10. Provide rooftop maintenance outlets per NEC, outlets shall be weatherproof and GFCI protected.

11. Do not wire GFCI's and non GFCI's in the same circuit.

C. Electric Vehicle Supply Equipment (EVSE) Charging Stations

1. A charging station, also known as a charge point, or EVSE, is a power supply device that supplies electrical power for recharging plug-in electric vehicles. When specified, typical units require a dedicated 40-Amp circuit to comply with the NEC requirements in Article NEC 625. A design-based vendor is required to determine the actual electrical requirements.
2. EVSE charging stations shall be installed at Parking Decks, Parking lots, and at various DOA facilities located throughout HJAIA when specified under the DOA project scope document.
3. Level 2 chargers shall be specified when required.
4. If multiple electric vehicle supply equipment (EVSE) units are connected to the same circuit, an EV charging load management systems shall be specified which allows the control of how much electricity each charging station can use.
5. The DSP shall review the City of Atlanta, ordinance 25-O-1011 for the comprehensive Electric Vehicle Charging Readiness Policy requirements to determine applicability.

7.0 Low Voltage Power Systems Design (<600 volts)

A. General Power Requirements: Applicable to low voltage power system electrical components (systems less than 600 volts).

1. Single Line Diagram Drawing details
   a. Single line drawings shall be provided for all HJAIA CPTC, DOA facilities, Capital, Concessions and Tenant projects. A riser diagram can be submitted to illustrate designs; however, riser diagrams shall not be substituted for single lines diagrams. Riser diagrams AND single line diagrams shall be provided for multiple story buildings.
   b. Electrical data such as voltage, amperage, phase, cable, conduits and breaker sizes, AIC ratings, metering (see section "Electric Power Monitoring System" (EPMS)), interconnection to utilities, downstream devices and ALL other pertinent electrical details to make a complete electrical distribution system shall be illustrated on the single line diagrams.

c. Single line diagrams shall be provided for each switchgear, switchboard, distribution panelboard and motor control center with partial single line diagrams provided for each switchboard showing downstream panelboards

d. Single Line diagram drawing(s) representing the entire electrical distribution system infrastructure or sections of the affected electrical system shall be developed for each project scope of a HJAIA CPTC, DOA Capital, Concessions and Tenant project. Details can be added to existing As-Built single-line diagram drawings as required.

e. Symbols used on single line diagram drawings shall be consistent with DOA CADD and ANSI standards.

f. Single line drawing detail illustrations shall start at the top of drawing with the highest voltage levels at the utility transformer and generator with the incoming source of the power at the building transformers(s). Then show all pertinent electrical equipment downstream to the panel board level including cables. Details such as switchboard/switchgear, transformers, panel boards, motor control centers, generators, automatic transfer switches, uninterruptible power supplies, inverter systems, motors, starters, main disconnect switches, etc. shall be included to show a complete system.

g. Transformers: note the kVA size, primary and secondary voltages, available fault current (at the transformer terminals) and phasing (building service entrance only).

h. Switchgears, Switchboards, and Distribution Panelboard equipment shall be shown in the “expanded” form. Drawings shall detail main breaker, tie breaker, feeder breakers, spare breakers, CT’s, PTs, and meter(s). Annotate switchboard rated amperage, voltage, short circuit capability to include frame and trip sizes of all breakers in the gear and distribution panelboard.

i. Starters: show starter/breaker/fuse and NEMA ratings for all starters.

j. Generators and Transfer switches when required: details shall include generators, automatic transfer switches and their respective single line diagrams. Note the service entrance, feeder wire and conduit sizes.

k. Provide short circuit information for Kilo Ampere Interrupting Capacity (KAIC) on single lines for all buses.

l. Circuit Breakers or fuses rated 1200 Amps or more must have a documented means of Arc Energy Reduction in accordance with NEC Section 240.67 and 240.87.

2. Electric Power Monitoring System (EPMS)

   a. The DOA utilizes an Electrical Power Monitoring System (EPMS) consisting of power digital smart meters, data connections, converters, gateways, hubs, cables, software and programing, interactive graphic displays, circuit breakers, receptacles and other accessories as required by the manufacturer to make a complete/operational system.

   b. The DSP shall include an EPMS scope of work to include EPMS single line diagram or riser diagram drawing (s) with notes, interactive graphic screen updates (with new or revised floor plans showing EPMS meter locations and graphic screen single line diagrams), software and programing details for the EPMS metering equipment to integrate and communicate with the existing EPMS system. The installation of software along with programming of the EPMS monitoring equipment and interactive graphic screens (new or updates) shall be provided by the AATC's preferred contractor and in conjunction with the EPMS contract service provider. The EPMS component naming methodology shall be consistent throughout the HJAIA CPTC and match construction documents.

   c. When metering for switchgear, switchboards, motor control centers, distribution panelboards and panelboards is specified, provide instruction indicating that meter(s) shall be integral to the equipment, supplied and installed by the original equipment manufacturer at the factory.

   d. Digital smart meters shall be provided to monitor the mains of switchgear, switchboards, motor control centers, distribution panelboards and panelboards. The digital smart meters shall be capable of aggregation to provide building-level usage representing total building energy consumption.

   e. Load Separation: The DSP shall include the separation of electrical circuits for electrical monitoring in their power system design. The system(s) shall be designed so that measurement devices can monitor the electrical energy usage of the following load types: lighting (interior and exterior), HVAC, boarding bridges, and receptacle loads. All load types shall be separately metered as required by ASHRAE 90.1-2013/2016 and LEED requirements.

   f. Separate metering: For new construction, lighting, HVAC (heating, cooling), boarding bridges, elevators, and escalators shall be metered separately which may require additional panelboards. The DOA electrical Assistant Director shall be notified as early as practical if additional panelboards are required.

   g. Concessions/*Tenants*: Concessions must draw power through a digital smart energy

meter. Each distribution section of new concession switchboards shall be equipped with (10) sub-meters for individual concessions feeder breaker monitoring. Sub-meters shall be factory pre-wired to main meter. Coordinate with AATC for concession revenue meter requirements (EPMS metering not required for internal concession spaces). *Tenant* space power consumption is covered under separate lease agreements with AATC.

h. Cyber Security: The vendor of the EPMS software shall have a cybersecurity evaluation program which is certified under UL 2900. Verification shall be provided by the DSP under the shop drawing review process.

i. Specifications - for small projects EPMS specification requirements can be included on the EPMS drawings.

j. Specifications - for large projects a Division 260913, Specification section titled "Electrical Power Monitoring System (EPMS)" shall be included as a standalone electrical specification section deliverable.

k. Digital Smart Meter Levels - Provide embedded main digital smart metering with display on new switchgear, switchboards, motor control centers and panelboards as follows: (Feeder metering is not required)

   i. Highest Level: Switchgear main metering shall be the highest-level product of the manufacturer.

   ii. Midrange Level: Switchboards meters shall be of the next highest-level product type of the manufacturer.

   iii. Lowest Level: Panelboard meter shall be of the basic lowest level product type required for wattage, voltage and current.

l. Data Storage: meters shall be able to store data for a minimum of 1 year and shall be capable of sending data to a server for use in a power monitoring software application.

3. Low Voltage Switchgear (SG)/Switchboards (SB)

   a. All new SGs and SBs shall be purchased with new Digital Smart Meters as described in section titled "Electric Power Monitoring System (EPMS)".

   b. All new and existing SGs and SBs shall be located on power plan drawings.

   c. Detail feeder and branch circuit wiring sizes shall be shown on single -line diagram.

   d. For all SG and SB provide load information, voltage, phase, Kilo Ampere

Interrupting Capacity (KAIC) ratings, mains ratings, load summary, demand load summary, circuit breaker sizes, spare sizes and space information in panel schedules.

e. Provide elevation front view drawings for each SG and SB showing all circuit breaker locations in each section with compartment / cubicle assigned with a unique identification number.

f. Provide any additional details on constructions drawings as necessary to make a complete and operational system.

g. Locate SGs and SBs indoors where possible, avoid outdoor locations.

h. Locate SGs and SBs in dedicated electrical rooms accessible only to qualified personnel.

i. For service entrance equipment, provide rear access when possible.

j. SG's/SB's shall be equipped with:

   i. Copper main bus; 100 percent capacity full length.

   ii. Copper neutral bus, if required; 100 percent capacity full length.

   iii. Copper ground bus; full length.

k. Main and feeder circuit breakers shall be arranged for compression connectors.

l. All circuit breakers for SGs/SBs shall be constructed according to NEMA standards and shall have provisions for lockout/tag out.

m. All circuit breakers shall include electronic interchangeable trip with adjustable LTPU, LTD, STPU, STD and INST functions. When required, provide integral GFPU and GFD functions.

n. The design for SGs/SBs shall include:

   i. a minimum of 20 percent spare capacity with the connected load not exceeding 80% of main circuit breaker rating.

   ii. at a minimum 1-spare circuit breaker of each frame size (excluding main) used.

   iii. future bus extensions and dedicated space for at least one future section.

o. Provide integral TVSS to meet requirements of NFPA 780, when required.

p. Where draw out circuit breakers are specified, provide manufacturer's overhead lifting device suitable for all circuit breaker sizes and locations.

q. Provide manufacturer's test kit for all circuit breaker types and functions used.

r. All circuit breakers larger than 200 amps shall be tested.

s. Main circuit breakers are to be sized according to the appropriate NEC section for any location. If a larger breaker is installed, then the appropriate trip plug must be installed. It is not permitted for the trip settings to be dialed down to meet the intent of this article.

t. Provide main lugs only when the switchboard is in the same room with their feeder breaker, otherwise, provide main circuit breaker.

u. Switchboards shall be provided with a main circuit breaker.

v. Switchboard and Distribution Panelboard (DP) requirements for Concession and *Tenant* spaces are as follows:

i. The power feed for the Concession spaces must originate at a switchboard dedicated to concessions. If there is no space or spare available in the Concession switchboards DOA shall be consulted so that a suitable alternative switchboard can be designated by the DOA.

ii. For large Concession spaces where the main disconnect size is 400 amps or above ground fault protection may be required at the discretion of the DOA.

iii. Verification of the actual load on the existing switchboard is the responsibility of Concession's DSP. Current load readings of the switchboard are required so that new loads can be added to the switchboard safely. See section titled "Circuit Load and Metering" and "Load Calculations".

iv. Power for the *Tenant* spaces shall originate at a CPTC house SB or DP with spare capacity to add load and not be dedicated to Concession spaces.

4. Motor Control Centers (MC)

a. MCs shall be purchased with new Digital Smart Meters as described in section titled "Electric Metering and Power Monitoring System (EPMS)"

b. MCs which consist of multiple enclosed sections with motor starters, fuses or circuit breakers and power disconnects shall be shown on the power plan layout drawings.

c. MC details shown on one-line diagram shall include all loads, circuit numbering and spaces. KAIC ratings of all components shall be shown to match the electrical system.

d. Provide elevation (front views) showing all starter locations and circuit (compartment) number in a logical industry sequence.

e. Provide additional details such as schedules or other information on drawings as necessary for construction.

f. Locate indoors where possible; avoid outdoor locations.

g. Locate MCs in dedicated electrical rooms accessible only to qualified personnel.

h. Use front accessible where possible.

i. Use copper main bus; 100 percent full length capacity, minimum 600A.

j. Use copper neutral bus, if required; 100 percent capacity full length.

k. Use copper ground bus, full length.

l. Wire MCs for NEMA Class I, Type B.

m. Circuit protectors, contactors, overload blocks and all accessories shall be NEMA construction.

n. Motor starters shall include overload reset button, red and green, LED type pilot lights-red for “run” mode and green for “stop”.

o. Provide (HAND-OFF-AUTO (HOA) in cover; minimum 2-normally open (N/O) and 2-normally closed (N/C) auxiliary contacts and individual control power transformer (CPT) if above 150V to ground. Provide fuses for transformers over current protection.

p. CPT, if required, shall be sized for 100 VA spare capacity and include 2 primary and 1-secondary fuses for 120V control.

q. Do not mount panelboards or associated transformers in MCs. In addition, transformers must not be installed above the ceilings.

r. Do not mount variable frequency drives (VFD) in MCs; VFD’s shall be individually mounted at controlled motor.

s. Provide future bus extensions and dedicated space for at least one future vertical section.

t. Provide minimum 20 percent spare capacity.

u. Provide 10 percent spare cubicles for each size provided.

5. Panelboards

a. All new Panelboards shall be purchased with new Digital Smart Meters as described in section titled “Electric Power Monitoring System (EPMS)”.

b. Locate new and existing panelboards identified for a project on power layout and or

enlarged layout floor plan drawings.

c. Provide completed panelboard schedules on drawings. Schedules shall show voltages to match voltages on single line diagram. Each circuit on the panel schedule shall be described to reflect the function and location of each load (for example, lighting room xx apron level). Each circuit shall show a connected and demand or estimated load in KVA whether the circuit is new or existing.

d. Locate indoors where possible, avoid rooftop locations.

e. Locate in dedicated electrical rooms and where possible avoid user or passengers' spaces. Column type panelboard is not allowed unless approved by DOA electrical Assistant Director or designee.

f. Flush-mounted in areas such as user hallways and office spaces. When flush-mounted, provide spare conduits, skirting or other provisions to facilitate future modifications.

g. Surface-mount in all other areas including user storage, warehouses, equipment chases and electrical or mechanical rooms.

h. Avoid sub feed or dual-feed lugs. Connecting more than one wire on or under a single lug or connection point in the industry is referred to as double lugging. This is only allowed if that terminal, lug or connection is specifically rated for more than one wire per NEC 110.14.

i. All buses for panelboards shall be copper.

j. Avoid individually mounted sub feed circuit breakers.

k. Main circuit breakers are to be sized according to the appropriate NEC section for any location. If a larger breaker is installed, then the appropriate trip plug must be installed as well. It is not permitted for the trip settings to be dialed down to meet the intent of this Section.

l. Provide Transient Voltage Surge Suppression (TVSS) for all panel boards serving electronic loads.

m. Provide 200% panelboard feeder neutrals and 200% neutral bus when required per harmonic analysis and for all electronic loads to include IT equipment. The 200% panelboard feeder neutrals shall be located on the appropriate feeder schedule.

n. Provide main lugs only when the panelboard is located in the same room with their feeder breaker otherwise, provide main circuit breaker.

o. Connected loads shall not exceed 80% of main circuit breaker rating.

p. Series rated circuit breakers are not acceptable.

q. Panelboards shall be provided with a main circuit breaker designated with the required KAIC ratings to match the electrical system.

6. Low Voltage Dry Type Transformers (TR)

a. Low voltage dry type TRs shall be shown on the power plan layout drawings.

b. Project design specifications shall include requirements for the transformers to factory assembled, metal enclosed and provided complete with mounting brackets (as required) to make a complete operational system.

c. Provide elevation and/or mounting details as required for construction.

d. Energy efficient type: Shall meet NEMA TP-1.

e. Taps: Voltages shall be compatible with the application. Taps shall be provided two at plus 2-1/2 percent increments and two minus 2-1/2 percent increments from rated voltage

f. Windings: TRs shall be provided with copper windings; aluminum is not acceptable.

g. Rating: The sizing of step down or step up dry type TRs shall take into consideration the current or expected normal and harmonic loading. The decision to use “K” transformers will be based on harmonic analyses of the connected and forecast load and be in compliance with IEEE- 110 and defined by UL as K-factor.

h. Mounting: TRs shall be mounted where accessible. No units may be mounted behind partitions, above ceilings, etc. If transformer is floor mounted see section 4, titled “Floor Mounted Equipment” for details. See section C.7.c for additional transformant mounting details.

i. Dry type TRs shall be U.L. listed and certified to meet NEMA Standards.

j. Grounding and bonding for TRs shall be per NEC requirements.

7. Motors

a. Motors shall be shown on the power plan layout drawings.

b. Motors that are controlled by across the line motor starters (contactor, motor circuit protector and overload relay) and are 25 HP or larger shall include power factor correction capacitors at the motor starter to achieve 95 percent power factor.

c. VFD controlled motors are excluded from the power factor correction requirement. Utilize VFD’s with minimal harmonic distortion.

d. To ensure a minimum standard of quality, identify devices, fittings, fixtures, and equipment on equipment list drawings with their electrical sizes, ratings, manufacture and catalog number. This is not necessary for items such as panel boards where complete specifications are written.

e. Identify motor starters with sizes on the motor control schedule.

f. Identify all equipment by using standard symbols and equipment schedules. In addition to the items already mentioned, the schedule should include information to help the contractor obtain the equipment and materials intended by the design.

g. Specify nameplates on all control items used on the job. Specify each nameplate either on the motor schedule or on the equipment list. Each nameplate identifies the system and the function of that device to the system.

h. Motors shall comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements.

i. Code Letter Designation: Motors 15 HP and larger: NEMA starting Code F or Code G, Motors Smaller than 15 HP: Manufacturer's standard starting characteristic. See project specifications for specific common motor requirements.

j. When required, provide motor thermal overload (TOL) relays IAW NEC requirements which serves as a crucial protective device in electrical systems used primarily to safeguard motors from overheating.

8. Variable Frequency Drives (VFD)

a. VFD’s shall be shown on the power plan layout drawings, indoors where possible; avoid outdoor locations. Locations shall match the mechanical drawings therefore coordination is required.

b. Typically, VFD’s will only be installed when requested by the Mechanical Engineer. Coordination with the mechanical project specifications is required for requirements.

c. Contrary to previous requirements, a manual bypass circuit is not typically required on a VFD. A bypass circuit should only be specified after discussing the requirements with the Mechanical Engineer.

d. Do not install VFD’s closer than five feet to an FID cabinet.

e. VFD’s should be located as near as practical to the motor it controls.

f. The VFD should never be located more than 50 feet from the controlled motor.

g. A disconnect switch with an auxiliary contactor shall be provided near the motor.

9. Busway Systems

a. Type: The DOA preferred Busway shall be the **"*Integral*"** ground busway system where all or part of the housing are designed-built-in (not an add on) for grounding.

b. Busway shall be copper with 100% neutral bus minimum. Other electrical characteristics such as voltage and phase, shall be specified on single line drawings.

c. The Busway shall be totally enclosed in a non-ventilated aluminum housing and single-bolt joints.

d. Use IP54 or greater for indoor installations and NEMA 3R for outdoor installations. Busway shall also comply with UL 857.

e. The Busway shall be protected against overcurrent in accordance with the allowable current rating of the busway.

f. Where busway is used as a feeder, the voltage drop should not exceed 3 percent.

g. All busways shall be grounded as described in section titled "Building Grounding System Designs"

h. Provide expansion fittings for all busways at building expansion joints.

i. The entire busway run shall be shown on power plan layout drawings. Busway shall also be shown and designated on the single line diagrams

j. Where busway penetrates walls and floors, seal all penetrations with the appropriate fire stopping material to maintain fire rating of walls and floors.

k. Existing legacy Busway at the CPTC is "Siemens". If existing sections of busway are to be replaced, the replacement should be "Siemens", like-for-like. If a different manufacturer is selected due to busway being obsolete a busway "TAP" box may be required which is not the preferred method for DOA,

B. Lightning Protection System Designs

1. The Lightning protection systems shall conform to UL 96A and NFPA 780 requirements.
2. A Master Label Lightning Protection system (UL certified) is required for all new roof and/or modified roof renovations/extensions associated with DOA facilities located at HJAIA. In addition, all new and existing Lightning Protection Systems shall have a Master Label UL Certification and or a UL "Letter of Findings". The scope of work associated with the "Letter of Findings" requires DOA electrical approval.

3. The DSP shall place notes on contract drawings and specifications stating that a new Master Label UL Certification is required for any new roof structures.
4. A Master Label UL re-Certification or a “Letter of Findings” is required when any new lighting protection components are tied to an existing lightning protection system or when the existing lightning protection system is modified.
5. A UL Master Label and or a “Letter of Findings” is also required for structures with expired Master Label UL Certification or with structures having an undetermined certification.
6. The DSP shall submit a Master Label UL Certification or a UL “Letter of Findings” as a project deliverable.
7. The DSP shall show a lightning protection system with details on Lightning Protection and Counterpoise Composite Plan drawings. Details such as loop conductor, air terminals, down conductors, bonding, penetration sleeves and all other components required to make a complete and operational Lightning Protection System shall be identified.
8. The Lightning protection drawings shall be sealed and signed by a P.E. (Electrical) registered in Georgia and submitted to the DOA for review.
9. The lightning protection system shall be connected to the building counterpoise system.
10. The DSP shall develop a performance specification for a certified Lightning Protection system which complements the submitted lightning protection drawings.

C. Building Grounding System Designs

1. The Grounding system shall conform to IEEE 142-2007 “Grounding of Industrial and Commercial Power Systems”, National Fire Protection Association (NFPA) and NEC Article 250 for all grounding requirements. IEEE 142, section 4.1.3 states “Resistances in the 1 ohm to 5-ohm range are required”. DOA requires that the resistance to ground for individual equipment and systems shall not exceed 5 ohms. See AIS Infrastructure Standards (latest edition) for specific and independent telecommunication grounding and bonding system requirements).
2. The Grounding system shall be designed and illustrated on a stand-alone grounding layout plan drawing.
3. Associated grounding details shall be placed on electrical drawings.
4. A grounding one-line or /riser diagram shall be developed for each project.
5. Grounding drawing shall show interconnection of the following:
    a. All metal systems of the building such as:

i. Interior and exterior water system.

ii. Metal ductwork.

iii. Building steel and HVAC roof top units (if applicable).

iv. Lightning protection system.

v. Made electrodes, etc.

vi. Building foundation rebar.

vii. Metal roof drains.

viii. Antennas and Apron light poles.

b. All busways shall be grounded in accordance with the NEC. See section titled "Busway Systems" for additional details.

c. Drawings shall indicate where bonding is required in the electrical system (that is, neutral or ground bushing on transformers).

d. Drawings shall indicate where any new electrode system (s) connects into the rest of the grounding system when applicable.

e. Drawings shall identify any special requirements for the building grounding system specifically for static or signal grounds.

f. The size of all required grounding conductors (grounding electrode conductor, equipment grounding conductors, main bounding jumpers, etc.).

6. The design shall consider the NEC as a minimum requirement and other factors need to be considered when designing the system, signal grounds, and lengths of grounding conductors to ground.

7. All ground connections to ground rods, buses, panels, etc., shall be made with pressure type solderless lugs and ground clamps.

8. Soldered or bolt and washer type connections are not acceptable, exothermic welds are the DOA's preferred method of connection to a ground rod.

9. The grounding design must also be based on a soil's resistivity test and ground resistivity calculations. Below grade connections should be exothermically welded.

10. A wall mounted copper ground bar shall be provided in each electrical room housing medium voltage switchgear or substations. It should be interconnected with the ground electrode and ground bus in the switchgear or switchboard

11. Tests: After installing grounding system but before permanent electrical circuits have

been energized, test for compliance with requirements. Measure ground resistance no fewer than two full days after the last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by fall-of-potential method according to IEEE 81.

12. If resistance to ground exceeds acceptance criteria of IEEE, the Grounding system will be considered defective and corrective actions shall be performed to reduce the ground resistance and bringing into compliance. The electrical DOA Assistant Director (or designee) shall be notified of any deficiencies; however, the grounding system will not be accepted until the 5 ohms acceptance criteria is met.

8.0 Design Calculations

A. Calculation requirements

1. All electrical calculations to include any recommendations shall be sealed and signed by a P.E. (Electrical) registered in Georgia. The original stamped signed copy of the calculations shall be provided to DOA as part of the design submittal.
2. Present all electrical calculations using the guidelines provided in this section. Provide two 8-1/2- by 11-inch, 3-hole-bound reports that contain all electrical calculations, time coordination curves, and protective device settings.
3. Provide one-line diagrams (hard copy) and electronic files with all calculations. At the end of the project, update both reports and electronic files in the same manner as other As-Built drawings.
4. The DSP shall submit calculations to DOA using PMWeb which is a web-based Project Management software tool IAW, P&D Policies and Procedure 02-001 “Document Control”.
5. The SKM System Analysis software tool (latest version) identified in this section, shall be used for all mid-to-large CPTC projects. For smaller non-CPTC projects, the DSP shall notify the DOA Assistant Director (or designee) of the analysis software tool being used and obtain approval.

B. Short Circuit, Circuit Breaker Coordination Study

1. The DSP shall prepare a complete set of short-circuit, circuit breaker coordination study calculations. The DSP may elect to sub-contract this work but must inform DOA in writing. The DSP shall submit the sub-consultant’s experience and

qualifications to the DOA electrical Assistant Director (or designee) for approval and shall be responsible for any sub-contracted work to include technical and quality assurance reviews.

2. When both normal and standby primary feeders serve a facility, provide calculations for both. The calculation shall be performed utilizing the latest SKM System Analysis software tool.
3. Calculations shall consider both three-phase and single-phase to ground fault current on secondary systems. State the base MVA/kVA on the calculations.
4. Prepare protective device coordination graphs which demonstrate coordination of devices for interrupting faults. Prepare these graphs for all new or modified primary and secondary systems. Coordination curves shall be prepared along with the single line diagram indicating which devices are under review.
5. Provide a flag on all coordination curves indicating the available short circuit current at each device. Curve plots from the software shall be used.
6. The Electrical System shall be fully coordinated unless directed otherwise by the DOA Engineering Director. Coordination study shall be from the utility transformer to the main circuit breaker in the smallest panel.
7. Indicate in the coordination sheet, short circuits (with flags), breaker type, settings and scales.
8. Calculations shall include ATS in closed-transition mode unless directed otherwise by DOA Engineering. See Engine Generator/Transfer Switch Sizing Calculations for additional guidance.
9. Present the manufacturer’s catalog data for each protective device to show they have adequate fault current interrupting capacity for the available short circuit current
10. The Short Circuit, Circuit Breaker Coordination calculation report shall include the following:
    a. Summary
    b. Assumptions (verified or unverified),
    c. Available short-circuit current letter from utility company,
    d. Tabulation of results of all scenarios,
    e. Print out of all inputs from SKM System Analysis software,
    f. Print out of all results from SKM System Analysis software,

g. Single Line Diagram from SKM System Analysis software, and

h. Single Line Diagram with available short-circuit current value on each bus.

11. One final hardcopy report shall be provided to the DOA in a 3” binder(s) and in an electronic SKM System Analysis file format. The DSP shall submit files to DOA using PMWeb IAW, P&D Policies and Procedure 02-001 “Document Control”.

12. See AC 150/5340-30J, section 13. “Short Circuit Analysis for airport airside projects.

C. Load Calculations

1. The DSP shall prepare and submit electrical normal load calculations early in the engineering process (schematic - design phases) to provide reasonable assurance that existing electrical equipment such as switchgear, switchboards (including main-tie-main configurations), panelboards and other equipment are adequately sized (with margin) to accommodate new load additions or if equipment concerns are preventing a code compliant design. The DSP shall analyze the Emergency Generator loads in parallel with the normal power loads.

2. The DSP shall follow steps outlined in section titled “Circuit Load calculation or Metering” for obtaining output load data used as input in the design basis load calculation(s).

3. The load calculation(s) shall provide an estimation of all newly added electrical loads along with existing for the system under review.

4. The units of electrical loads shall be kilovolt-amperes (kVA). The units of kilowatts (kW) shall be converted to kVA using a power factor (PF).

5. If an existing Panelboard illustrated on a contract drawing is used as the design basis for a load calculation the following is required:

a. The load calculation shall indicate load classifications (type such as lighting, heating, motor, HVAC, receptacles, miscellaneous equip, etc..), connected loads, demand factors and estimated demands.

b. The Panelboard “Totals” shall be identified for connected loads, estimated demands, existing connected current loads (A), estimated demand loads (A).

c. All verified or unverified assumptions shall be identified.

6. The electrical load calculation results shall demonstrate that the existing equipment is sufficient to meet new added load demands (Pass) or is inadequate (Fail) with recommended corrective actions. A discussion with the DOA Assistant director (or designee) is required if code compliant issues are identified and resolutions are necessary to continue.

D. Emergency Generator/Transfer Switch Sizing Calculations

1. For HJAIA CPTC: The HJAIA Resiliency Emergency Power program provided and installed emergency power generators for each individual concourse and main terminal at the CPTC which were sized to accommodate their individual concourse loads upon loss of normal power (resilient 100% back-up emergency power). When loads are added to the normal power source, the DSP shall analyze the associated generator load block (emergency generators) capacity and determine if the existing emergency generators are adequately sized to provide a resilient emergency power source. Load shedding to remain resilient is prohibited. Coordination with the DOA electrical Design Manager may be required to obtain the latest Peak demand load data from the utility.
2. When loads are added/removed the emergency generator's capacity/margin shall be revised and documented in the analysis.
3. For all HJAIA CPTC and DOA facilities, the emergency generator sizing calculations shall show the "sequence of operation" for the various loads that are served from the generator. Consideration that the voltage dip shall not exceed 35% for general loads and motors and 20% for critical and electronic loads.
4. For HJAIA DOA facilities with generators, as new loads are added to an existing generator the analysis shall illustrate the generator's ability to handle new and existing loads along with identifying the reserve capacity remaining for the generator size.
5. All loads used for this analysis shall be from a verifiable source with all verified or unverified assumptions identified and documented.
6. Automatic Transfer Switch (ATS) sizes fed from the generator shall match the generator size.

7. ATS's shall be closed transition as required by Georgia Power or unless otherwise directed by the DOA electrical engineering department. Noted exceptions: ATS's shall be open - transition for parking decks, parking lots, guard booths and escalator designs if required.

E. Arc Flash Calculations

1. Arc Flash calculations shall be in accordance with NFPA 70E and IEEE STD-1584. Provide complete electronic calculation in its original format (i.e. SKM System Analysis files).
2. For arc flash, provide calculations for each piece of electrical equipment and provide 3 samples of the arc flash warning signs to DOA for approval.
3. Based on the calculation output, Arc-flash warning signs shall be placed on electrical equipment in locations where arc-flash hazards exist IAW requirements of OSHA and NFPA 70E.
4. One final Arc Flash hardcopy report shall be provided to the DOA in a 3" binder(s) and in an electronic SKM System Analysis file format via. the PMWeb system, IAW P&D Policies and Procedure 02-001 "Document Control" (latest revision). For smaller non-CPTC projects, the DSP shall notify the DOA Assistant Director (or designee) of the software being used.
5. See AC 150-5370-10H for airport airside project arc flash requirements.

F. Harmonic Calculations

1. Electronic loads are generally nonlinear, and results in the generation of harmonic currents. These currents circulate within the AC distribution system, which supplies power to electronic loads. For each HJAIA - DOA facility, prepare a harmonic study calculations when significant harmonic (nonlinear) load is added to the distribution or building power system.
2. A harmonic study will also be required when the new load exceeds the recommended voltage or current distortion levels as allowed per by IEEE 519-2022, "Recommended Practices and Requirements for Harmonic Control in Electric Power Systems."
3. The results of the harmonic study will dictate when additional harmonic correction measures are required. Provide base line harmonic measures prior to adding new equipment that may introduce harmonics. Ensure that harmonics introduced due to the new equipment will not exceed the base line values.
4. One final Harmonic Analysis Calculation hardcopy report shall be provided to the

DOA in a 3” binder(s) and in an electronic SKM System Analysis file format via. the PMWeb web-based Project Management software system, IAW P&D Policies and Procedure 02-001 “Document Control” (latest revision).

G. Voltage Drop Calculations

1. To mitigate voltage drop concerns during design, the electrical DSP shall take into account factors like cable length, gauge (size) of the conductors and the current load.
2. A maximum combined voltage drop of 5 % with feeders at 2% and branch circuits at 3% shall not be exceeded.
3. Sensitive circuits: Branch circuits supplying sensitive circuits shall be limited to a voltage drop, not exceeding **1.5** % and the combined voltage drop of feeder and branch-circuit conductors shall not exceed **2.5** % per NEC 647-4(D). For Cord-Connected equipment the voltage drop on branch circuits supplying receptacles shall not exceed 1% per NEC 647-4(D)(2).
4. Prepare voltage drop calculations IAW the National Electrical Code (when required) and place details on drawing(s) or in a stand-alone document and submit as a deliverable via. the PMWeb web-based Project Management software system, IAW P&D Policies and Procedure 02-001 “Document Control” (latest revision).
5. See AC 150-5340-30J, section 13.2.6.1.1 for airport airside control voltage drop requirements.

H. Lighting Calculations

1. Photometric calculations shall be in the point-to-point format. A Photometric calculation summary shall also be provided to describe the output details such as light loss factor used (LLF), the Average fc, Maximum (Max.) fc, Minimum (Min.) fc, Average/Min. fc, Max./Min. fc (maintain ratio between maxima and minimum).
2. Photometric calculation drawings shall be provided for building (interiors and exterior), parking lots, parking decks and other locations where applicable to illustrate the designed fc levels.
3. Provide individual photometric calculations for normal and emergency lighting.
4. Provide final As Built lighting calculations and photometrics drawings at the completion of each project via. the PMWeb web-based Project Management software system, IAW P&D Policies and Procedure 02-001 “Document Control” (latest revision).

9.0 Equipment Identification

A. Branch Circuit Panelboard Directories

1. Computer generated panelboard directories shall be created under the As-Built phase and placed under plastic jacket or protective cover for protection from damage or dirt. Handwritten directories are not allowed.
    a. As a minimum provide the following details on directories:
        i. Number each single pole space.
        ii. Odd-numbered circuits on the left side starting at the top, even on right side starting from the top.
        iii. Securely mount directories on inside face of panelboard door.
        iv. Define briefly, but accurately, nature of connected load (i.e. lighting office number, receptacles, electrical room, etc..).
        v. Provide CPTC official GIS room number locations for all loads and indicate panel name on schedule.
        vi. Multi-pole circuits shall utilize all pole space numbers as its circuit identifier, i.e., a three-pole circuit will have three space numbers.

B. Identification Nameplate Labels

1. Equipment identification nameplate labels which are different from electrical manufacturers nameplates shall be provided for all electrical equipment located at HJAIA. For CPTC and DOA ancillary facilities, the unique electrical equipment nameplates shall be created using the methodology outlined in this standard and applied to all electrical equipment with the noted exception: Concession spaces shall have unique identification nameplates for all electrical equipment designed by the DSP using a systematic approach. The following is a minimum equipment list:
    i. Normal and Emergency (Life Safety, Critical, Legally Required Standby, Optional Standby, and Uninterruptible Power Supply)
    ii. Power electrical equipment including but not limited to, substations, switchgear, switchboards,
    iii. Panel boards (power, lighting, receptacle),
    iv. Motor control centers,
    v. Non-fusible disconnect switches (including individually mounted circuit breakers),

vi. Fusible disconnect switches,

vii. Wire ways,

viii. Bus ducts and associate components when required,

ix. Cable trays,

x. Automatic transfer switches,

xi. Transformers,

xii. Uninterruptible power supplies,

xiii. Generators,

xiv. Miscellaneous electrical components, etc.

2. For new installations label cubicle/compartment/spaces for all Switchgear, Switchboards and MCCs. Label each disconnecting and overcurrent protective device, meter and control device mounted in compartment doors with a nameplate.
3. Identify fuse type and size on the cover of fusible equipment
4. Time Delay: Provide 1/8-inch lettering at the control location to identify a motor having a time delay relay – “Time Delay Start to limit System Inrush”.
5. Identify soft start on motor starter.
6. All nameplates shall be engraved.
7. Securely attach engraved nameplates using epoxy adhesive.
8. No temporary markings are permitted to remain on equipment.
9. Coordination with the DOA “Assess Management” department is required to determine if specific asset tagging requirements are applicable to the scope of work.

C. Color Scheme for Engraved Electrical Nameplate Labels

Table 2 – Nameplate Voltage Color Identifier

System	Label Background Color	Lettering Color
120/240 Volts, Single Phase – Normal	Black	White
208/120 Volts, Three Phase – Normal	Black	White
480/277 Volts, Three Phase – Normal	Black	White
120/240 Volts, Single*	Red	White
208/120 Volts, Three Phase*	Red	White
480/277 Volts, Three*	Red	White

* Connected to generator power source (Emergency, Legally Required Standby and Optional Standby).

D. Nameplates: Electrical Equipment Identification Methodology

1. All new electrical equipment shall have a unique identification number.
2. The identification number shall be annotated on three lines, centered within a nameplate with a minimum ½ inch margin maintained around the outer edges.
3. The methodology used to create an electrical equipment nameplate identification number is outlined in Table 3:

Table 3 – Nameplate Label Description

Line One	Line one shall list the official H-JAIA GIS room number where equipment is located. Room numbers for existing spaces are located near each electrical room at the CPTC. For existing CPTC electrical rooms without GIS room number identification nameplates or for new proposed electrical rooms, the DSP shall contact the HJAIA DOA planning department to obtain the official GIS room number identification which is required to build unique identification labels. For CPTC electrical designs, which utilize existing open spaces, where electrical equipment will be or is located and a CPTC space number has not been assigned for this area, an identifier shall be developed by using the following method: • step one) obtain the CPTC zone number for this area by contacting the H-JAIA DOA planning department. This designator will become the first identifier for line one, • step two) add the CPTC level. This designator will become the second identifier for line one, • step three) locate the closest vertical and horizontal column identifier which is typically a letter and number and add to line separated by a back slash. This designator will become the third identifier for line one. These key designators together and separated by a hyphen will become the new electrical equipment location name. Example: CPTC zone designator is **AS17**, CPTC level number designator is **1,** and horizontal/vertical column number designators are **A/16**. Line one will now become **AS17-1-A/16**
Line Two	Line two shall include the **Power** Type - **Voltage** Type - **Equipment** type (plus sequential number) - **Source** identifier and CPTC concourse identifier. A hyphen shall be used to separate the categories identified. See Table 4, 5, 6, 7 and section 1.14 for type descriptions which shall be used when creating the identification number for line 2.
*Line Three	Line three shall include the word Concession in parentheses.

*****Applicable to concession distribution equipment only.

Table 4 - POWER TYPE IDENTIFIER

N	Normal Power
E	Standby Power
R	Legally Required
S	Life Safety
U	Uninterruptible Power Supply (UPS) Power

Table 5 - VOLTAGE TYPE IDENTIFIER

M	Medium (above 480VAC)
H	277/480 VAC, 3 phase
L	120/208 VAC, 3 phase
B	120/240 VAC, 1 phase
O	Other (24VDC and below 120VAC)

Table 6 - EQUIPMENT TYPE IDENTIFIERS:

The below listed identifier abbreviations approved by the DOA Electrical Department shall be used. To use abbreviations not listed, submit a descriptive written request to the DOA Electrical Department for approval.

Identifier	Equipment Type
AT	Automatic Transfer Switch
BD	Bus Duct
BP	Bus Plug
BTB	Bus Tap Box
CB	Cable Bus
CT	Cable Tray
DF	Fusible disconnect Switch
DP	Distribution Panelboard
DS	Non-Fusible disconnect Switch
EG	Emergency Generator
FA	Fire Alarm Control Panel
IB	Individually mounted circuit breaker
LC	Lighting Control Panel
MC	Motor Control Center
M1	Meter (number denotes the meter type)
PP	Panel board (Power, Lighting, Receptacle)
SB	Switchboard
SG	Switchgear
TR	Transformer
TV	Transient Voltage Surge Suppressor
UP	Uninterruptible Power Supply (UPS)
UT	Utility Transformer or Bus
WW	Wire way

Table 7 – CPTC CONCOURSE IDENTIFIERS

A	Concourse A	E	Concourse E
B	Concourse B	F	Concourse F
C	Concourse C	M	Main Terminal including Atrium
D	Concourse D	T	Concourse T

E. Source Identifier Methodology

1. Any electrical distribution equipment connected directly to a utility bus (or utility transformer) will be considered a SOURCE.
2. The equipment type identifier shown in table 4 shall be used to identify the source.
3. Once the source equipment type identifier has been defined, a proxy shall be assigned using letter **S** (for source) followed by a numeric number and location. Locations are as follows:
   a. Example: three Switchgear and two Switchboard's fed directly from the utility bus and all equipment located in the same CPTC electrical room with the official GIS room number **AS17-1- F1**: the identifications
      i. Line One Line one shall list the official HJAIA GIS room number where equipment is physically located. **AS17-1-F1**
      ii. Line Two Line two shall list the **Power** Type - **Voltage** Type - **Equipment** type (plus sequential number) - **Source** and Concourse Designator. A hyphen shall be used to separate the categories identified from Tables 4, 5, 6 and 7: **N – H – SG1 – UT – S1A.**
4. The designation **UT** will only be used in the equipment identification name at the Main SWGR or SWBD level. This **UT** identifier shall not appear in any downstream equipment identification numbers.
5. If any downstream equipment is fed from two upstream sources, then list both sources separated by a back slash, example **S1A/S2A.** See Figures 1, 2, 3 and 4 for examples.

10.0 Quality Assurance

A. Requirements

The DSP shall submit project deliverables reviewed under their approved Quality Assurance (QA) program.

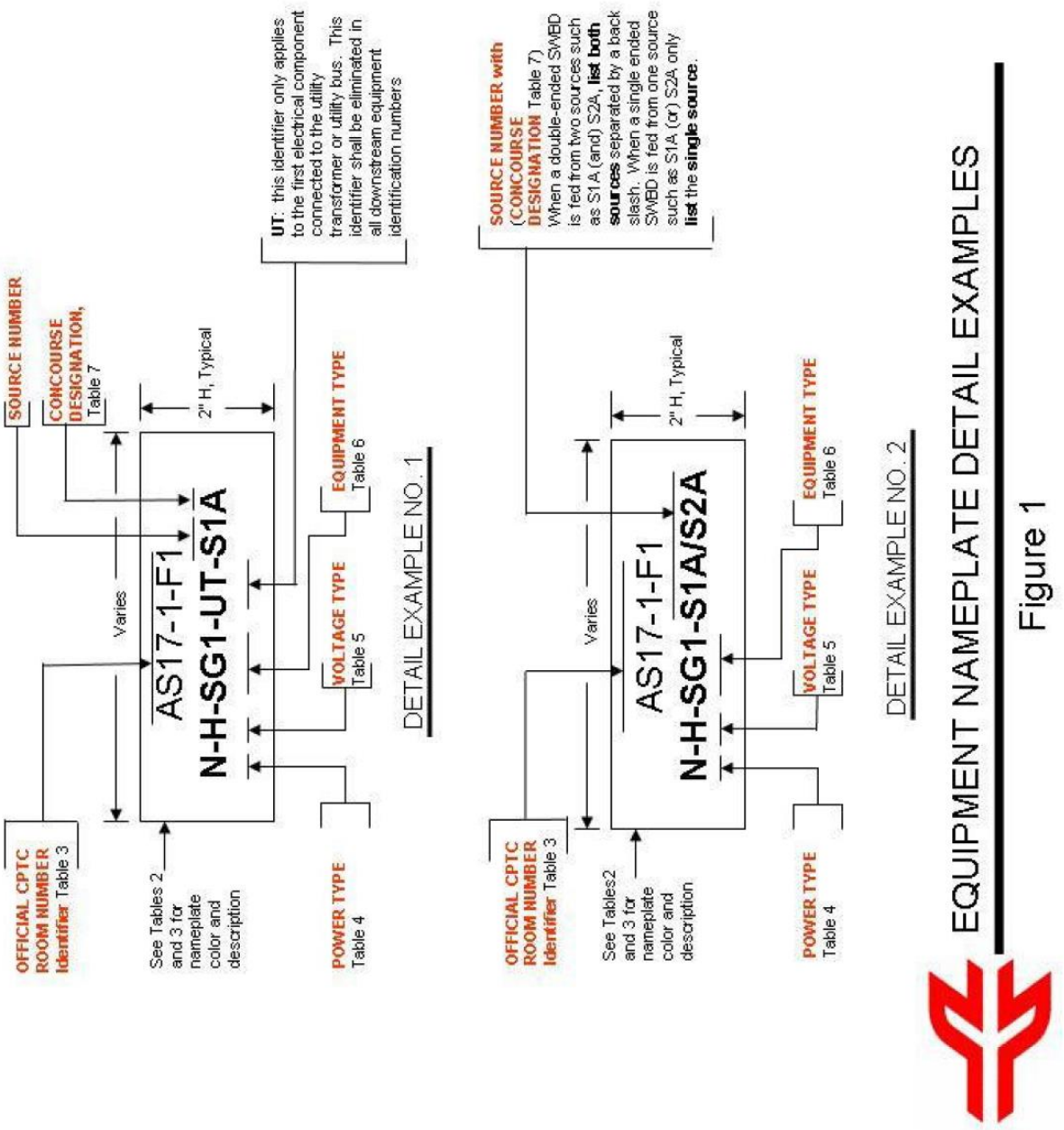
B. Redi-Check Interdisciplinary Coordination Review

The DSP shall develop and implement a “Redi-Check Interdisciplinary Coordination” review methodology to document review results.

C. Quality Assurance (QA) Checklists

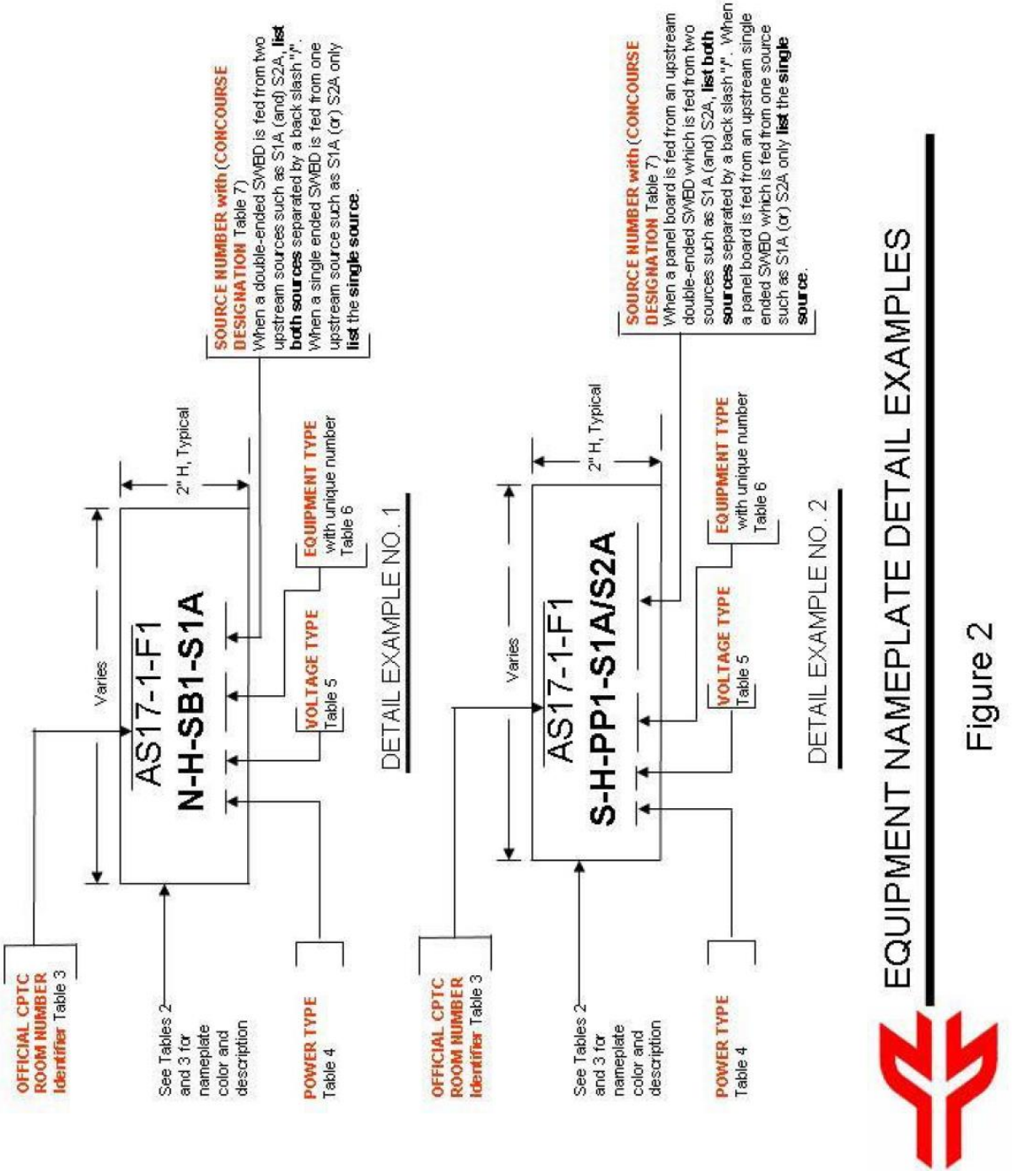
The DSP shall submit a draft QA checklist to the DOA Assistant Director Electrical (or designee) prior to all initial schematic 30% deliverable for “Capital Projects”. Once approved by DOA a completed QA checklist shall be submitted with each contract submittal to demonstrate compliance. The DSP will be notified by the DOA if the QA expectations are not met. An in-person meeting may be required to discuss the corrective actions.

Figure Index:



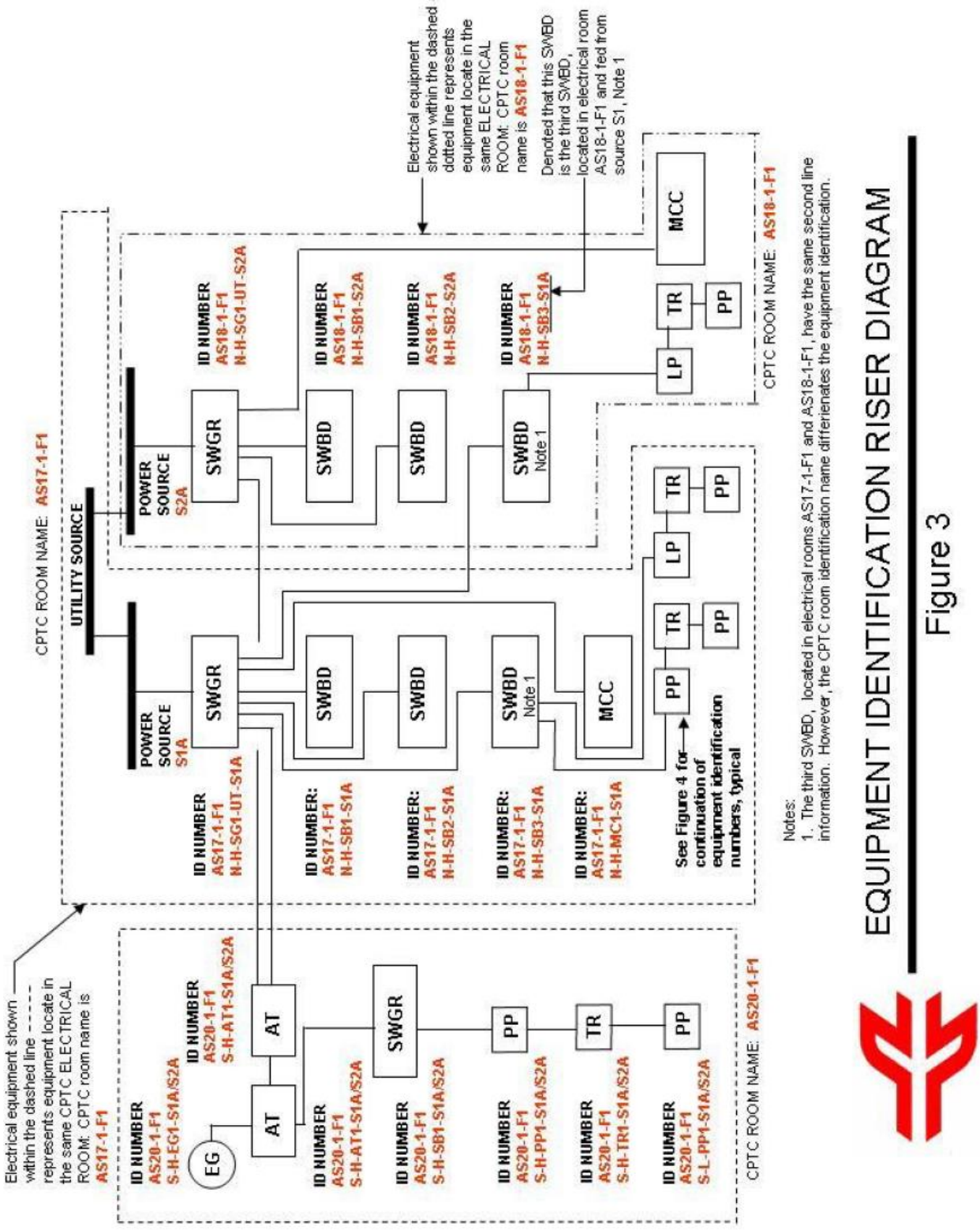
EQUIPMENT NAMEPLATE DETAIL EXAMPLES

Figure 1



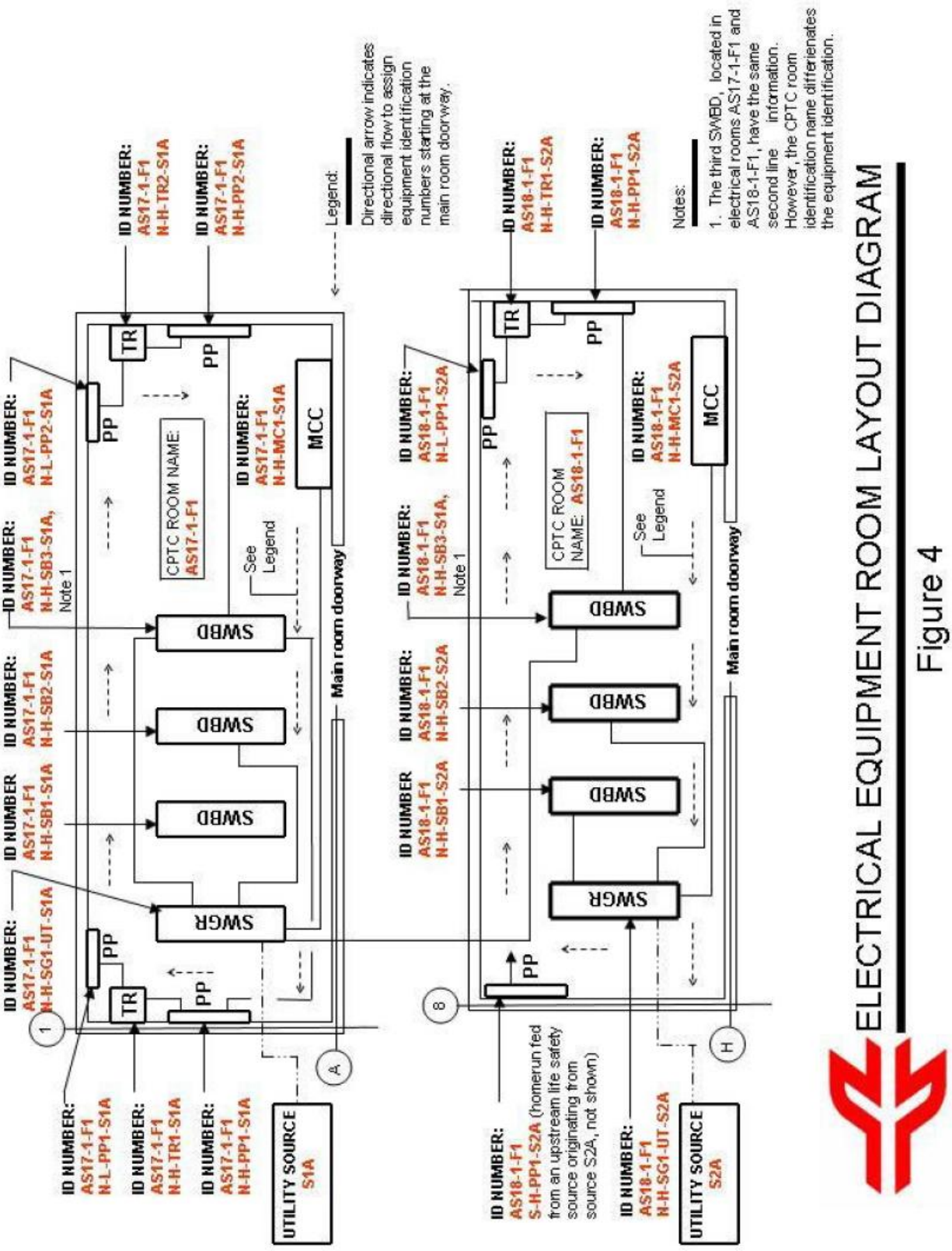
EQUIPMENT NAMEPLATE DETAIL EXAMPLES

Figure 2



EQUIPMENT IDENTIFICATION RISER DIAGRAM

Figure 3



Revision Log

07/16/2025	Reformatted entire document to include clarifying/updating existing details, adding new details, and re-installing Airfield design details.
01/12/2023	Latest Revision
09/23/2021	Latest Revision
09/03/2020	Latest Revision
12/11/2019	Latest Revision
04/18/2018	Latest Revision
10/14/2016	Latest Revision
03/07/2013	Revised color scheme for engraved electrical nameplate labels.
01/15/2013	Added branch circuit monitoring/embedded metering and equipment identification requirements for concession switchboard.
01/25/2010	Last Revision
06/27/2007	Initial release.
Last Revised Date	**Description of changes**

Hartsfield-Jackson Atlanta International Airport

City of Atlanta

Department of Aviation

Operations – Airport Wildlife

Airport Facilities Landside/ Airside New Construction and Modifications

General Wildlife Design Criteria

Table of Contents

1.0 Purpose

A. Federal Aviation Administration (FAA) Qualified Airport wildlife biologists have developed this criteria to incorporate and standardize Landside and Airside construction guidelines concerning Part 139.337 Wildlife Hazard Management in and around Hartsfield-Jackson Atlanta International Airport (H-JAIA). This Wildlife Mitigation Criteria shall be incorporated into all airport Capital Projects

B. Airport operators accepting federal funding for airfield improvements and their associated contractors should implement guidelines set forth in AC150/5200-10H *Standard Specifications for Construction of Airports*, AC 150/5200-33C *Hazardous Wildlife Attractants on or near Airports*, *Wildlife Hazard Management at Airports-A Manual for Airport Personnel,* or other Federally drafted supporting documentation involving the mitigation of hazardous wildlife at airports.

2.0 Landside Mitigation

A. Buildings

1. Building design should incorporate the needs of the airport environment and wildlife hazard management. Generally, building façades/roofs/soffits should omit horizontal ledges and similar spaces to the maximum extent practical to reduce nesting, roosting, perching, and congregating birds. Supporting structures, utilities, or their containment boxes associated with the building should not present gaps, holes, spaces, or other voids that create opportunities for cavity dwelling birds, urban dwelling birds, or other wildlife to nest, roost, perch or congregate.

B. Plantings/Turf

1. Generally, landscape trees, shrubs, or other plants should be selected to reduce maintenance and watering that is appropriate for sandy and loamy soils identified in soil survey areas. Selected trees, shrubs, or other plantings will not produce fruits, berries, seeds, or provide dense roosting habitat attractive to wildlife including birds, mammals, or other wildlife.

2. Landscape turfgrasses will be limited to Bermudagrass for warm season plantings and Turf-type Tall Fesue (high-endophytic fescue preferred) for cool season plantings. Seed mixtures containing brown-top millet, ryegrasses, foxtails, and other large seedhead producing plants should be omitted from use. Grass plantings and sod areas should be left with sufficient coverage and left in a healthy state with limited bare patches of ground before considered complete. If bare patches are present, additional suitable covering may be required (i.e., tackifiers, asphalt emulsion, coconut wood fiber, excelsior erosion control).

C. Landscape Materials

1. Landscape materials that create shelter for rodents, lizards, or other small animals will be omitted from use (e.g., boulders, large stone, water features, etc.).

D. Light Poles/Communication Structures

1. Light poles should be outfitted with anti-perch devices that will reduce perching and roosting opportunity. Building lighting, signage, or other connecting structures should be designed with limited gaps, voids, or other access points to reduce nesting opportunity and if present, should be fitted with rigid exclusion materials and anti-perch devices.

E. Roadway Information Signage

1. Roadway signage (e.g., directional, hospitality, advertisement, etc.), lighting, and its supporting structures should be designed in a manner that reduces perching, roosting, and nesting opportunity. Roadway signage, lighting, or other supporting structures should have limited gaps, voids, or other access points. If perches, gaps, voids, or access points do exist, they should be retrofitting with anti-perch devices and rigid exclusion materials.

F. Ponding

1. Landscape materials and plantings will be selected to reduce the potential of ponding water from rain or irrigation. Grading and other sloped features should be designed to move water away to covered inlets quickly to reduce ponding and attracting wildlife.

G. Structures

1. Bridges

a. Bridge structures will be built with reduced ledges, cubbies, or cavities created by beams, crossmembers, and other supporting structures. These spaces and voids create nesting and roosting opportunities for hazardous bird species. Bridge sections that cannot be poured or formed without ledges, cubbies, or cavities will be retrofitted with rigid materials to exclude these areas long-term with minimal maintenance required. Bird netting should be substituted with other permeant materials.

2. Overhangs

a. Overhang structures will be fitted with appropriate anti-perch devices that will reduce perching and roosting opportunity.

3. Walkways

a. Walkway structures will be built with reduced ledges, cubbies, or cavities created by beams, supporting structures, or connection points to other structures or buildings. Ledges, cubbies, or cavities that cannot be avoided will be retrofitted with rigid materials to exclude these areas long-term with minimal maintenance required. Bird netting should be substituted with other permeant materials.

H. Trash

1. Trash containers in public gathering locations, construction sites, security gates, or other areas outside the Air Operating Area (AOA) should always remain covered to reduce food scraps and trash as wildlife attractants. Trash containers should also be regularly emptied by personnel to mitigate attracting wildlife.

2. Signage stating “No Feeding Birds” or similar with city ordinance code should be posted throughout public gathering areas and near trash containers to reduce wildlife attractants.

3.0 Airside Mitigation

A. Buildings

1. Building design should incorporate the needs of the airport environment and wildlife hazard management. Generally, building façades/roofs/soffits should omit horizontal ledges and similar spaces to the maximum extent practical to reduce

nesting, roosting, perching, and congregating birds. Supporting structures, utilities, or their containment boxes associated with the building should not present gaps, holes, spaces, or other voids that create opportunities for cavity dwelling birds, urban dwelling birds, or other wildlife to nest, roost, perch or congregate.

B. Culverts/Scuppers

1. Culverts, scuppers, improvised designs, or other stormwater structures should be designed and installed in a manner that reduces the ability for wildlife to enter through the device onto the AOA. Designs that reduce access such as catch basins, closed storm drains, slot drains, or covered culverts should be incorporated as a 139.337 wildlife mitigation standard when designing stormwater or other drainage inlet/outlet structures. Spacing of exclusion and covers should be no greater than three inches (3”) to reduce entry by most hazardous wildlife observed outside the airport environment.

C. Erosion Control

1. Erosion control should incorporate the needs of the airport environment and wildlife hazard management. Standards listed in the “Manual for Erosion Sediment Control in Georgia” do not consider specific requirements for FAA certificated airports. Omit the use of ryegrasses, millets, sudangrasses, hays, straws, corn stalks, or other material for planting or cover that could contain seeds of problematic plants. Tackifiers, asphalt emulsion, coconut wood fiber, excelsior erosion control mating, low seed-producing temp grasses, permanent turf-type fescue and Bermudagrass seed, or their sod equivalents are approved materials for erosion control. Grass plantings and sod areas should be left with sufficient coverage and left in a healthy state with limited bare patches of ground before considered complete. If bare patches are present, additional suitable covering may be required (i.e., tackifiers, asphalt emulsion, coconut wood fiber, excelsior erosion control).

D. Fencing

1. All airport fencing should incorporate Part 139.337 wildlife mitigation standards. Fencing should provide exclusion of wildlife including underneath fence fabric, overtop fabric, and at corners, and associated gates. Fencing should be at least 10 feet in height with at least three stranded barbed wire outriggers. New fence lines should be developed on concrete barrier or with at least two feet of fence fabric material buried into the ground under the footprint of the fence line. A buffer of 10 feet should be maintained on either side of the fence line for safe and effective inspections and maintenance.

E. Gates

1. All airport manual or mechanical gates should incorporate wildlife mitigation standards. All new manual gates should be built on a reinforced concrete pad with no more than a three-inch (3”) gap when closed anywhere within the gate system. Automated gates should incorporate some form of speed bumps, shoulders, or humps directly underneath the gate panels to reduce gaps that may exist when gates are in the closed position. Weep holes or channels can be incorporated into the speed bump design if concerns for proper water flow through the system are present. Preexisting gates should be retrofitted with speed bumps or other devices to reduce gaps underneath the gate panels.

F. Ponding/Detention Basins

1. Construction Site Ponding. Construction sites should incorporate 139.337 wildlife mitigation standards. Grading of disturbed areas should effectively move stormwater to nearby stormwater structures. If grading is no longer effective, temporary trenching may be required and area regraded. Silt traps or other sediment barriers should be regularly viewed after rain events and managed for the buildup of silt and other debris. Standing water that is not effectively moving to storm drains should be pumped out mechanically to ensure water has been properly drained within 48 hours of rainfall. Areas mentioned above should be dry after 48 hours and in between rain events.
2. Pre-existing Detention Basins. Pre-existing detention basins must drain within a 48-hour period after rainfall or be supplementally pumped out during a 48-hour period to ensure timely movement of water. Additionally, detention ponds should remain completely dry between rain events. If excessive rain at construction sites causes sedimentation and transfers materials downstream, downstream structures, detention basins, and their parts should be reviewed and managed to adequately support its continuous use and functionality as intended.
3. Temporary Detention Basins. Temporary detention basins are not approved within the AOA or within airport separations. If temporary detention basins are needed under special circumstances, airport operators must use physical barriers such as wire grids, floating covers, or netting (mesh size <5 cm to reduce entanglement) and reviewed by the airports qualified wildlife biologist before implementation.

G. Seed/Sod/Turf

1. Landscape turfgrasses will be limited to Bermudagrass for warm season plantings and Turf-type Tall Fesue (high-endophytic fescues preferred) for cool season plantings. Seed mixtures containing brown-top millet, ryegrasses, foxtails, and other large seedhead producing plants should be omitted from use. Grass plantings should be full and healthy with little to no bare patches before considered complete. If bare patches are present, additional coverings with suitable methods may be required. Weed management during and after sod establishment should be the responsibility of the contractor until a healthy stand of grass has been established.

H. Trash/FOD

1. Trash containers in gathering locations, construction sites, security gates, or other areas outside the AOA should always remain covered to reduce food scraps and trash as wildlife attractants. Trash or other items that create FOD should be picked up and removed promptly. Approved trash containers should be emptied regularly by personnel to mitigate attracting wildlife.

4.0 Project Close-Out and Transfer

Proper close out and transfer of ownership should be implemented when a project is completed. This should include a plan for continued maintenance and transfer of other information such as training, training materials, pamphlets, guides, or other pieces of information for success and management of infrastructure or grounds after the project has been transferred.

5.0 References

1. Hartsfield-Jackson Atlanta International Airport - Airport Facilities/Landside/Airside New Construction and Modifications Design Standards (https://atlstandards.com).
2. Cleary, E. C., and R. A. Dolbeer Wildlife Hazard Management at Airports, A Manual for Airport Personnel. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, July 2005
3. DFW Dallas Fort Worth International Airport-DFW Development Design Guidelines, March 2021
4. U.S. Department of Transportation Federal Aviation Administration-Hazardous Wildlife Attractants on or near Airports-AC 150/5200-33C, February 2020
5. U.S. Department of Transportation Federal Aviation Administration-Standard Specifications for Construction of Airports-AC 150/5370-10H, December 2018

Hartsfield-Jackson Atlanta International Airport

City of Atlanta
Department of Aviation
Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Computer Aided Drafting (CAD) Standards

Table of Contents

Design Standards
CAD

1.0 OVERVIEW

A. The Hartsfield-Jackson Atlanta International Airport (ATL) CAD (Computer Aided Design and Drafting) Standard is a guideline for preparation of deliverable engineering drawings in the AutoCAD environment.

B. Policies established by this manual are mandatory for employees of the City of Atlanta Department of Aviation Planning and Development Bureau (P&D) and for the information and guidance of architects and engineers providing consulting services supporting P&D and DOA tenants.

C. The CAD Standards must be adhered to in every way when preparing new drawings for P&D (Sheet size, font style and weights, line weights, layer naming conventions, and sheet numbering conventions).

D. Any special conditions which may require a change or variance from these policies and procedures shall be subject to prior approval by the P&D department.

E. These standards will continue to evolve as technology advances. CAD standards for BIM (Building Information Modeling) and or AutoCAD Revit submittals will be developed on a project-by-project basis. The contents of this manual supersede all previous versions published and are subject to change without notice. P&D encourages comments by end users and will consider all requests for revision or clarification of the intent of this document.

F. This document does not explain, nor does it replace the overall requirements of a DOA contract. Always use this manual in conjunction with DOA Contract Specifications and/or agreements. This standard does not apply to projects currently under design or construction.

2.0 DRAWING FORMAT

P&D accepts only submittals prepared with Autodesk products, the files must be “native” formats, fully functional, editable and be completely usable by the Department of Aviation (DOA) in the AutoCAD environment. It is not acceptable to create drawings with any other software and submit translations to AutoCAD.

A. AUTODESK AutoCAD

AutoCAD products version 2018 or higher are accepted by P&D. P&D currently supports the use of Autodesk 2023 products.

1. All title blocks must be placed in paper space.
2. For engineering drawings, drawing units must be set to decimal units with one base unit equal to one foot. For architectural and structural drawing, drawing units must be set to one base unit equal to one inch.
3. Only one copy of the base file should be used throughout the entire contract. Sharing of the base file should be done through XREF instead of INSERT.
4. Drawing entities must be created in full (1:1) scale and placed in model space.
5. The Z coordinates of all elements must be “0” unless the drawing is in three (3) dimensions.
6. The application of line widths and colors should always be set by layer.
7. The name of the general external reference file must begin with an “X”, i.e. XGRID.DWG, XBASEFILE.DWG, etc.
8. The final drawings must be zoomed to extents and purged.
9. All viewports shall be locked.
10. Do not bind or insert external reference files into the base drawings.
11. All incidental drawing work must be deleted.
12. The default coordinate system is the Hartsfield-Jackson International Airport Grid system.

B. SHEET SIZE

1. The P&D standard engineering drawing size is ArchE1 (30” x 42”) for full size sheets. ANSI B (Modified) shall be used when plotting Half Size sheets. Other sizes may be allowed with preapproval by the P&D Project Manager and the P&D

xx. However, all sheets issued as a complete set shall be the same size.

Size Designation	Vertical	Horizontal	Top Margin and Bottom Margin	Lef t Margin	Right Margin
Arch E 1	30"	42"	1/2”	1-1/2 "	1/2 "
ANSI B (Modified)	15”	21”	1/4”	3/4”	1/4”

3.0 DRAWING CONTENT

All Plan sheets provided to P&D shall include and follow the below content and guidelines:

A. Scale bar shown on all site plans

B. North arrow oriented always to right bottom of page or rotated clockwise

C. North arrow maintains the same direction on all plan sheets

D. All Civil site plans shall have airport coordinate grid ticks at a 5” spacing to cover the entire project area

E. The drawing sequence follows baseline direction (where applicable)

F. Details provided by other agencies shall be displayed on single sheets

4.0 FLASH DRIVE OR LINK

P&D will provide a CAD Standard Link for consultants at the time the Project Contract is given that includes:

A. Cover sheet example

B. ATL base map XREF

C. Base Street Names XREF

D. Airport grid ticks XREF’s (for a variety of scales)

E. Title Block Border Sheet

5.0 SHEET NUMBERING/NAMING SYSTEM

Reference the National CAD Standards (NCS), latest edition, Sheet Numbering/Naming System and Appendix B for sheet sequence number and sheet type designator variances.

A. Submit proposed variance to P&D xx/MAPPING Manager for approval.

6.0 FILE NAMING SYSTEM

A. Reference the National CAD Standards (NCS), latest edition, File Naming System.

Submit proposed variance to P&D CAD/MAPPING Manager for approval

7.0 LAYERING

Reference the National CAD Standards (NCS), latest edition, Layering Guidelines.

A. Use only NCS layer names. Any difference must be submitted through DOA, P&D for approval.

B. Use the minimum number of layers necessary to adequately separate entities in each drawing. The number of layers contained in each drawing will vary depending on the scope and complexity of the drawing, however drawings should not contain extraneous, redundant, or overly detailed layer names.

C. Purge each drawing of unused layers prior to submittal. The drawing file should contain only those layers necessary for displaying and plotting the information and drawing entities contained in each drawing. To ensure that subsequent prints made from each AutoCAD drawing match the original, unused or unnecessary layers must be purged from the drawing prior to delivery.

D. Drawings must utilize the layer line type, layer color, and layer line weight outlined by the National CAD Standards.

E. Use DOA .CTB files to print.

8.0 FILE TRANSMITTALS

A. For each submittal you must create a Transmittal.

B. The transmittal package type must be Zipped "(*.zip)" using the E-Transmit Autodesk feature. This will ensure that a copy of all the elements that make up the project files will be captured.

C. All files shall have one root project folder.

D. Save and purge drawings prior to E-Transmit.

E. Include options: fonts, textures from materials, files from data links, photometric web files, and sheet set data and files.

F. All As-Built should be finished in AutoCAD and clearly marked "As-Built". A complete set, hard and soft copy, must be submitted.

G. PDFs of individual sheets should also be included in the electronic file submittal.

H. A Flash Drive or File Share with all associated drawings and files shall be delivered to P&D and include a labeled file with the submitter's name, project title, WBS number, issued for date, issued for stage, and applicable contract number.

Note: Additional or re- submittals may be required during any design phase and those anticipated are scheduled per the DOA Task Order. Revisions to the drawings during the bid phase are made by addenda. Revision clouds are never used to indicate additions/changes to drawings during the design phases. Drawings Issued for Permit and drawings Released for Construction are identical except drawings Issued for Permit are signed and sealed by the registered professional approving the release of the drawings.

9.0 Appendices

Appendix A

Request for CAD Standards Modification

Prepared By: _____Phone Number:_____

Organization/Group: _____FAX Number: _____

Date:_____

Suggested Improvements/Modifications:

_____

_____

_____

_____

_____

Benefits:

_____

_____

_____

_____

_____

For DOA Use Only:

☐ Accepted

☐ Rejected

☐ Accepted with the following modifications:

_____

_____

_____

_____

Action Taken:

☐ Incorporated into Manual ☐ Issue Manual Supplement ☐None Required

Appendix B

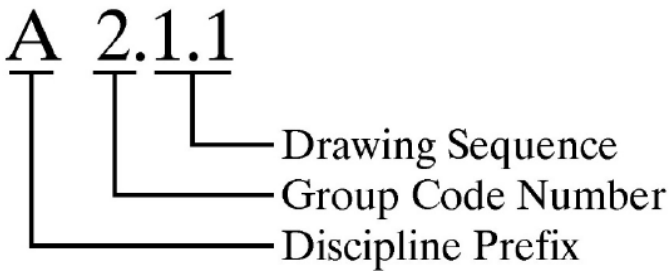
Exceptions to National CAD Standards Table of Contents

1.0 Overview

A. The Hartsfield-Jackson Atlanta International Airport (ATL) CAD Standard is a guideline in general follows the National CAD Standards (NCS), latest edition however there are some Department of Aviation specific exceptions as described below.

2.0 Sheet Number for Drawings

A. In the DOA Sheet number system, every sheet number consists of discipline prefix, group code number, and drawing sequence.



B. The same sheet numbering scheme type should be used for the entire project. An example of the drawing sequence format is as follows: A2.1.1, A2.2.1, A2.3.1… The last number in the sequence should be used to insert new sheets after the release for bid set is released. For example, A2.1.1, A2.1.2 (new sheet), A2.2.1, A2.3.1.

The chart below lists the basic DOA sheet sequence. Special sheets shall be created or combined with Appendix A Request for CAD Standards Modification approval.

Drawing Number		**Description**
G.	**Series**	**General**
G.	0.1.1	Cover Sheet
G	1.1.1	Drawing Index and Release Status
C	**Series**	**Civil Drawings**
C	0.1.1	Summary of Quantities
C	1.1.1	Legend, Abbreviations, General Notes, and Key Map
C	2.1.1	Construction Control Plan and Notes
C	3.1.1	Project Phasing
C	4.1.1	Traffic Control Plans and Details
C	5.1.1	Typical Sections
C	6.1.1	Existing Conditions
C	7.1.1	Demolition Plan
C	8.1.1	Site Plan (Profile may be on this sheet)
C	9.1.1	Geometric Control Plan (Including Curve Tables)
C	10.1.1	Runway, Taxiway or Roadway Profiles
C	11.1.1	Super Elevation Plans or Tables
C	12.1.1	Paving and Joint Plans
C	13.1.1	Paving and Joint Details
C	14.1.1	Grading, Drainage, and Utility Plans (Underdrain may show here)
C	15.1.1	Detailed Pavement Grades
C	16.1.1	Grading, Drainage, and Utility Details
C	17.1.1	Drainage and Utility Profiles
C	18.1.1	Surface Settlement Platform Layout
C	19.1.1	Surface Settlement Platform Details
C	20.1.1	Underdrain Plans
C	21.1.1	Underdrain Details
C	22.1.1	Stripping and Signage Plans
C	23.1.1	Stripping and Signage Details
C	24.1.1	Fencing Plans
C	25.1.1	Fencing Details
C	26.1.1	Miscellaneous Details
C	27.1.1	Erosion Control Plans and Details
C	28.1.1	Boring Location Plan
C	29.1.1	Cross Sections
C	30.1.1	Traffic Signal Plans

A	Series	Architectural Drawings
A	0.1.1	Architectural General Notes and Key Drawings
A	1.1.1	Architectural Site Plan, Site Details, and Demolition Sheets
A	2.1.1	Floor Plans
A	3.1.1	Exterior Elevations and Details
A	4.1.1	Building Sections
A	5.1.1	Wall, Stair, and Elevator Sections
A	6.1.1	Roof Plan and Details
A	7.1.1	Reflected Ceiling Plans and RCP Details
A	8.1.1	Interior Elevations and Details
A	9.1.1	Door Schedule, Door and Frame Types, Door Details, Window Schedule, Window Types, and Window Details
A	10.1.1	Miscellaneous Details
A	11.1.1	Vertical Circulation, Stairs, Elevators, Escalators
I	Series	Interior Drawings
I	0.1.1	General Notes
I	1.1.1	Overall Finnish Plan
I	2.1.1	Finish Schedule
I	3.1.1	Enlarged or Enlarged Finnish Plans or Multistory Plans
I	4.1.1	Finish Details
S	Series	Structural Drawings
S	0.1.1	General Notes
S	1.1.1	Site Work, Foundation Plan
S	2.1.1	Framing Plans
S	3.1.1	Elevations
S	4.1.1	Schedules
S	5.1.1	Concrete
S	6.1.1	Masonry
S	7.1.1	Structural Steel
S	8.1.1	Timber
S	9.1.1	Special Design
S	10.1.1	Foundation Plan
M	Series	Mechanical Drawings
M	0.1.1	General Notes
M	1.1.1	Site Plan
M	2.1.1	Floor Plans
M	3.1.1	Details
M	4.1.1	Control Diagrams

P	Series	Plumbing Drawings
P	0.1.1	General Notes
P	1.1.1	Site Plan
P	2.1.1	Floor Plan
P	3.1.1	Riser Diagrams
P	4.1.1	Piping Flow Diagram
P	5.1.1	Details
FP	Series	Fire Protection Drawings
FP	0.1.1	General Notes
FP	1.1.1	Site Plan
FP	2.1.1	Floor Plan
FP	3.1.1	Riser Diagrams
FP	4.1.1	Details
E	Series	Electrical Drawings
E	0.1.1	General Notes, Legend and Abbreviations
E	1.1.1	Site Plan
E	2.1.1	Electrical Demolition
E	3.1.1	Floor Plans, Lighting
E	4.1.1	Floor Plans, Power
E	5.1.1	Electrical Rooms
E	6.1.1	Riser Diagrams
E	7.1.1	Fixture/Panel Schedules
E	8.1.1	Single Line Diagram
E	9.1.1	Enlarged Plans
E	10.1.1	Cable Routing
E	11.1.1	Miscellaneous Details
E	12.1.1	Plan/ Elevation Telecommunications
E	13.1.1	Details Telecommunications
EA	Series	Airfield Electrical Drawings
EA	0.1.1	General Notes, Legend and Abbreviations
EA	1.1.1	Electrical Demolition
EA	2.1.1	Lighting Plan
EA	3.1.1	Lighting Details
EA	4.1.1	Lighting Schedules
EA	5.1.1	Electrical Vault Lighting Plan
EA	6.1.1	Electrical Vault Power Plan
EA	7.1.1	Electrical Vault Details
EA	8.1.1	Panel Schedules

EA	9.1.1	Power One Line Diagrams
EA	10.1.1	Riser Diagrams
EA	11.1.1	Cable Routing
EA	12.1.1	Cross Sections
EA	13.1.1	Guidance Sign Plans
EA	14.1.1	Guidance Sign Details
EA	15.1.1	Guidance Sign Schedules
EA	16.1.1	Miscellaneous Details
L	Series	Landscaping Drawings
L	0.1.1	Landscape General Notes
L	1.1.1	Landscape Plans
L	2.1.1	Landscape Details
L	3.1.1	Irrigation Plan Sheet
CW	Series	Casework
SS	Series	Security and Access Control Systems
GR	Series	Graphic Signage
W	Series	Wireless Systems
B	Series	Baggage Handling System
APM	Series	Airport People Mover System
PA	Series	Public Announcement System
MU	Series	MUFIDS & BIDS System
CU	Series	CUTE/AIS
FA	Series	Fire Alarm System
MC	Series	Master Clock System
-	Series	Other Agency Drawings (ex. GDOT)

3.0 CAD Layer Guidelines

A. Methodology

1. The CAD Layer Guidelines are organized as hierarchy. This arrangement accommodates expansion and the addition of user-defined extensions to the layer list. Layer names are alphanumeric and use abbreviations that are easy to remember. This legibility is particularly important when CAD files are distributed among architects, consultants, and clients.

B. Codes and Groups

The following section details the methodology behind the layer naming conventions and their general use.

1. Field 1 Discipline Code

```
          |     Field 2 Status
          |   |          Field 3 Major Group
          |   |          |      Field 4 Minor Group
          |   |          |      | X_XX_XXXX_XXXXXX
- - - - - - - - - - - - -
```

4.0 CAD File Naming Convention

A. File naming for Contract/Construction drawings shall match the Sheet number per this document.
B. File names for drawings to be used as external references shall be the single word description of the contents of the file preceded by the letter “X” and a dash i.e.: X- Alignment, X-E Contours, X-P Contours etc.
C. File names for design development drawings or reference drawings not intended to become a part of the contract drawings shall be the single word description of the contents of the file.

Hartsfield-Jackson Atlanta International Airport

City of Atlanta
Department of Aviation
Office of Infrastructure Planning & Development

Airport Facilities Landside/ Airside New Construction and Modifications

Design Standards

Sustainable Development

The Sustainable Development Standards serve as guidance to Designers of Record, Consultants, and Contractors for incorporating sustainable development components and City of Atlanta ordinance requirements into all projects in the ATLNext Capital Improvement Program at Hartsfield Jackson Atlanta International Airport (“ATL” or “the Airport”). These standards outline the minimum sustainability requirements for all design and construction projects at the Airport.

These standards can be accessed by clicking here.

Atlanta Fire Rescue Department Plan Review Requirements

I. FIRE SITE REVIEW REQUIREMENTS

<u>Site and Utility Plans to include</u>:

- Fire Department site access.
- *Roadway width(s)
  - ✓ 20 ft. minimum and 13ft. 6 in. vertical clearance.
  - ✓ 26 ft. minimum for buildings 30ft or higher.
- *Turning radius:
  - ✓ Structure with 3 stories or less – inside radius - 28ft. and outside radius - 48 ft.
  - ✓ Structure more than 3 stories – inside radius - 35ft. and outside radius - 50ft. ***Note: ARFF (Aircraft Rescue Fire Fighting) apparatus radius shall be verified.**
- Show overhead power lines within 20ft. of fire access road.
- *Gates – (specify mode of operation).
- *Knox Box(s) equipment location(s) i.e. breezeways, gates, entrances.
- *Location of all fire hydrants located within proximity of proposed project. *100ft. from FDC (Fire Department Connection(s).
- *FDC (Fire Department Connection(s), standpipe connection, sprinkler test headers, PIV (Post Indicator Valves) locations.
- *Exit discharge from the proposed structure(s).
- *Transformer(s) location(s).
- Parking decks.
- *Generators.
- *ASTs/USTs. (Aboveground Storage Tanks/Underground Storage Tanks) - ***Note: Must be shown on both Site and Utility Plans.**

II. FIRE REVIEW FOR NEW/RELOCATION/REMOVAL OF ABOVE OR BELOW GROUND TANK OR FUEL DISPENSING UNIT

<u>General Information</u>:

Applicable codes:

- ✓ NFPA 30 Flammable and Combustible Liquids Code.
- ✓ NFPA 30A Automotive and Marine Service Station Code.
- ✓ NFPA 37 Standard for Installation and Use of Stationary Combustion Engines and Gas Turbines.
- ✓ NFPA 70 National Electrical Code.

***Note: Most current code edition shall apply**

<u>Site Plan to include</u>:

- Location of tank, drawn to scale.
- Distance from buildings, observation wells, vents, hazardous features such as electrical equipment and incinerators.
- Distance from property lines, parking and drives.

Structural Plans to include:

- Identify type of liquid being stored.
- Identify type of storage: above ground, underground, container or portable tank.
- Specify volume of each tank in gallons.
- Section to scale through above ground tank and containment showing dimensions, calculation of containment volume, shape, dimensions, and construction of containment, tank base, fireproofing for metal tank supports, anchorage and venting.
- Section through underground tank(s) and excavation showing depths, physical dimension of tanks, backfill, anchorage (if required), venting and cathodic protection.
- Details for fuel dispensing units designating solenoid valves, shear valves, hose breakaway valves and emergency power shut-off switch.
- Manufacturers cut sheets – describe tank and all appurtenances indicated above and specify applicable UL listing information (e.g. UL 142 or UL 2085 tanks).
- Location and type of fire extinguishers.
- Description of vapor recovery system.

III. FIRE ASSEMBLY REVIEW REQUIREMENTS

- ✓ Seating layout or floor plan if no seating is required.
- ✓ Full set of architectural plans.

Life Safety Plan to include:

- Occupant load, Egress capacities and Exit Remoteness calculations.
- Travel distances, Common Path Travel and Dead-End limitations.
- Exit discharge termination at a public way.
- Exit signs, emergency lighting and pull Station locations
- Fire extinguisher locations and type.
- Fire rated walls.
- Furniture/Fixture/Equipment layouts.
- Symbols legend.
- Room identifications.
- Fire protection (sprinklered or non-sprinklered).
- P/H (Panic hardware).

***Note: Seated capacity must be noted on plans.**

IV. APPROVED QUALIFIED CONTRACTORS for IFC 510 and EMERGENCY RESPONDER RADIO COVERAGE TESTING

The following structures are not required to comply with the requirements of IFC Section 510:

- ✓ Buildings with no more than two occupiable stories, no more than 12,000 total square feet, and no floors below grade.

- ✓ Temporary buildings including tents when permitted by the Fire Marshal. For additions to buildings, unless the exceptions above are met for the area of the addition, the entire building being expanded must meet IFC 510 requirements.

V. FIRE ALARM REVIEW ITEMS FOR APPROVAL

- Riser Diagram "Point to Point" diagram and wire legend.
- Battery Calculations and Voltage Drop Calculations.
- Accurate Legend of Symbols for All Fire Alarm Devices Being Installed.
- Identification of Type of Wiring Used, Including Gauge and Wire Counts.
- The Matrix of Sequence of Operation/Events When Alarm System Is Activated.
- Stamp and Signature of the Designer in Responsible Charge of the Project.
- Location of FACP (Fire Alarm Control Panel), Annunciators, DACT's (Digital Alarm Communicator Transmitter), Power Extenders and Command Centers.
- Speaker wattages and decibel ratings for both horn alarm and voice evacuation system.
    - ✓ Components.
- The candela rating shown for drawing for each strobe device and each illuminated emergency.
    - ✓ Exit sign.
- Fire Alarm Systems with more than 6 devices and no new control panel installation or major
    - ✓ Modification to the system.

***Note – Fire alarm plan is a separate review and shall be submitted by the contractor elected to install.**