ATL P&D DESIGN STANDARDS

AIRPORT

FACILITIES / LANDSIDE / AIRSIDE

New Construction and Modifications

Department of Aviation
Planning & Development Bureau

November 2022

Hartsfield-Jackson
Atlanta International Airport

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Cardinal®

Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Planning & Development Bureau

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Project Submittal & Review Standards

Design Standards
Project Submittal & Review Standards

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Design Standards
Project Submittal & Review Standards

1.0 Purpose

1.1 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

2.1 These standards apply to all Designers of Record.

3.0 Responsibilities

3.1 Designers of Record

3.1.1 Designers of Record shall be responsible for submitting all project submittals to P&D per P&D's Electronic Design Review Process Flow Chart (Appendix A).

3.1.2 Designers of Record shall be responsible for complying with all P&D's Design Standards dated November 2020.[1]

3.1.3 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.

3.2 DOA Planning & Development (P&D)

3.2.1 P&D shall be responsible for the cursory 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.

3.2.2 P&D shall be responsible for ensuring that all project submittals comply with P&D's Design Standards dated November 2020.[2]

3.2.3 P&D shall be responsible for transmitting (per P&D's Electronic Review Process, Appendix A) the technical review comments to the Designers of Record.

3.2.4 P&D shall be responsible for issuing the final P&D/AFD hard copy stamped accepted project submittals to the P&D Project Manager for distribution to the Contractor. Contractor shall be responsible for obtaining all required building permits from appropriate agencies before start of any construction work. City of Atlanta Office of Buildings shall not accept any submittals for permitting without the P&D/AFD stamped/accepted seal.

4.0 Procedure

4.1 Project Submittals

4.1.1 Delivery of Submittals

4.1.1.1 All project submittals shall be submitted and review electronically per P&D's approved Electronic Design Review Process Flow Chart (Attachment 1). The new electronic process is a paperless data base 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 Bluebeam. All comments, response to comments, tracking of comments and notifications for all submittals will be done electronically.

4.1.1.2 Reviews can be perform at the reviewer's desktop or at the P&D's Review Room. Reviewers outside P&D can perform their reviews remotely at their desktops.

4.1.1.3 To access the new system, login to htt://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 Review Coordinator for creating an account.

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

4.1.2 Design Review Submittals

4.1.2.1 Design review submittals shall be prepared and submitted for each of the following review phases unless contractually noted otherwise:

4.1.2.1.1 Schematic Design (30%)

4.1.2.1.2 Design Development (60%)

4.1.2.1.3 Construction Documents (90%)

4.1.2.2 Issue for Construction (100%)/Issue for Bid/Pricing

4.1.2.2.1 Sealed drawings by the State of Georgia Architect/Engineer of Record are not required for this submittal.

4.1.2.3 Issue for Construction (Final Conformed/Permitting)

4.1.2.3.1 Sealed drawings by the State of Georgia Architect/Engineer of Record are required for this submittal.

4.1.2.3.2 Submittal of six (6) full size hard copies of plans and specifications are required for P&D/AFD stamp acceptance.

4.1.2.3.3 Submittal of one (1) thumb drives containing the AutoCAD, REVIT & PDF version of the plans and Word document of the specifications.

4.1.2.3.4 P&D's Review Coordinator will coordinate the review and stamp acceptance of the plans by the P&D's Director of Architecture/Engineering and AFD.

4.1.2.3.5 P&D's Review Coordinator will coordinate the preparation of the Request for Permit letter by P&D's Director of Architecture/Engineering.

4.2 Review Timing

4.2.1 P&D's initial review time shall be fifteen (15) business days.[3]

4.2.2 P&D's re-submittal review time shall be a maximum of five (5) business days.

4.2.3 P&D/AFD final Issue for Construction stamp acceptance of hard copy drawings and Release Notification letter shall be a maximum of five (5) business days.

4.2.4 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.

4.3 Review Responsibility

4.3.1 P&D's cursory technical review and stamped acceptance of documents is solely for compliance with P&D's Design Standards dated November 2020.[4]

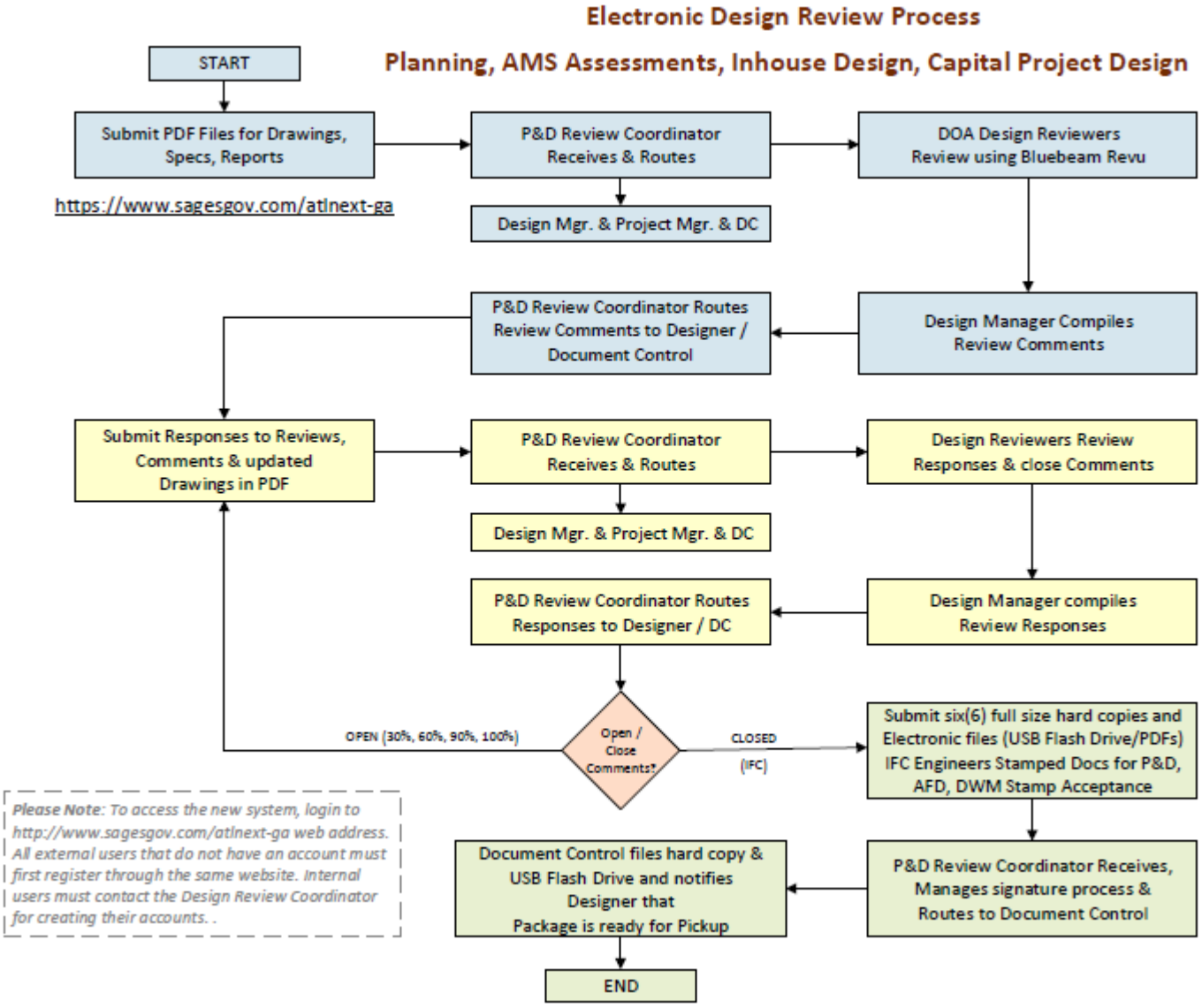
4.3.2 City of Atlanta Office of Buildings, Atlanta Fire Department and Department of Watershed Management are responsible for code reviews. Compliance with City, State and Federal Codes, Regulations and Ordinances shall be the responsibility of the Designers of Record.

4.3.3 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

5.1 Appendix A: Electronic Design Review Process Flow Chart

Appendix A: Electronic Design Review Process Flow Chart



Hartsfield-Jackson Atlanta International Airport
City of Atlanta
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Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Civil Engineering – Airfield

Design Standards
Civil Engineering – Airfield

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Design Standards
Civil Engineering – Airfield

1.0 Overview

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

1.2 The preparation of this standards manual assumes that the designer has access to appropriate FAA publications, particularly Advisory Circulars that set forth minimum standards for airport design. These circulars are listed in Section 1.10. Since these are available publicly through FAA district offices and the FAA website, they are not re-created in this manual.

1.3 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 Aircraft Design Groups

2.1 For planning and design purposes, aircraft are divided into design groups, as defined in FAA AC 150/5300-13. Design groupings are based on wingspan and are further subdivided into approach categories, based on the normal approach speed of a particular aircraft. The predominant aircraft types currently using ATL are Design Group IV, Approach Categories C and D. However, recent growth in international and air cargo traffic have increased the percentage of Group V aircraft in the mix, and has also resulted in low frequency operations by Group VI aircraft.

2.2 In light of continued growth at the airport, it is recommended that all future planning for taxiways, runways, aprons, and the associated clearances and gradients should be based on Group V aircraft. Exceptions to this recommendation may occur for localized project sites, where the proposed aircraft mix can be specifically defined as Group IV or smaller. Similarly, in certain areas of the airfield, provisions for Group VI may be required by DOA.

3.0 Geometrics

3.1 Space Requirements

3.1.1 AC 150/5300-13 contains dimensional criteria for the various aircraft design groups. These should be adhered to at all times unless the Department of Aviation proposes to seek a modification of standard from FAA. Table 1 presents an abbreviated listing of frequently used spatial requirements as set forth in the advisory circulars. Dimensions are in feet.

TABLE 1

FREQUENTLY USED SPATIAL REQUIREMENTS

Aircraft Design Group	Runway Width	Taxiway Width	Taxiway Shoulder Width	Taxiway Safety Area Width	Taxiway Object Free Area Width	Taxilane Object Free Area Width
III	100/150	50/60	20	118	186	162
IV	150	75	25	171	259	225
V	150	75	35	214	320	276
VI	200	100	40	263	386	334

Sources:
Data obtained from AC 150/5300-13; and ATL Standards

3.2.1 As an observation on the dimensions above, the designer will occasionally encounter a situation where a Group IV taxiway (for example) may be better set at a width of 100' instead of the 75' shown above. This situation may occur where there are numerous cross taxiways, curved alignment, or other factors that influence the nominal width. The intent is to simplify construction by building one standard width instead of numerous transitional or tapered sections.

3.1.3 It should also be noted that the standards above are FAA minimums and that widths can be made larger. As an example, taxiway shoulders at ATL are routinely set at a 35' width for Group IV taxiways, rather than the 25' nominal value specified above. This increased width has provided increased blast protection for adjacent infield turf.

3.1.4 In several cases, the current layout of the airfield does not meet FAA criteria for Group VI aircraft, particularly with respect to separation and clearance distances. In future projects, the designer should consult with Planning and Development staff to determine whether these large aircraft should be considered.

3.2 Line and Grade Requirements

3.2.1 It is an operational and safety requirement that surface gradients in aircraft traversable areas be relatively flat. AC 150/5300-13 specifies a maximum 1.5% gradient for taxiway pavement in all design group cases likely to be encountered at ATL. For runways, FAA Advisory Circulars should be consulted since additional factors come into play such as maintaining minimum grades in the first and last quarter of the runway. Along longitudinal profiles, grade breaks are not allowed without vertical curves, and such curves must have a length of 1000 x sum of algebraic difference for runways, and 100 x algebraic difference for taxiways.

3.2.2 For parking aprons, grades should be flattened to the maximum extent practical, particularly where fueling operations will occur. A surface gradient of 0.5% has been utilized at ATL in several cases, but this requires very tight tolerances in construction to avoid ponding. Also, on fueling aprons, the fire code requires a positive 1.00% slope away from buildings for at least the first 50 feet. On fueling aprons, drainage structures should not be located inside the aircraft parking envelope.

3.2.3 Safety areas for runways and taxiways should follow the requirements of AC 150/5300-

13. Longitudinal grades in these areas will generally follow the pavement profile, while transverse grades may range from 1.5-3.0%. Where the longitudinal pavement grade is very flat, longitudinal grades at the outer edges of safety areas should be "waffled" to provide positive drainage to inlets or slope drains as appropriate.

3.2.4 The existing airfield pavements at HJAIA were constructed with a 1.5 inch drop from edge of concrete to asphalt shoulder. For new pavements, this practice should be continued, but with an additional 1" drop from the edge of asphalt shoulder to the turf. These design details help to minimize ponding at the pavement edges.[5]

3.2.5 For embankment sections where the top of embankment is 5 feet or more above existing ground, a berm should be included just outside the safety area to collect drainage and direct it to slope drain inlets. Cut slopes greater than 5 feet above new grading should be treated in the same manner, if surface water is draining toward the top of the new cut slope. Side slopes for embankment fills should be not flatter than 2 horizontal to 1 vertical to minimize space requirements, unless directed otherwise by DOA Engineering. If fill slopes steeper than 2:1 are required because of space constraints, the use of slope reinforcement systems should be evaluated.

3.3 Imaginary Surfaces

3.3.1 Imaginary surfaces are prismatic sections of airspace around runways that must be kept clear of obstacles to aircraft movement. The dimensions of these surfaces are tied to the runway classification, i.e., non-precision, precision, etc., and are defined in FAR Part 77, as well as TERPS and ICAO guidance. Additional surfaces (OFZ, RPZ) are illustrated in AC 150/5300-13. These publications should be consulted during the conceptual phase of every project on the airfield for potential conflicts with existing or proposed imaginary surfaces.

4.0 Pavement Design

4.1 Airfield pavement design is based on projections of the aircraft fleet mix and number of repetitions (take-offs and landings). FAA AC 150/5320-6D contains procedures for pavement thickness design and evaluation. In general, all taxiway, runway and apron paving shall be concrete pavement, with asphalt shoulders. Occasionally, where construction phasing requires the use of a temporary taxiway, asphalt pavement may be used for the taxiway riding surface.

4.2 All airfield pavements for HJAIA shall be designed in accordance with the Pavement Section Design Manual, dated June 2003 prepared by the Facilities Management Group. That manual currently shows all new aircraft pavement to be 20" thick Portland Cement Concrete pavement, underlain by 9" of crushed aggregate base course. For NLVR's (Non-Licensed Vehicle Roads), the current pavement section for permanent roads under heavy wheel loads is 10" thick Portland Cement Concrete pavement, underlain by 9" of Soil Cement Stabilized subgrade. For temporary NLVR's, and for those roads anticipated to carry lighter loads, flexible pavements may be used, with the section to be determined on a case by case basis by DOA Engineering.[6]

4.3 All utility manholes placed in airfield pavement shall be installed in utility slabs.

5.0 Drainage

5.1 General Background

5.1.1 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 150/5320-5D, 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 was later modified to 10-year events for all pipes to provide some additional safety factors and to get in line with 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. [7]

5.1.2 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 HGL can be maintained at least two feet below finished pavement, the system may be deemed acceptable.

5.1.3 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.

5.1.4 Another basin was created for the South Cargo Area and is currently being modified to accommodate 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.

5.2 Criteria

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

5.3 Time of Concentration

5.3.1 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 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.

5.4 Drainage Structures

5.4.1 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.

5.5 Storm Detention

5.5.1 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 50 year.

5.6 Water Quality

5.6.1 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. This work should be coordinated with the DOA's Environmental Manager.

5.7 Storm Sewers

5.7.1 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.

5.7.2 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 however, the 25 year hydraulic grade line should also be modeled on pipe profiles. 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.[8]

5.7.3 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.

5.7.4 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.

5.7.5 Slope drain pipes 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.

5.7.6 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.

6.0 Subsurface Drainage

6.1 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.

7.0 Non-Licensed Vehicle Roads

7.1 Non-Licensed Vehicle Roads (NLVR's) are the internal road network providing access to the ramps and airfield, inside airport security. Geometrically, these roads are designed for low-speed travel, typically 25mph. The design speed is sometimes even less since these road alignments have occasionally been constrained in restrictive sites. Profile grades are typically set with 5% as a maximum, since certain types of airport emergency equipment have limitations on grade changes and grade climbing. These roadways have generally been built with two 12' lanes and 6' wide asphalt shoulders, plus 4 additional feet of extended grassed shoulder. Curb and gutter sections have been used in certain specialized cases. In these sections a 6' wide shoulder is utilized, measured outward from the face of curb. Current DOA Standard Details incorporate concrete shoulders on the NLVR's, when so directed by DOA. The concrete shoulders will primarily be used in roadway segments with a high frequency of aircraft tug traffic.

7.2 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.

8.0 Lighting

8.1 Airfield lighting shall be coordinated with the concrete pavement joint design and grading plan as required. Other detailed requirements for airfield lighting are given in the Electrical Design Standards.

9.0 Airfield Signage

9.1 General signage conventions, signage size and signage location requirements can be found in FAA Circular AC 150/5340-18D. Signage bases shall not obstruct drainage.

10.0 Airport Navigational Aids

10.1 Electronic equipment located in vicinity of the airport provides guidance to pilots of properly equipped aircraft which assists them in landing safely under conditions of reduced ceilings and lowered visibility. The majority of these NAVAIDs are owned, installed, and maintained by the Federal Aviation Administration. Relocations, replacements, or upgrades of these facilities shall be accomplished with proper coordination with FAA and in accordance with their standards.

11.0 Grassing

11.1 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 also 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.

12.0 SIDA/AOA Fence

12.1 Fence shall be placed on concrete barrier when public roads are in close proximity to the fence location. Airport Security shall approve the limits of the barrier requirement for each project.

Hartsfield-Jackson Atlanta International Airport
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Airport Facilities Landside/Airside New Construction/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

1.1 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.

1.2 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

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

2.2 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

3.1 Hourly

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

3.2 Daily

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

3.3 Economy

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

3.4 Park-Ride

3.4.1 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's

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.

3.5 Gold Reserve

3.5.1 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.

3.6 Park-Ride Reserve

3.6.1 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.

3.7 Cell Phone

3.7.1 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

4.1 Security

4.1.1 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.

4.1.2 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.

4.1.3 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.

4.2 Traffic Patterns

4.2.1 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.

4.2.2 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.

4.2.3 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.

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

5.0 Surface Parking

5.1 Entry /Exit Lanes

5.1.1 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.

5.2 Parking Layout

5.2.1 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.

5.3 Height Clearance

5.3.1 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.

5.4 Pavement

5.4.1 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

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

5.5 Signing, Striping, and Pavement Markings

5.5.1 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.

5.5.2 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.

5.6 Grading/Drainage

5.6.1 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.

5.7 Pedestrian Access

5.7.1 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.

5.7.2 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

6.1 Deck Parking Layout

6.1.1 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.

6.1.2 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.

6.2 Entry /Exit Lanes

6.2.1 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.

6.3 Height Clearances

6.3.1 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).

6.4 Ramping

6.4.1 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.

6.4.2 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.

6.5 Pedestrian Access

6.5.1 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
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/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

1.1 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.

1.2 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.

1.3 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:

1.3.1 Connections to Interstates and other public roads
1.3.2 Passenger terminal curbside operations, including loading zones, parking and drop-off lanes
1.3.3 Taxi staging areas
1.3.4 Shuttle bus operations
1.3.5 Public transit related services
1.3.6 Landside service roads for maintenance and emergency vehicles
1.3.7 Cargo building, shipping and receiving areas
1.3.8 Other public roads in non-AOA areas of the Airport intended for public access and circulation

1.4 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.

1.5 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.

1.6 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

2.1 The basic goals of this chapter are:

2.1.1 To outline design intent standards as they relate to various categories, which are applicable and common to all Landside roadways.

2.1.2 To focus on established safety standards for ATL patrons throughout the design process.

2.1.3 To establish convenient traffic circulation patterns for vehicular and pedestrian movement.

2.1.4 To provide for the construction of new access and circulation roads owned by ATL.

2.1.5 To provide for the reconstruction of local roads and streets disturbed by ATL construction.

3.0 Design Vehicles

3.1 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

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

5.0 Capacity

5.1 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

6.1 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

7.1 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

8.1 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

9.1 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

10.1 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

11.1 Horizontal Alignment

11.1.1 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.

11.2 Horizontal Curvature

11.2.1 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 0.04 ft/ft. Spiral curves shall not be used on landside roadways.

11.3 Vertical Alignment

11.3.1 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.

11.4 Profile Grades

11.4.1 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.

11.5 Clearances

11.5.1 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.

11.6 Cross Slopes

11.6.1 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.

11.7 Lane Width

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

11.8 Roadway Width

11.8.1 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

12.1 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

12.2 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

13.1 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.

13.2 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

14.1 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

15.1 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.

15.2 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

16.1 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.

16.2 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.

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

17.0 Sidewalks

17.1 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

18.1 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

19.1 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

20.1 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

21.1 Roadway Signals

21.1.1 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)*.

21.2 Roadway Lighting

21.2.1 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

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

23.0 Way Finding/Graphics

23.1 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

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

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

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

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

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

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

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

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

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

24.10 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
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards – Civil Engineering – Drainage

Design Standards
Civil Engineering – Drainage

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Design Standards
Civil Engineering – Drainage

1.0 Overview

1.1 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).

1.2 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.

1.3 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

2.1 General Background

2.1.1 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.

2.1.2 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.

2.1.3 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.

2.1.4 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.

2.2 Criteria

2.2.1 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

2.3 Time of Concentration

2.3.1 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.

2.4 Drainage Structures

2.4.1 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.

2.5 Storm Detention

2.5.1 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.

2.6 Water Quality

2.6.1 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.

2.7 Storm Sewers

2.7.1 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.

2.7.2 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.

2.7.3 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.

2.7.4 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.

2.7.5 Slope drain pipes 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.

2.7.6 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

3.1 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

4.1 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.

4.2 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

5.1 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 Americans with Disabilities Act (ADA) accessible route requirements where appropriate.

6.0 Grassing

6.1 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 also 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

7.1 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

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

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

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

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

8.5 Georgia Storm Water Management Manual published by the Atlanta Regional Commission

CITY OF ATLANTA, GEORGIA

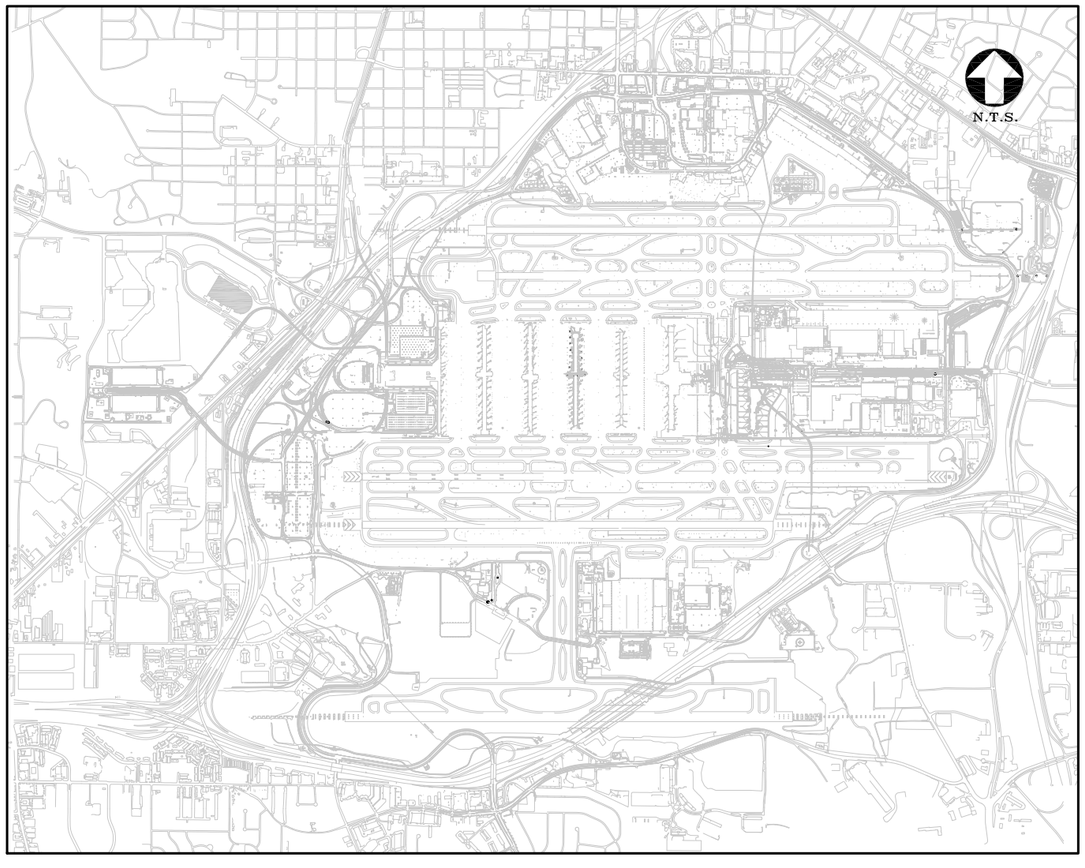
Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

DOA CIVIL STANDARD DETAILS

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

THESE DRAWINGS SHOULD NOT BE USED FOR CONSTRUCTION UNLESS NOTED BELOW AS "RELEASED FOR CONSTRUCTION" AND SIMILARLY NOTED ON EACH INDIVIDUAL DRAWING.

RELEASED FOR CONSTRUCTION BY: _____

DATE: _____

SHEET NO:

STD-00-100

NOT RELEASED FOR CONSTRUCTION

DOA CIVIL STANDARD DETAILS

CIVIL DOA STANDARD DETAILS

RELEASE STATUS SUMMARY

DWG NO.	SHEET NO.	SHEET TITLE	DATE OF LATEST RELEASE									COMMENTS
			ISSUED	REV1	REV2	REV3	REV4	REV5	REV6			
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									

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
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

DOA CIVIL STANDARD DETAILS

DOA Civil Standard Details Index

WBS NUMBER: .
FC NUMBER: .
CONSULTANT PROJECT NUMBER: .
STANDARD SHEET NUMBER: STD-00-200

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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		CIVIL DOA STANDARD DETAILS	RELEASE STATUS SUMMARY								
			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								
61											
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CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

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

DOA CIVIL STANDARD DETAILS

DOA Civil Standard Details Index

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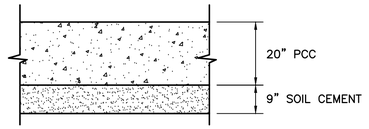
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-00-201	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

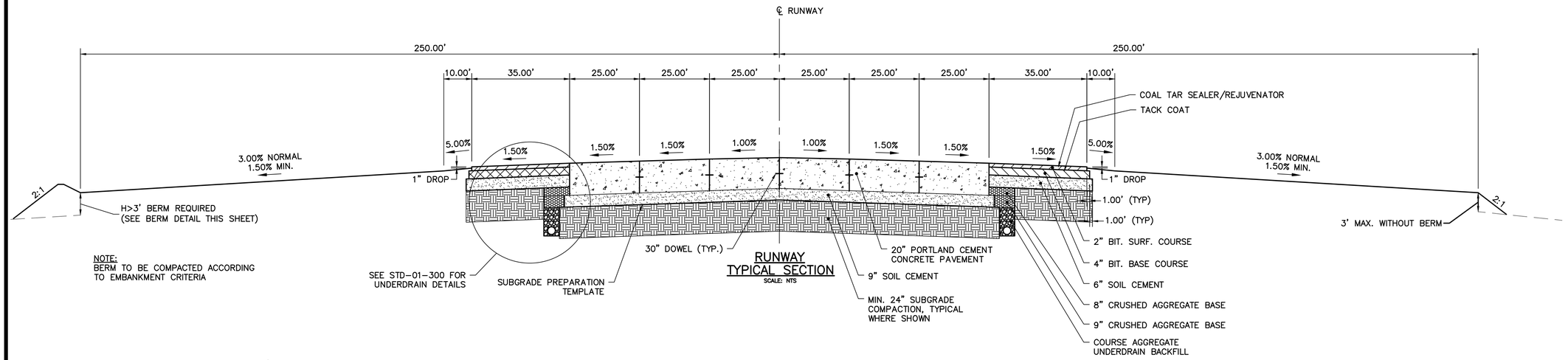
NOT RELEASED FOR CONSTRUCTION

NOTES FOR THE DESIGNER:

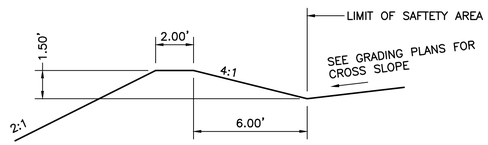
1. IDENTIFY BASELINE LOCATIONS ON TYPICAL SECTIONS.
2. TYPICAL SECTIONS SHALL SHOW STATION RANGES FOR THE ENTIRE BASELINE WITH NO GAPS.
3. TYPICAL SECTIONS SHALL BE SHOWN LOOKING IN THE DIRECTION OF THE STATIONING.
4. CONCRETE PAVEMENT JOINTS SHALL FOLLOW A LENGTH TO WIDTH RATIO LESS THAN OR EQUAL TO 1.25 L TO 1 W. WHERE THAT RATIO IS NOT ARCHIVED SLABS SHALL BE REINFORCED.
5. SEE STD-01-600 FOR JOINT DETAILS.



APRON TYPICAL PAVEMENT SECTION
SCALE: NTS



RUNWAY TYPICAL SECTION
SCALE: NTS



BERM DETAIL
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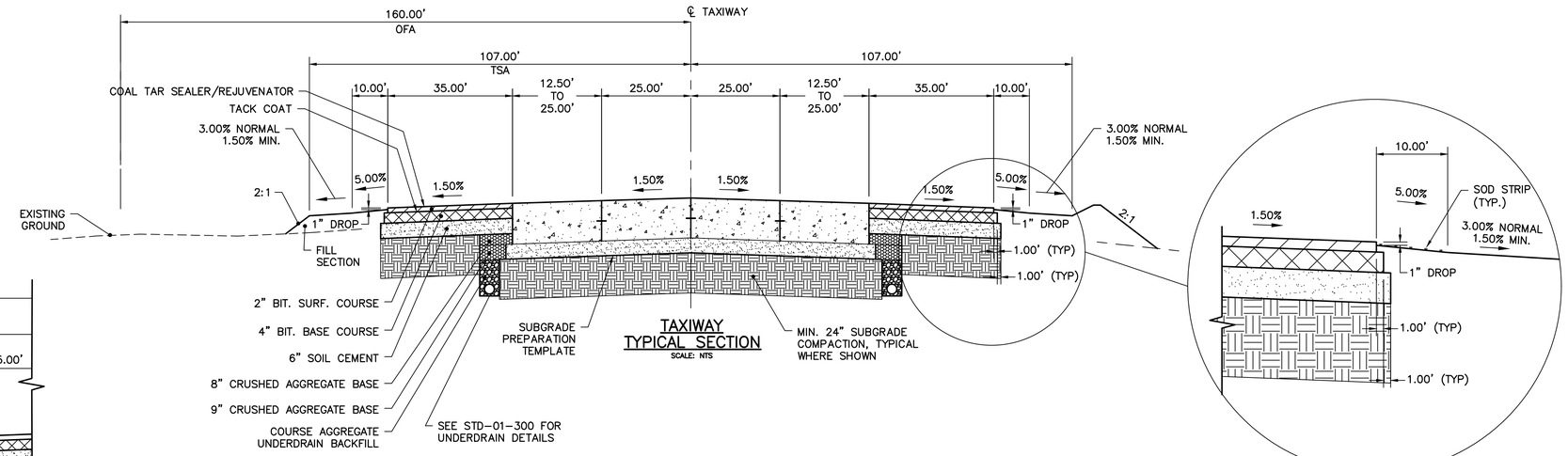
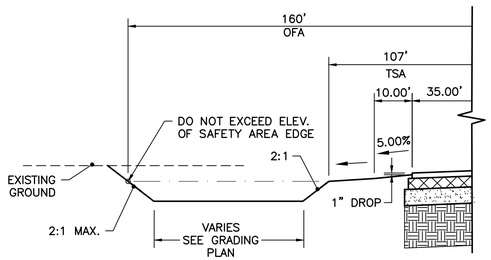


TAXIWAY TYPICAL SECTION
SCALE: NTS



CUT SECTION
SCALE: NTS

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

DOA CIVIL STANDARD DETAILS

NO.	DATE	BY	REVISION
2	8/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Airfield Typical Pavement Sections

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-100	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

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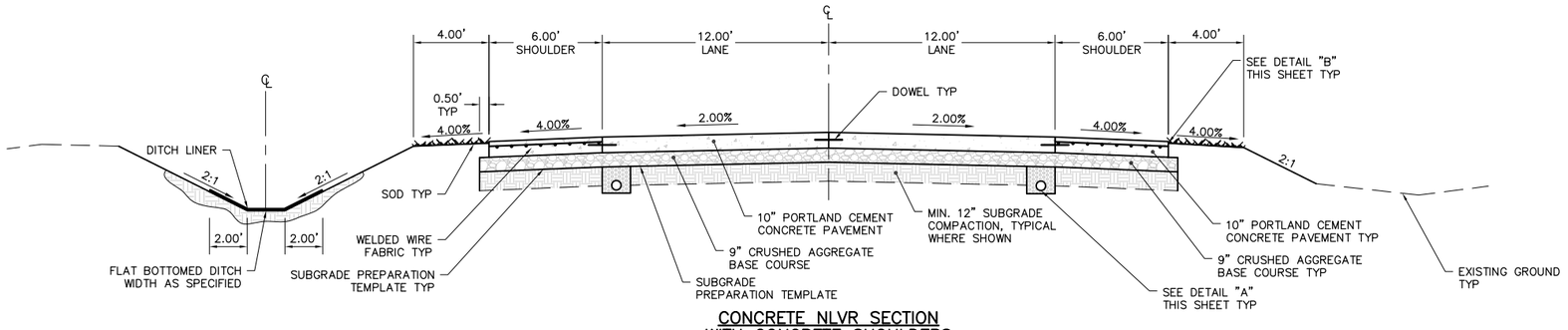
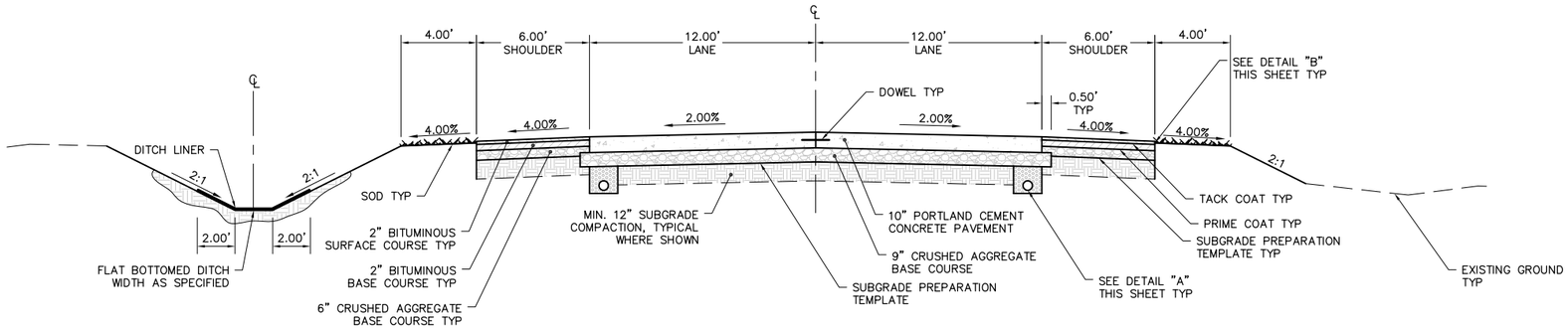
NOTES FOR THE DESIGNER:

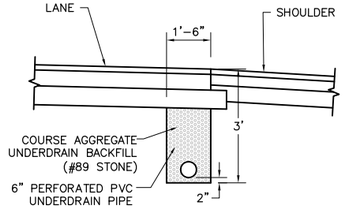
1. IDENTIFY BASELINE LOCATIONS ON TYPICAL SECTIONS.
2. GUARDRAIL, FENCE, AND ALL OTHER ROADSIDE ELEMENTS SHALL BE SHOWN WHERE APPROPRIATE.
3. TYPICAL SECTIONS SHALL SHOW STATION RANGES FOR THE ENTIRE BASELINE WITH NO GAPS.
4. TYPICAL SECTIONS SHALL BE SHOWN LOOKING IN THE DIRECTION OF THE STATIONING.
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



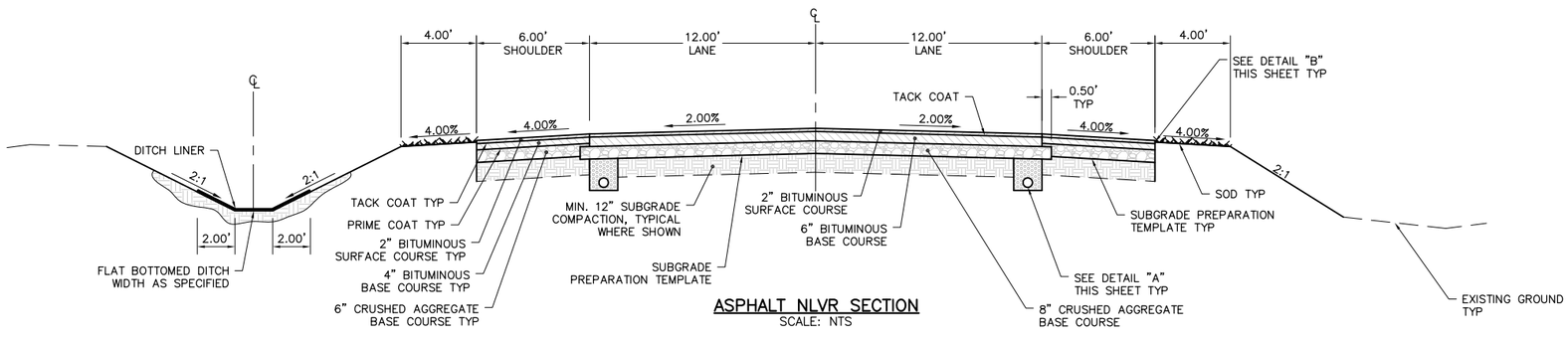
CONCRETE NLVR SECTION WITH CONCRETE SHOULDERS
SCALE: NTS



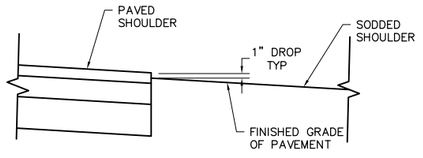
CONCRETE NLVR SECTION
SCALE: NTS



DETAIL "A"
SCALE: NTS



ASPHALT NLVR SECTION
SCALE: NTS



DETAIL "B"
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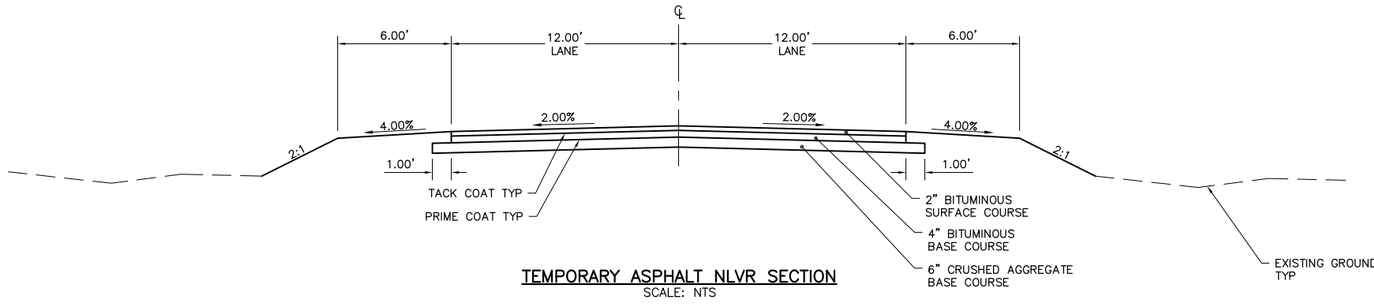


TEMPORARY ASPHALT NLVR SECTION
SCALE: NTS

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 NLVR

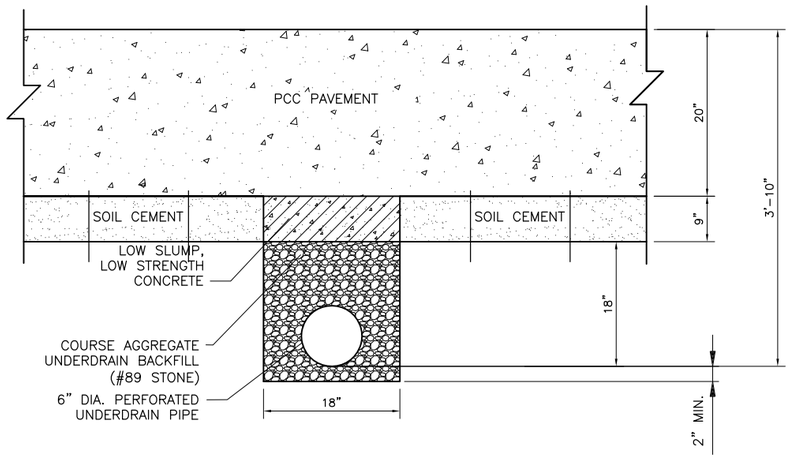
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-200	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

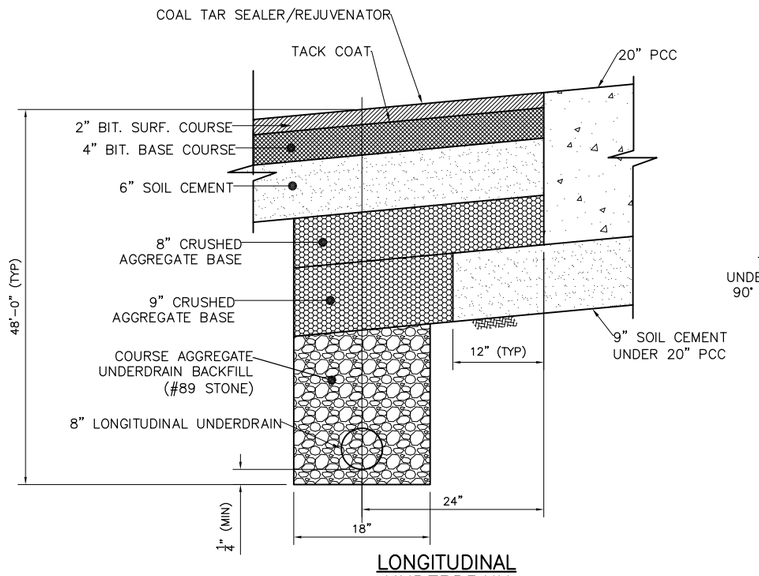
NOT RELEASED FOR CONSTRUCTION

NOTES:

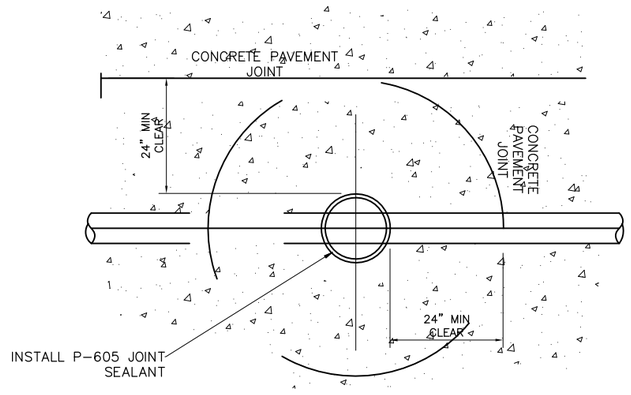
1. THE CONTRACTOR SHALL USE #89 STONE FOR THE POROUS UNDERDRAIN BACKFILL.



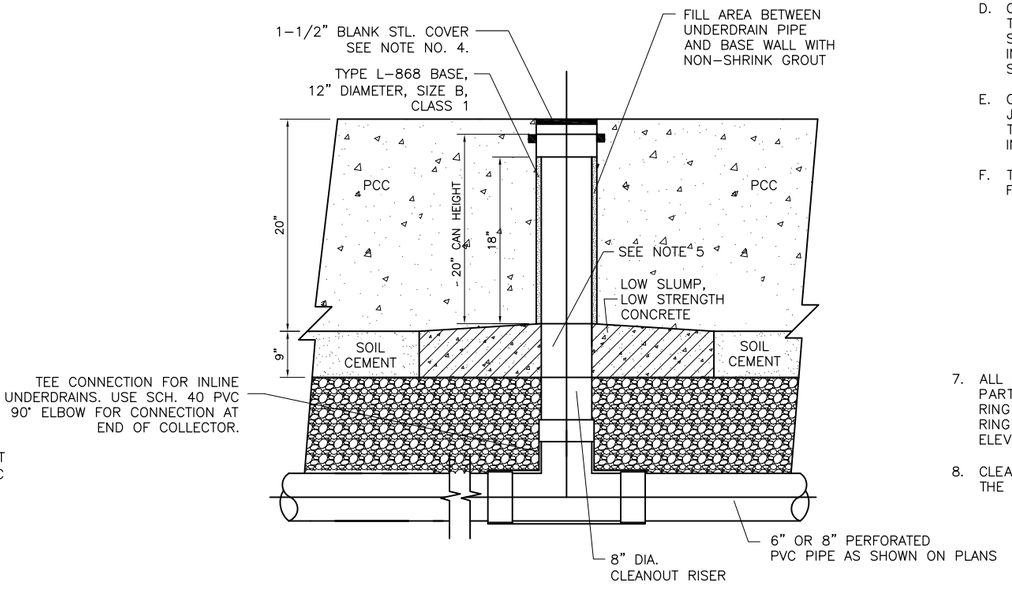
TRANSVERSE UNDERDRAIN
N.T.S.



LONGITUDINAL UNDERDRAIN
N.T.S.



PLAN



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
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DETAILS ON THIS SHEET ARE INTENDED FOR USE IN NEW APRON CONSTRUCTION

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

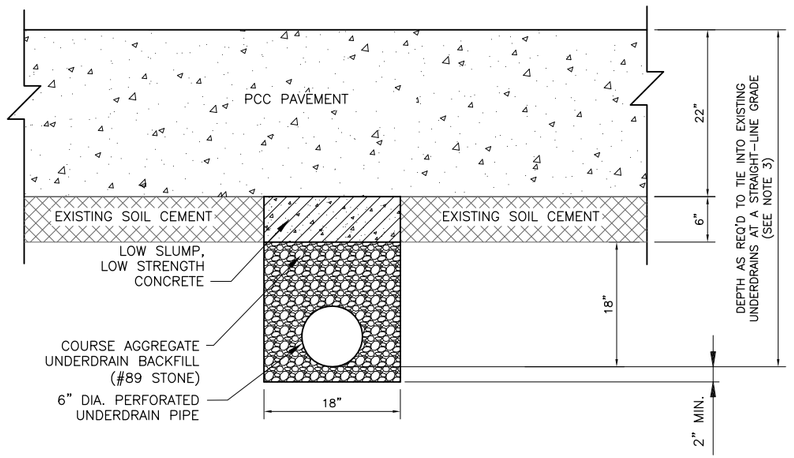
DOA CIVIL STANDARD DETAILS

Apron Underdrain Details - New Pavement

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-300	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO:

DOA CIVIL STANDARD DETAILS

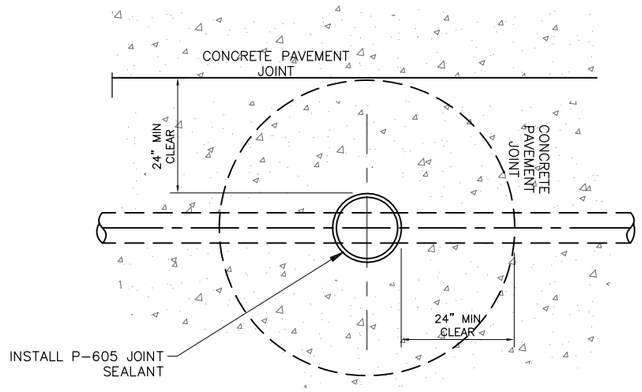
NOT RELEASED FOR CONSTRUCTION



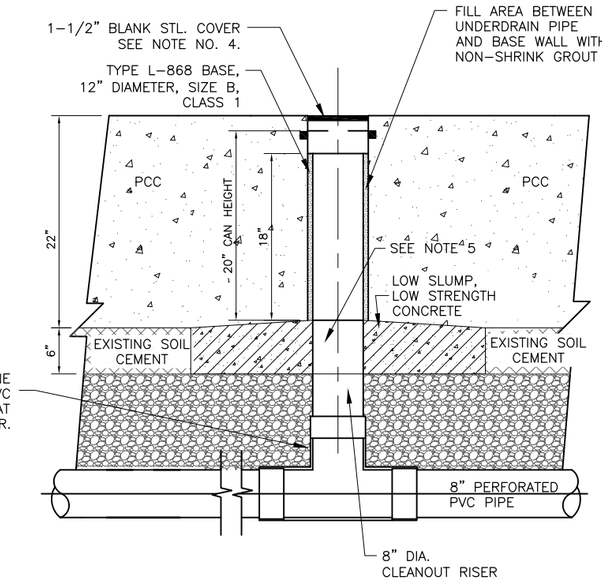
TRANSVERSE UNDERDRAIN UNDER TAXIWAY
N.T.S.

NOTES:

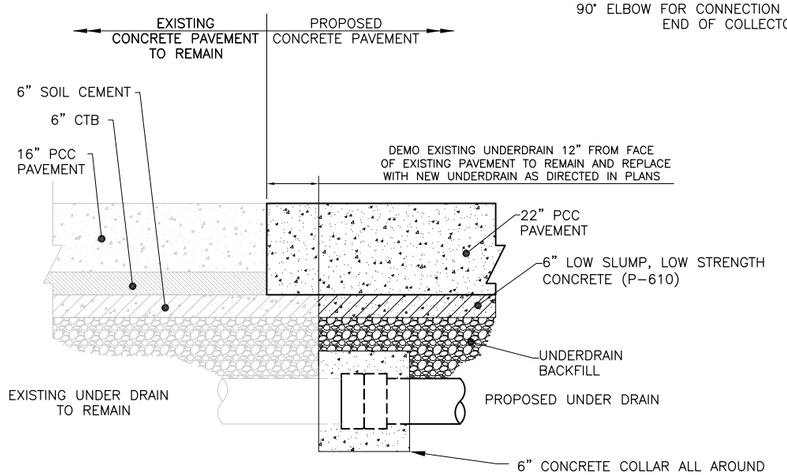
1. THE CONTRACTOR SHALL USE #89 STONE FOR THE POROUS UNDERDRAIN BACKFILL.
2. UNDERDRAIN INVERT ELEVATIONS SHALL MATCH EXISTING. EXISTING INVERTS ARE TYPICALLY 3'-10" BELOW TOP OF PCC PAVEMENT.



PLAN



UNDERDRAIN CLEANOUT ELEVATION
(SHOWN FOR INSTALLATION IN CONCRETE)
N.T.S.



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.

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DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

DETAILS ON THIS SHEET ARE INTENDED FOR USE IN PAVEMENT REPLACEMENT AND RETROFIT PROJECTS.

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

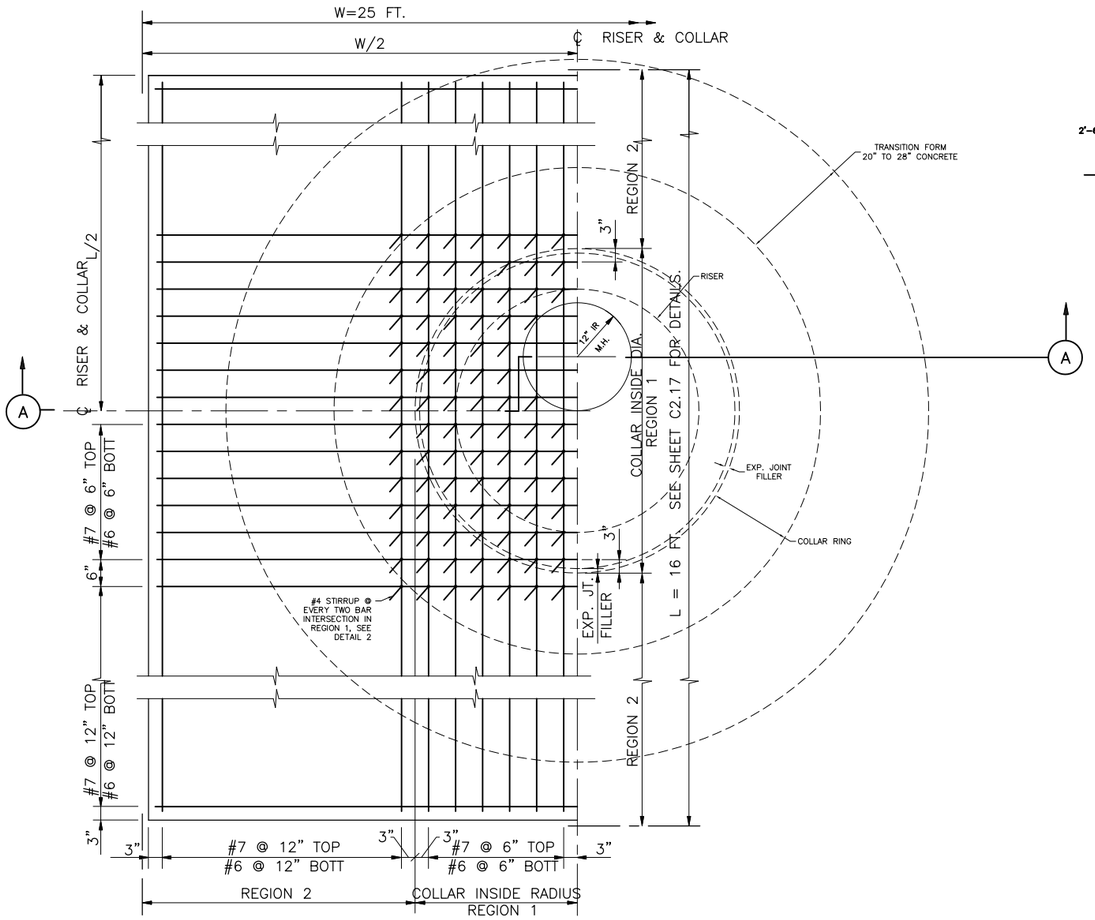
DOA CIVIL STANDARD DETAILS

Underdrain Details - Replacement Projects

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-301	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO:

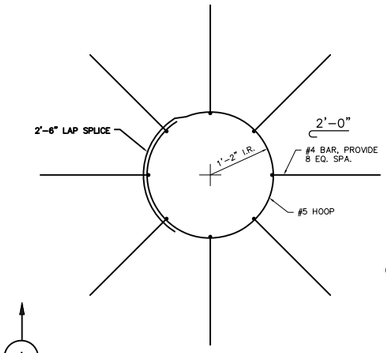
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



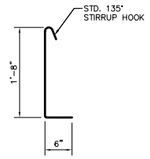
PLAN – PAVEMENT WITH UTILITY MANHOLE

NTS



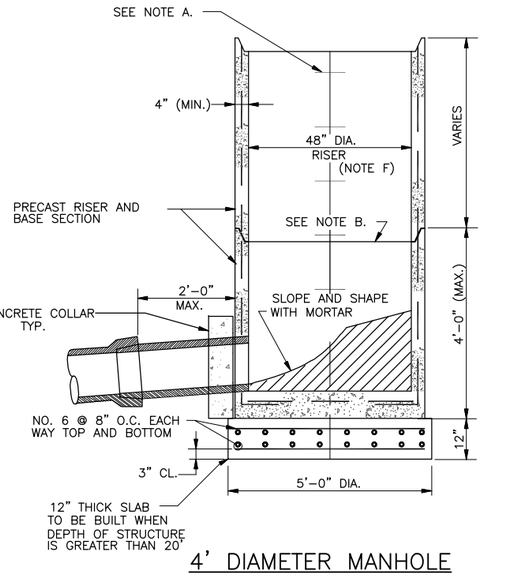
DETAIL 1

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.

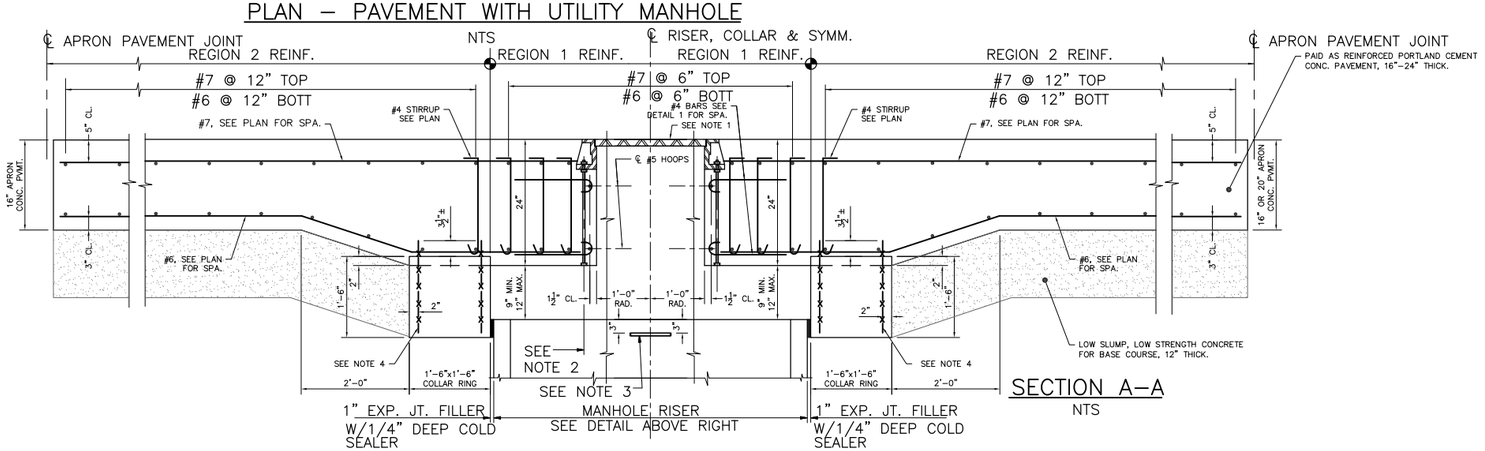
B. JOINTS BETWEEN ALL PRECAST MANHOLE COMPONENTS SHALL BE O-RING, OR PROFILE TYPE.

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.



SECTION A–A

NTS

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.

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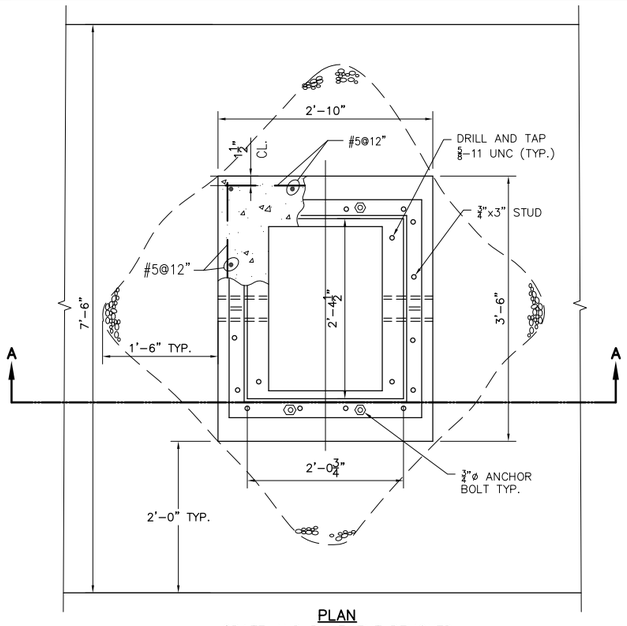
0	06/20/2014	RFM	FIRST ISSUE

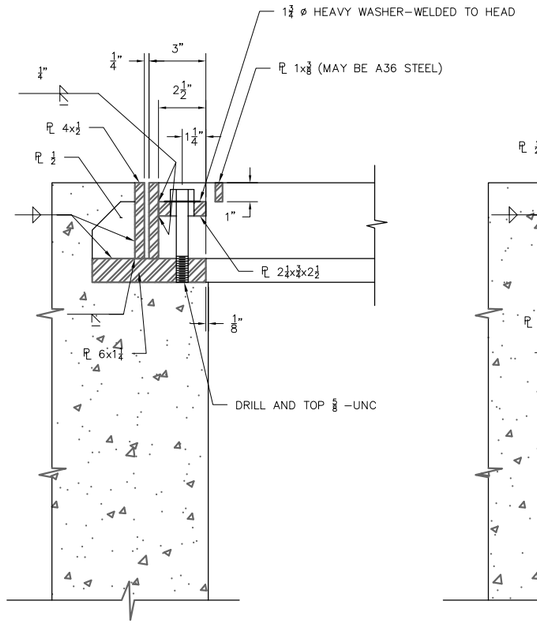
DOA CIVIL STANDARD DETAILS

In-Pavement Manholes

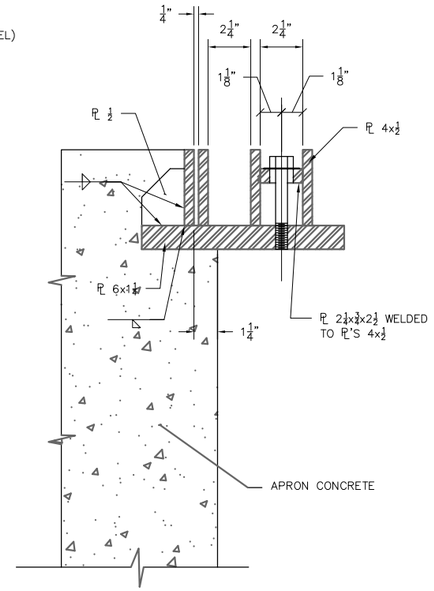
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-400	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .



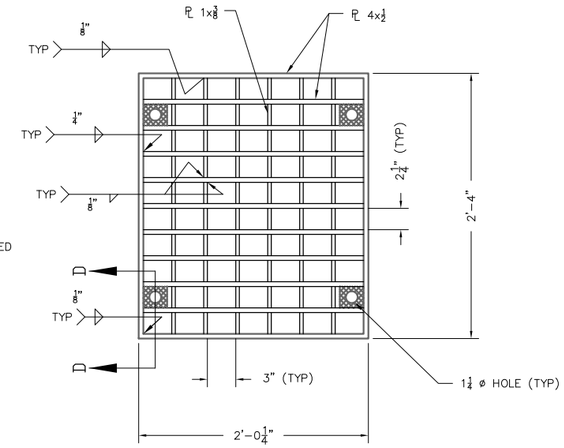
PLAN
GRATE AND PAVEMENT REMOVED



DETAIL A
GRATE SHOWN

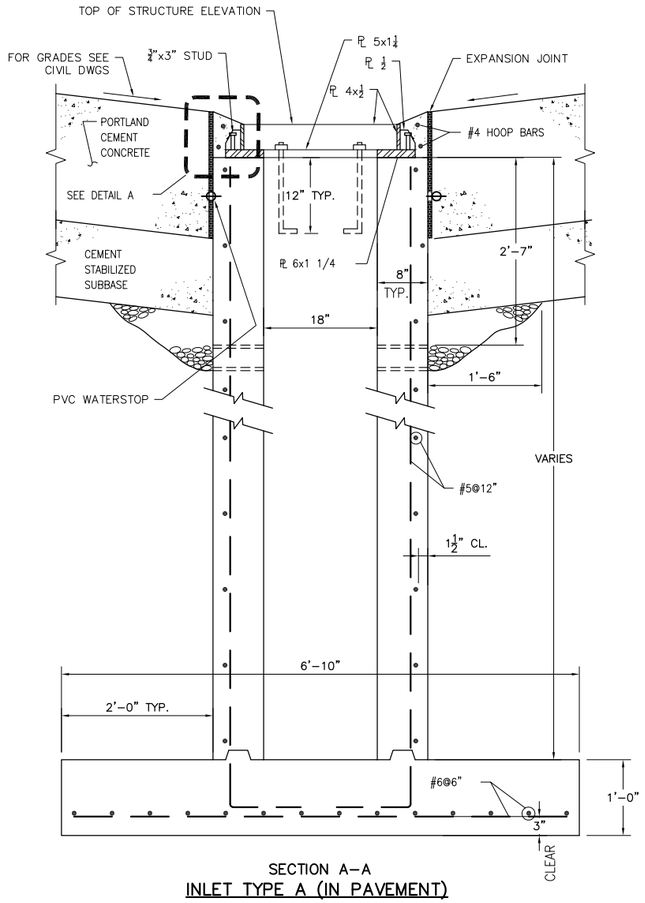


SECTION D-D



GRATE DETAIL
N.T.S.

STEEL FRAME AND GRATING
N.T.S.



SECTION A-A
INLET TYPE A (IN PAVEMENT)

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PLANNING & DEVELOPMENT

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

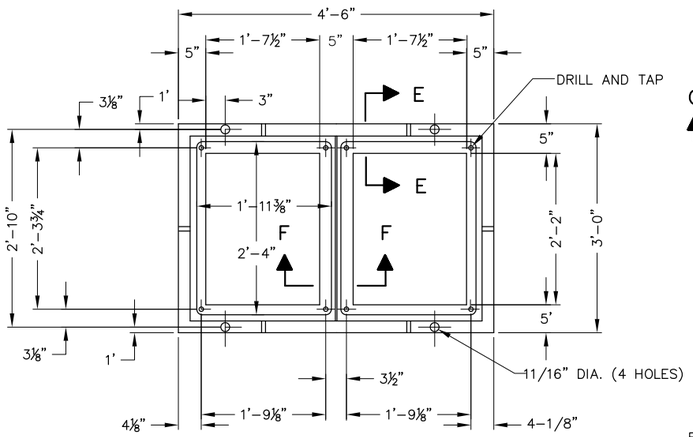
DOA CIVIL STANDARD DETAILS

In-Pavement Inlets
Inlet Type 'A'

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-500	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



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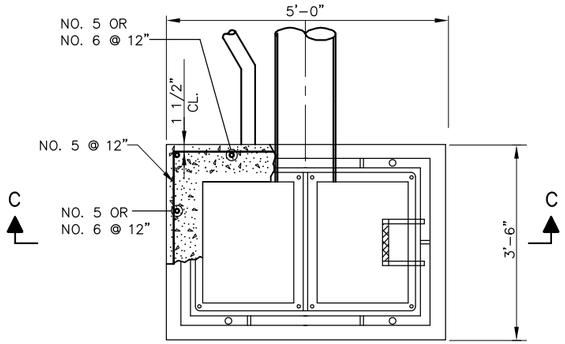
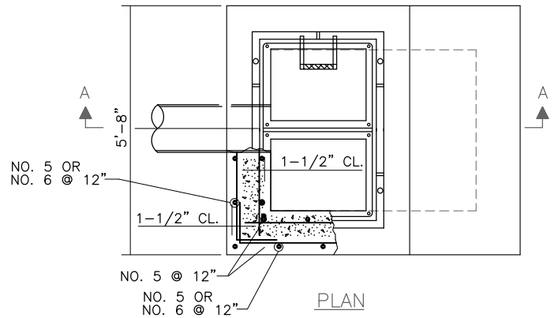


GRATES AND CONCRETE APRON REMOVED

PLAN



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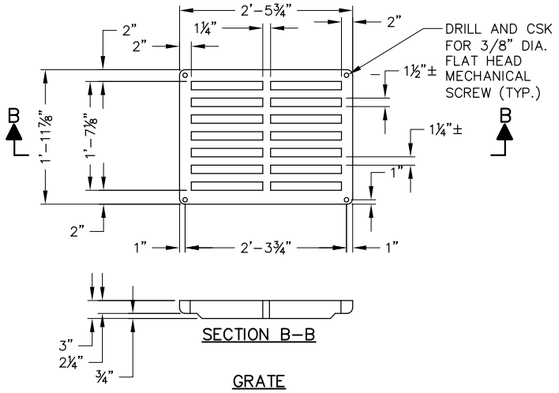
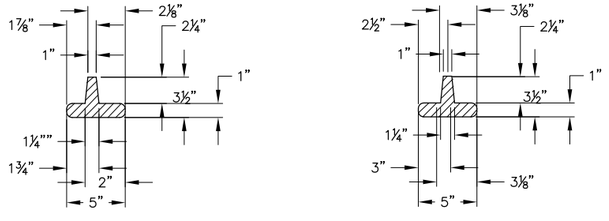


SECTION B–B

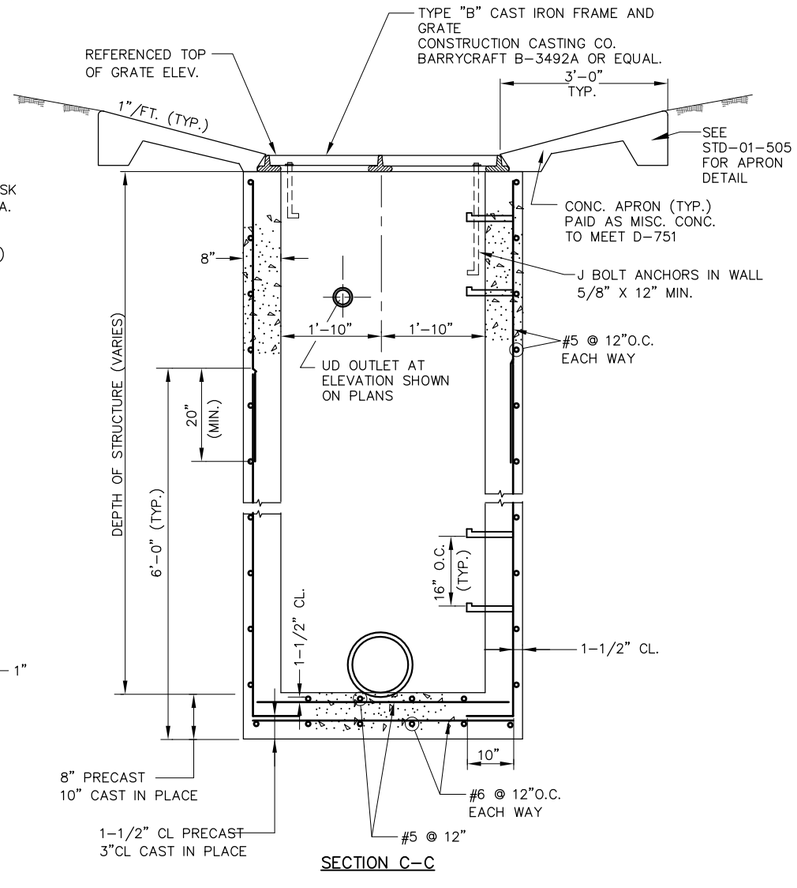
GRATE



SECTION E–E

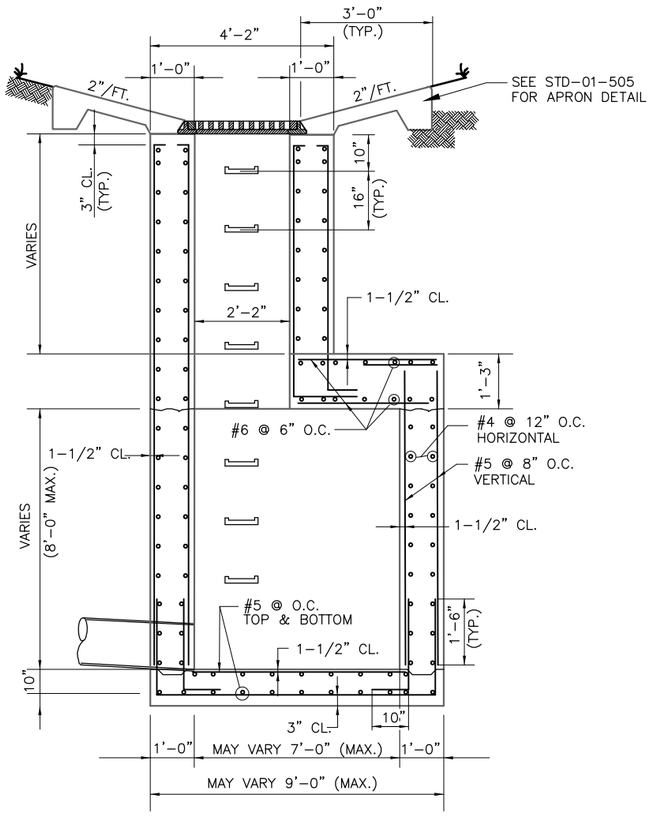
SECTION F–F

TYPE "B" GRATE DETAIL
N.T.S.



SECTION C–C

INLET TYPE "B"
N.T.S.



SECTION A–A

MODIFIED INLET TYPE "B"
N.T.S.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson
Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

Infield Inlets Type 'B' and
Type 'B' Modified

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-501	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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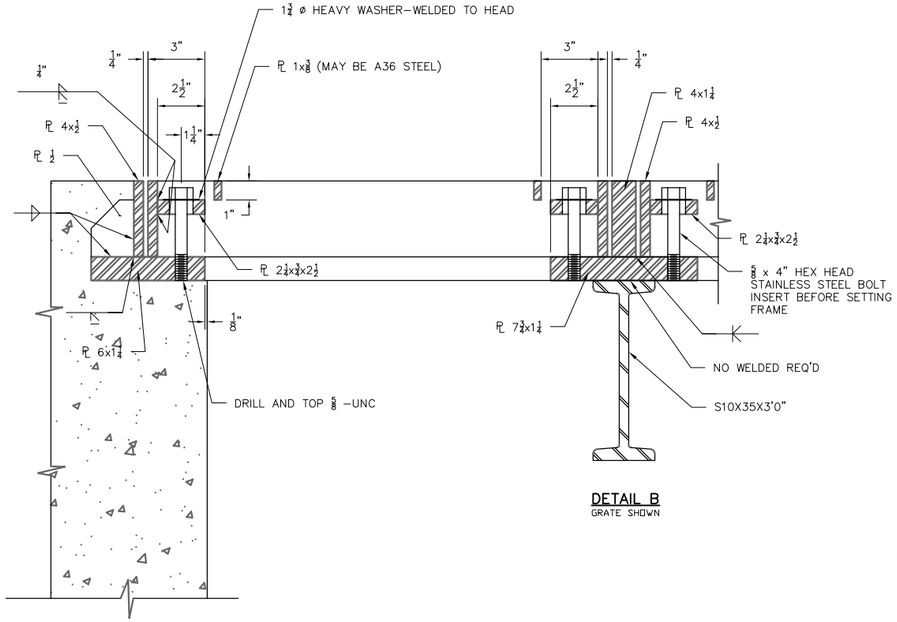
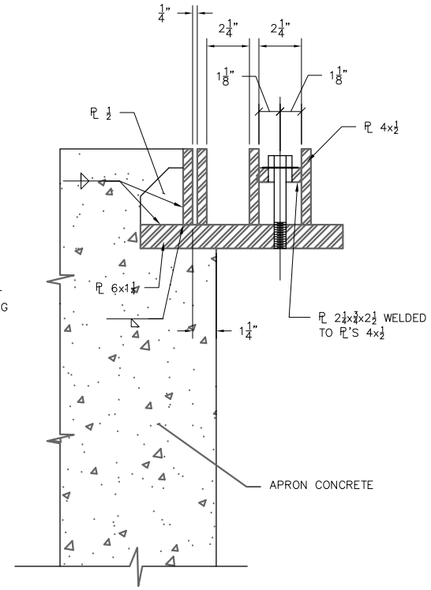
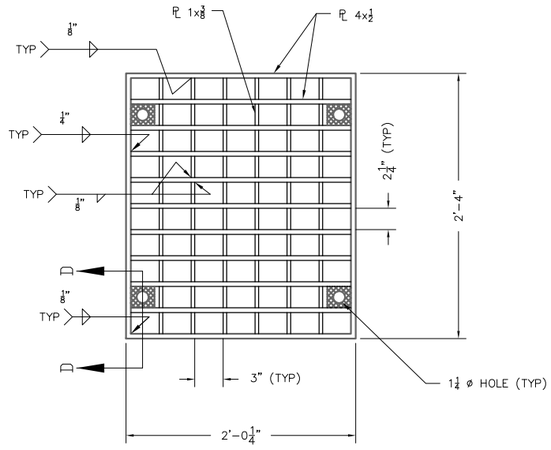


DETAIL A
GRATE SHOWN

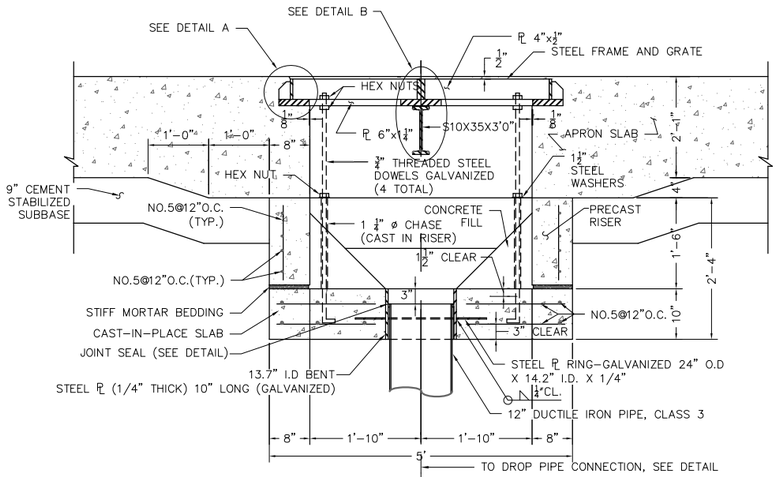
DETAIL B
GRATE SHOWN

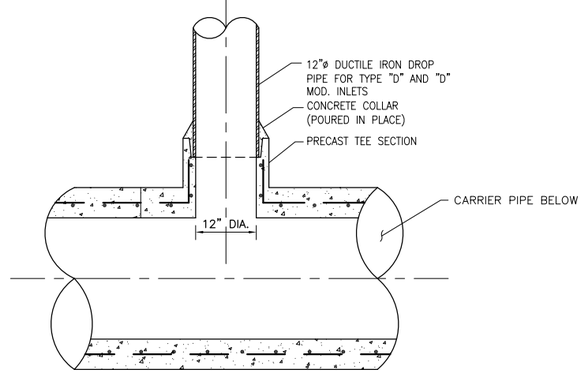


SECTION D–D



GRATE DETAIL
N.T.S.

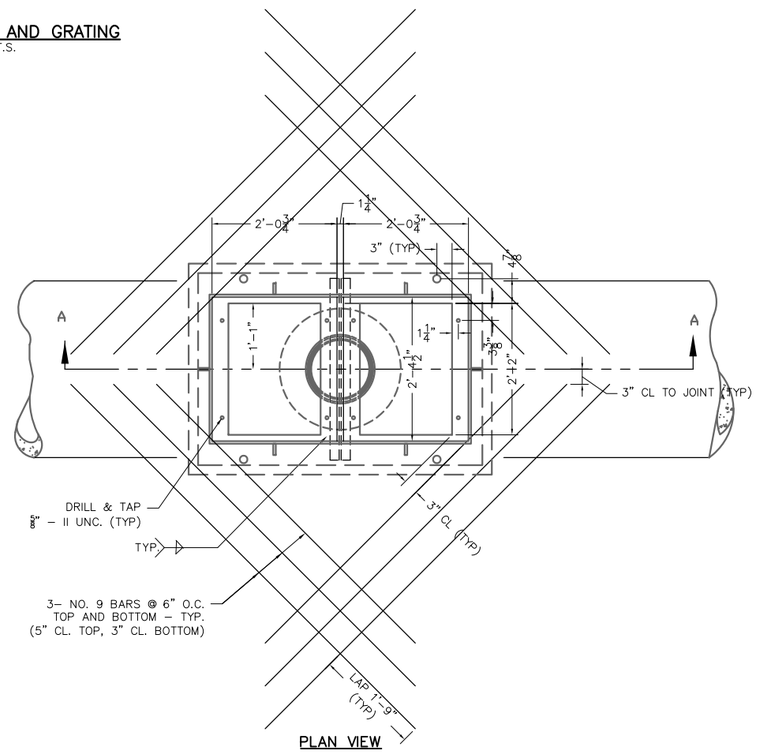




SECTION A–A

INLET TYPE "D" DETAIL
N.T.S.

STEEL FRAME AND GRATING
N.T.S.



PLAN VIEW

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

In-Pavement Inlet
Type 'D'

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-502	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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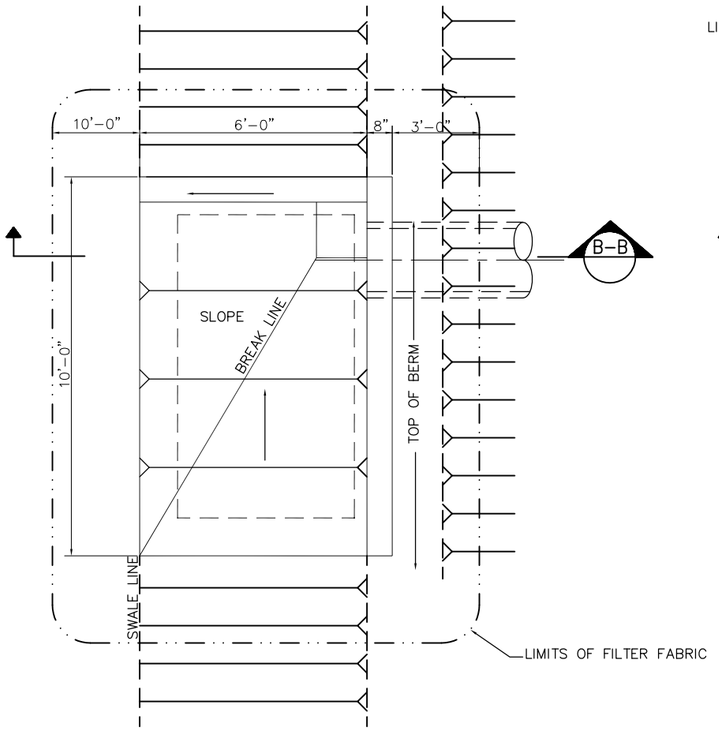
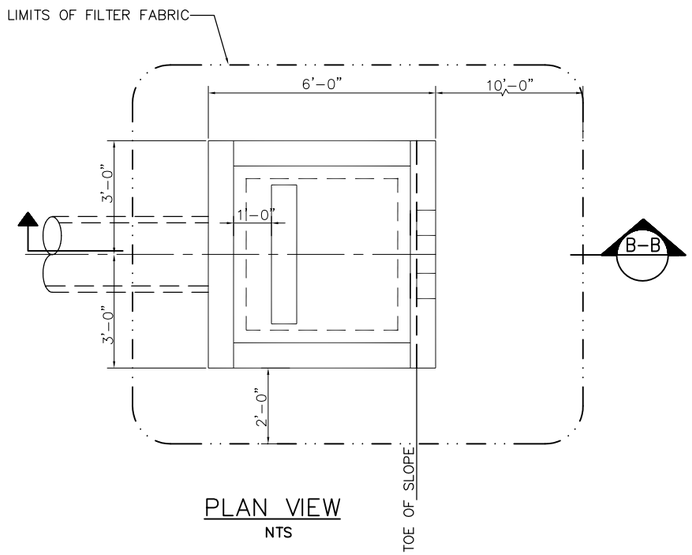
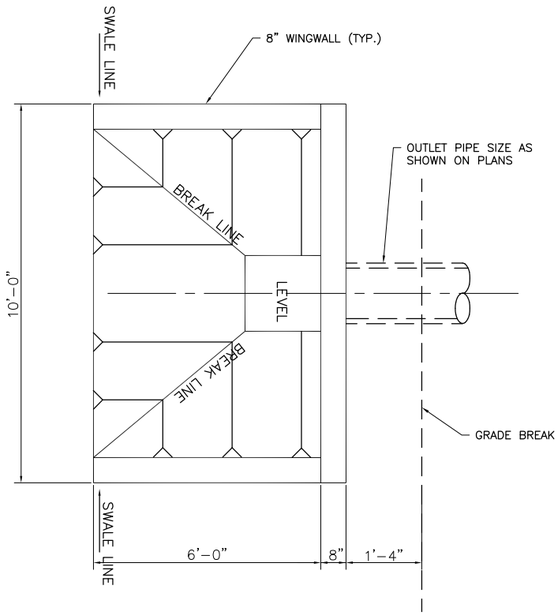


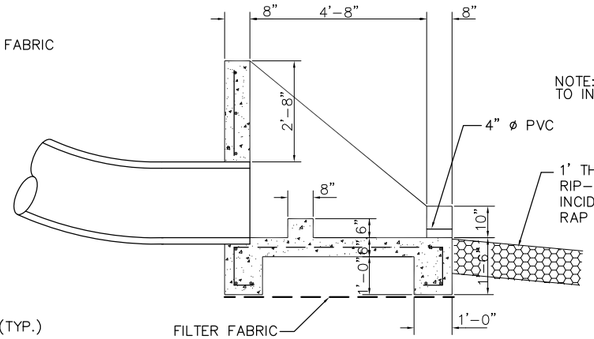
PLAN VIEW
FOR ONE WAY DITCH FLOW
NTS



PLAN VIEW
NTS



PLAN – SLOPE DRAIN INLET
FOR USE IN LOW-POINT LOCATION
NTS



NOTE: REINFORCING SIMILAR TO INLET DETAIL

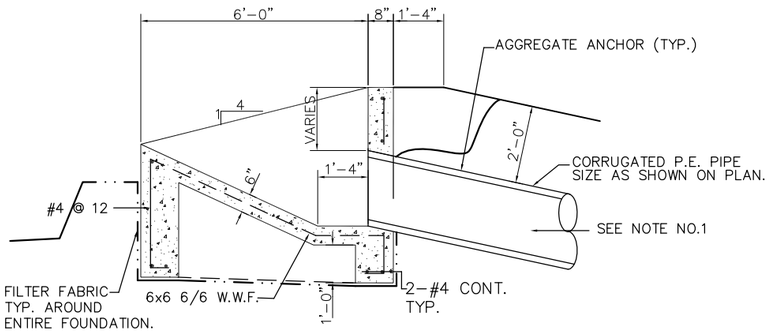
1' THICK PLAIN STONE RIP-RAP STONE. RIP-RAP COST TO BE CONSIDERED INCIDENTAL TO COST OF SLOPE DRAIN. RIP RAP PAD TO BE 6 FT SQUARE.

SECTION B-B
SLOPE DRAIN OUTLET
NTS
FOR IMFORMATION ONLY

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 THICK LAYER OF MASTIC PRIOR TO INSTALLING 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.



SECTION B-B
SLOPE DRAIN INLET
NTS
FOR IMFORMATION ONLY

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

Slope Drain Detail

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-503	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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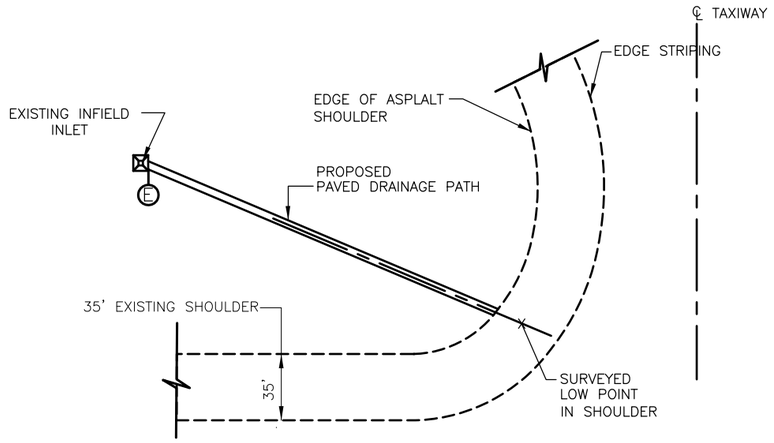
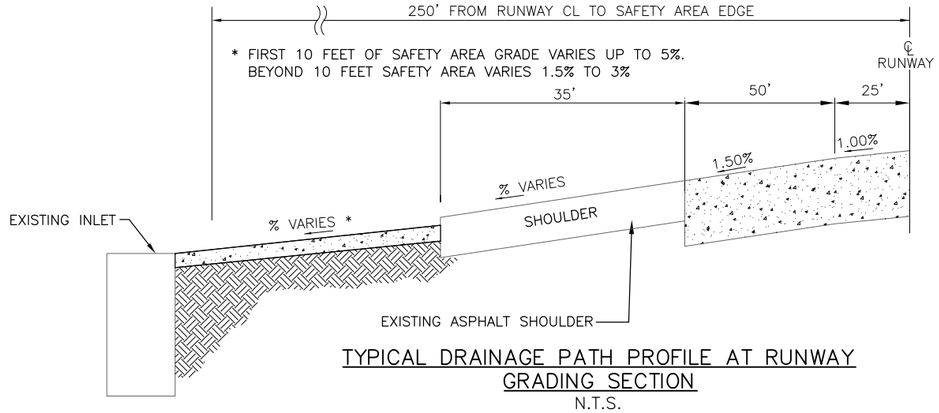
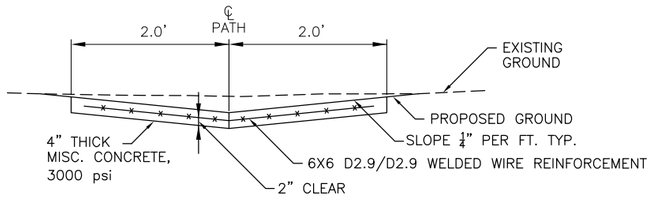


PAVED DRAINAGE PATH PLAN VIEW
N.T.S.



TYPICAL DRAINAGE PATH PROFILE AT RUNWAY GRADING SECTION
N.T.S.

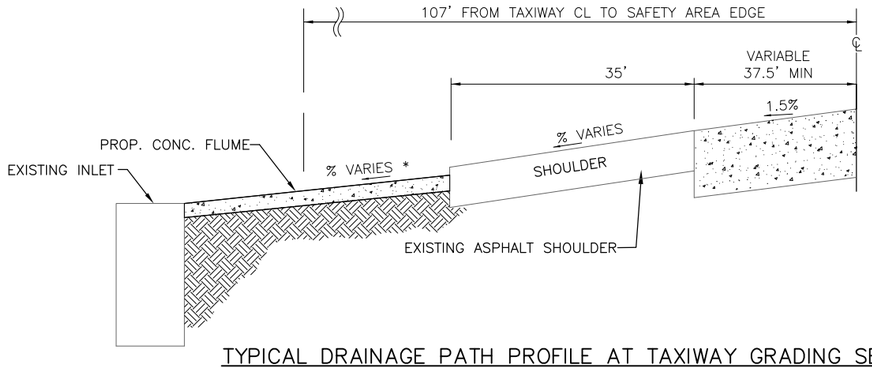
FOR USE IN RELIEVING PONDING DUE TO TURF BUILD UP ON SHOULDER LOW POINTS



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.



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%

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0	06/20/2014	RFM	FIRST ISSUE

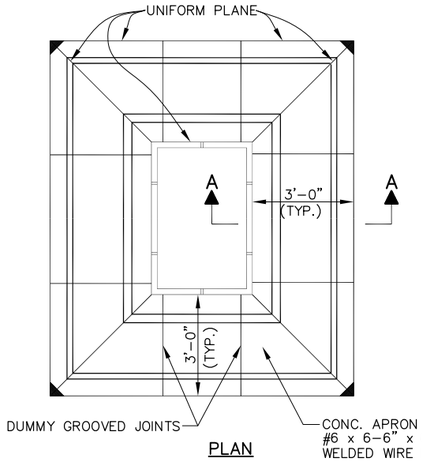
DOA CIVIL STANDARD DETAILS

Paved Drainage Path Detail

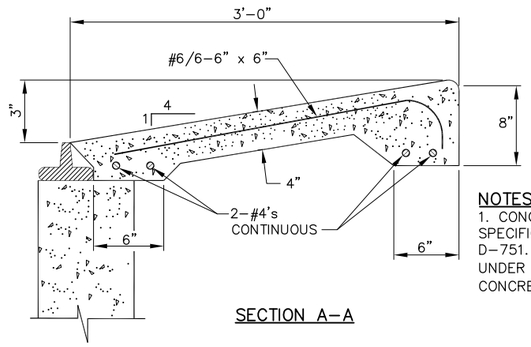
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-504	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



PLAN



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.

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DOA CIVIL STANDARD DETAILS

Miscellaneous
Drainage Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-505	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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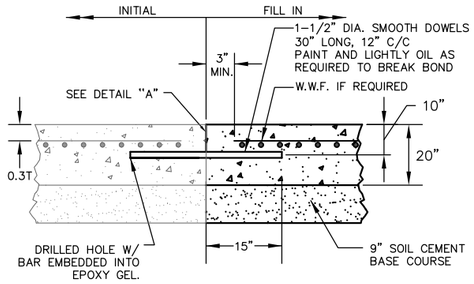
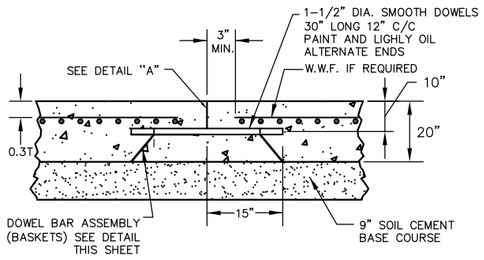
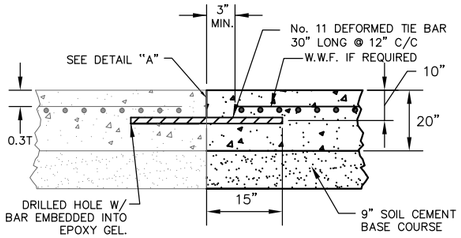


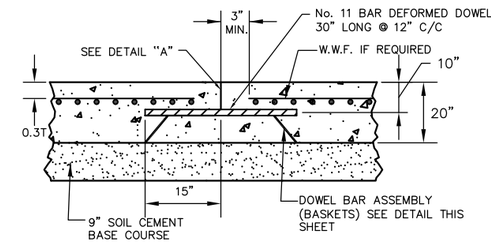
SMOOTH DOWELED
LONGITUDINAL CONSTRUCTION JOINT
SCALE: NTS



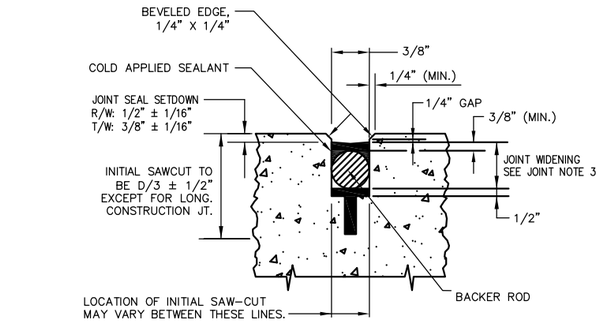
SMOOTH DOWELED TRANSVERSE
CONTRACTION JOINT
SCALE: NTS



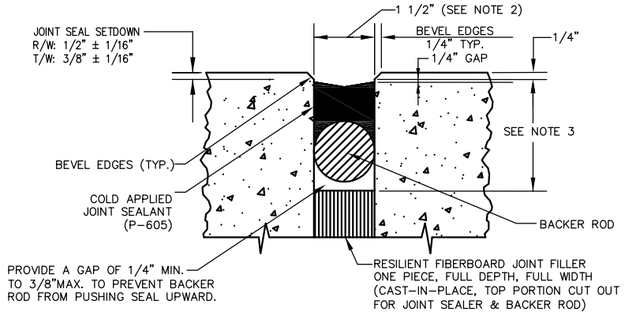
DEFORMED DOWELED
LONGITUDINAL CONSTRUCTION JOINT
SCALE: NTS



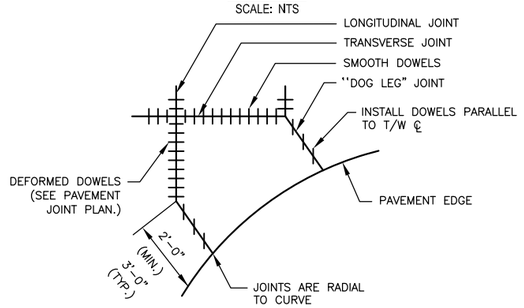
DEFORMED DOWELED
TRANSVERSE CONTRACTION JOINT
SCALE: NTS



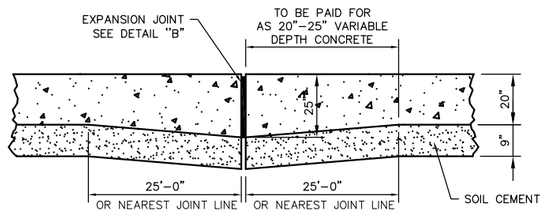
LONGITUDINAL OR TRANSVERSE JOINT SEAL
DETAIL "A"
SCALE: NTS



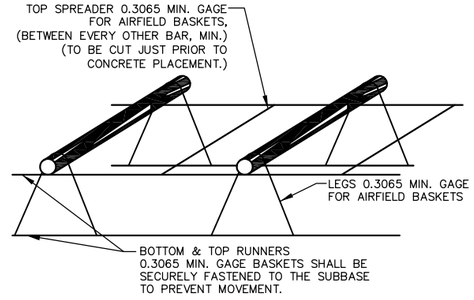
EXPANSION JOINT SEAL
DETAIL "B"
SCALE: NTS



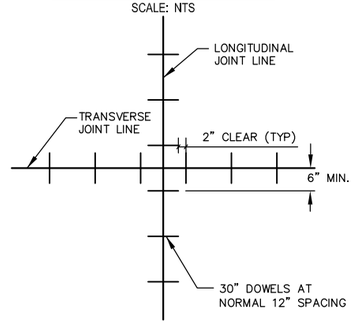
SKEWED DOWEL INSTALLATION
SCALE: NTS



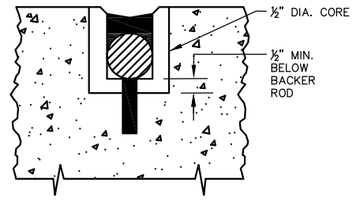
THICKENED EDGE EXPANSION JOINT
SCALE: NTS



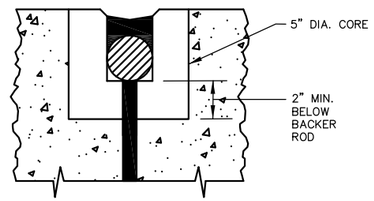
TYPICAL DOWEL BAR BASKET
SCALE: NTS



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

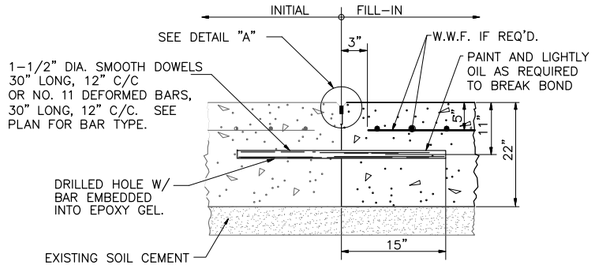
Pavement Joint Details - New Projects

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-600	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

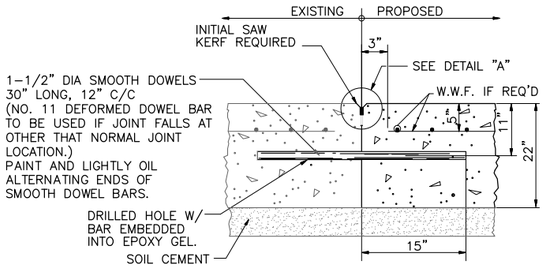
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

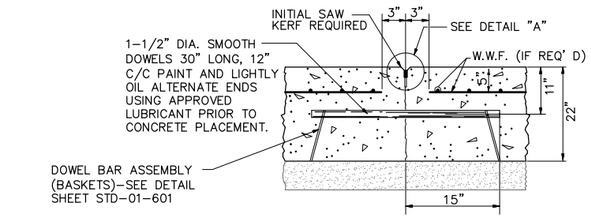
a:\facilities\engineering\design standards\drawings\std-01-600 pavement joint details – new projects.dwg



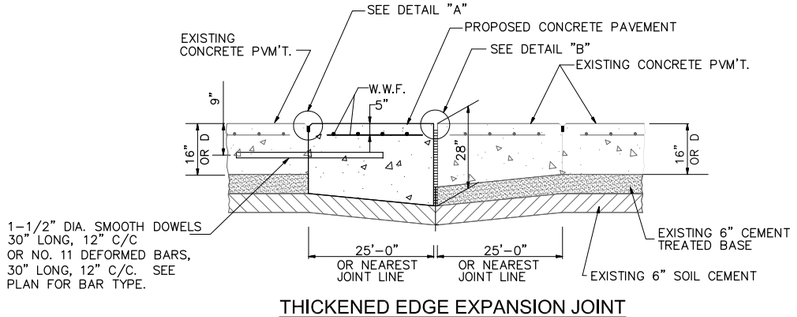
LONGITUDINAL CONSTRUCTION JOINT
N.T.S.



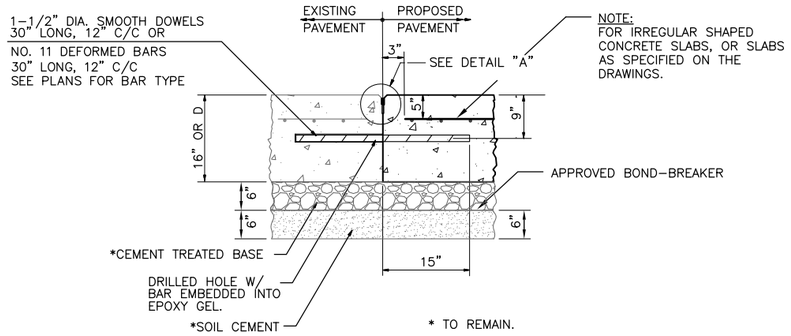
TRANSVERSE CONSTRUCTION JOINT
N.T.S.



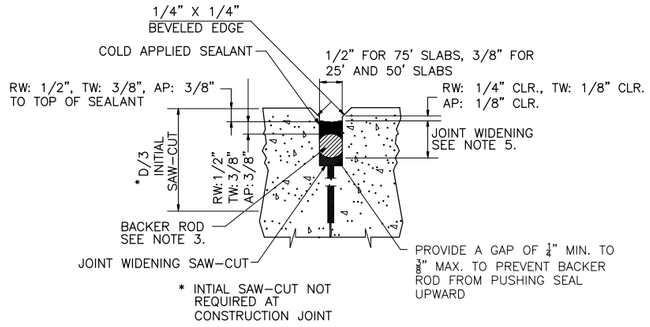
TRANSVERSE CONTRACTION JOINT
N.T.S.



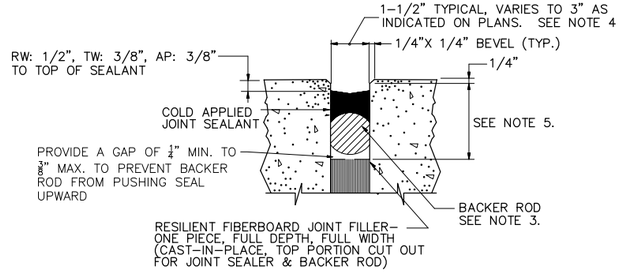
THICKENED EDGE EXPANSION JOINT
N.T.S.



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.

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 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.

B. 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 DETRIMENTAL TO BONDING.

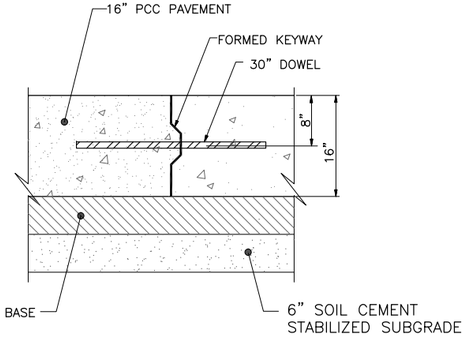
C. EPOXY GEL SHALL BE APPLIED TO THE DOWEL AND SUFFICIENT GEL INJECTED IN THE BACK OF THE TIE BAR HOLE BY A MECHANICAL MIXING/PUMP DEVICE, SO THAT A SLIGHT AMOUNT OF GEL WILL BE FORCED OUT WHEN THE DOWEL OR TIE BAR IS INSERTED AND TAPPED TO THE CORRECT POSITION. IT WILL BE NECESSARY TO TWIST THE BAR 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.

E. DAMAGED CEMENT TREATED BASE SHALL BE REPAIRED OR REPLACED WITH LOW SLUMP LOW STRENGTH CONCRETE.

NOTES:

1. LONGITUDINAL AND TRANSVERSE JOINTS SHALL BE SAWED AS INDICATED.
2. TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED ONLY WHEN APPROVED BY THE ENGINEER.
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. WELDED WIRE REINFORCING SHALL BE 6X6 D6/D6. ALL REINFORCING STEEL SHALL BE DELIVERED IN FLAT SHEETS. NO ROLL STOCK WILL BE ACCEPTABLE.



EXISTING APRON SECTION CPTC, NORTH AND SOUTH CARGO
N.T.S.

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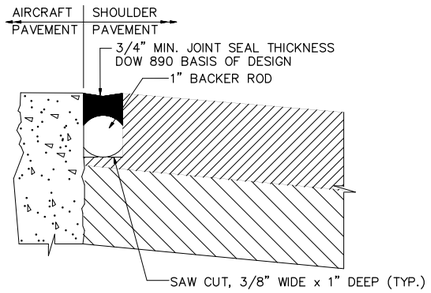
DOA CIVIL STANDARD DETAILS

Pavement Joint Details - Replacement Projects-1

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-700	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

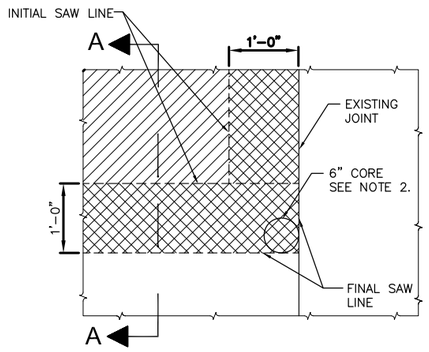
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



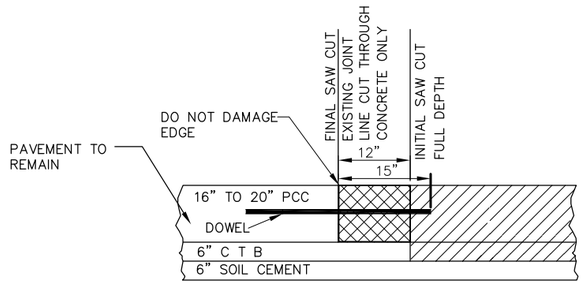
ASPHALT/ PCC PAVEMENT JOINT DETAIL

N.T.S.



PAVEMENT REMOVAL TYPICAL PLAN

N.T.S.



SECTION A-A: TYPICAL SAWCUT ADJACENT TO EXISTING PAVEMENT TO REMAIN

N.T.S.

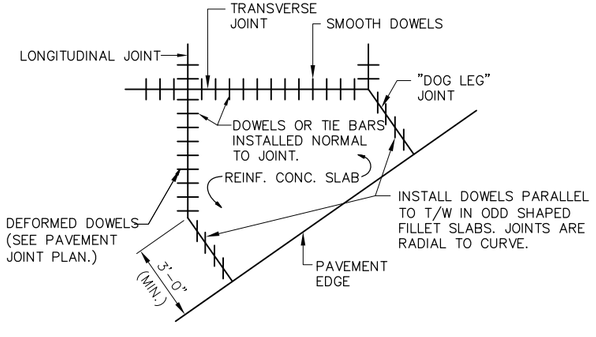
LEGEND

FINAL CONC. PAVEMENT REMOVAL ZONE

INITIAL CONC. PAVEMENT REMOVAL ZONE

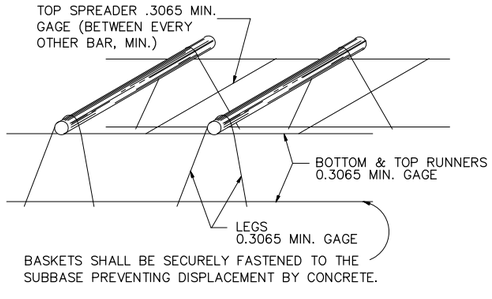
DEMOLITION NOTES:

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.



SKEWED DOWEL INSTALLATION

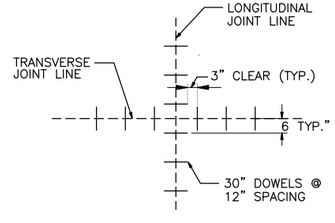
N.T.S.



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.



DOWEL SPACING DETAIL AT JOINT CORNERS

N.T.S.

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Pavement Joint Details - Replacement Projects-2

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-701	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

NOT RELEASED FOR CONSTRUCTION

g:\facilities\engineering\design standards\drawings\std–01–701 pavement joint details – replacement projects–2.dwg

GENERAL NOTES:

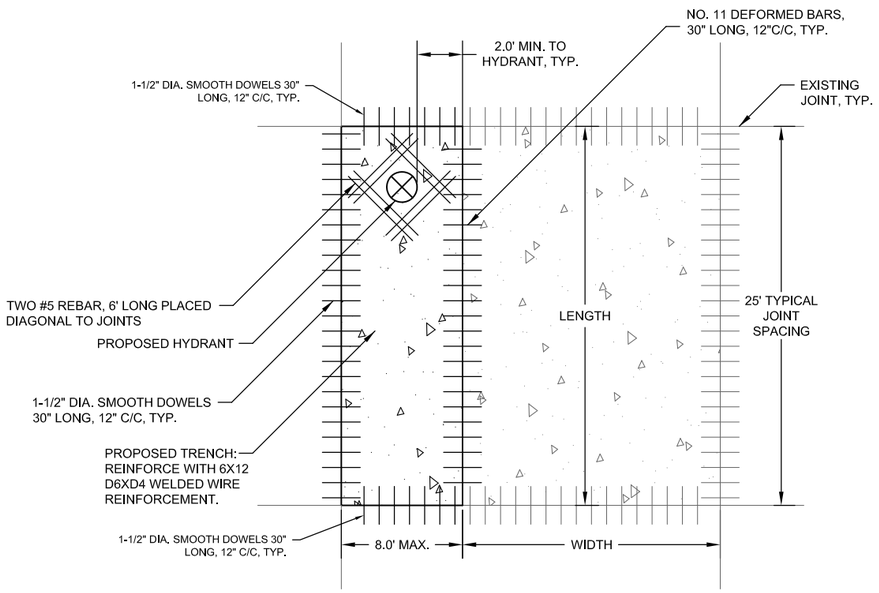
1. NO "U"- OR "L"-SHAPED REMAINING SLABS WILL BE PERMITTED.

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.

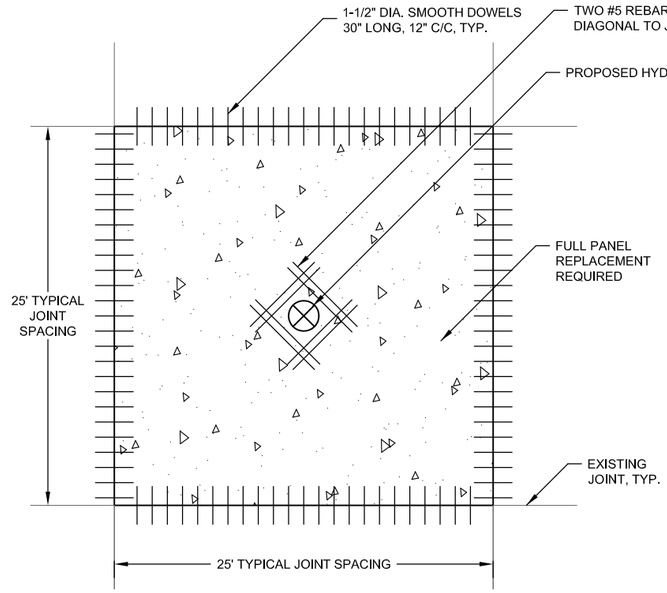
4. IF TRENCHING CREATES REMAINING CONCRETE AREAS THAT VIOLATE THE 1.5 TO 1 LENGTH TO WIDTH RATIO, SLAB REPLACEMENT IS REQUIRED.

5. TRENCHING THROUGH ADJACENT SLABS IS SUBJECT TO THE SAME LENGTH TO WIDTH RATIO REQUIREMENTS.



CASE 1:

HYDRANT, PENETRATION, OR TRENCH NEAR SLAB CORNER OR EDGE



CASE 2:

HYDRANT, PENETRATION, OR TRENCH AT OR NEAR CENTER OF SLAB

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0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Exist. Pavement Removal and Replacement for Fuel Hydrants

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-702	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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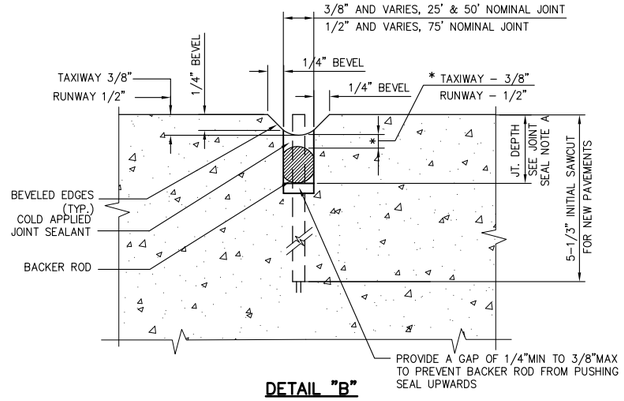
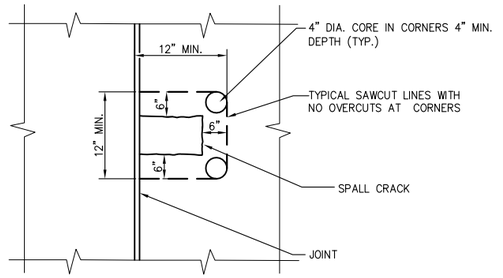


DETAIL "B"

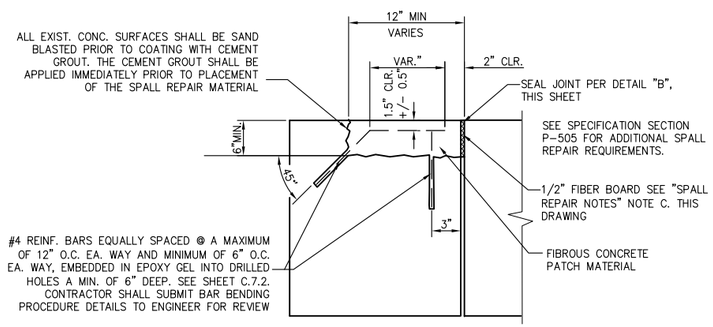
LONGITUDINAL AND TRANSVERSE JOINT SEAL

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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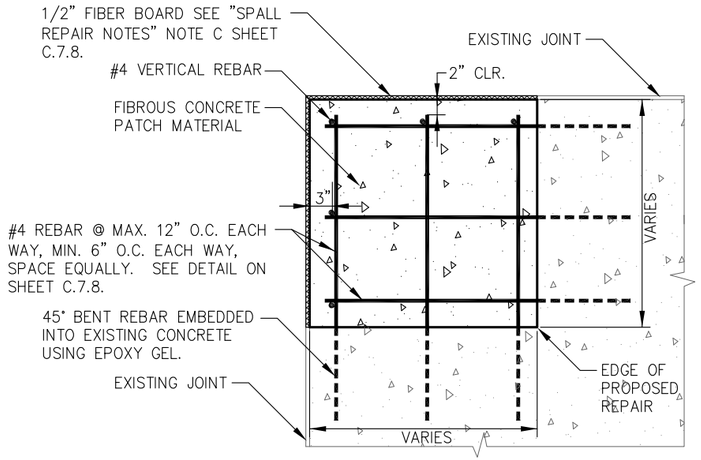
DOA CIVIL STANDARD DETAILS

Spall and Joint Repair Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-703	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

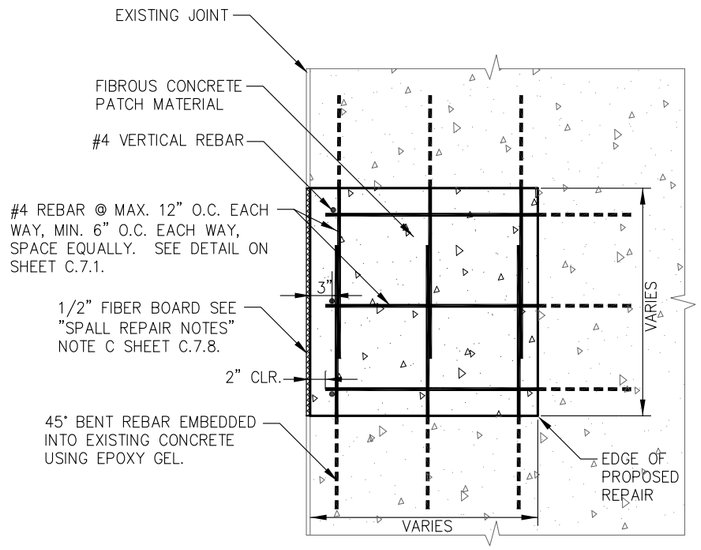
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



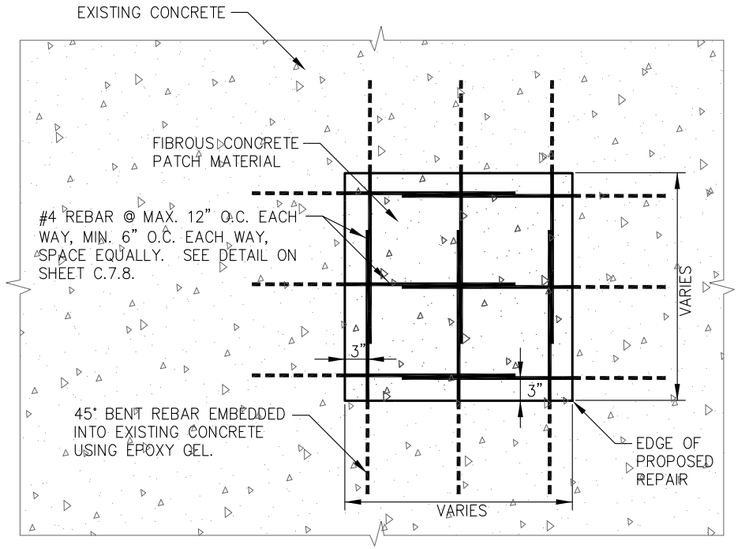
SPALL ADJACENT TO 2 JOINTS

SCALE: NTS



SPALL ADJACENT TO SINGLE JOINT

SCALE: NTS



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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DOA CIVIL STANDARD DETAILS

Typical Spall Repair Rebar Placement Detail

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-704	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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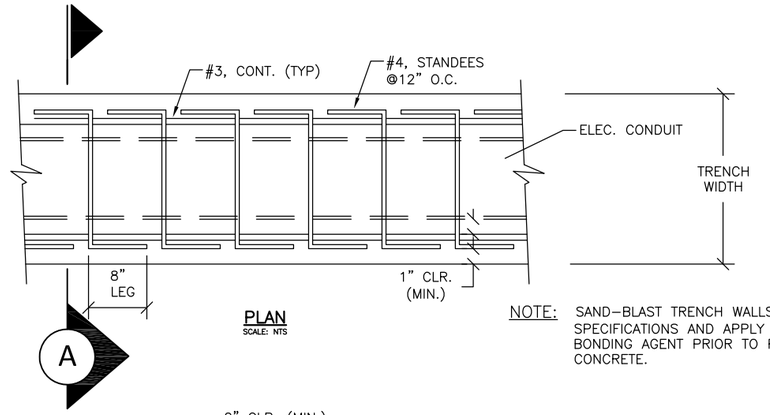
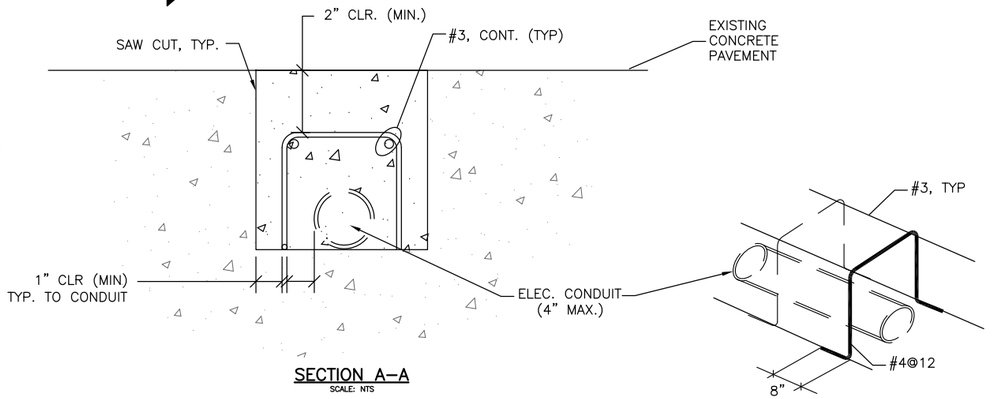


PLAN
SCALE: NTS

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.



SECTION A–A
SCALE: NTS

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

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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

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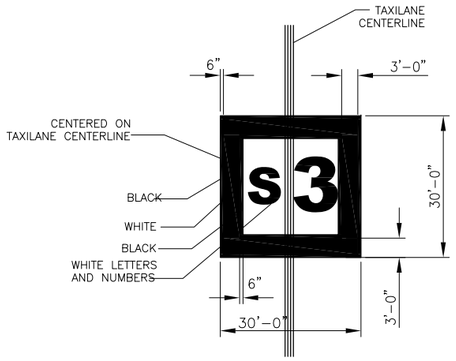
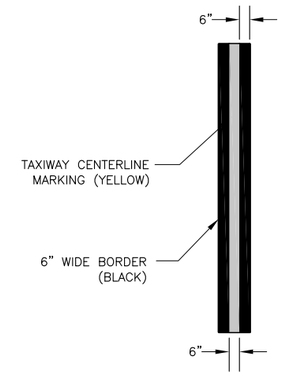


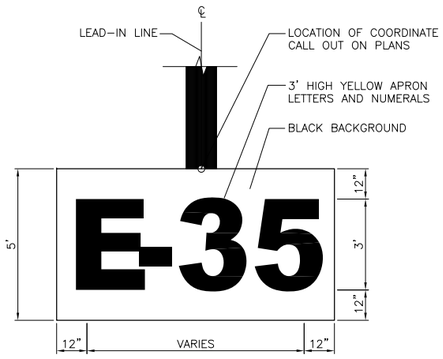
TAXILANE / RAMP DESCRIPTION

N.T.S



TAXILANE CENTER MARKING

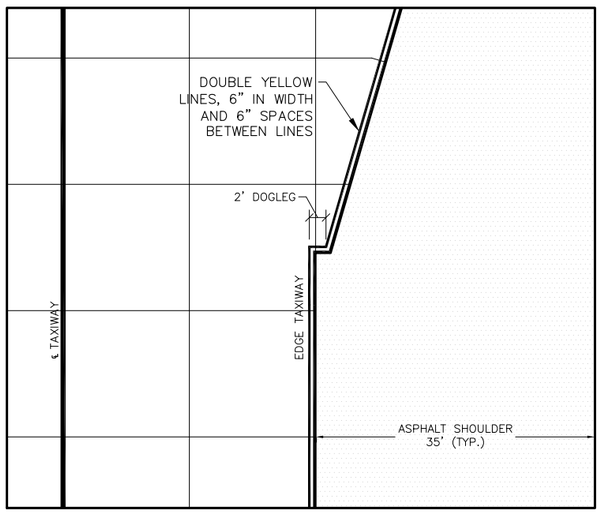
N.T.S



NOTE:
FOR ADDITIONAL DETAILS REFER TO FAA ADVISORY AC 150/5340-1L.

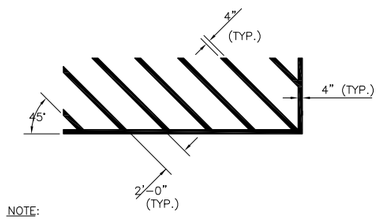
TAXILANE / RAMP DESCRIPTION

N.T.S



DOGLEG STRIPING

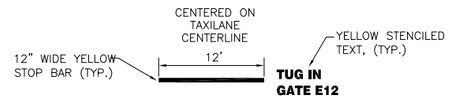
N.T.S



NOTE:
ALL STRIPES SHALL BE PAINTED WITH YELLOW PAINT THAT COMPLIES WITH FS TT-P-115, TYPE 1, OR AASHTO M-248, TYPE N.

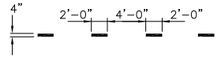
CHEVRON STRIPING

N.T.S



TAXILANE STOP/TUG-IN BAR

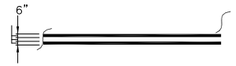
WHITE SOLID LANE LINE (WSLL)



WHITE DASHED LANE LINES (WDLL)

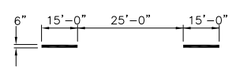
RED SOLID LANE LINE (RSLL)

SINGLE YELLOW CENTER LINE (SYCL)

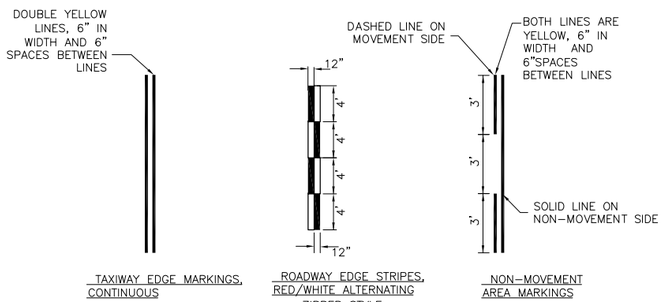


DOUBLE YELLOW CENTER LINE (DYCL)

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

APRON PAVING STRIPING

N.T.S

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
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DOA CIVIL STANDARD DETAILS

Apron Striping and Marking

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-800	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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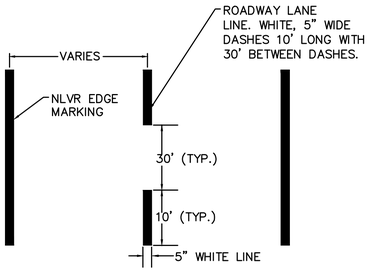
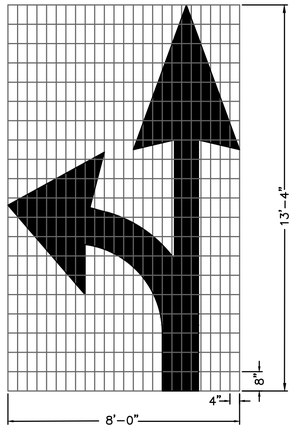
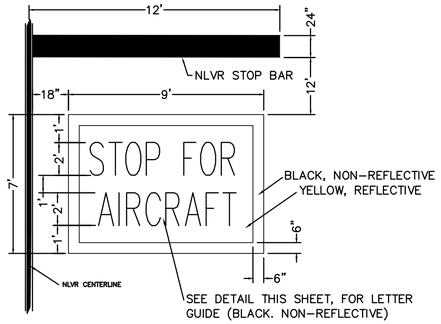
g:\facilities\engineering\design standards\drawings\std-01-800 apron striping and marking.dwg



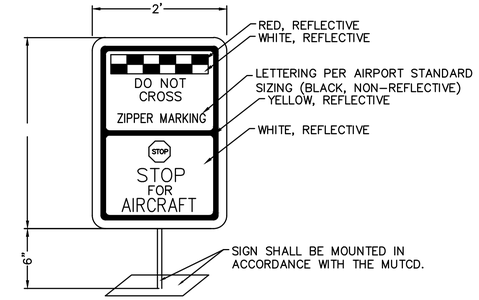
ROADWAY LANE LINE DETAIL
N.T.S.



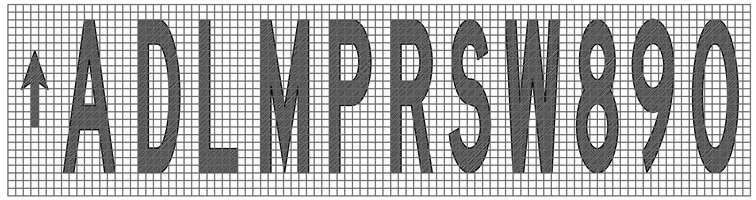
PAVMENT MARKING, ARROW, TYPE '3'
N.T.S.



STOP FOR AIRCRAFT PAVEMENT MARKING
N.T.S.

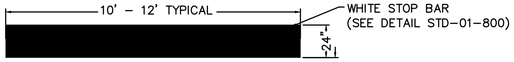


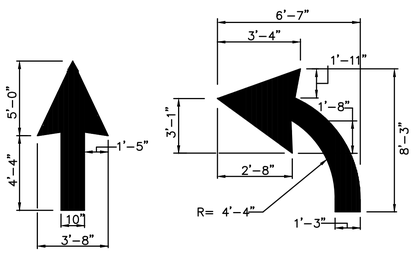
TAXIWAY/TAXILANE CROSSING SIGN
N.T.S.



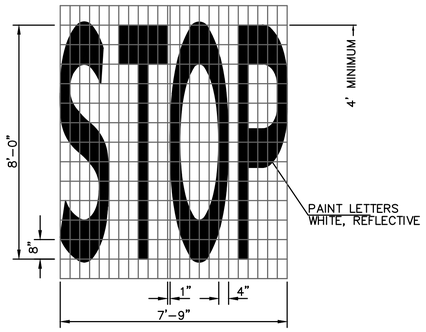
SURFACE PAINTED SIGN LETTERING GUIDE
N.T.S.

NOTES:
1. FOR VERTICAL AND HORIZONTAL PLACEMENT OF THE ARROW WITH RESPECT TO OTHER CHARACTERS SEE PLAN SHEETS.

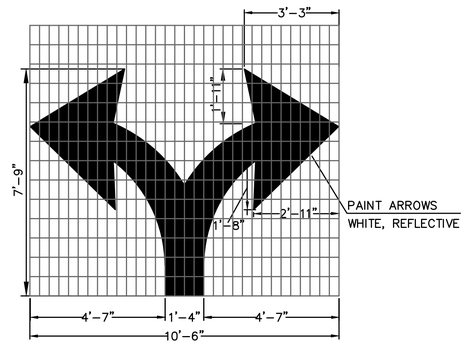




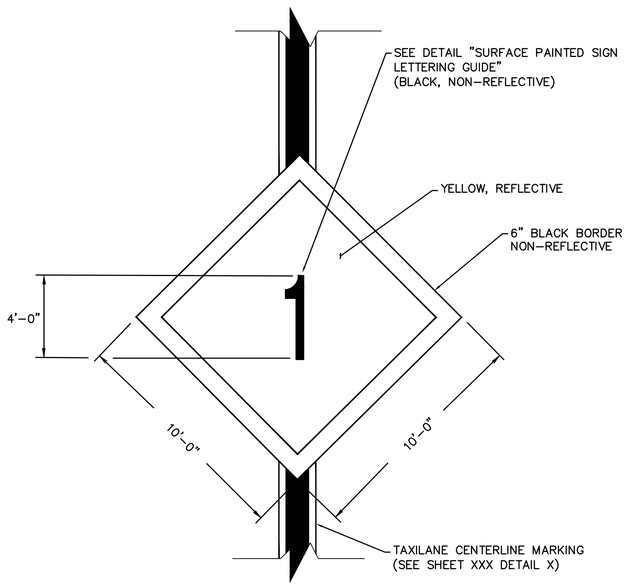
PAVEMENT ARROW DIMENTIONS
N.T.S



PAVEMENT MARKING, WORD, TYPE '2'
N.T.S.



PAVMENT MARKING, ARROW, TYPE '5'
N.T.S.



TAXIWAY/TAXILANE POWERUP MARKER
N.T.S.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

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3	07/2020	RFM	REVISED
2	07/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

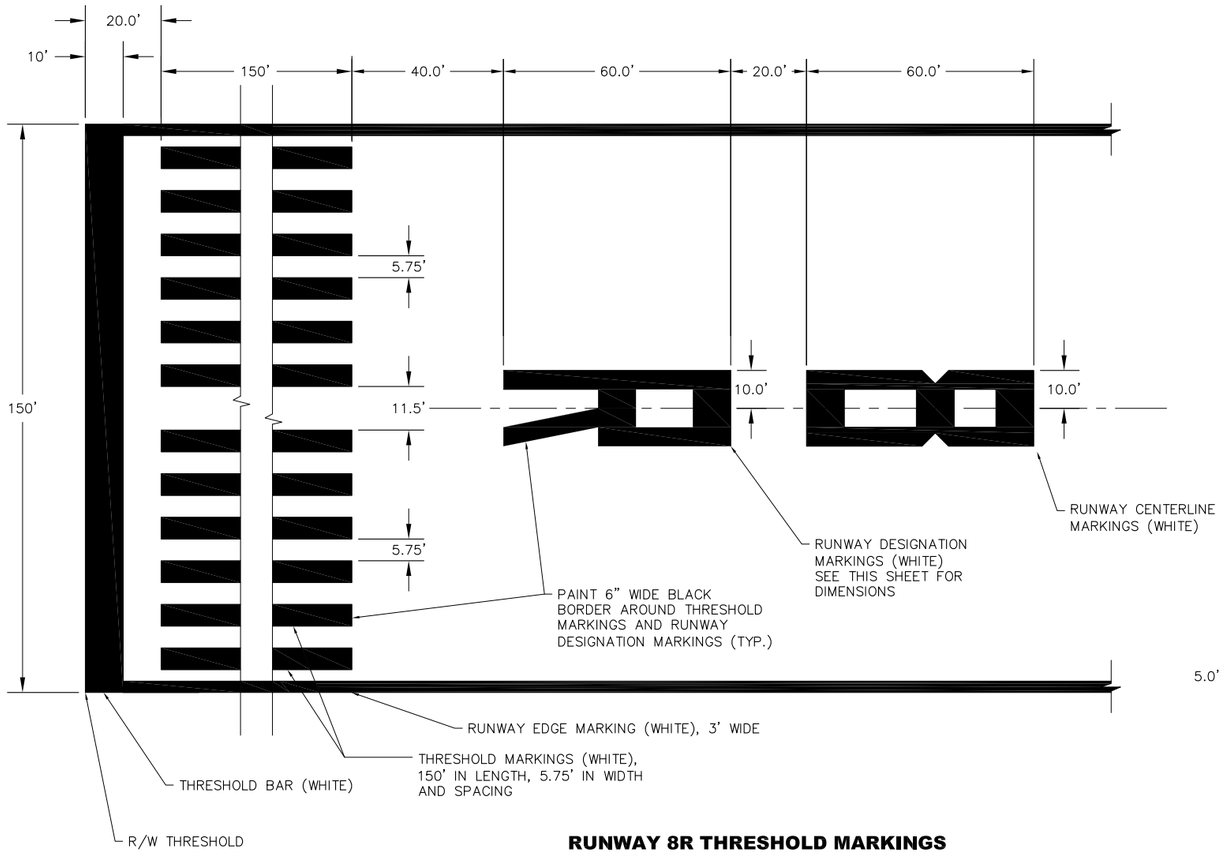
DOA CIVIL STANDARD DETAILS

Apron NLVR Striping and Signage

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-801	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

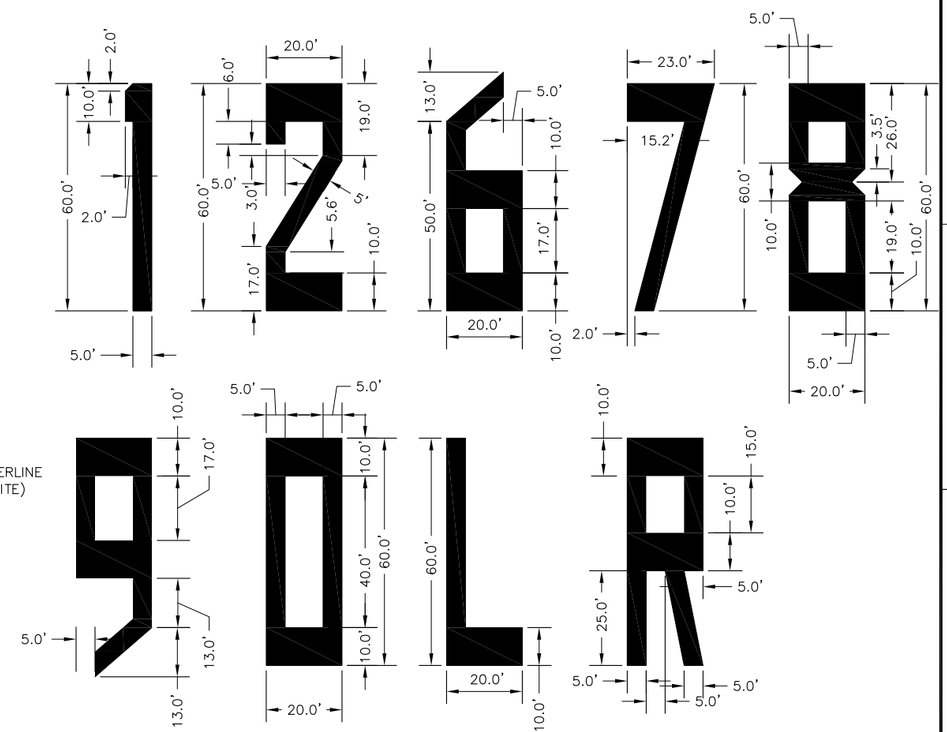
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



RUNWAY 8R THRESHOLD MARKINGS

SCALE: 1"=20'



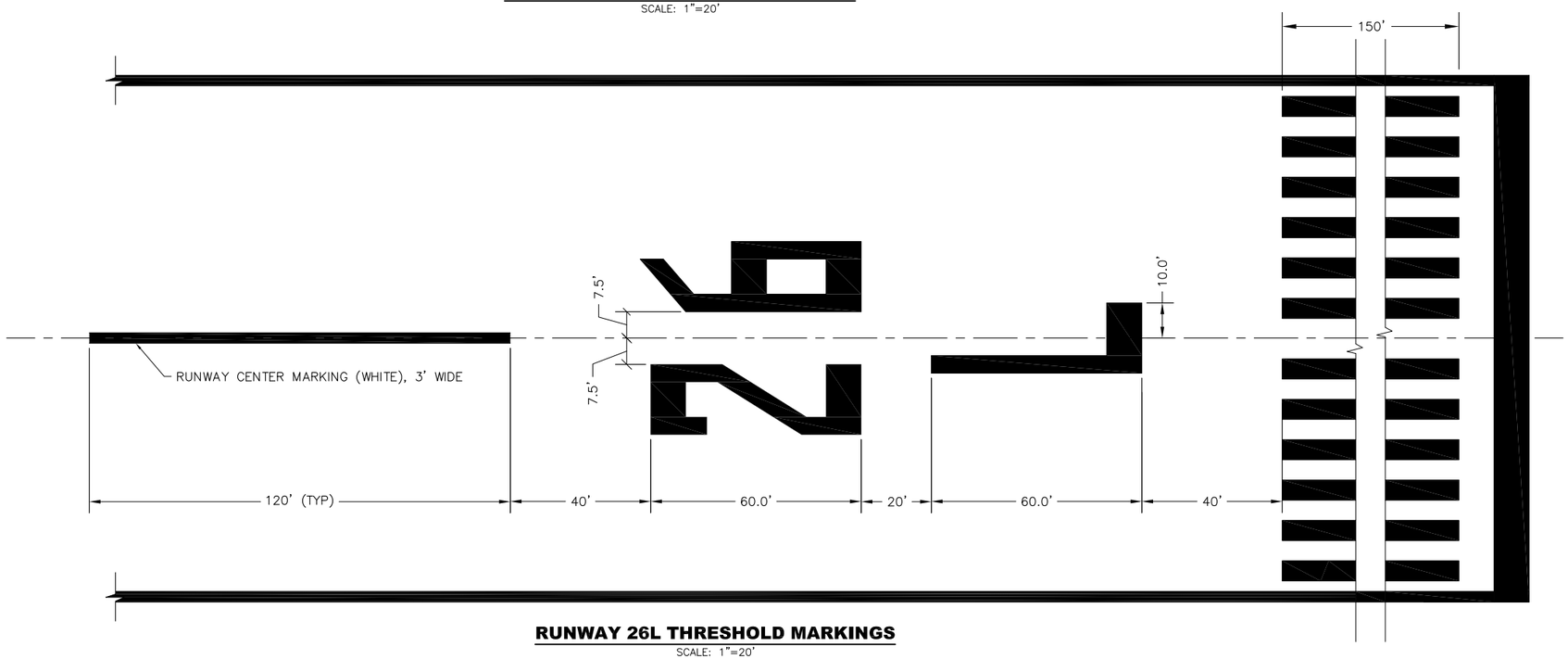
RUNWAY DESIGNATION MARKINGS

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 15 APART.
4. SINGLE DESIGNATIONS ARE CENTERED ON THE RUNWAY PAVEMENT CENTERLINE. FOR DOUBLE DESIGNATIONS, THE CENTER OF THE OUTER EDGES OF THE TWO NUMERALS IS CENTERED ON THE RUNWAY PAVEMENT CENTERLINE.

RUNWAY 26L THRESHOLD MARKINGS

SCALE: 1"=20'



CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

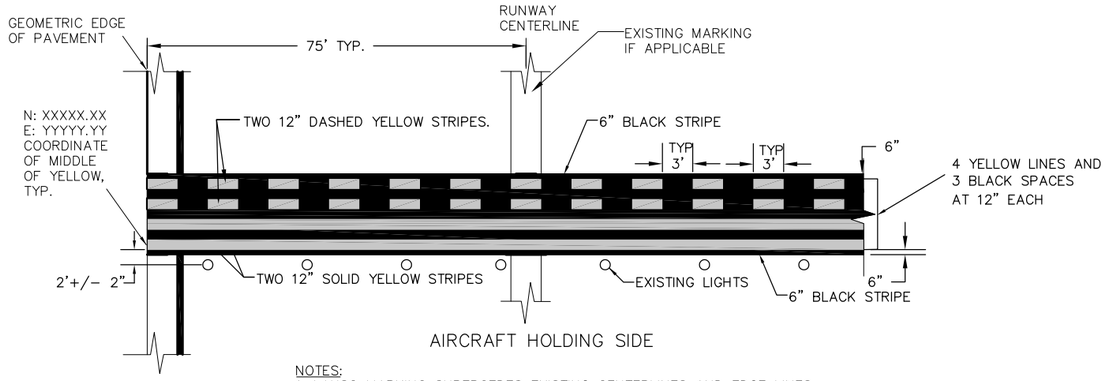
DOA CIVIL STANDARD DETAILS

Runway Striping and Marking-1

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-802	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

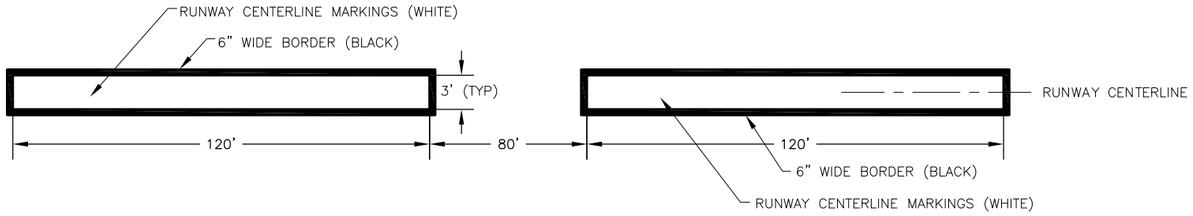
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

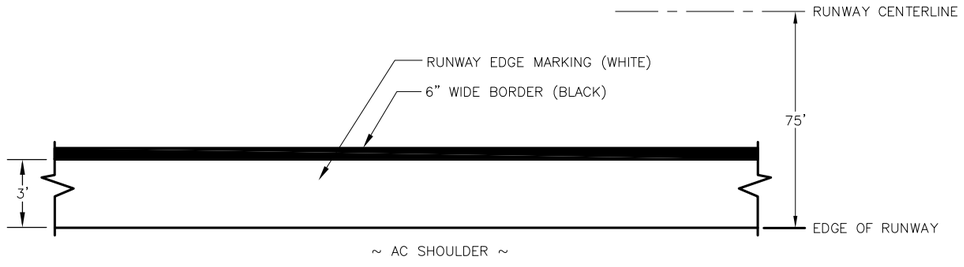


NOTES:
1. LAHSO MARKING SUPERCEDES EXISTING CENTERLINES AND EDGE LINES.
2. MARKING IS NOT PAINTED ON THE ASPHALT SHOULDER.
3. SEE PLANS FOR LOCATIONS.

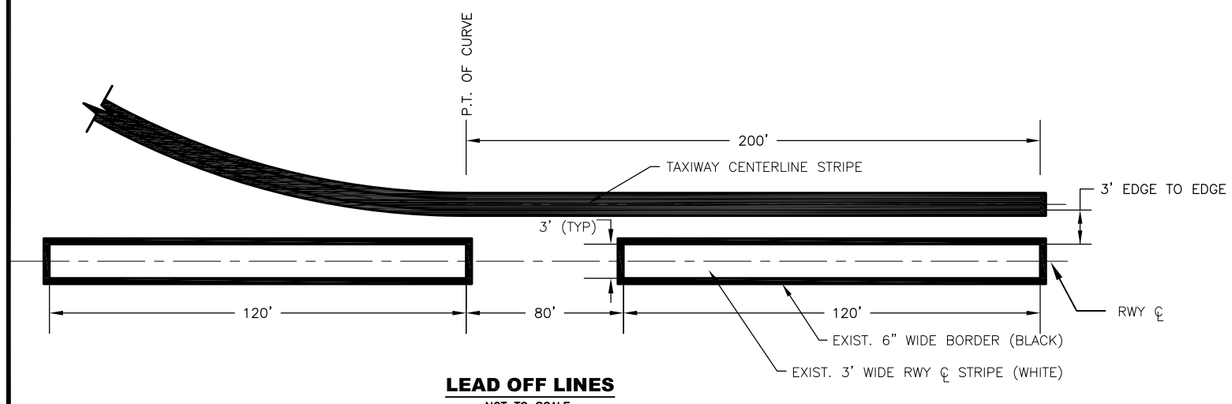
LAHSO MARKING
NOT TO SCALE



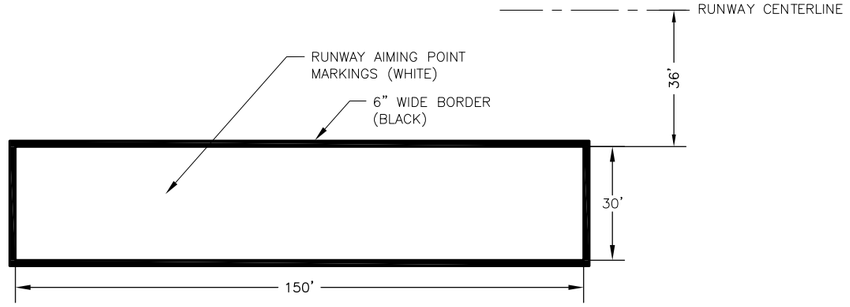
RUNWAY CENTERLINE MARKINGS
NOT TO SCALE



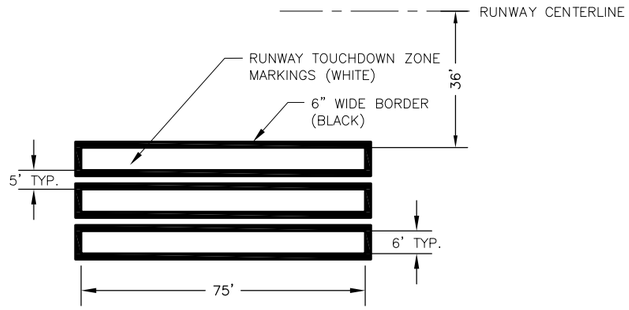
RUNWAY EDGE MARKING
NOT TO SCALE



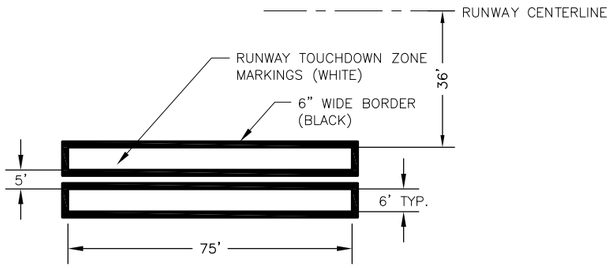
LEAD OFF LINES
NOT TO SCALE



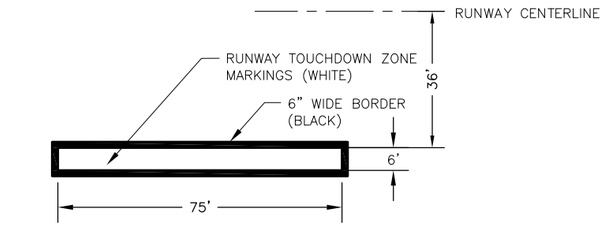
AIMING POINT MARKING
NOT TO SCALE



TOUCHDOWN ZONE MARKINGS (3 BARS)
NOT TO SCALE



TOUCHDOWN ZONE MARKINGS (2 BARS)
NOT TO SCALE



TOUCHDOWN ZONE MARKINGS (1 BAR)
NOT TO SCALE

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PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

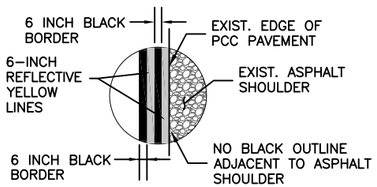
Runway Striping and Marking-2

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-803	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

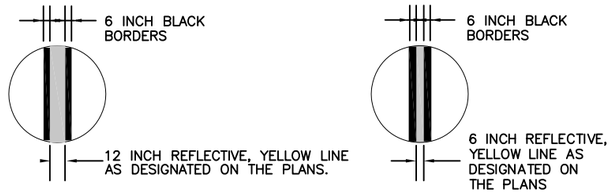
NOT RELEASED FOR CONSTRUCTION

g:\facilities\engineering\design standards\drawings\std-01-803 runway striping and marking-2.dwg



TAXIWAY EDGE MARKING DETAIL

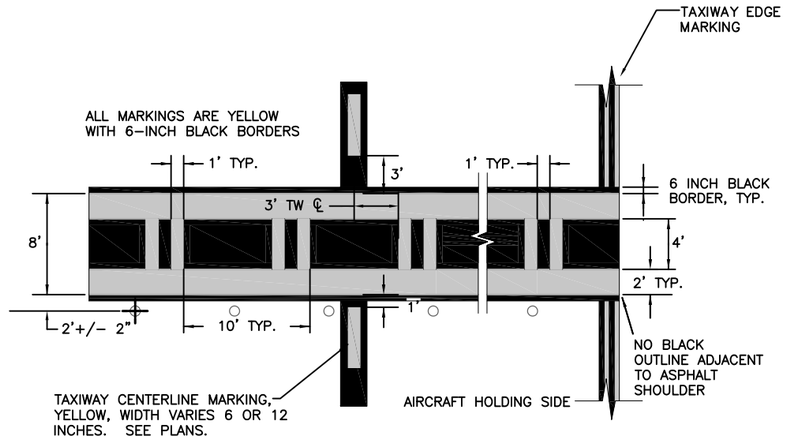
N.T.S.



TAXIWAY CENTERLINE MARKING DETAILS

N.T.S.

1. ALL TAXIWAY CENTERLINE MARKINGS SHALL BE OUTLINED WITH 6" WIDE BORDERS (BLACK, NON–REFLECTIVE).



ILS HOLDING POSITION MARKING DETAIL

N.T.S.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NOTES:

1. DURING LAYOUT OF PROPOSED MARKINGS, THE CONTRACTOR SHALL IMMEDIATELY ADVISE THE ENGINEER IF ANY PROPOSED MARKINGS FALL OUTSIDE OF REQUIRED TOLERANCES. LAYOUT SHALL CEASE UNTIL REVISIONS ARE PROVIDED BY THE ENGINEER.

2. ALL MARKINGS SHALL MEET THE REQUIREMENTS OF FAA ADVISORY CIRCULAR 150/5340–1L

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1	08/2019	RFM	REVISED
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DOA CIVIL STANDARD DETAILS

Taxiway Striping and Marking

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-805	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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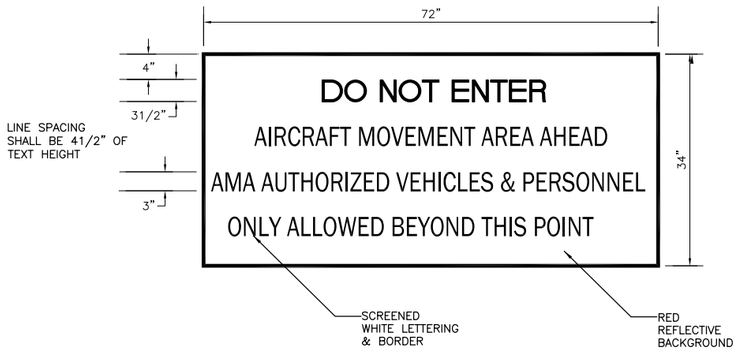

RUNWAY/TAXIWAY WARNING SIGN DETAIL

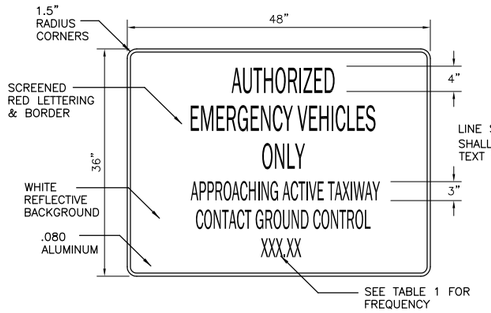

TABLE 1

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

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DOA CIVIL STANDARD DETAILS

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0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Miscellaneous Airfield Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-01-900	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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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.

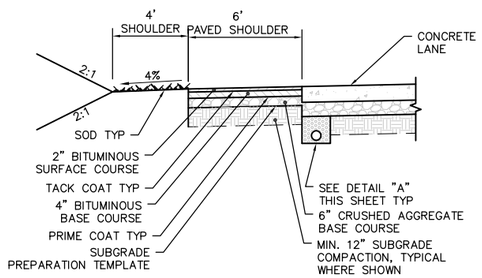
7. CURB JOINTS SHALL MATCH CONCRETE PAVEMENT LANE JOINT SPACING.

8. SEE STD-02-200 FOR JOINT DETAILS.

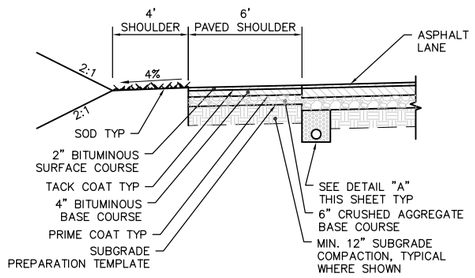
9. SEE STD-01-200 FOR AIRSIDE ROADWAY TYPICAL SECTIONS.

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
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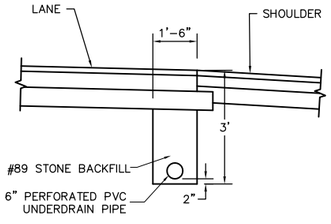
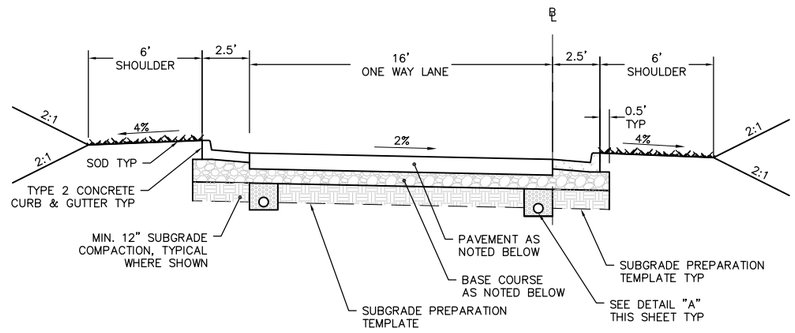
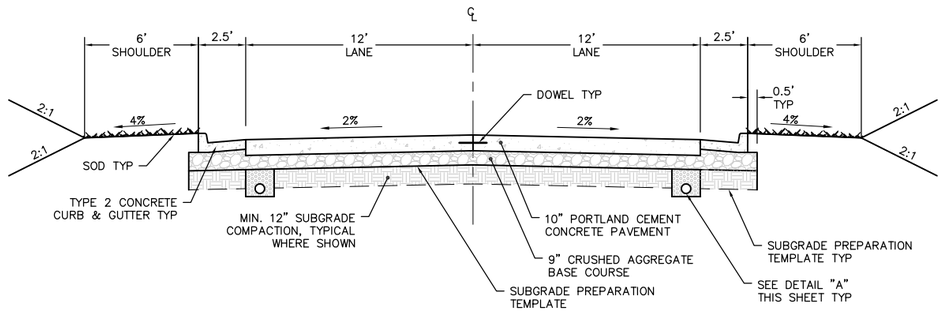


DETAIL "A"
SCALE: NTS



ONE WAY ROADWAY LANDSIDE SECTION
SCALE: NTS



CONCRETE ROADWAY LANDSIDE SECTION
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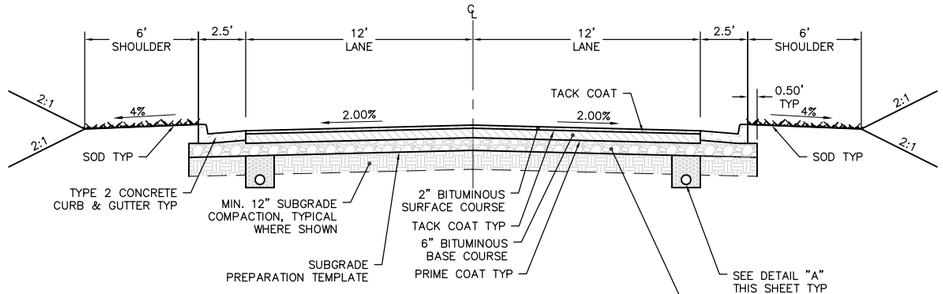

ASPHALT ROADWAY LANDSIDE SECTION
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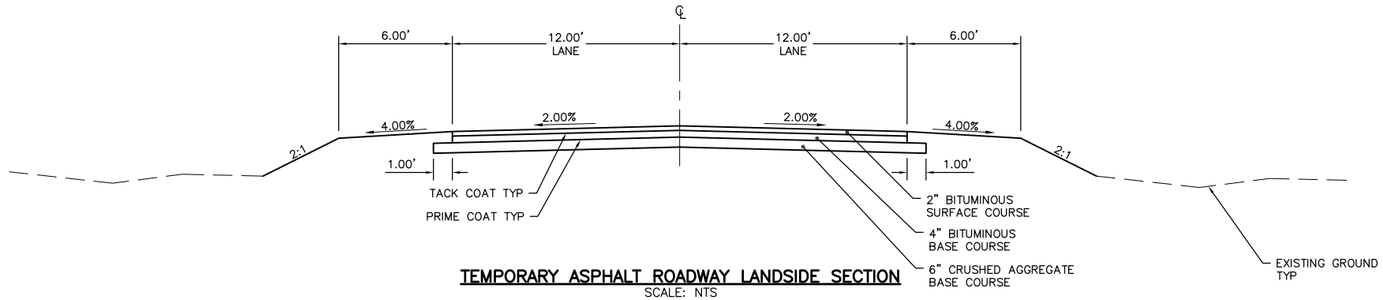

TEMPORARY ASPHALT ROADWAY LANDSIDE SECTION
SCALE: NTS

CITY OF ATLANTA, GEORGIA

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DOA CIVIL STANDARD DETAILS

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1	08/2019	RFM	REVISED
0	06/28/2004	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Typical Pavement Sections - Roadways

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-100	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

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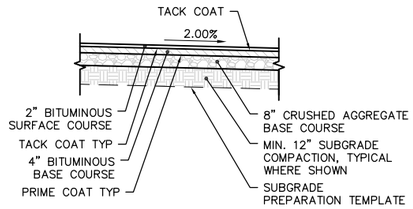
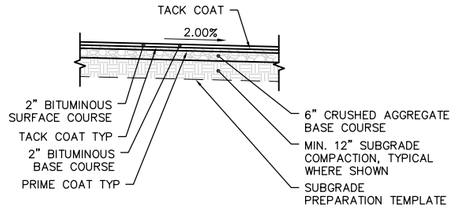
q:\facilities\engineering\design standards\drawings\std-02-100 typical pavement sections - roadways.dwg



ASPHALT PARKING LOT CIRCULATION ROAD SECTION

SCALE: NTS



ASPHALT PARKING LOT SECTION

SCALE: NTS

CITY OF ATLANTA, GEORGIA

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DOA CIVIL STANDARD DETAILS

Typical Pavement Sections - Parking

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-101	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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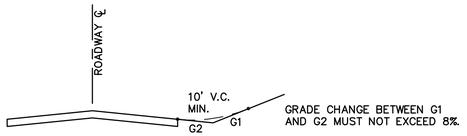
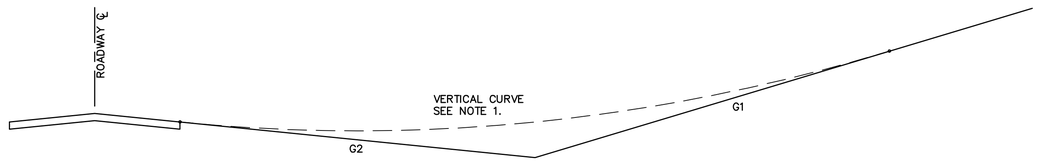


DRIVEWAY INTERSECTING ROADWAY



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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DOA CIVIL STANDARD DETAILS

Grade Break Standard

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-105	APPROVED BY: STAFF
	DATE: .
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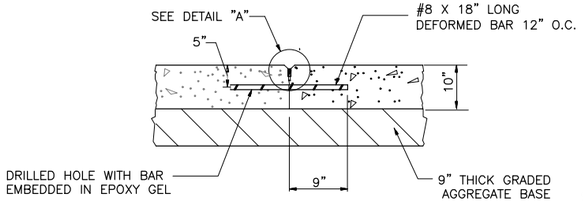
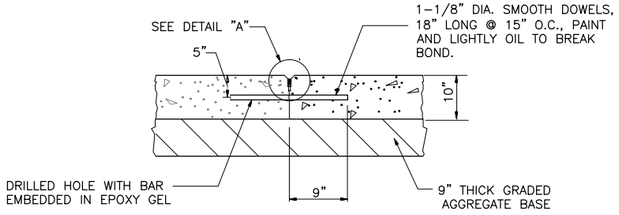


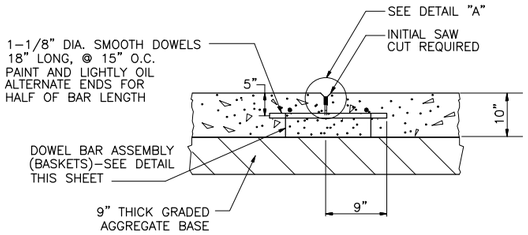
DEFORMED DOWEL LONGITUDINAL CONSTRUCTION JOINT

N.T.S.



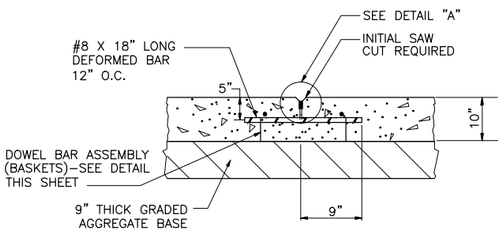
SMOOTH DOWEL LONGITUDINAL CONSTRUCTION JOINT

N.T.S.



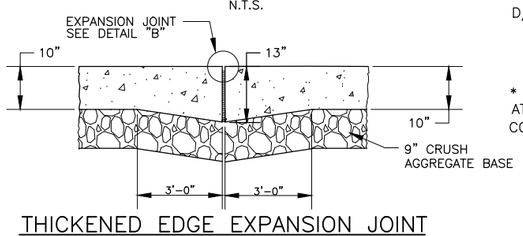
SMOOTH DOWEL TRANSVERSE CONTRACTION JOINT

N.T.S.



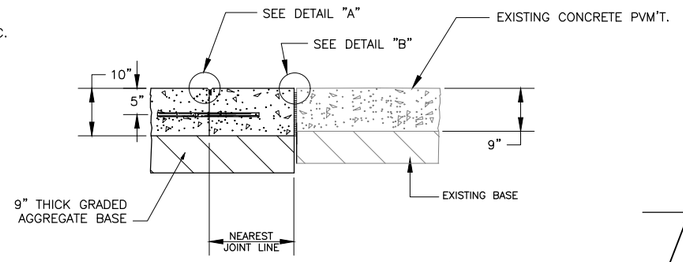
DEFORMED DOWEL TRANSVERSE CONTRACTION JOINT

N.T.S.



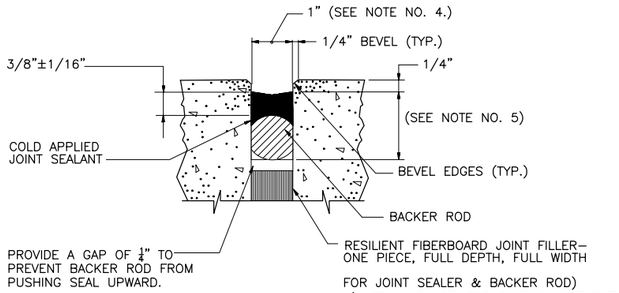
THICKENED EDGE EXPANSION JOINT

N.T.S.



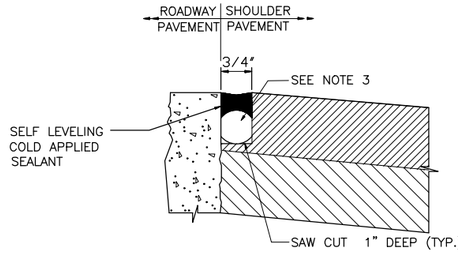
EXPANSION JOINT AT EXISTING 9" PAVEMENT

N.T.S.



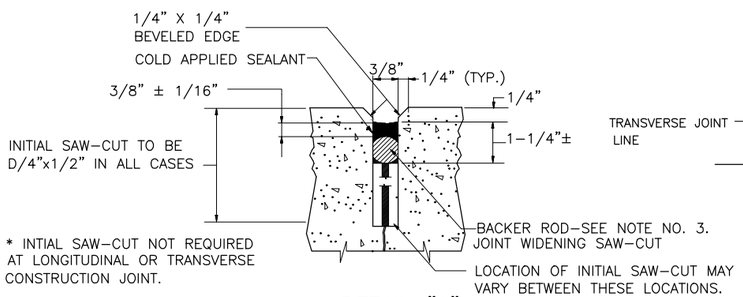
EXPANSION JOINT SEAL DETAIL "B"

N.T.S.



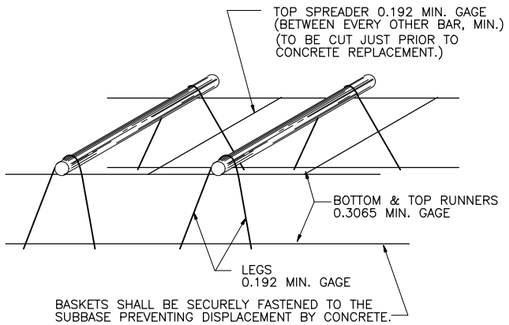
ASPHALT/PCC PAVEMENT JOINT

N.T.S.



DETAIL "A" LONGITUDINAL AND TRANSVERSE JOINT SEAL

N.T.S.

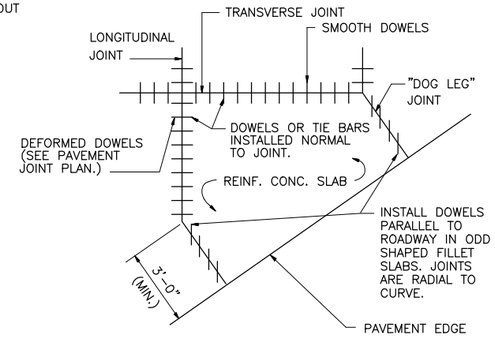


TYPICAL DOWEL BAR BASKET

N.T.S.

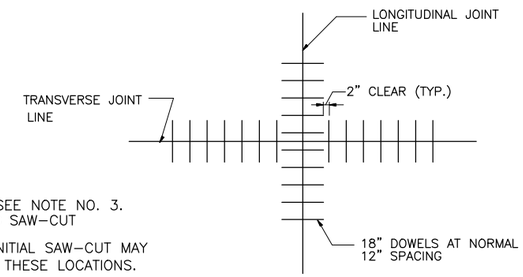
NOTES:

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 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.

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

DOA CIVIL STANDARD DETAILS

NO.	DATE	BY	REVISION
2	8/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

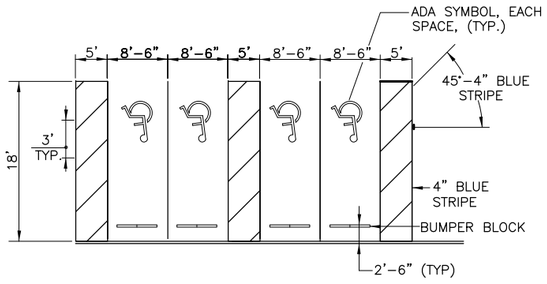
DOA CIVIL STANDARD DETAILS

Joints - NLVR or Landside Roads

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-200	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

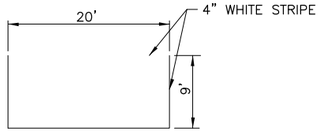
NOT RELEASED FOR CONSTRUCTION

q:\facilities\engineering\j rone\std-02-200 joints - nlvr or landside roads.dwg



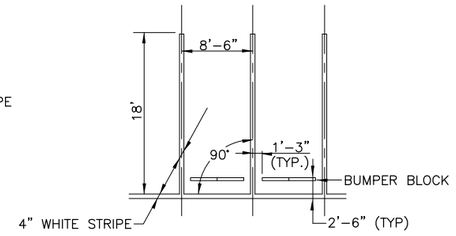
ADA PARKING SPACES

SCALE: N.T.S.



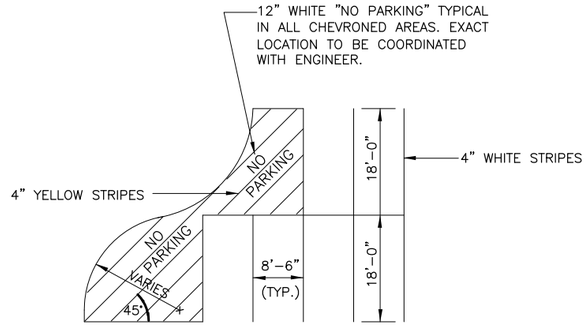
PARALLEL PARKING SPACES

SCALE: N.T.S.



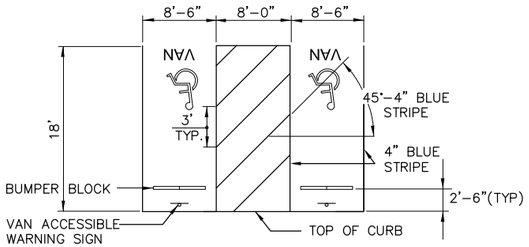
90° PARKING SPACES

SCALE: N.T.S.



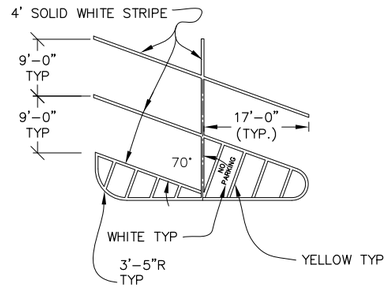
NO PARKING AREA DETAIL

SCALE: N.T.S.



ADA VAN PARKING SPACES

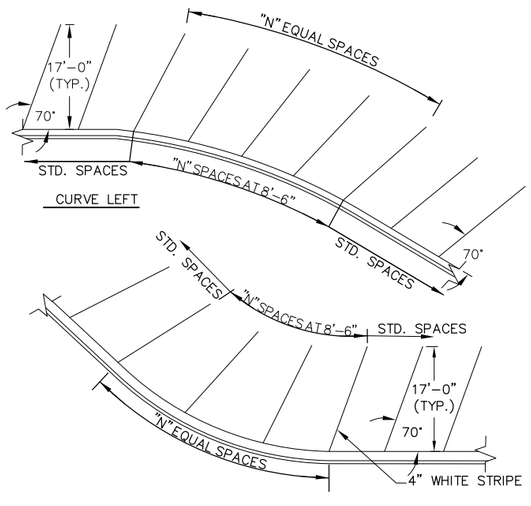
SCALE: N.T.S.



TYPICAL 70° PARKING SPACES

SCALE: N.T.S.

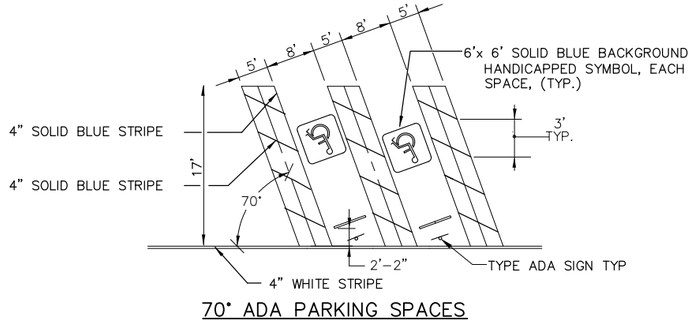
NOTE: 12" MESSAGE "NO PARKING" TYPICAL ALL CHEVRONED AREAS. EXACT LOCATION TO BE COORDINATED WITH THE ENGR.



PARKING SPACES ALONG CURVES

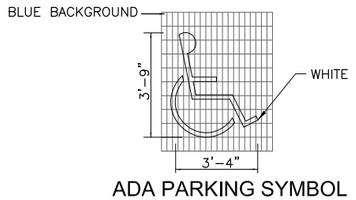
NOTE: "N" DENOTES NUMBER OF SPACES IN CURVE, SEE STRIPING AND MARKING PLANS FOR LOCATIONS.

SCALE: N.T.S.



70° ADA PARKING SPACES

SCALE: N.T.S.

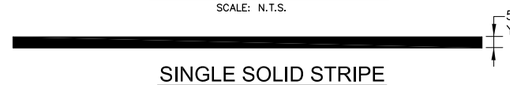


ADA PARKING SYMBOL

SCALE: N.T.S.

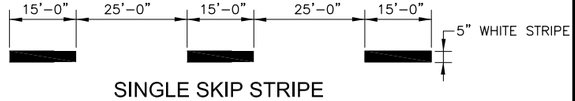
DOUBLE SOLID STRIPE

SCALE: N.T.S.



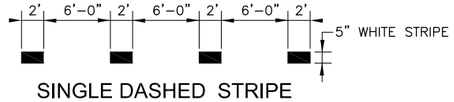
SINGLE SOLID STRIPE

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

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

DOA CIVIL STANDARD DETAILS

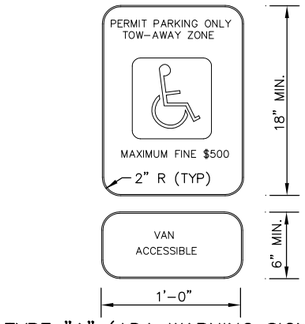
Landside Striping and Marking Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-300	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

g:\facilities\engineering\design standards\drawings\std-02-300 landside striping and marking details.dwg



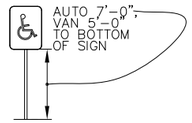
TYPE "A" (ADA WARNING SIGN)
N.T.S.

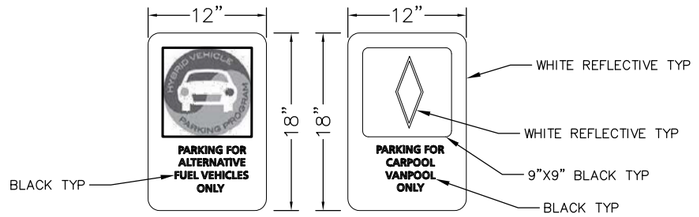
1. SIGNAGE. ACCESSIBLE PARKING SPACES SHALL BE DESIGNATED AS RESERVED BY A SIGN COMPLYING WITH AMERICAN DISABILITY ACT (ADA) RULE 120-3-20.41(7) AND THE FOLLOWING:

   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

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PLANNING & DEVELOPMENT

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0	06/20/2014	RFM	FIRST ISSUE

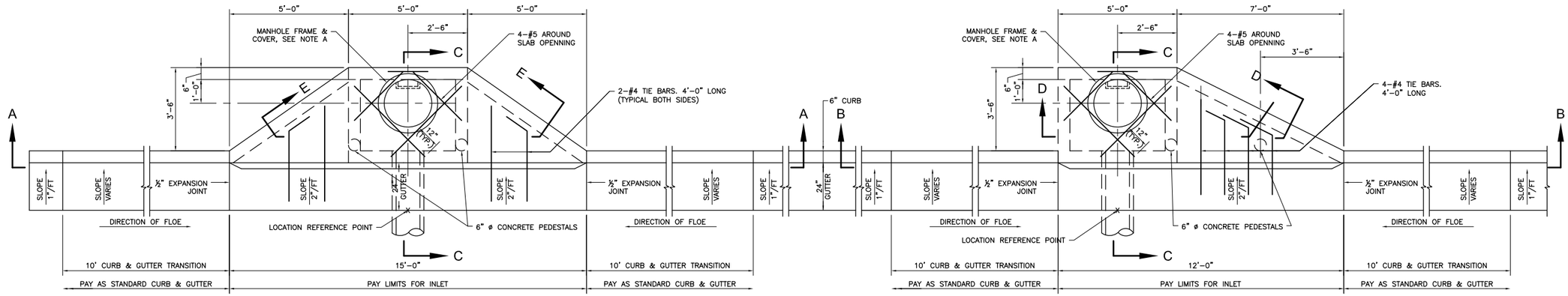
DOA CIVIL STANDARD DETAILS

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: .

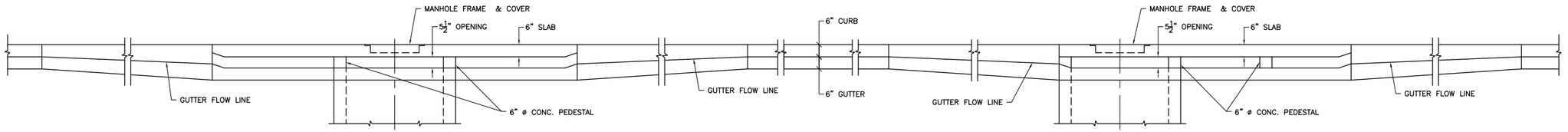
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



PLAN
DOUBLE WING CATCH BASIN TYPE A2
SCALE: N.T.S.

PLAN
SINGLE WING CATCH BASIN TYPE A1
SCALE: N.T.S.



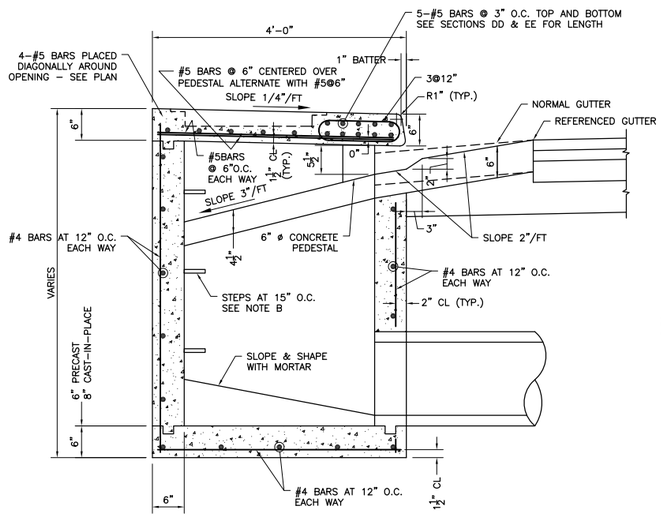
SECTION A-A
SCALE: N.T.S.

SECTION B-B
SCALE: N.T.S.

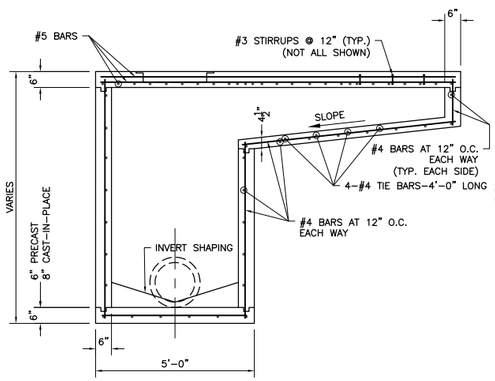
NOTES:

A. MANHOLE FRAME AND COVER TO BE BARRY PATTERN B-1650-F OR APPROVED EQUAL.

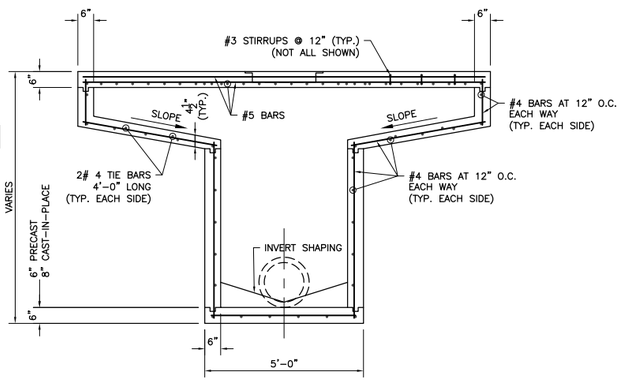
B. STEPS SHALL BE NEENAH PATTERN R-1980-C OR APPROVED EQUAL.



SECTION C-C
SCALE: N.T.S.



SECTION D-D
SCALE: N.T.S.



SECTION E-E
SCALE: N.T.S.

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

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

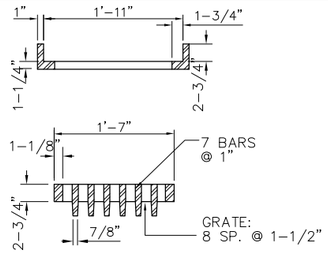
DOA CIVIL STANDARD DETAILS

DOA CIVIL STANDARD DETAILS

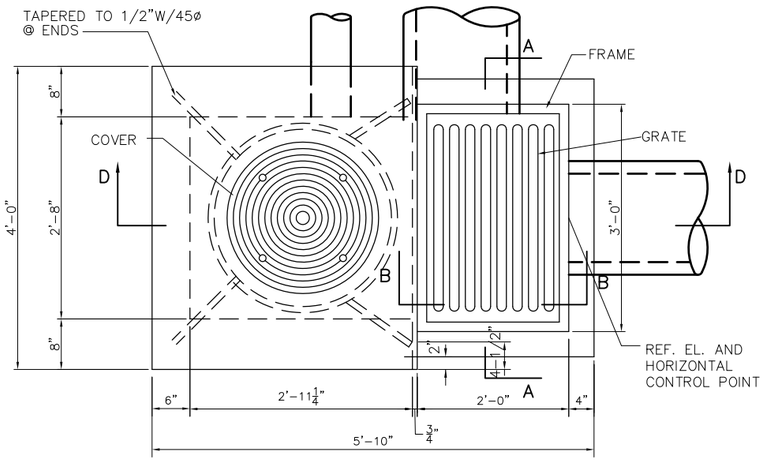
Landside Drainage-1

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-500	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

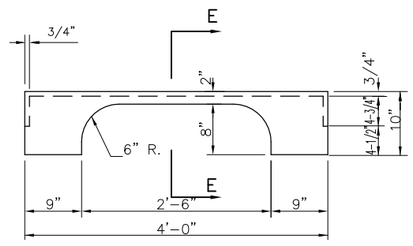
NOT RELEASED FOR CONSTRUCTION



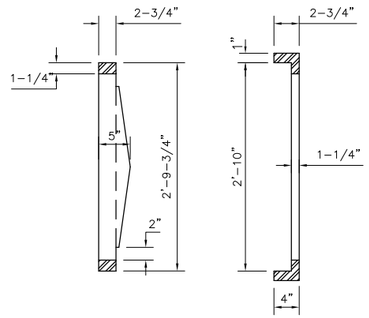
SECTION B–B
1" = 1'-0"



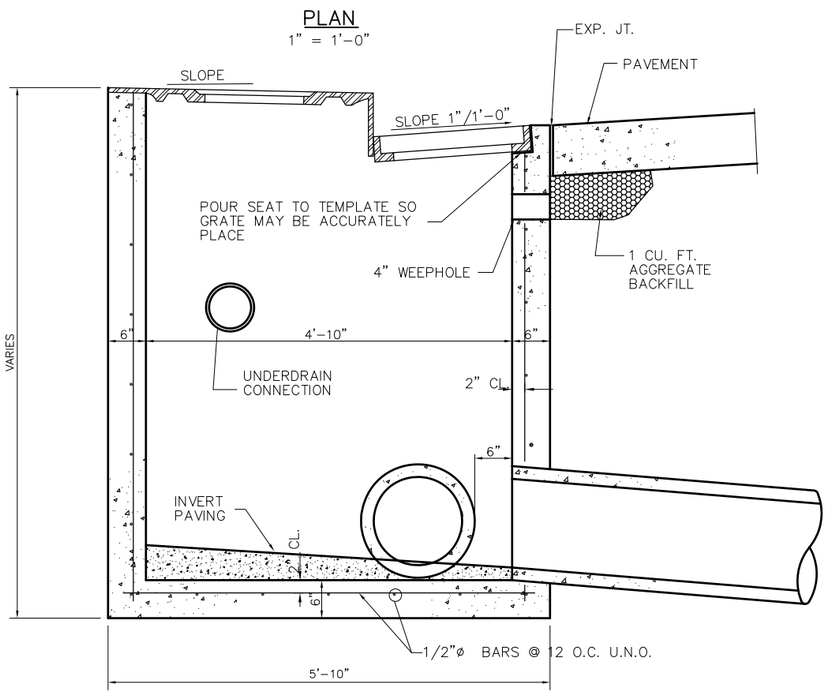
PLAN
1" = 1'-0"



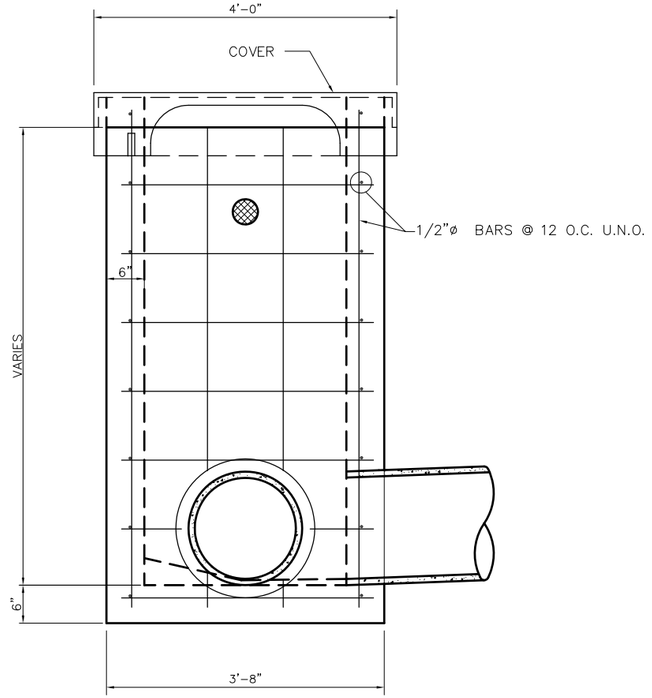
FRAME & COVER
1" =1'-0"



SECTION A–A
1" = 1'-0"



SECTION D–D
1" = 1'-0"



FRONT ELEVATION
1" = 1'-0"

CURB INLET, TYPE "A"

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION
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0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

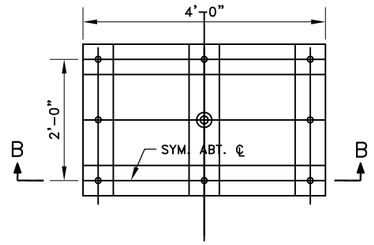
Landside Drainage-2

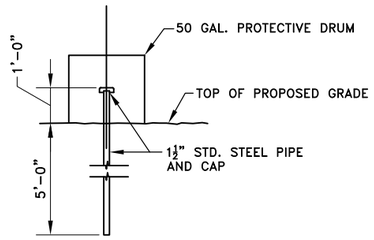
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-02-501	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

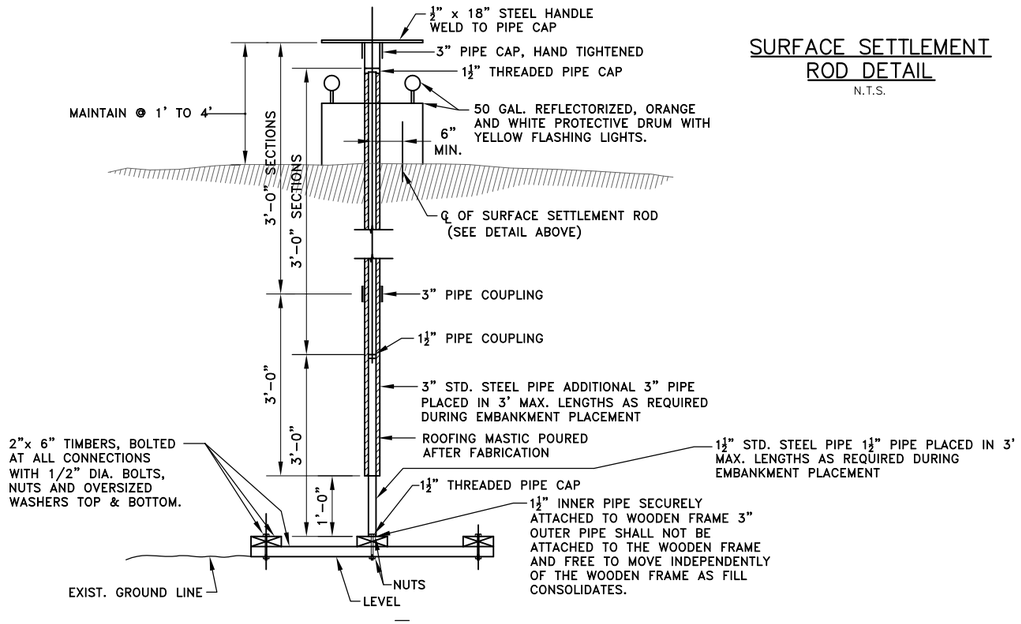
NOT RELEASED FOR CONSTRUCTION

a:\facilities\engineering\design standards\drawings\std-02-501 landside drainage-2.dwg





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.

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DOA CIVIL STANDARD DETAILS

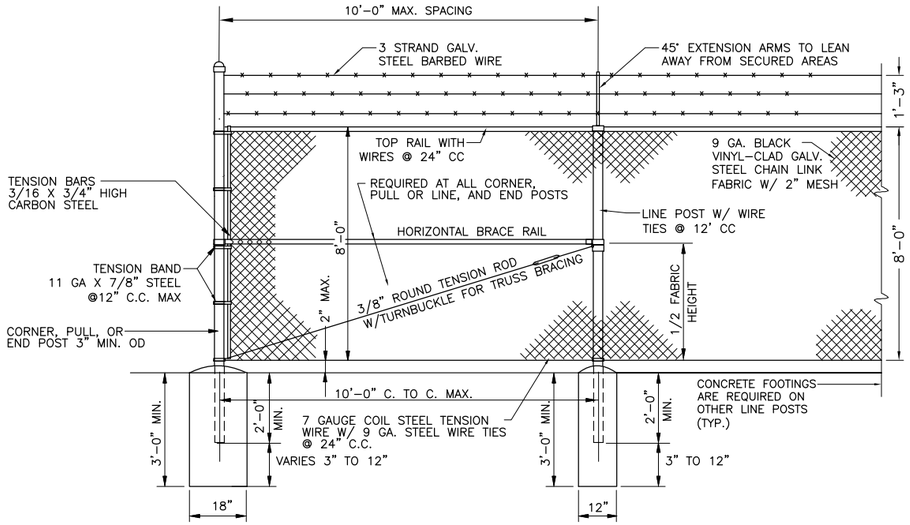
Settlement Platforms

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

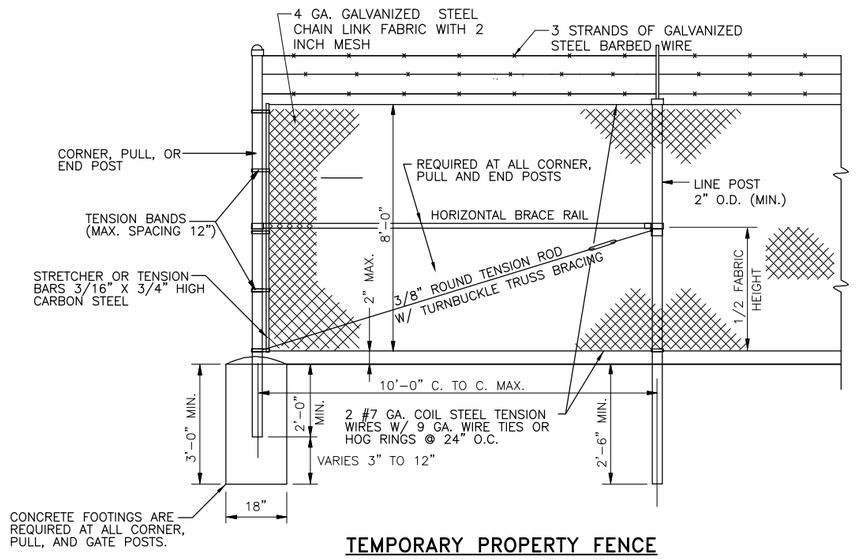
NOT RELEASED FOR CONSTRUCTION

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



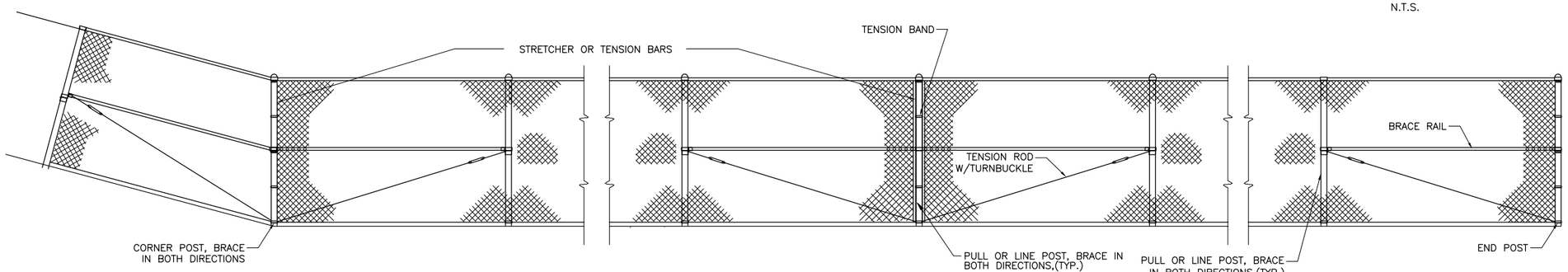
PROPERTY FENCE

N.T.S.



TEMPORARY PROPERTY FENCE

N.T.S.

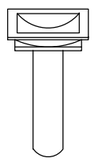


METHOD OF BRACING END, CORNER, AND PULL POST ON GRADE AND BARRIER

N.T.S.

LATCH FORK

LOCK KEEPER GUIDE

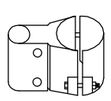


CATCH FOR PLUNGER BAR

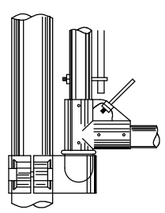
SOLID LATCH FORK

FORK CATCH

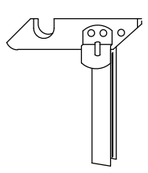
LOCK KEEPER GUIDE



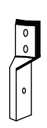
UPPER HINGE



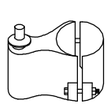
BOTTOM CORNER AND HINGE



STOP



LOCK KEEPER



BOTTOM HINGE

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.

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0	06/20/2014	RFM	FIRST ISSUE

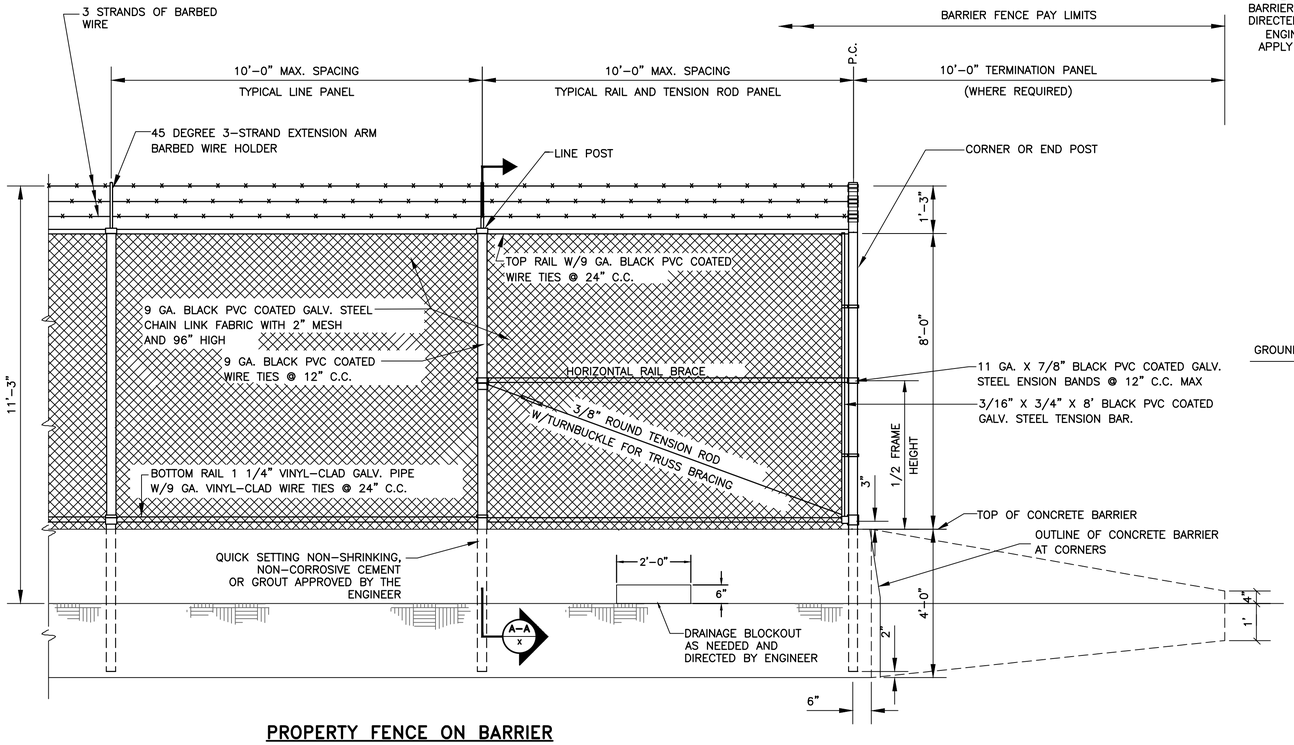
DOA CIVIL STANDARD DETAILS

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: .

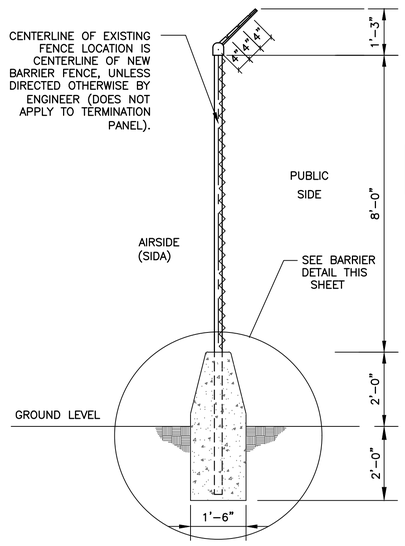
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



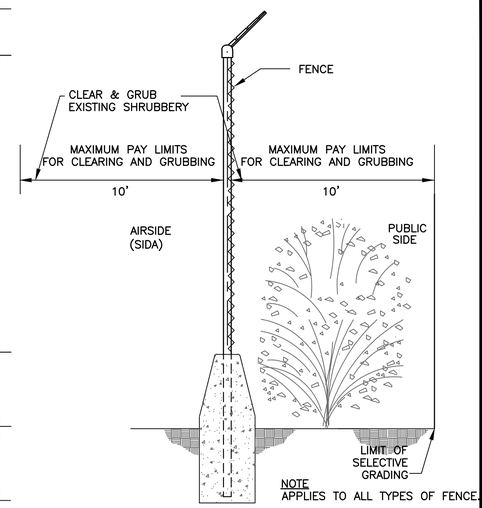
PROPERTY FENCE ON BARRIER

N.T.S.



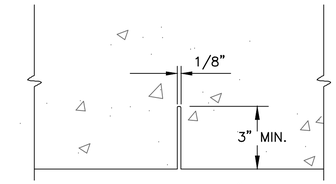
TYPICAL SECTION A-A

N.T.S.



CLEAR LIMITS

N.T.S.



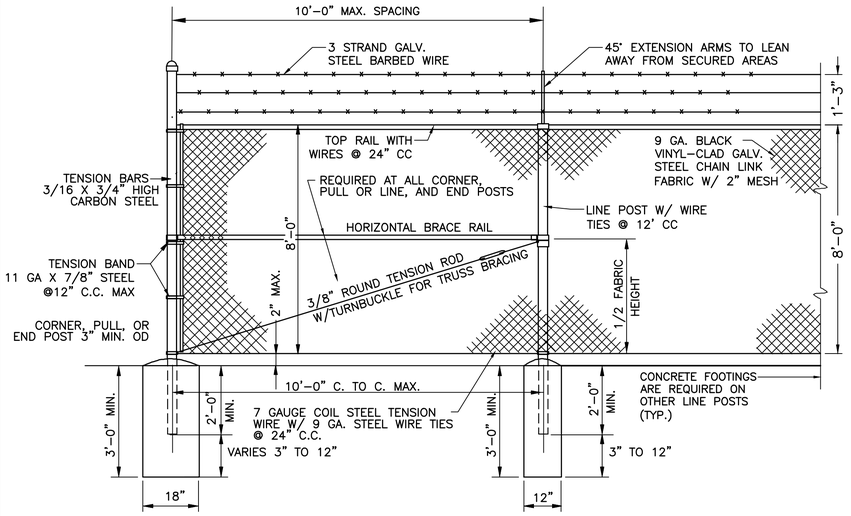
JOINT MAY BE FORMED WITH 1/8" HARDBOARD RETAINED IN JOINT AND CUT BACK TO FACE OF CONCRETE.

BARRIER CONTRACTION JOINT

N.T.S.

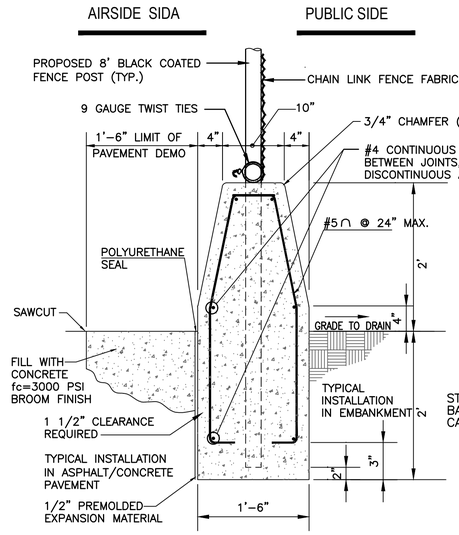
1. CONTRACTION JOINTS SHALL BE PROVIDED AT 20 FOOT INTERVALS. THEY MAY BE FORMED WITH WASTEABLE OR REMOVABLE MATERIAL

2. CONTRACTOR MAY SUBMIT ALTERNATIVE JOINT DETAILS FOR ENGINEER'S APPROVAL.



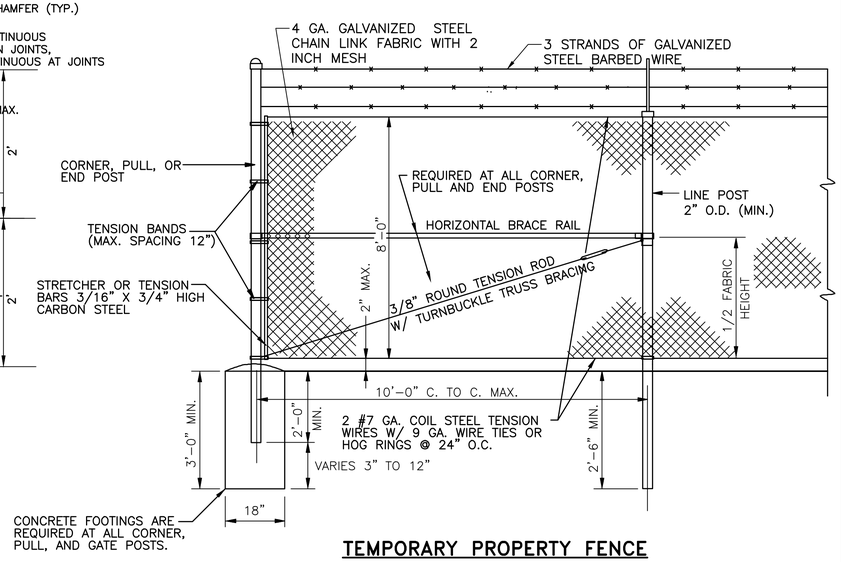
PROPERTY FENCE

N.T.S.



BARRIER WALL DETAIL

N.T.S.



TEMPORARY PROPERTY FENCE

N.T.S.

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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
2	07/2020	RFM	REVISED
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

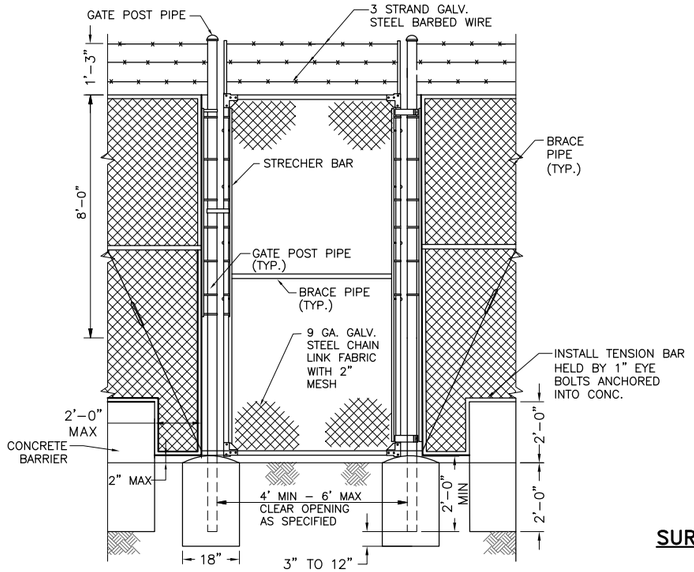
DOA CIVIL STANDARD DETAILS

Chain Link Fences - 2

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-201	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

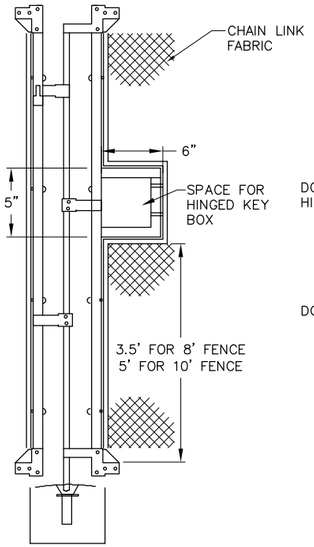
NOT RELEASED FOR CONSTRUCTION

DOA CIVIL STANDARD DETAILS



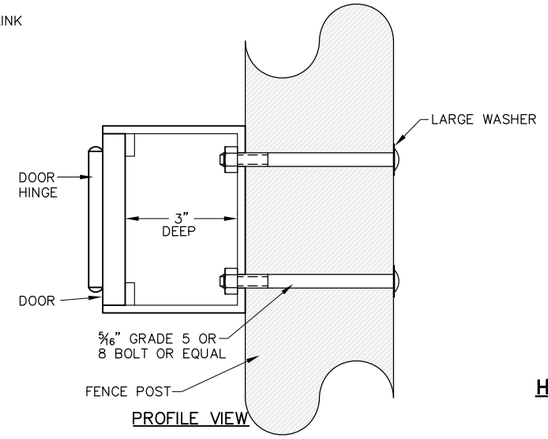
PROPERTY SINGLE SWING GATE WITH BARRIER

N.T.S.



HINGED KEY BOX SURFACE MOUNT FOR GATES

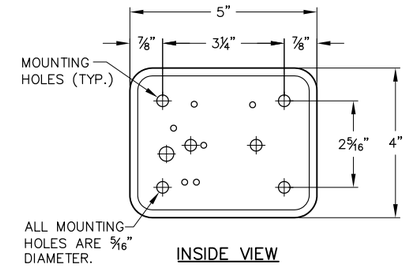
N.T.S.



PROFILE VIEW

HINGED DOOR SURFACE MOUNTED KEY BOX

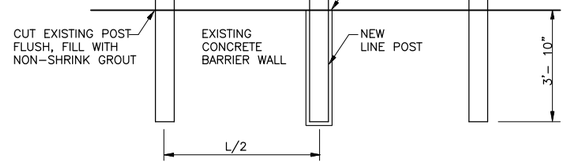
N.T.S.



INSIDE VIEW

HINGED KEY BOX SURFACE MOUNT INSIDE VIEW

N.T.S.



FENCE INSTALLATION ON EXISTING CONCRETE BARRIER

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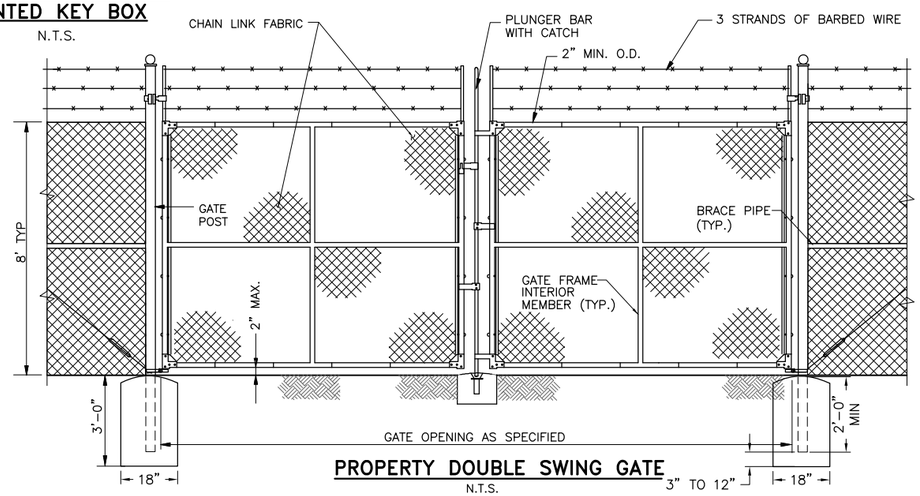
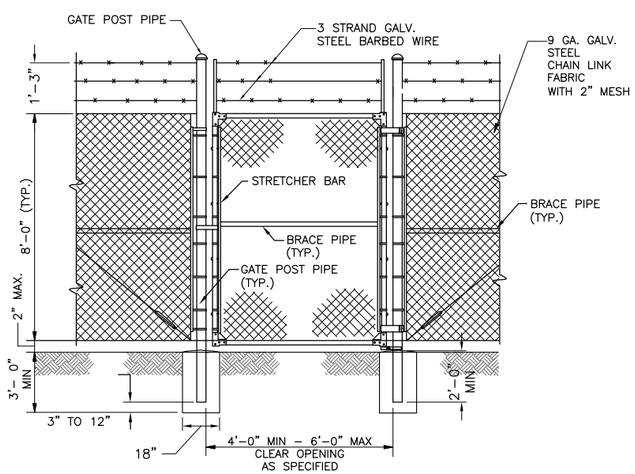


PROPERTY DOUBLE SWING GATE

N.T.S.



PROPERTY SINGLE SWING GATE

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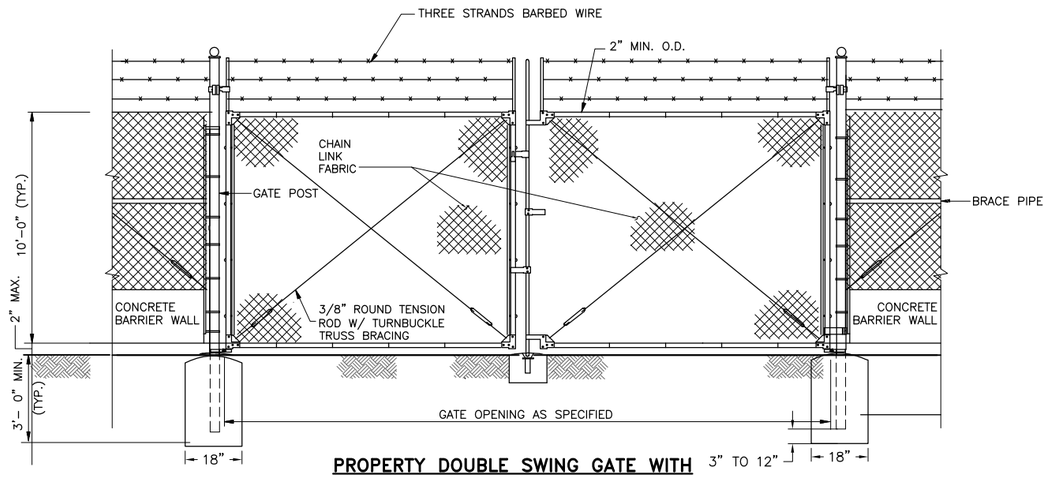

PROPERTY DOUBLE SWING GATE WITH BARRIER WALL

N.T.S.

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NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD-03-200.

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

DOA CIVIL STANDARD DETAILS

Chain Link Fences - 3

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-202	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

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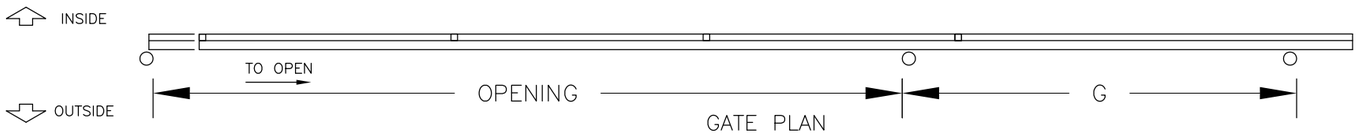
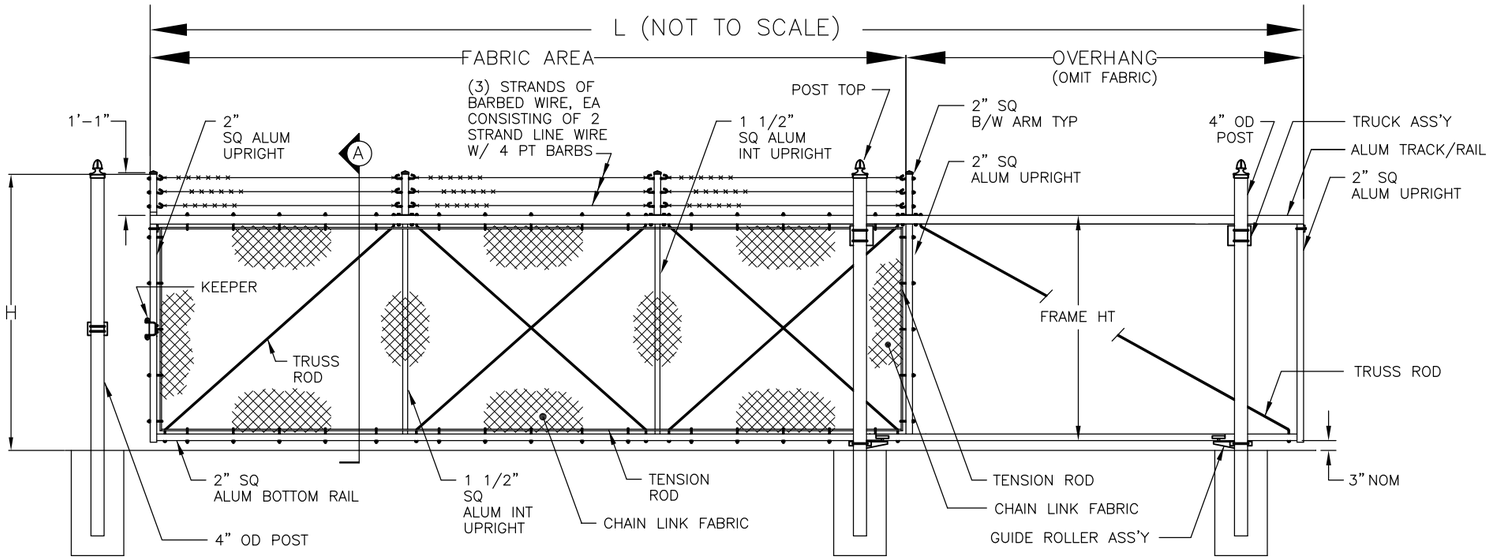
POST TOP OPTIONS	
STANDARD	DOMED
	

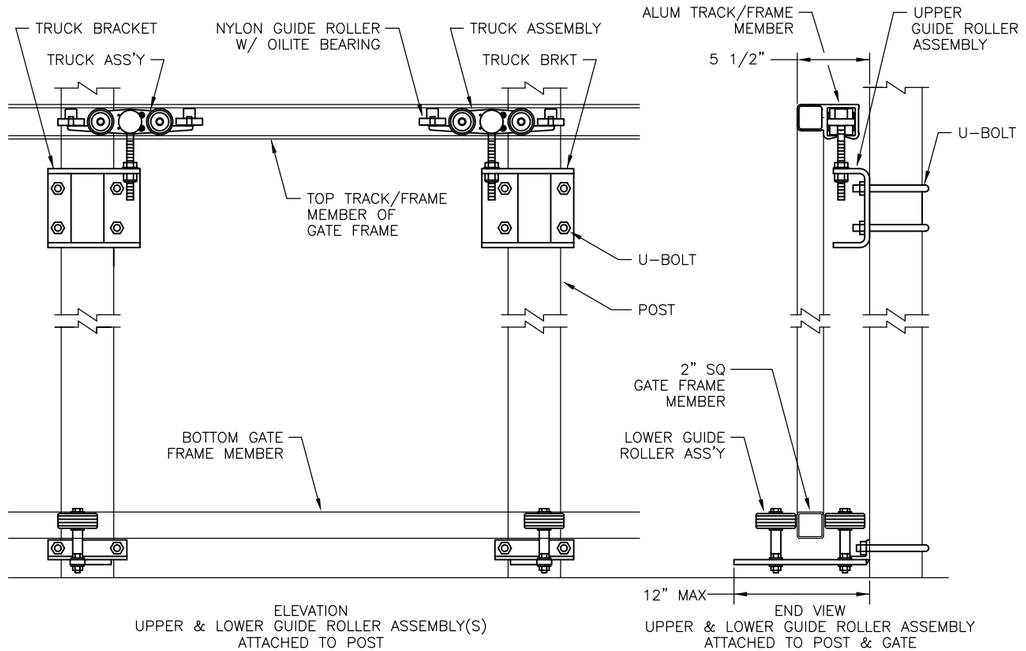


GATE PLAN



NOM HEIGHT (H)
7'-0" (6'+1')
8'-0" (7'+1')
9'-0" (8'+1')

OPENING
6'-0" THROUGH 22'-0"



ELEVATION
UPPER & LOWER GUIDE ROLLER ASSEMBLY(S) ATTACHED TO POST

END VIEW
UPPER & LOWER GUIDE ROLLER ASSEMBLY ATTACHED TO POST & GATE

CANTILEVERED SLIDING GATE
DETAILS

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

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DOA CIVIL STANDARD DETAILS

Chain Link Fences - 4

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-203	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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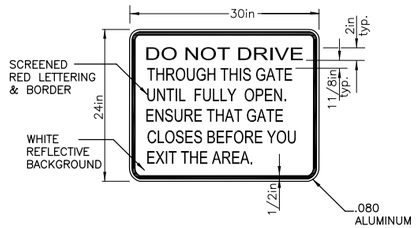
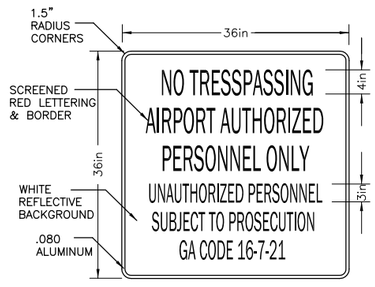
SIDA DANGER SIGN DETAIL

SIGN TO BE PLACED APPROX. 10' FROM SIDA WARNING SIGN WHICH IS PLACED EVERY 200 FEET.

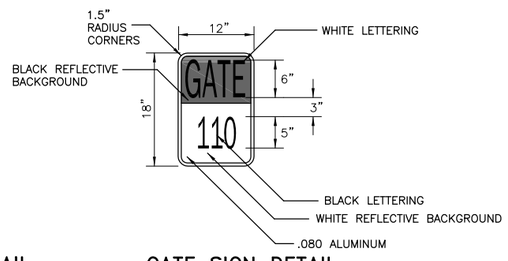


AUTOMATIC SIDA GATE WARNING SIGN DETAIL



SIDA FENCE WARNING SIGN DETAIL

NOTE: TO BE PLACED EVERY 200 FEET ON SIDA ADJACENT FENCING.



GATE SIGN DETAIL

CITY OF ATLANTA, GEORGIA

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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

Chain Link Fence - Signage

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-204	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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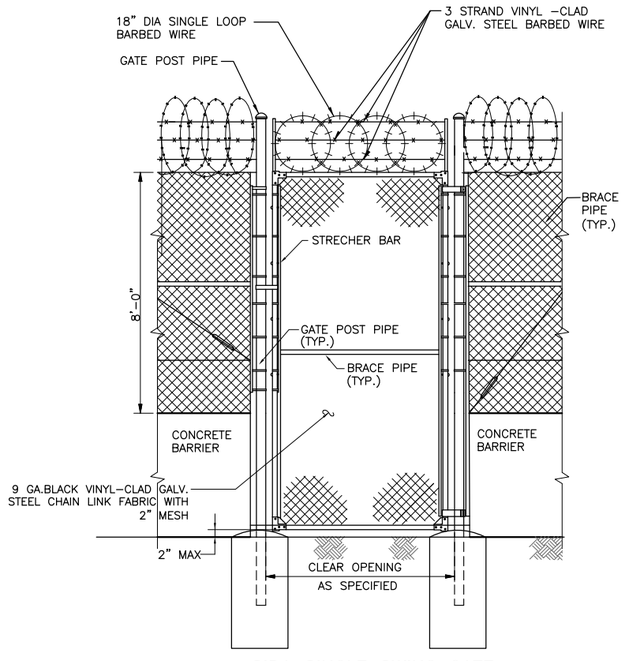
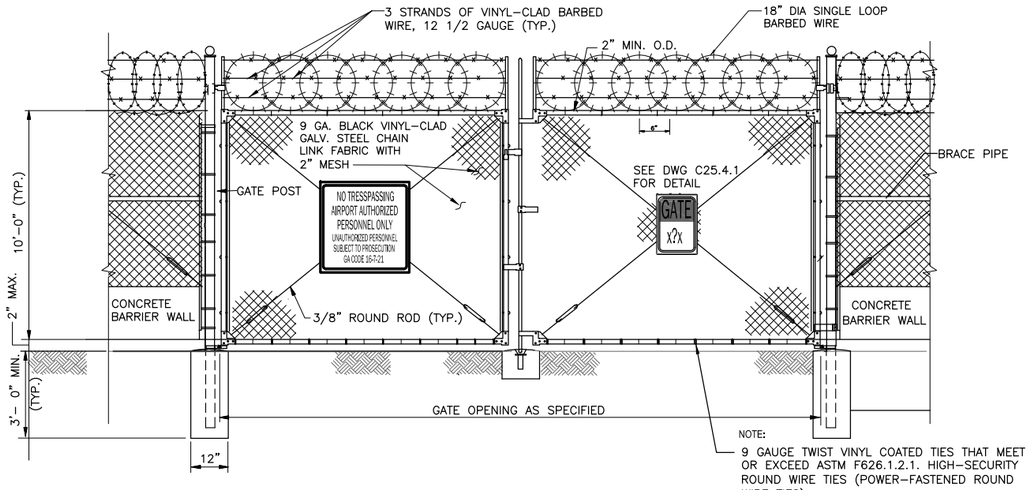


SIDA SINGLE SWING GATE WITH BARRIER

N.T.S.



SIDA DOUBLE SWING GATE WITH BARRIER

N.T.S.

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PLANNING & DEVELOPMENT

NOTE TO DESIGNER: ALL FENCING DETAILS SHALL INCLUDE OR REFERENCE FENCING NOTES ON STD–03–200.

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

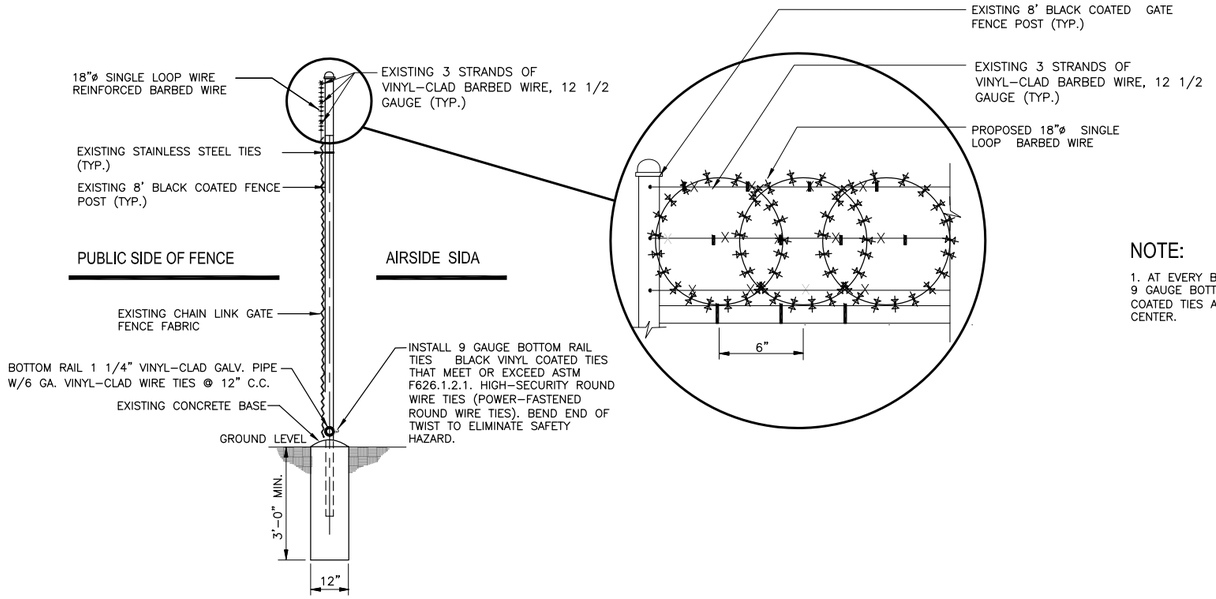
DOA CIVIL STANDARD DETAILS

Chain Link Fences - 6

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-206	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

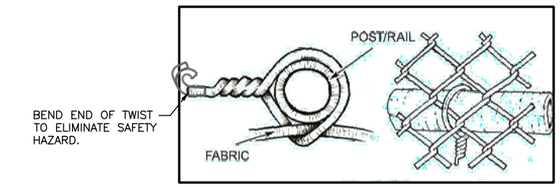
NOT RELEASED FOR CONSTRUCTION



TYPICAL SECTION SIDA SWING GATES POST

NOTE:

1. AT EVERY BOTTOM FENCE RAIL, INSTALL 9 GAUGE BOTTOM RAIL TIES BLACK VINYL COATED TIES AT 12" INCHES CENTER TO CENTER.



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).

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1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Chain Link Fences - 7

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-207	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

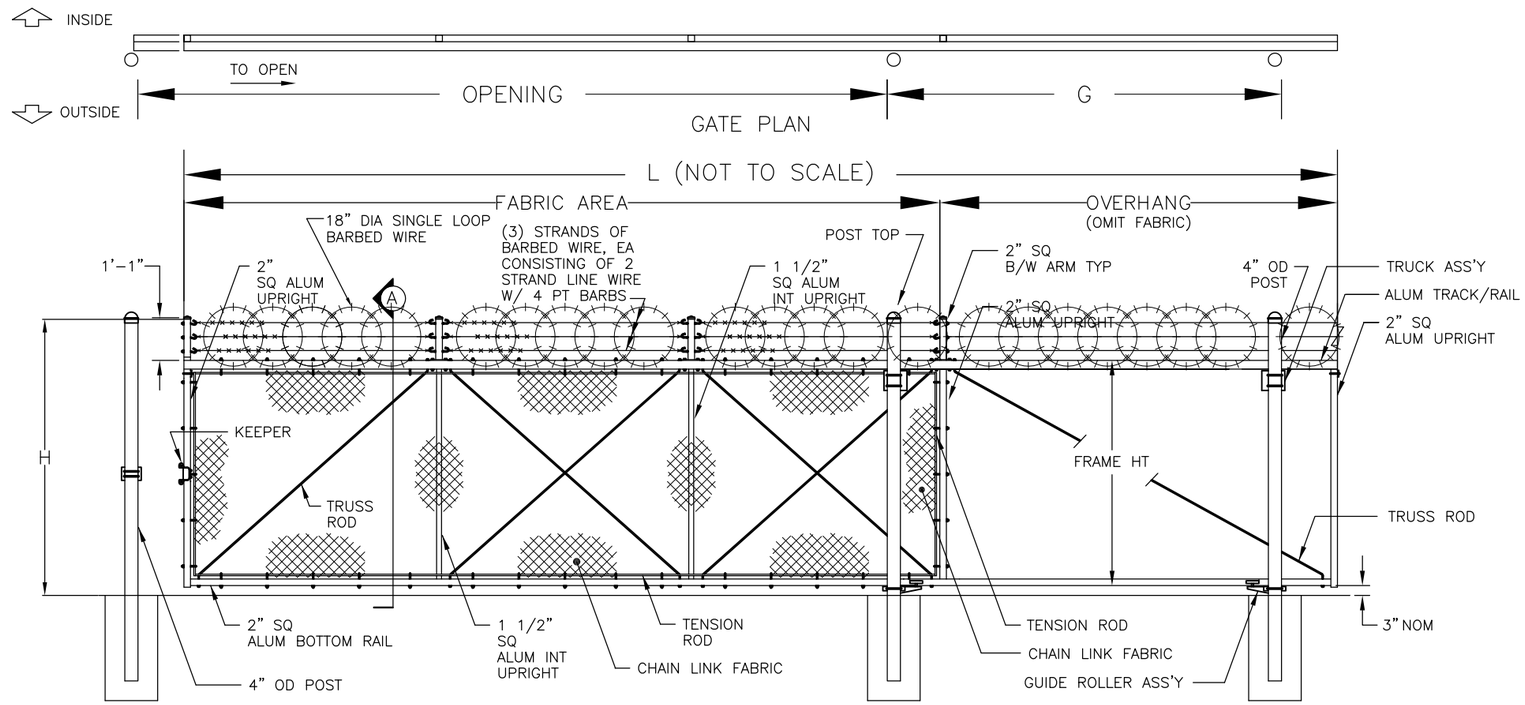
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

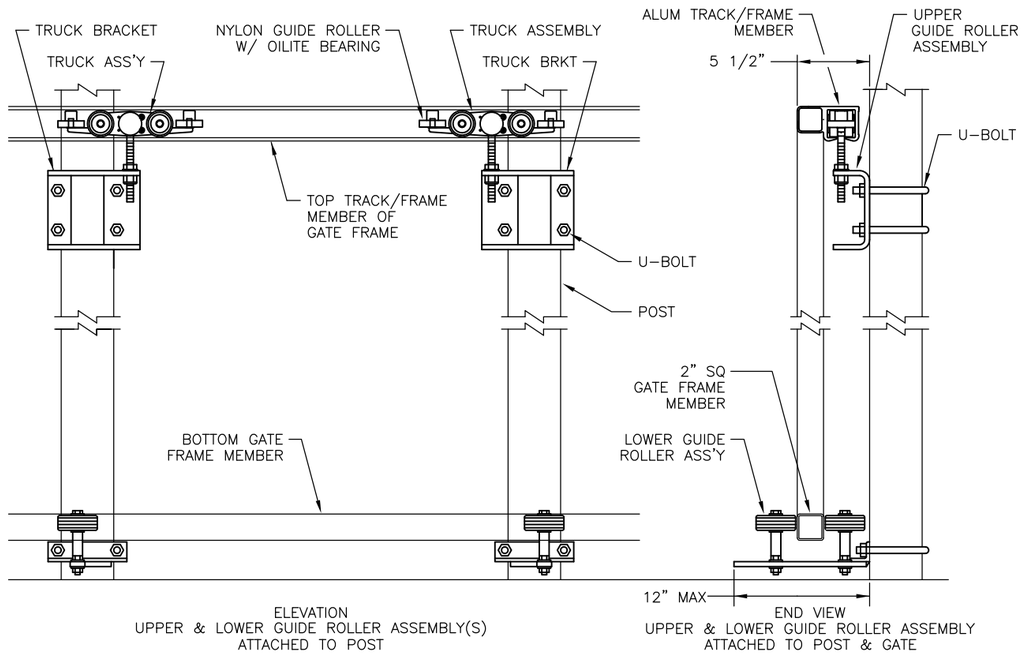
POST TOP
DOMED

NOM HEIGHT (H)
7'–0" (6'+1')
8'–0" (7'+1')
9'–0" (8'+1')

OPENING
6'–0" THROUGH 22'–0"



SINGLE CANTILEVERED SLIDING GATE
ROUND POSTS, W/ BARBED WIRE
N.T.S



CANTILEVERED SLIDING GATE
DETAILS

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.

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NO.	DATE	BY	REVISION

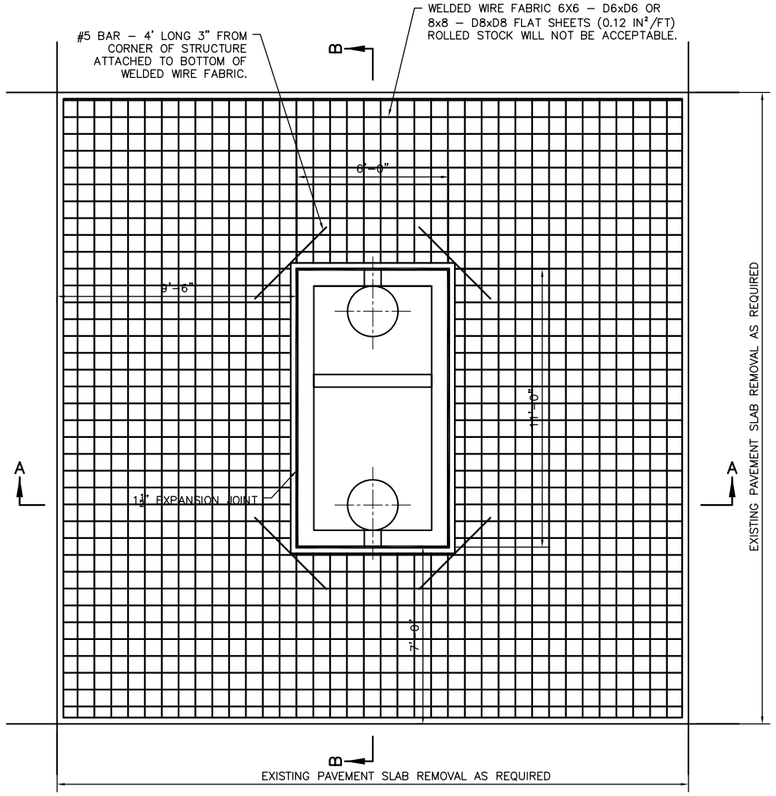
DOA CIVIL STANDARD DETAILS

Chain Link Fences - 8

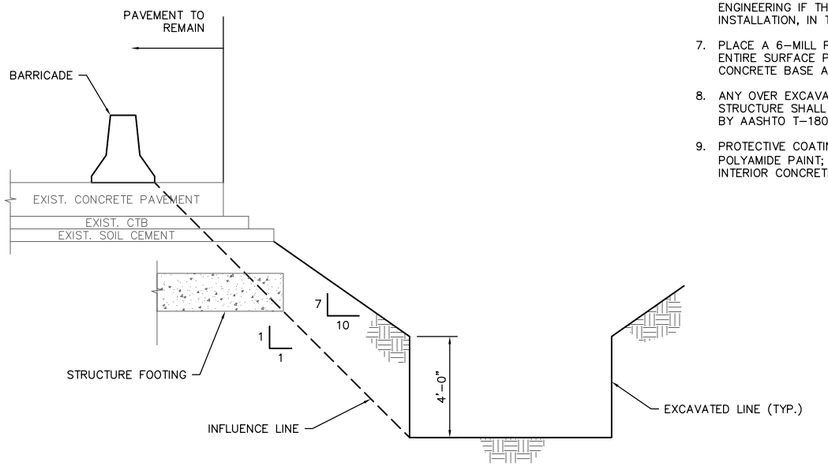
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-208	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

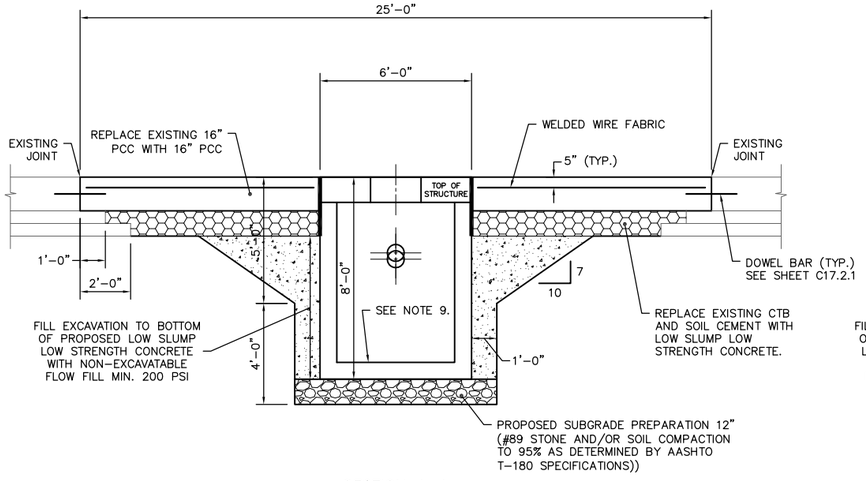
NOT RELEASED FOR CONSTRUCTION



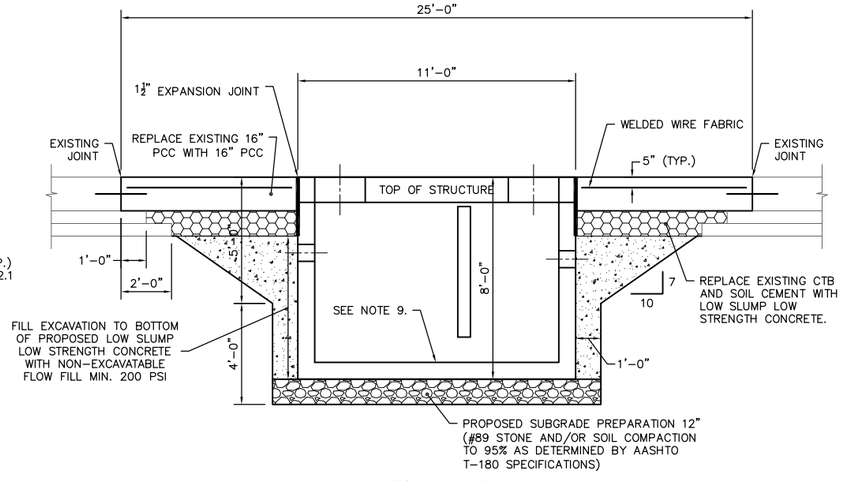
PLAN VIEW



TYPICAL EXCAVATION SECTION



SECTION A–A



SECTION B–B

1,500 GALLON CAPACITY GREASE INTERCEPTOR IN CENTER OF 25'x25' CONCRETE SLAB

N.T.S.

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 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 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 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.

CITY OF ATLANTA, GEORGIA

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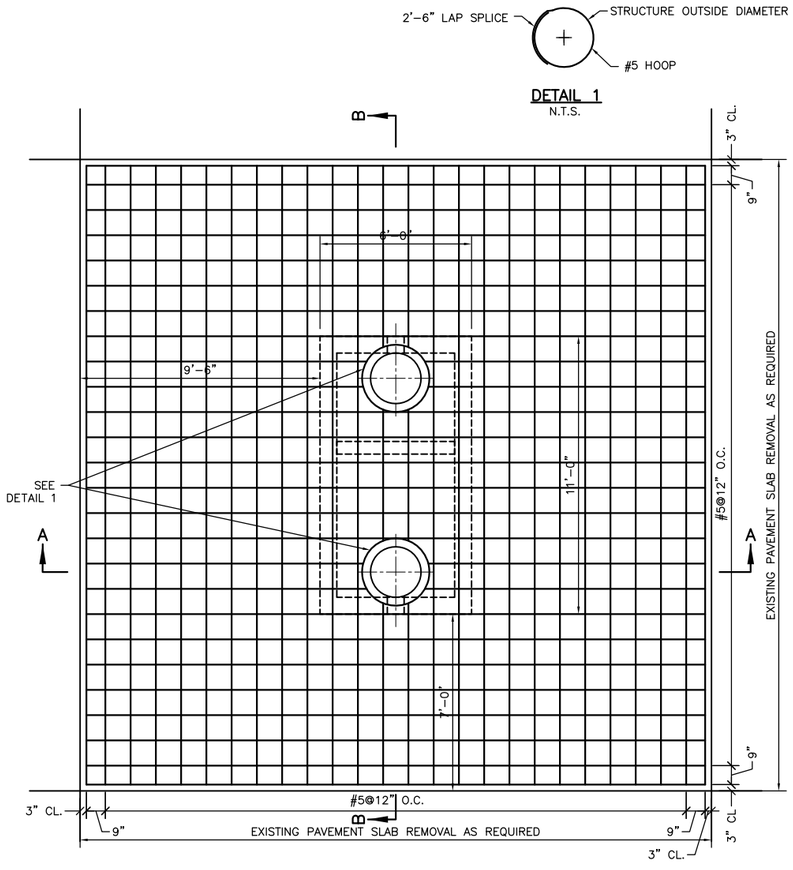
DOA CIVIL STANDARD DETAILS
Typical Grease Interceptor Installation
(Top Of Interceptor Flush With Pavement Surface, Designed For Tug Loading) - Case 1

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-03-300	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

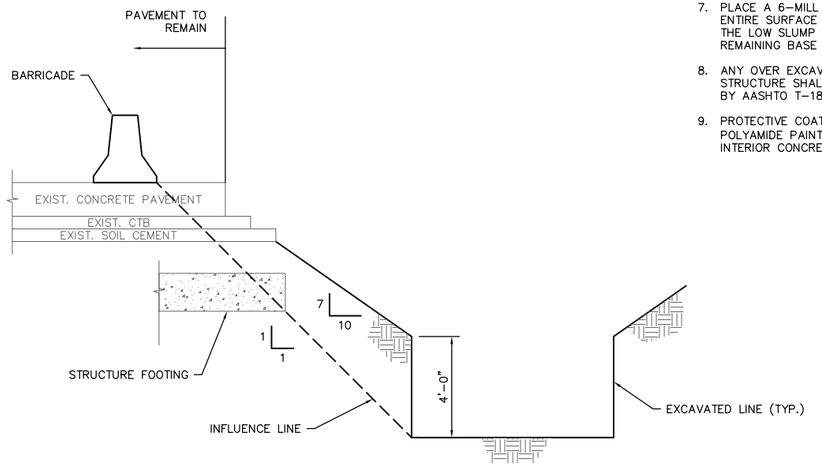
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

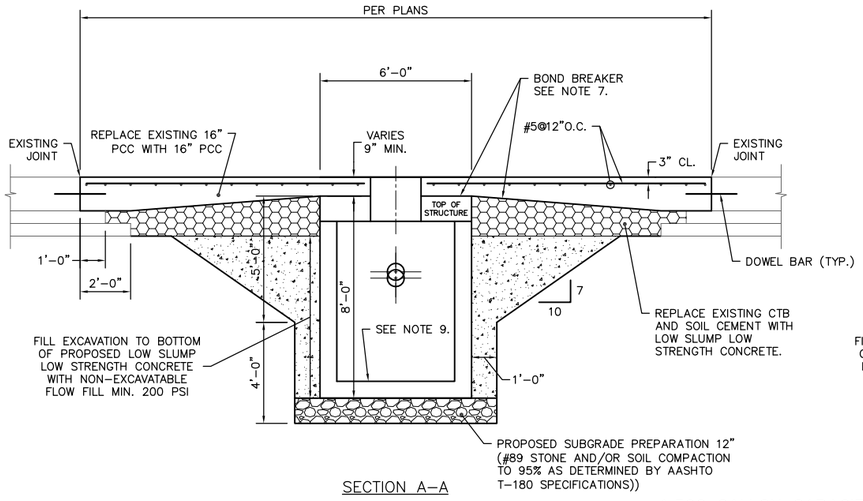


DETAIL 1
N.T.S.

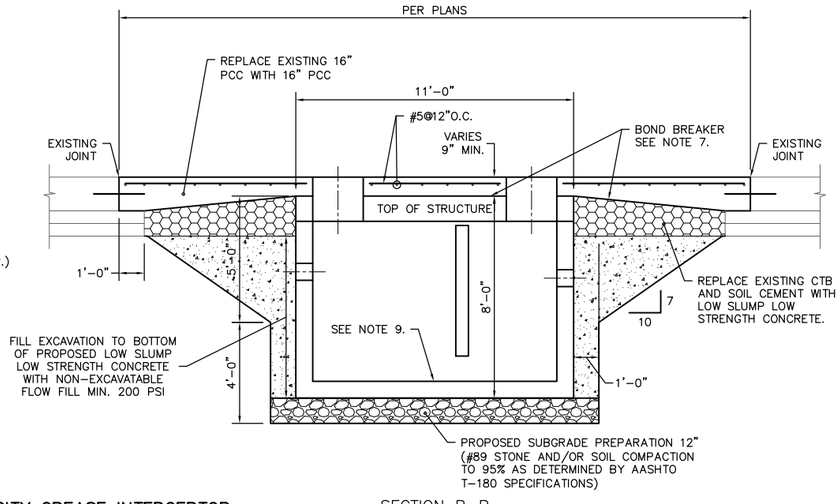
PLAN VIEW



TYPICAL GREASE INTERCEPTOR EXCAVATION SECTION



SECTION A-A



SECTION B-B

1,500 GALLON CAPACITY GREASE INTERCEPTOR IN 25'x25' CONCRETE SLAB

N.T.S.

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 FEET 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 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 25X25' 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.

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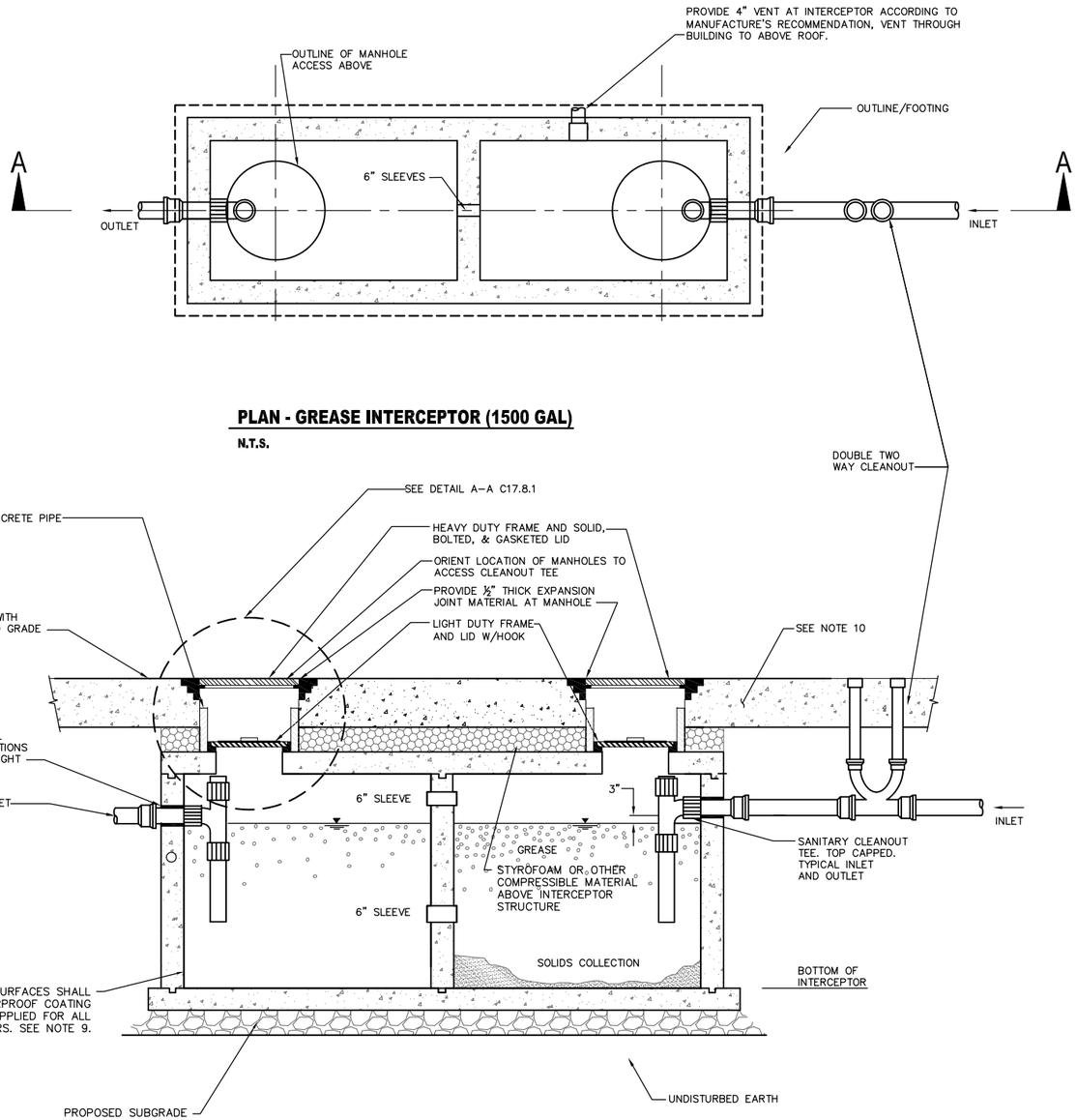
0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS
Typical Grease Interceptor Installation (Top Of Interceptor Below Pavement, Designed For Tug Loading) - Case 2

WBS NUMBER: .	DRAWN BY: STAFF
TC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-03-301	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



PLAN - GREASE INTERCEPTOR (1500 GAL)

N.T.S.

SECTION A-A - GREASE INTERCEPTOR (1500 GAL)

N.T.S.

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.

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0	06/20/2014	RFM	FIRST ISSUE

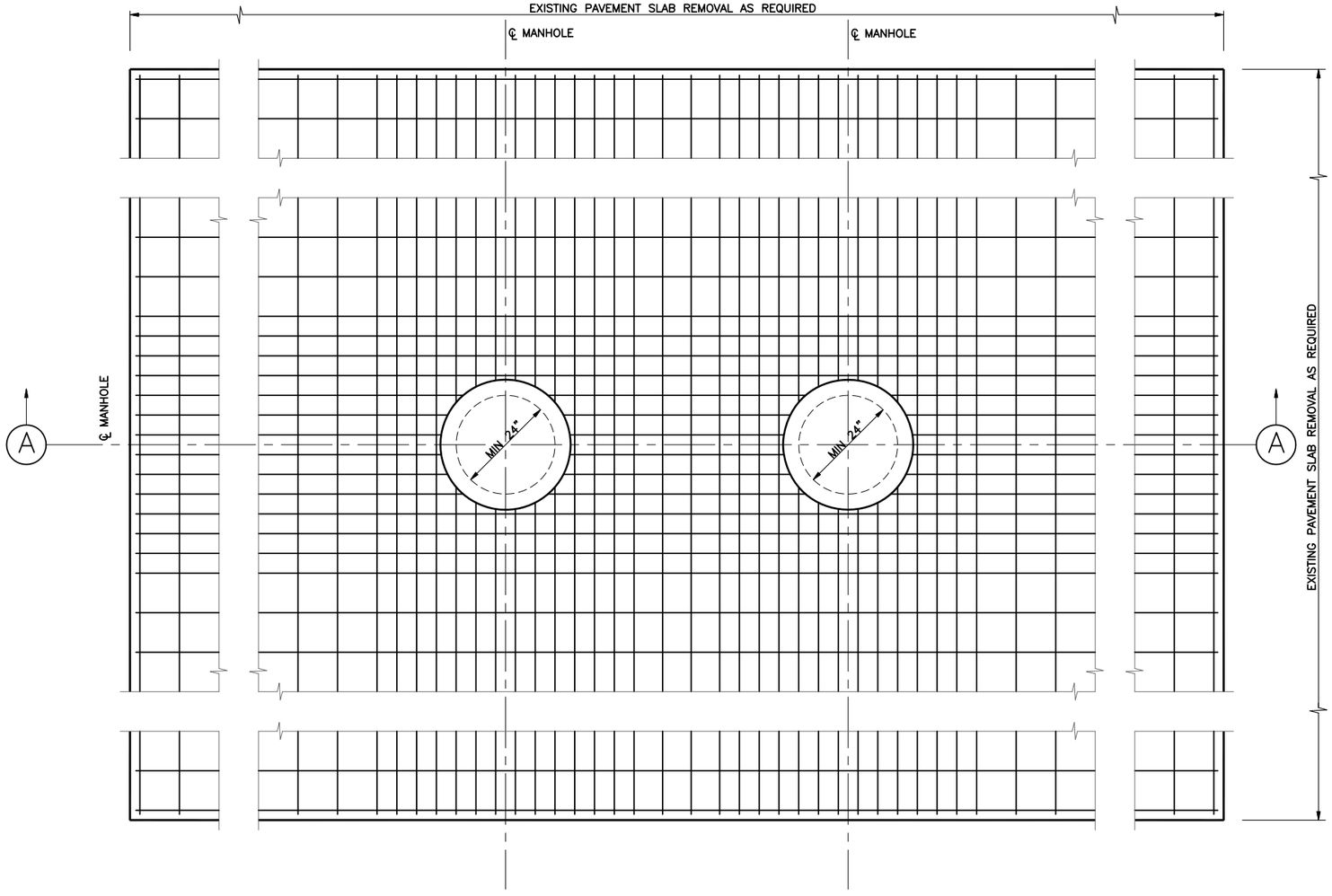
DOA CIVIL STANDARD DETAILS

Below Pavement Grease Interceptor Details (Interceptor Not Designed For Tug Loading) - Case 3

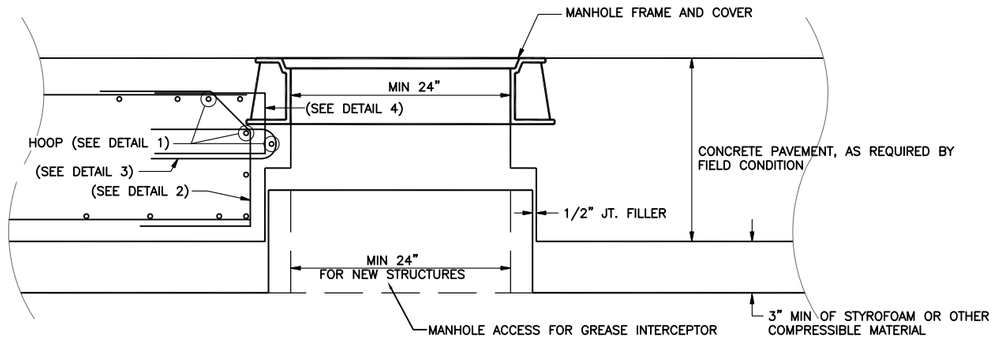
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER: STD-03-302	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

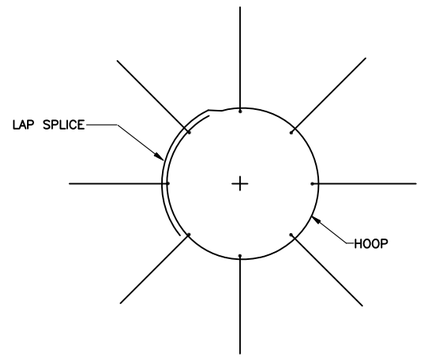
NOT RELEASED FOR CONSTRUCTION



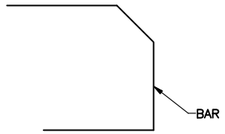
PLAN – PAVEMENT WITH GREASE INTERCEPTOR
N.T.S.



SECTION A–A
N.T.S.

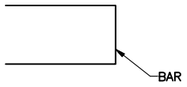


DETAIL 1
N.T.S.



DETAIL 2
N.T.S.

DETAIL 3
N.T.S.



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.

CITY OF ATLANTA, GEORGIA

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0	06/20/2014	RFM	FIRST ISSUE

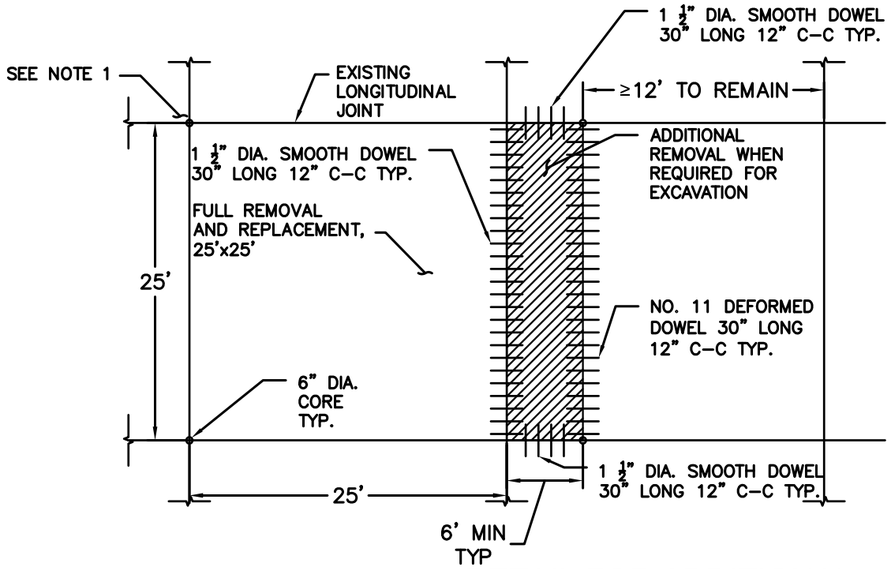
DOA CIVIL STANDARD DETAILS

Utility Slab Detail For Interceptor Below Pavement

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-303	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

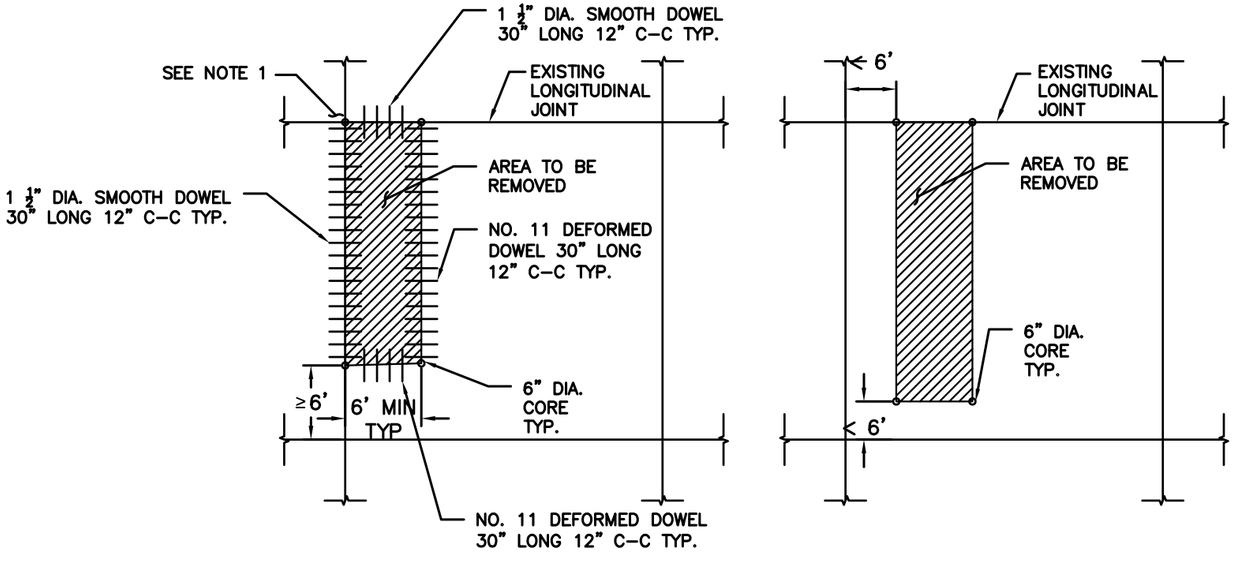
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



DETAIL FOR ADDITIONAL PAVEMENT REMOVAL

NTS



CASE 1
ACCEPTABLE

CASE 2
NOT ACCEPTABLE

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

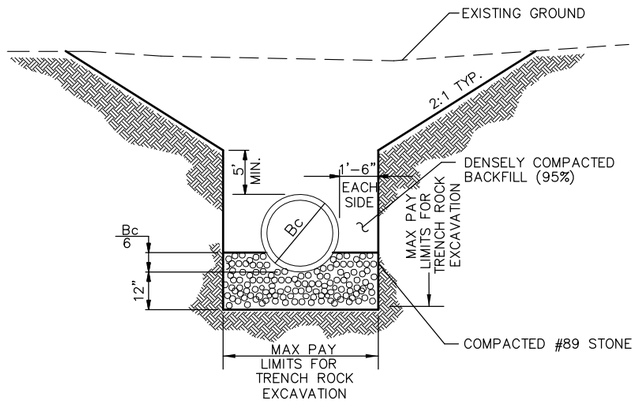
DOA CIVIL STANDARD DETAILS

Additional Pavement Removal

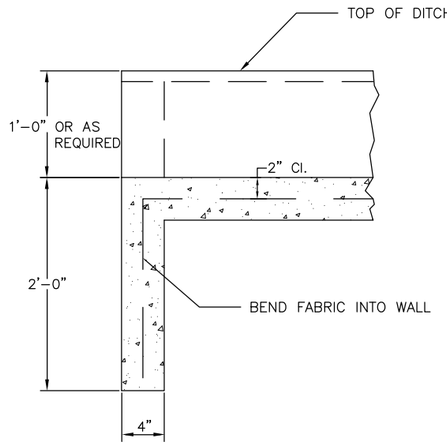
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-304	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

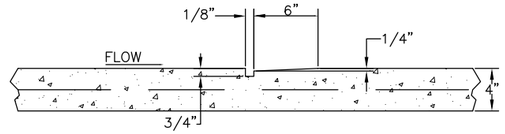
NOT RELEASED FOR CONSTRUCTION



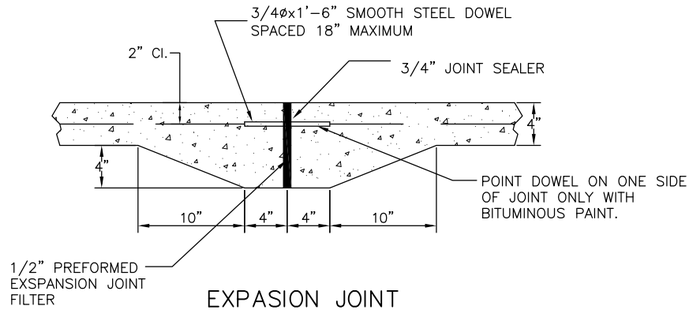
TYPE "B" PIPE BEDDING AND EXCAVATION SECTION
N.T.S.



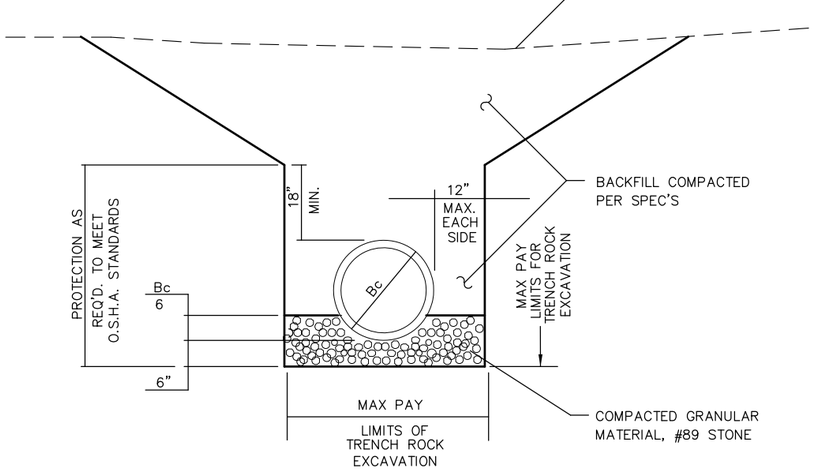
SECTION A-A



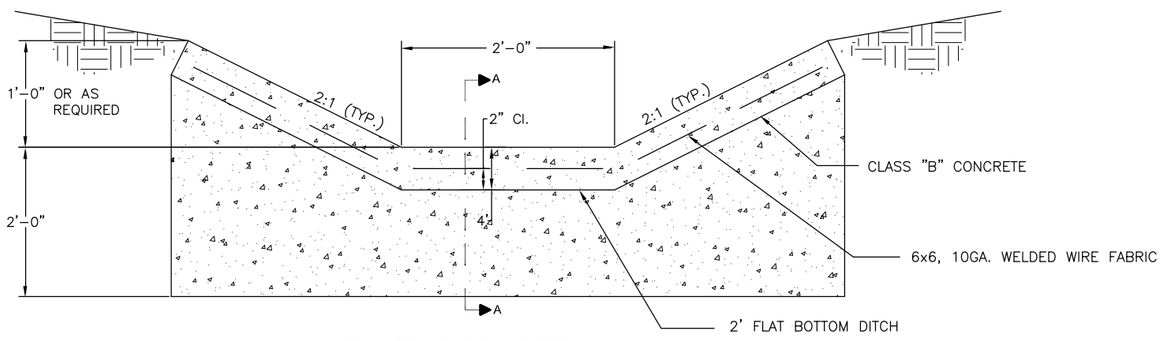
CONTRACTION JOINT



EXPASION JOINT



TYPE "C" PIPE BEDDING AND EXCAVATION SECTION
(GRANULAR FOUNDATION)
N.T.S.



PAVED DITCH DETAIL
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.

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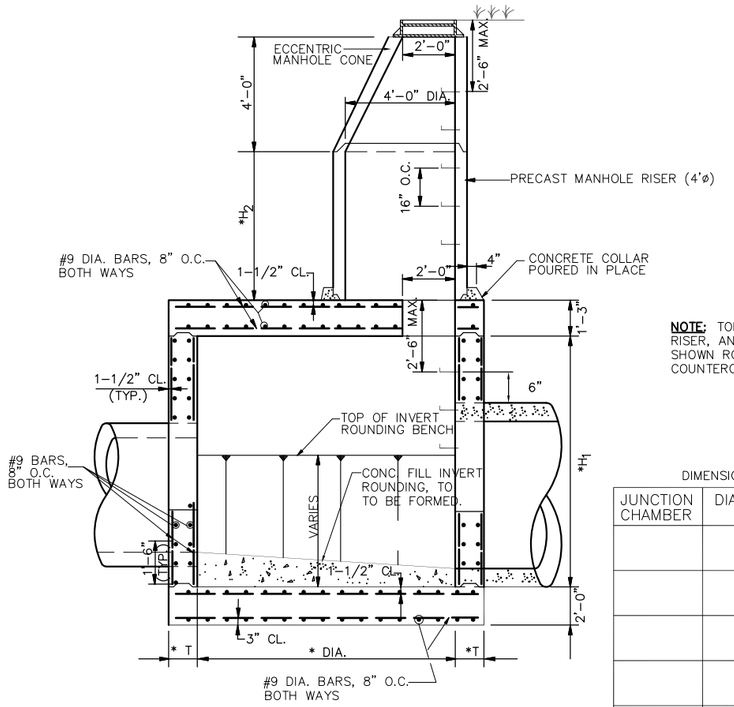
NO.	DATE	BY	REVISION
1	08/2019	RFM	REVISED
0	06/20/2014	RFM	FIRST ISSUE

Pipe Bedding Type 'B' and 'C', Paved Ditch Detail

WBS NUMBER:	DRAWN BY: STAFF
FC NUMBER:	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER:	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-400	APPROVED BY: STAFF
	DATE:
	SCALE:
	SHEET NO:

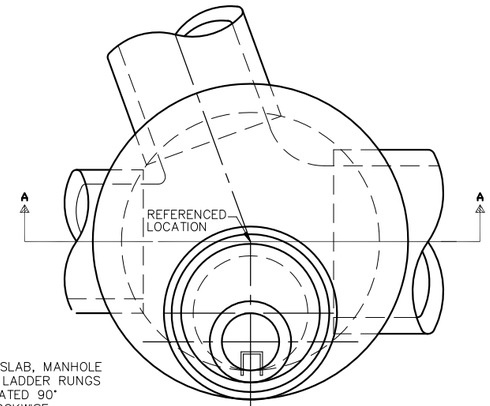


SECTION A–A

PRECAST JUNCTION CHAMBER

N.T.S.

* REFER TO DIMENSIONS FOR CHAMBER CHART ON THIS SHEET



TOP PLAN

NOTE: TOP SLAB, MANHOLE RISER, AND LADDER RUNGS SHOWN ROTATED 90° COUNTERCLOCKWISE.

DIMENSIONS FOR CHAMBER

JUNCTION CHAMBER	DIA.	H_1	H_2	T

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DOA CIVIL STANDARD DETAILS

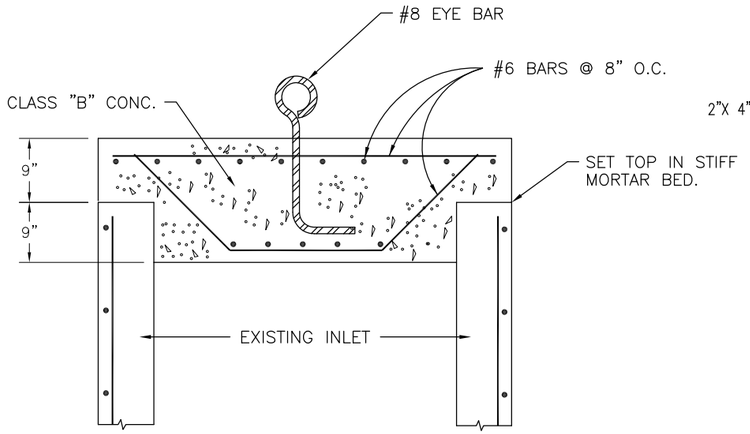
Precast Junction Chamber

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-401	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

q:\facilities\engineering\design standards\drawings\std-03-401 precast junction chamber.dwg

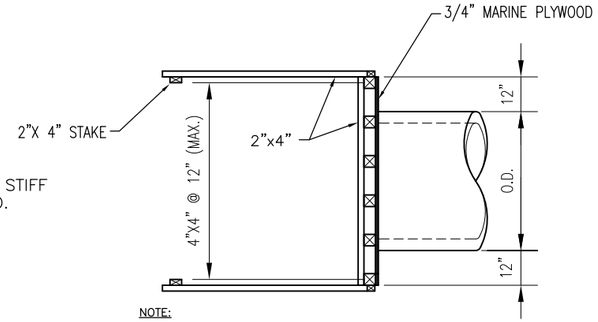


NOTE:
REMOVE FRAME & GRATE AND INLET WALLS DOWN TO 2'–6" FROM CROWN OF OUTLET PIPE.

CAP FOR EXISTING INLET

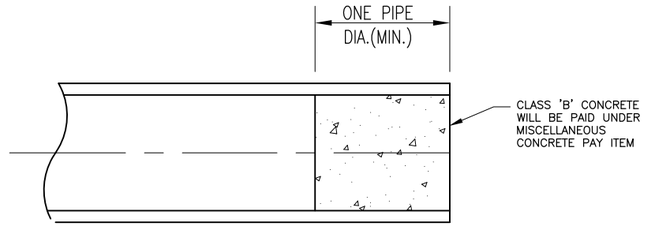
N.T.S.

PAID FOR AS MISC. CONCRETE.



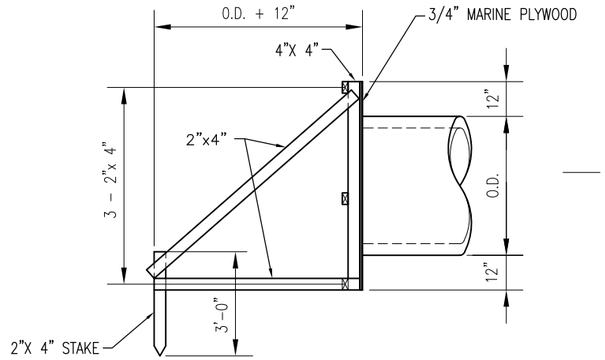
NOTE:

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.



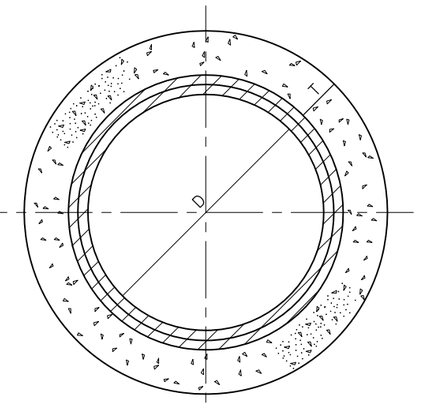
SECTION OF CONCRETE PIPE PLUG

SCALE: NTS

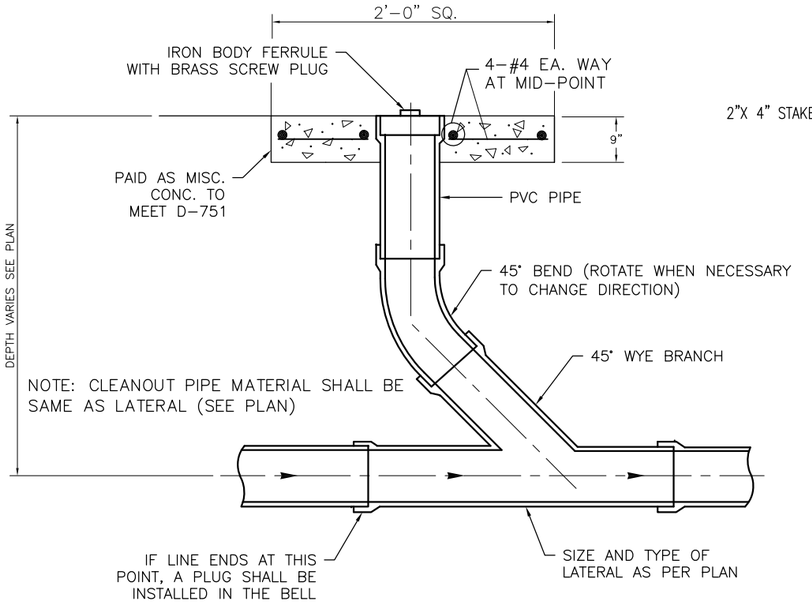


ELEVATION

TEMPORARY TIMBER BULKHEAD

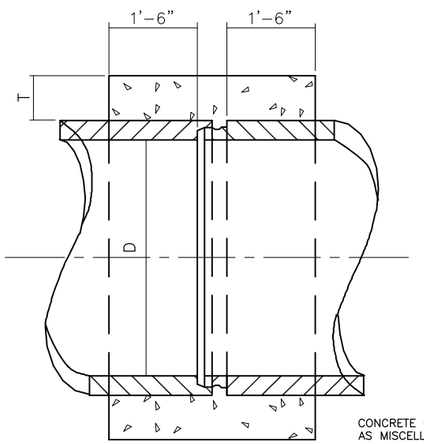


N.T.S.



CLEANOUT DETAIL

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.

CONCRETE PIPE COLLAR DETAIL

(FOR CONNECTING EXISTING PIPE TO PROPOSED PIPE)

N.T.S.

CITY OF ATLANTA, GEORGIA

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DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

DOA CIVIL STANDARD DETAILS

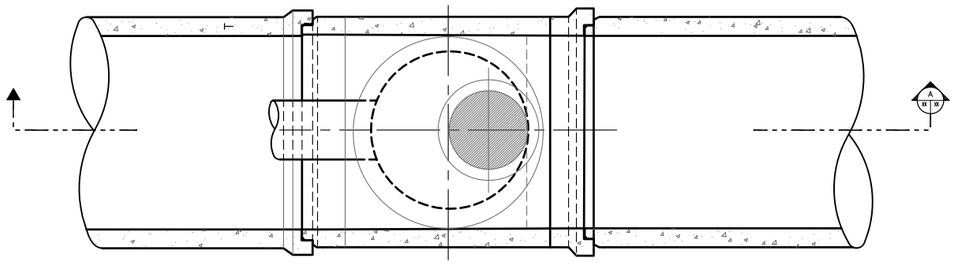
Concrete Pipe Collar, Cleanout, Cap for Exist. Inlet

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-402	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

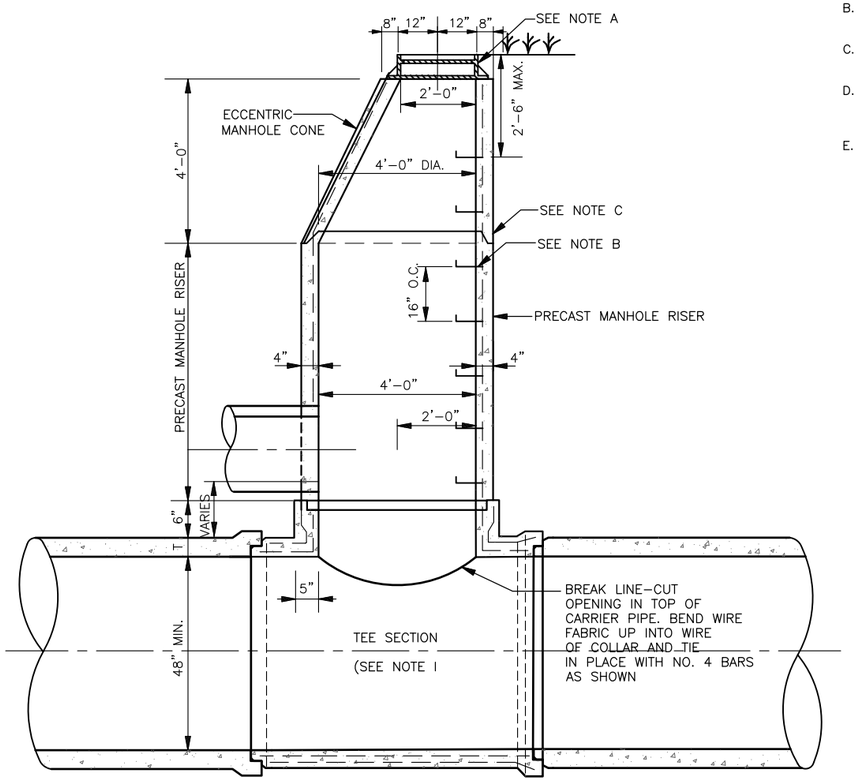
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

q:\facilities\engineering\design standards\drawings\std-03-402 concrete pipe collar, cleanout, cap for exist. inlet.dwg



PLAN SECTION
NOT TO SCALE



RISER TEE MANHOLE FOR EXISTING OR PROPOSED PIPE
NOT TO SCALE

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, NEENAH PATTERN NO. R-1980-C OR EQUAL.

C. JOINTS BETWEEN ALL PRECAST MANHOLE COMPONENTS SHALL BE FUEL RESISTANT O-RING.

D. MANHOLE FRAME AND COVER TO BE BARRY PATTERN B-1600-D OR APPROVED EQUAL WITH NO. 4 STEEL DOWELS BEDDED IN STIFF MORTAR.

E. PRECAST MANHOLE RISERS AND BASE SHALL CONFORM TO THE PROVISIONS OF ASTM C-478.

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DOA CIVIL STANDARD DETAILS

Riser Tee Manhole for Existing or Proposed Pipe

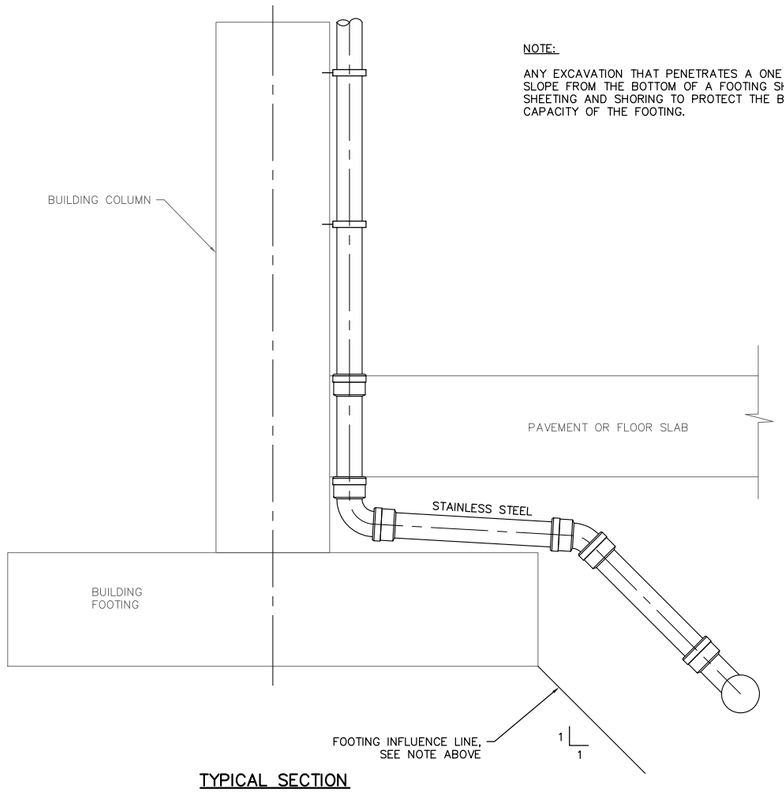
WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-403	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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.

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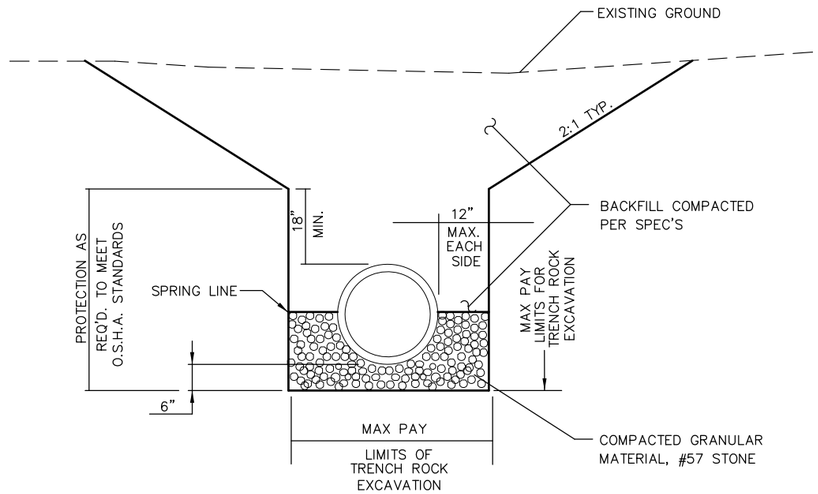
DOA CIVIL STANDARD DETAILS

Misc Pipe Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-404	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



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.

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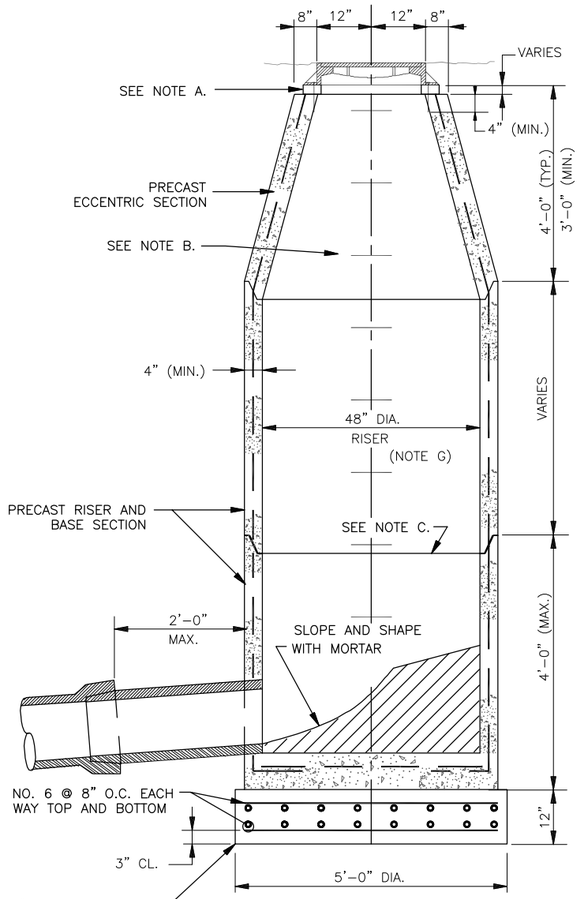
0	06/20/2014	RFM	FIRST ISSUE

DOA CIVIL STANDARD DETAILS

Waterline Bedding and Excavation Section

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-405	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .



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.

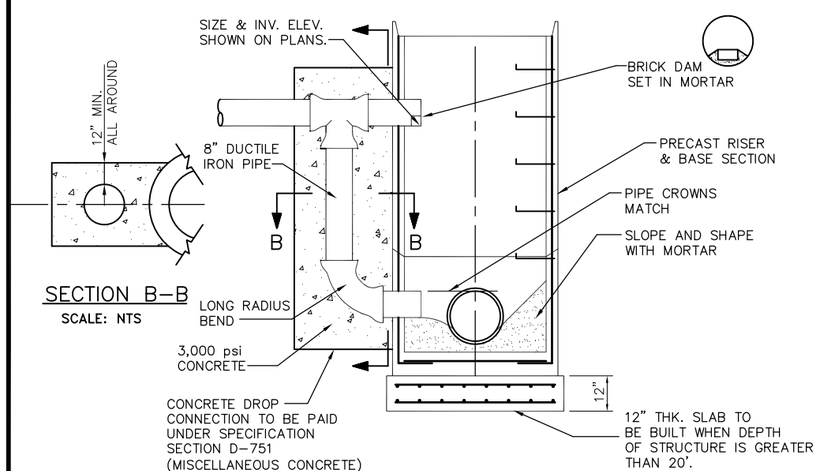
C. JOINTS BETWEEN ALL PRECAST MANHOLE COMPONENTS SHALL BE O-RING, OR PROFILE TYPE.

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.

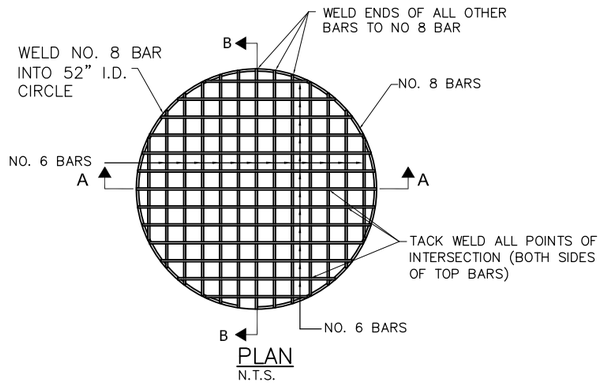


SECTION B-B

SCALE: NTS

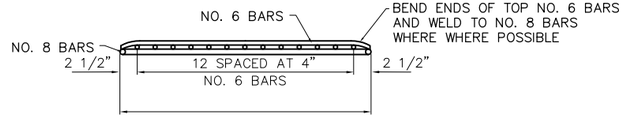
4' DIAMETER DROP CONNECTION MANHOLE FOR SANITARY SEWER

NTS



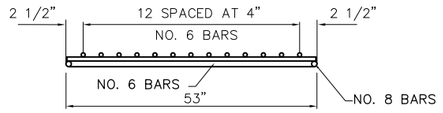
PLAN

N.T.S.



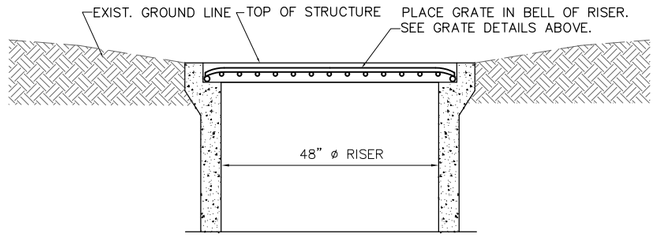
SECTION A-A

N.T.S.



SECTION B-B

N.T.S.



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

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Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION
PLANNING & DEVELOPMENT

NO.	DATE	BY	REVISION

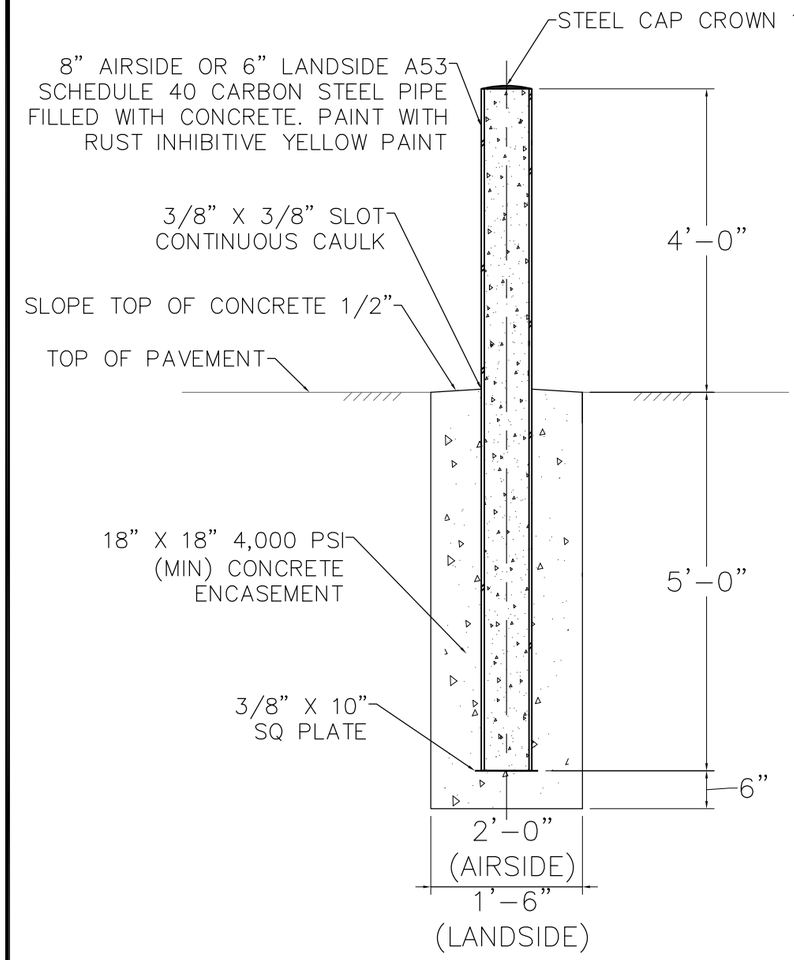
DOA CIVIL STANDARD DETAILS

Standard Manhole and Type E Inlet

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-500	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

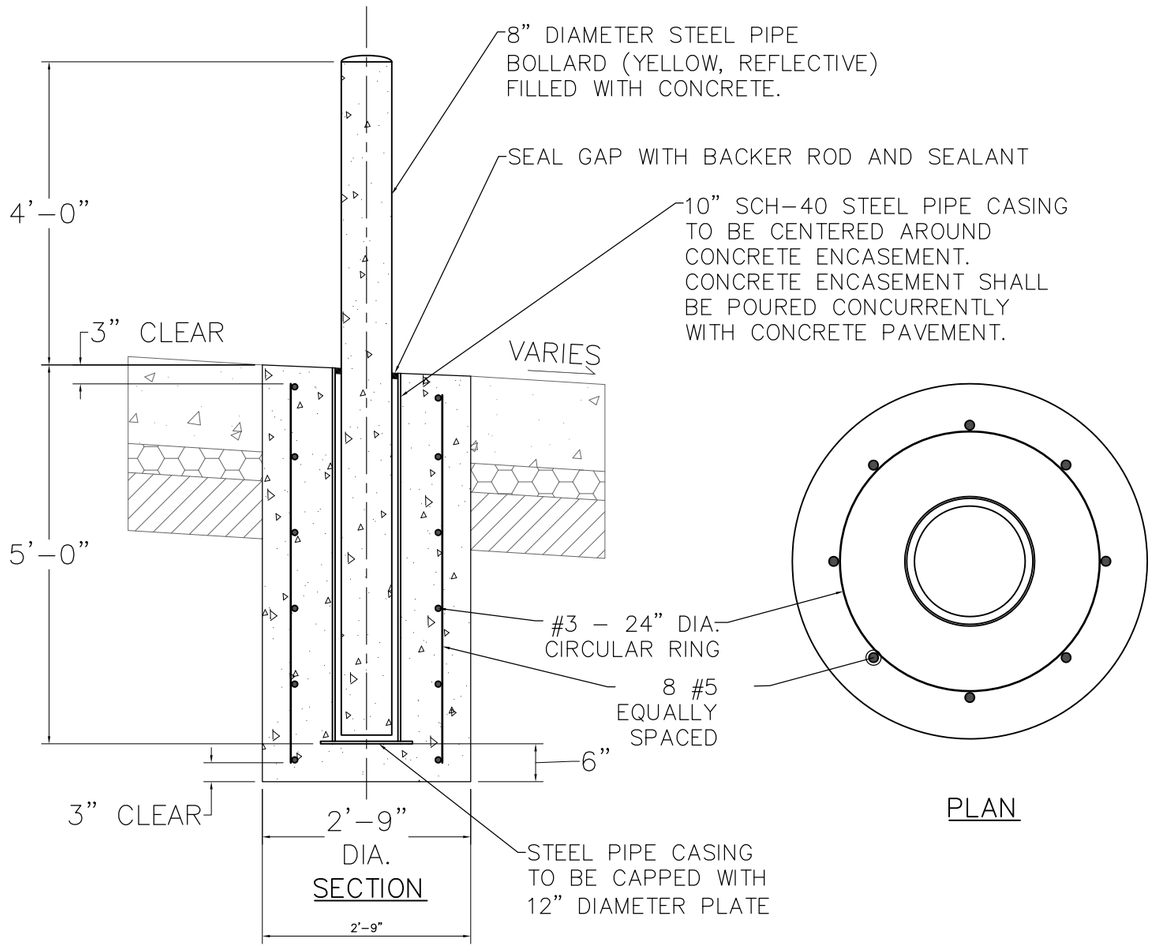
DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



CONCRETE FILLED STEEL BOLLARD

NTS



REMOVABLE CONCRETE FILLED STEEL BOLLARD

NTS

CITY OF ATLANTA, GEORGIA

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1	08/2019	RFM	REVISED
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DOA CIVIL STANDARD DETAILS

Bollard Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-600	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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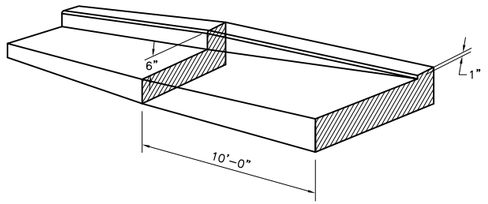
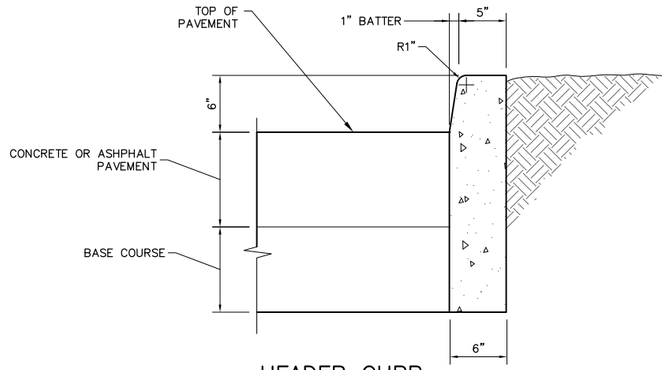
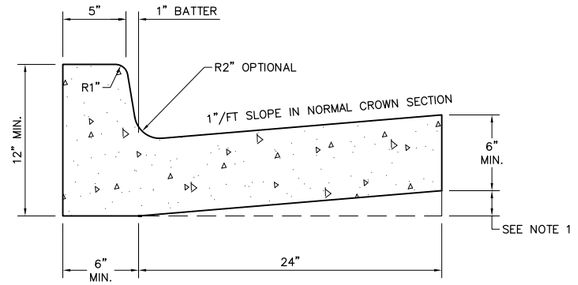


CURB & GUTTER
HEIGHT TRANSITION
NTS

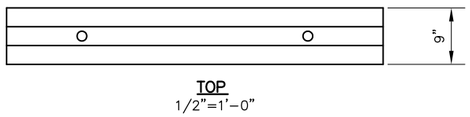


HEADER CURB
NTS

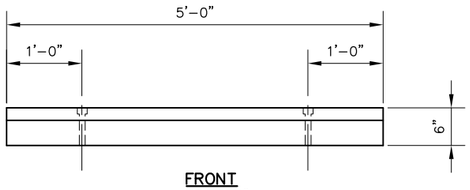


CURB & GUTTER
NTS

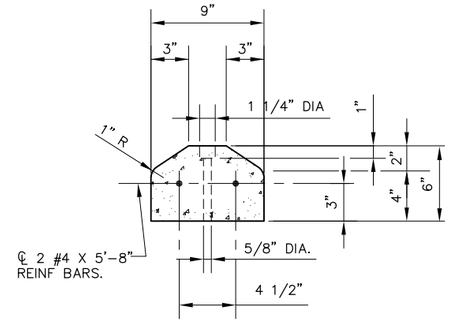
1. GUTTER THICKNESS MAY BE INCREASED AT EDGE OF OF PAVEMENT TO MAKE BOTTOM OF GUTTER PARALLEL WITH PAVING BASE COURSE.
2. CRUSHED AGGREGATE BASE COURSE SHALL EXTEND 6" BEYOND BACK OF CURB.



TOP
1/2"=1'-0"



FRONT
1/2"=1'-0"

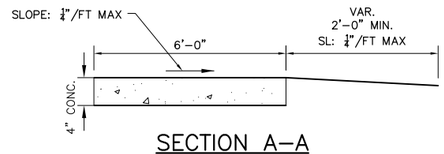


SECTION A-A
SCALE: N.T.S.

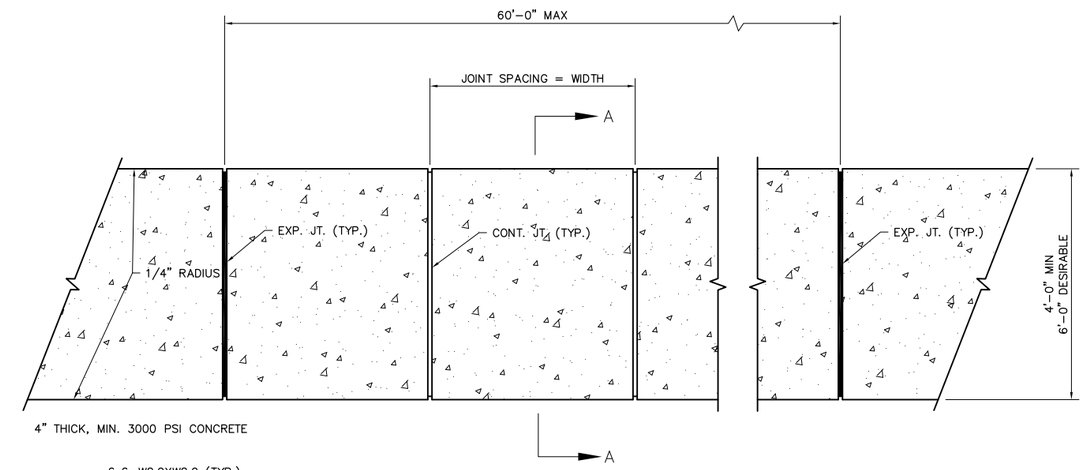
CONCRETE BUMPER BLOCK
N.T.S.

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



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

NO.	DATE	BY	REVISION
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DOA CIVIL STANDARD DETAILS

Miscellaneous Paving and Bumper Block Details

WBS NUMBER: .	DRAWN BY: STAFF
FC NUMBER: .	DESIGNED BY: STAFF
CONSULTANT PROJECT NUMBER: .	CHECKED BY: STAFF
STANDARD SHEET NUMBER STD-03-601	APPROVED BY: STAFF
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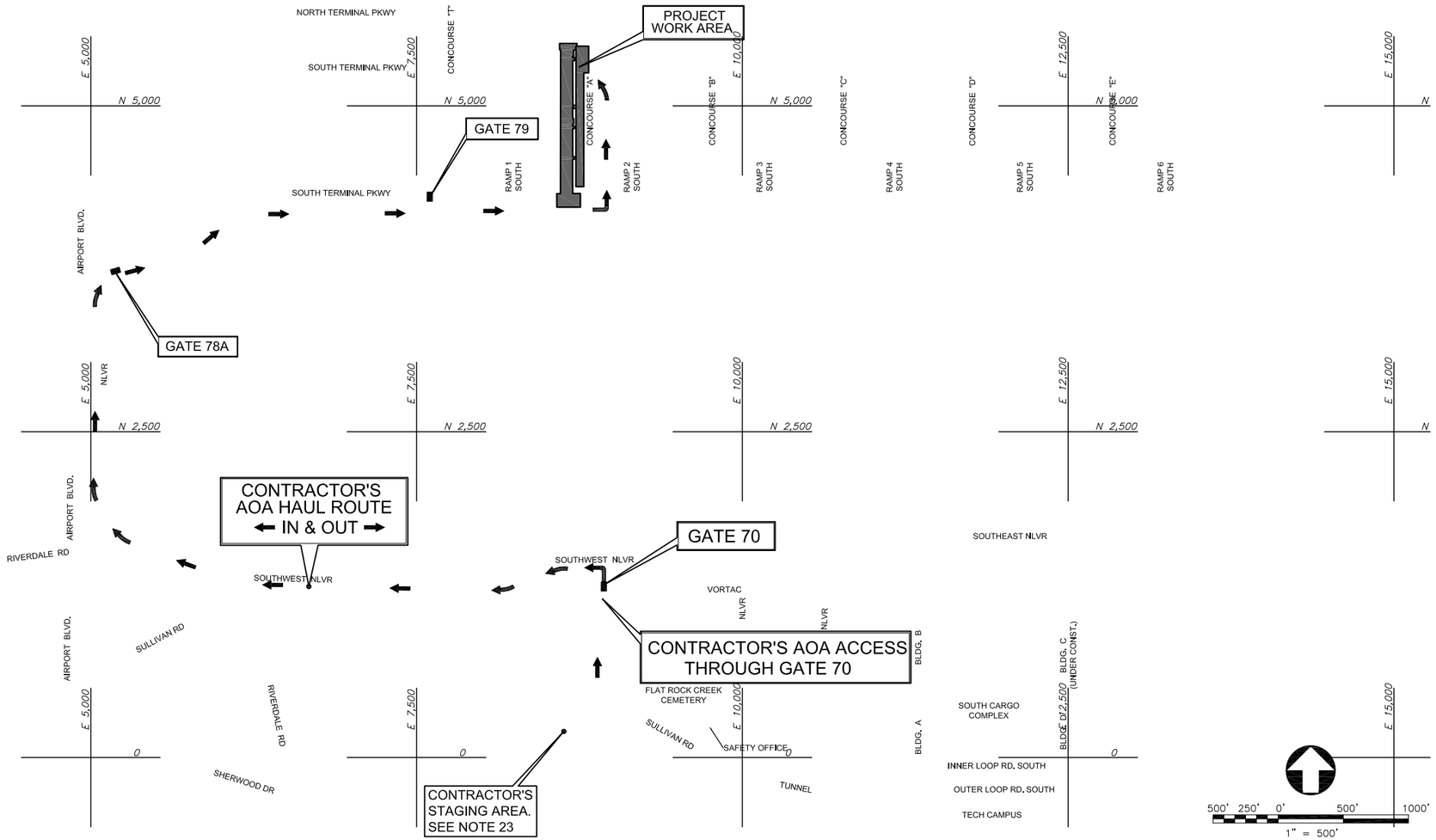
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



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

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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
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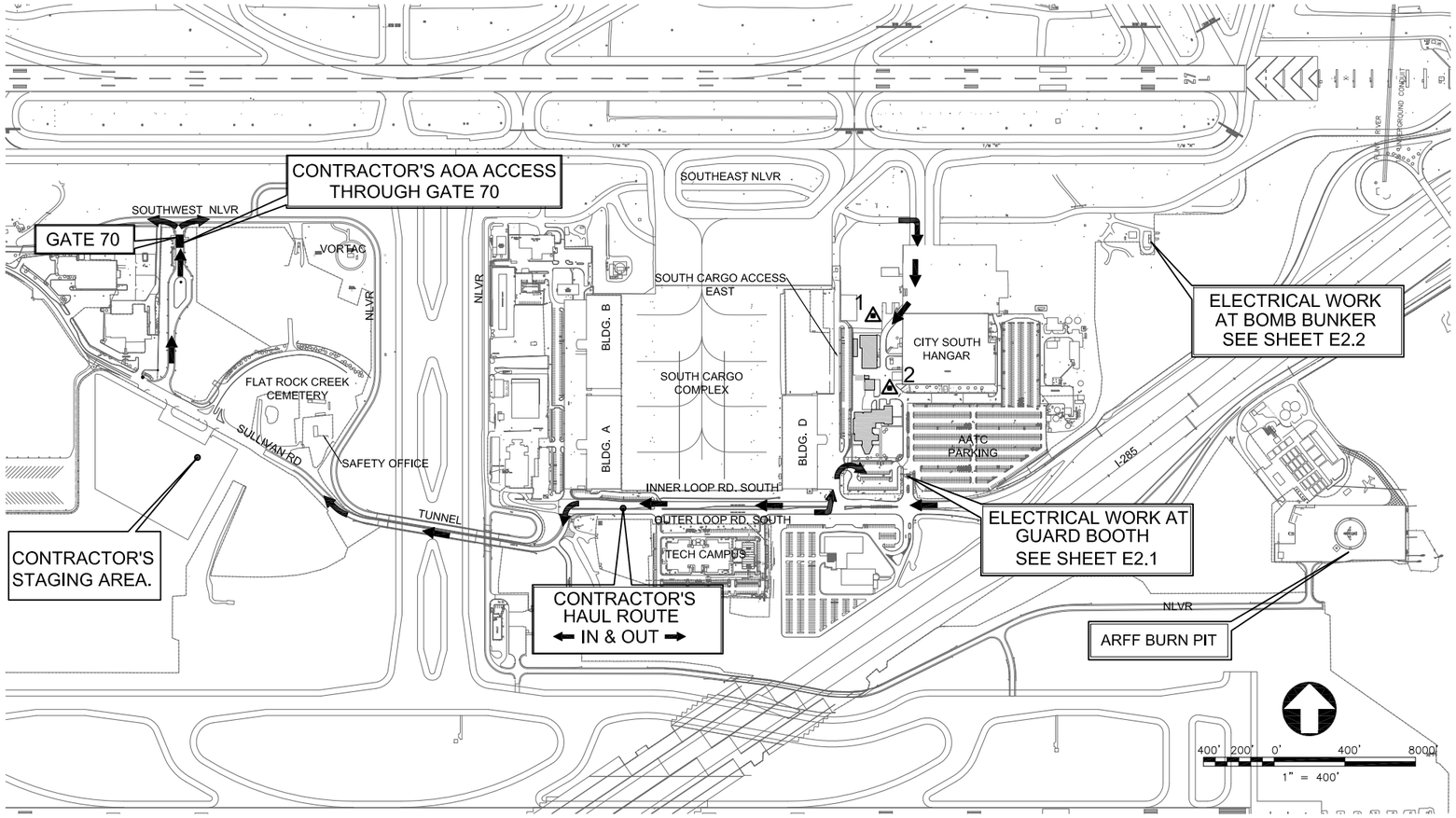
STANDARD SHEET NUMBER STD-03-700	APPROVED BY: STAFF
	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION



SCOPE OF WORK
1.

PHASING
1.

2.

SPECIAL CONDITIONS
1.

2.

APPLICABLE CODES
1.

2

GENERAL NOTES

1. 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 FEE FOR THE BADGE UNLESS A REPLACEMENT IS REQUIRED. FOR MORE INFORMATION ON SAFETY BADGES CONTACT EARL KELLER AT 404-569-0794.

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

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4. 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.

5. 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.

6. ALL COORDINATES SHOWN ON THE PLANS ARE IN THE H-JAIA GRID COORDINATE SYSTEM.

7. CONTRACTOR SHALL COOPERATE WITH EXISTING AND FUTURE CONTRACTORS WORKING IN THE AREA AND AT ALL TIMES WILL COORDINATE THEIR EFFORTS. POTENTIAL PROJECTS FOR COORDINATION ARE: SEE RELATED PROJECT ABOVE.

8. 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.

9. 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.

10. 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.

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

14. 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.

15. TRAFFIC ON PROJECT AREA ROADS SHALL BE MAINTAINED WITHOUT INTERRUPTION THROUGHOUT THE CONSTRUCTION PERIOD. AS REQUIRED, THE CONTRACTOR SHALL PROVIDE SIGNS TO DIRECT TRAFFIC AND ENSURE SAFETY OF ALL USERS. THE CONTRACTOR SHALL MEET THE REQUIREMENTS OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND SUBMIT TRAFFIC CONTROL SHOP DRAWINGS TO ILLUSTRATE THE PROPOSED PLAN.

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

17. CONTRACTOR SHALL PREPARE AND SUBMIT AN EROSION CONTROL PLAN, SUFFICIENT TO STABILIZE THIS SITE UNTIL THE NEXT PHASE OF CONSTRUCTION WHICH WILL BE CARGO BUILDING C AND TRUCK STAGING. SEE SECTION P-156 OF THE SPECIFICATIONS.

18. THE EXACT LIMITS OF THE CONTRACTORS STAGING AREA FOR MATERIAL STOCKPILING AND OFFICE TRAILERS SHALL BE ESTABLISHED BY THE CONTRACTOR WITH APPROVAL OF THE CITY IN THE AREA SHOWN. THE PUBLIC ACCESS AREA SHALL BE ENCLOSED BY TEMPORARY SECURITY FENCING ACCEPTABLE TO THE CITY. ALL REQUIRED UTILITIES FOR THE CONTRACTOR'S STAGING AREA SHALL BE ARRANGED AND PROMPTLY PAID FOR BY THE CONTRACTOR DIRECTLY WITH THE APPROPRIATE AGENCY. UTILITY ARRANGEMENTS SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER. NO SEPARATE PAYMENTS SHALL BE MADE FOR ANY ITEM REQUIRED FOR THE CONTRACTOR TO ENCLOSE AND SETUP HIS OPERATIONAL AREA. ADDITIONALLY, THE CONTRACTOR SHALL RESTORE THE SITE TO ITS ORIGINAL CONDITION UPON COMPLETION OF THE PROJECT.

CITY OF ATLANTA, GEORGIA

Hartsfield-Jackson Atlanta International Airport

DEPARTMENT OF AVIATION PLANNING & DEVELOPMENT

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DOA CIVIL STANDARD DETAILS

General Notes and Construction Control Plan Landside

(EXAMPLE)

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WBS NUMBER: .	DRAWN BY: STAFF
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	DATE: .
	SCALE:
	SHEET NO: .

DOA CIVIL STANDARD DETAILS

NOT RELEASED FOR CONSTRUCTION

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Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Structural

Design Standards
Structural

Table of Contents

Section **Page**

Design Standards
Structural

1.0 Purpose

1.1 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).

1.2 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.

1.3 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

2.1 Applicable Codes

2.1.1 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.

2.2 Design Narrative

2.2.1 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.

2.3 Design Calculations

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

2.3.1.1 Cover Sheet
2.3.1.2 Table of Contents
2.3.1.3 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.
2.3.1.4 Design Information – Provide a summary of design criteria, applicable codes applied loads and any design assumptions.
2.3.1.5 Major Element Design – Actual design calculations or the preliminary design activities leading to the development of input data for structural analysis/design computer programs.

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

2.3.1.7 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

2.3.1.8 References

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

2.3.2 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.

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

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

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

2.4 Loads and Loading Combinations

2.4.1 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]

2.5 New Construction

2.5.1 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.

2.6 Modifying Existing Structures

2.6.1 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.

2.7 Framing System Economics

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

2.8 Foundation Systems

2.8.1 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.

2.8.2 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.

2.8.3 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.

2.9 Delegated Design

2.9.1 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.

2.9.2 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.

2.9.3 The Structural Engineer of Record shall confirm in writing that the specialty engineer's work on the project, as a whole, conforms to the Structural Engineer of Record's intent.

2.10 Drawings

2.10.1 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.

2.10.1.1 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[12]

2.10.1.2 Columns, foundation elements, concrete beams and concrete joists (conventional or prestressed) shall be summarized in schedules and presented within the project plans.

2.10.1.3 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.

2.10.1.4 All prestressed concrete girder and major beam construction shall be bonded.

2.10.1.5 Where deep foundations are proposed, estimated pile/drilled pier tip and bearing elevations shall be shown on appropriate schedules.

2.10.1.6 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.

2.10.2 Final plans shall include one (1) plan set with manually affixed signature and date over the seal of the Engineer of Record.

2.11 Specifications

2.11.1 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.

2.11.2 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.

2.12 Design Milestones

2.12.1 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 particular milestone.

2.13 Quality Control Plan

2.13.1 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.

2.14 Miscellaneous

2.14.1 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

3.1 General

3.1.1 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.

3.1.2 All reinforced concrete slabs within building footprints shall be detailed with bar steel reinforcement. Welded wire fabric shall not be permitted.

3.1.3 All building designs shall include summary reinforcement schedules for beam, column and foundation elements.

3.1.4 Design for temperature change shall be based on a mean temperature at construction of 62°F with a variation of ±50°F.

3.2 Steel Framed Structures

3.2.1 Provide criteria for vibration design. At a minimum, conform to the recommended criteria of AISC Design Guide 11, “Floor Vibrations Due to Human Activity.”

3.2.2 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.

3.2.3 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.

3.3 Concrete-Framed Structures

3.3.1 Cast-in-place conventional

3.3.1.1 Lap splices between upper and lower columns shall be detailed as Class B splices under ACI 318, unless specifically agreed otherwise.

3.3.1.2 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.”

3.3.1.3 The potential incompatibility between different construction materials shall be anticipated and appropriate guidance provided on the contract drawings or in the specifications.

3.3.1.4 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.

3.3.1.5 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.

3.3.2 Cast-in-place post-tensioned

3.3.2.1 Observe applicable provisions for cast-in-place conventional concrete construction presented above.

3.3.2.2 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.

3.3.2.3 Prestressing tendons shall be detailed with adequate cover to meet the required fire rating for the structure being designed.

3.3.3 Precast

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

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

3.3.3.3 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

4.1 Roadway

4.1.1 Georgia DOT standards, details and specifications may be used where they do not conflict with airport standards, details and requirements.

4.1.2 All bridge widening shall be accomplished through the use of a pour strip. Pour strip components shall be constructed of accelerated strength concrete.
4.1.3 All bridge decks shall have epoxy-coated reinforcing steel top mats.
4.1.4 Design for temperature change shall be based on a mean temperature at construction of 62°F with a variation of ±50°F.

4.2 Aircraft

4.2.1 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 .

4.3 Pedestrian

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

4.4 Sign Bridges

4.4.1 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.
4.4.2 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 configured 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

5.1 Parking Garages

5.1.1 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.
5.1.2 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.
5.1.3 Cast-in-place, Post-tensioned Concrete

5.1.3.1 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.

5.1.4 Precast Concrete

5.1.4.1 Precast prestressed concrete parking structures are permitted for airport construction where authorized by the Department in writing.

5.1.4.1.1 Where precast prestressed construction is approved for a parking garage structure, a cast-in-place, reinforced

concrete topping slab shall be required to provide proper surface drainage.

5.1.4.1.2 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.

5.1.4.1.3 All precast, prestressed concrete flexural members shall be designed as Class U per ACI 318.

5.2 Retaining Walls

5.2.1 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.

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

5.2.3 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.

5.3 Tunnels

5.3.1 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

6.1 Drawing Revisions

6.1.1 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 on a monthly basis.

Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Architectural

Design Standards - Architectural
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Design Standards
Architectural

1.0 Purpose

1.1 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

2.1 Applicable Codes & Standards

2.1.1 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.

2.2 Art Program

2.2.1 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.

2.3 Modifying Existing Structures

2.3.1 The installation or relocation of heavy equipment shall be evaluated and endorsed by a Structural Engineer.

2.3.2 Proposed improvements that require partial or complete, severing, altering or removal of structural members shall require evaluation and design by a Structural Engineer.

2.3.3 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

2.3.4 Modifications to existing structures shall not be made without prior approval by the Department of Aviation.

2.4 Floor, Wall and Roof Penetrations

2.4.1 Proposed penetrations and openings for existing floors, walls, and roofs shall be located where there are no impacts to existing concrete reinforcements.

2.4.2 Contractor shall be required to locate existing reinforcements prior to commencing coring operations.

2.4.3 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.

2.4.4 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.

2.4.5 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).

2.4.6 Roof penetrations shall comply with existing TPO roof manufacturer's detail(s) recommendations in order to maintain integrity of roof system and its warranty.

2.4.7 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.

2.5 Ceilings

2.5.1 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.[13]

2.6 Door Hardware

2.6.1 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.

2.6.1.1 Type of openings, approach, frame, door and electronic mechanisms for public or back-of-house will be provided based on new Security standards.

2.6.2 Non-Security Hardware- Von Duprin Panic Hardware. Hardware Cores to be Best Locks.

2.7 Floor Mounted Appertenances[14]

2.7.1 Any appurtenances such as luggage carts, luggage cart dispensing equipment, wheel chairs, wheel chair 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

3.1 Domestic Terminal

3.1.1 Domestic Terminal Building Interior

3.1.1.1 Floors: Terrazzo and Granite Tile 18"x18" (Luna Pearl)

3.1.1.2 Walls : Granite Wainscot 36” and Painted Gypsum Board above
Stainless Steel Base
Stainless Steel Corner Guards

3.1.1.3 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.

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

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

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

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

3.1.1.8 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.

3.1.1.9 Vestibules:

3.1.1.9.1 Floor: Granite Tile 18”x18” (Honed Luna Pearl) & Stainless Steel Walkmats

3.1.1.9.2 Walls:Stainless Steel Base/Glass Wainscot/ Gypsum Board Above

3.1.1.9.3 Ceiling: Gypsum Board; LED Lighting

3.1.1.9.4 Doors: Automatic Sliding Glass

3.1.1.10 Restrooms:

3.1.1.10.1 Floor: Terrazo and Quartz Tile

3.1.1.10.2 Walls: Terrazo & Quarts Base/Quartz Tile/Stainless Steel Corners Guards

3.1.1.10.3 Ceilings: Painted Gypsum Board; LED Lighting

3.1.1.10.4 Countertops: Granite - Under bowls and openings for waste Disposal

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

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

3.1.1.10.7 Fixtures/Accessories:

Water Closets: Wall Mounted – automatic flush valves

Faucets: Hands Free

Soap Dispensers: Hands Free with central soap reservoir System

Paper Towel Dispenser: Hands Free

Shelves: Above toilets and urinals (Stainless Steel)

Corner Guards: Stainless Steel

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.

Baby Changing: Koala Kare Type

3.1.1.10.8 Vertical Circulation

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

Escalators: Stainless Steel 36" and 42", Stainless Steel Handrails, Kone.

3.1.2 Domestic Terminal Building Exterior

3.1.2.1 Roofing:

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

3.1.2.2 Facades:

3.1.2.2.1 Non-Insulated Metal Panel /Vestibule Shafts
Centria Aluminum Wall Panels
Intercept Entyre
PPG, Duranar XL, UC124347XL, Pigmento Blue
Paint System, three (3) coat

3.1.2.2.2 Non-Insulated Metal Panel /High bay and parapet
Centria Aluminum wall Panels
Intercept Entyre
PPG, Duranar XL, UC5113XL, Silver
Paint System, three (3) coat

3.1.2.2.3 Insulated Glass Systems
Window Walls: Insulated Viracon Low iron Architectural Glass
Curtain Walls: Insulated Viracon Low iron Architectural Glass
Spandrel Glass: Insulated Viracon Low iron Architectural Glass

3.1.2.2.4 Non-insulated Glass Systems
Decorative Glass: QC Facades Opague Glazing /PPG Starphire Low iron Tempered Glass
Guardrails: Old Castle – ½" Temmpered, PPG Starphire, Low iron glass
Background color: SW 7006 Extra White

3.1.2.3 Entry Portals /Vestibules
Non-Insulated Metal Panel /Above waiscot
Centria Aluminum Wall Panels
Intercept Entyre
PPG, Duranar XL, UC124347XL, Pigmento Blue
Paint System, three (3) coat

3.1.2.4 Entry Portals /Vestibules
Decorative Glass: QC Facades Opaque Glazing /PPG Starphire Low iron Tempered Glass /Wainscot
Custom color to match Pigmento Blue

3.1.2.5 Stairwells & Other Exposed Steel:
Final coated with-PAINT, BENJAMIN MOORE IMPERVO EXTERIOR GLOSS OIL - COLOR "PISMO DUNES" Black

3.1.2.6 Existing CMU Paint: Brown- BENJAMIN MOORE BXK1182 or PPG Dark Granite 520-7.

3.1.2.7 Curbside Sidewalk Coating: SureCrete SCR (with base coat and seal coate) Slip resistant epoxy coating-Gray color

3.1.2.8 Bollards: Embedded steel bollards, concrete filled (K rated) with Stainless Steel covers

3.1.2.9 Upper Roadway Canopies: Pressure-inflated ETFE (Ethylene-tetra Fluoro-ethylene) Foil /Transparent

3.1.2.10 Lower Roadway Canopies: Flame-retardant weather resistant fabric. Basis of design is Serge Ferrari – Precontraint 502.

3.1.2.11 Device Poles: Eaton-Cooper /40' min. Ground- set

3.1.2.12 Electronic Displays: Daxtronics Galaxy exterior monitors

3.1.2.13 Site Furnishings:

3.1.2.13.1 Benches: Petoskey features: (all complement each other)
Backed Bench
Backless Perforated Bench
Backless Metal Rod Bench
29", 62". 78" length

Durability of 3" tube support

3.1.2.13.2 Litter Receptacle:
30-gallon capacity, polyethylene liner included
11-gauge steel
Perforated metal
20in dia. X 42in. h

3.1.2.13.3 Ash Urn:
14-gauge steel
Perforated metal
12in. dia. X 21in. h

3.1.2.14 Smoking Corrals: Defined space with signage, seating, and stanchions supporting plexi panels. Refer to Signage Standards for details.

3.1.2.15 Vertical Circulation

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

3.1.2.15.2 Escalators: Stainless Steel 36", Stainless Steel Rails, Kone.

3.2 International Terminal/ Concourse F

3.2.1 International Terminal Building Interior

3.2.1.1 Floors: 18"x18", 9"x18" Granite Tiles /Various suppliers for various granites

3.2.1.2 Walls : Quartz tile Wainscot 36", Painted gypsum board above Wainscot

3.2.1.3 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.

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

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

3.2.1.6 Vestibules

3.2.1.6.1 Floor: Granite Tile 18"x18" (Honed Luna Pearl), Stainless Steel Walkmats

3.2.1.6.2 Walls: Glass Wainscot/ Granite

3.2.1.6.3 Ceiling: Gypsum Board; LED Lighting

3.2.1.6.4 Doors: Automatic Sliding Glass

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

3.2.1.8 Arrivals Area Barriers: 3" diameter Stainless Steel Rail with ½" tempered glass infill.

3.2.1.9 Restrooms

3.2.1.9.1 Floor: Quartz Tile

3.2.1.9.2 Walls: Quartz Tile; Quartz Base; Stainless Steel Corners Guards

3.2.1.9.3 Ceilings: Painted Gypsum Board; LED Lighting

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

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

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

3.2.1.9.7 Fixtures/Accessories:

Water Closets: Wall Mounted – automatic flush valves

Faucets: Hands Free

Soap Dispensers: Hands Free with central soap reservoir system

Paper Towel Dispenser: Hands Free

Shelves: Above toilets and urinals – Stainless Steel

Corner Guards: Stainless Steel

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.

Baby Changing: Koala Kare Type

3.2.1.10 Vertical Circulation

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

3.2.1.10.2 Escalators: Stainless Steel 36", Tempered Glass Rails, Kone.

3.2.2 International Terminal Building Exterior

3.2.2.1 Roofing: Thermoplastic Polyvinyl Chloride Membrane Roof Base of Design- Firestone TPO fully adhered UltraPly TPO XR 135 Platinum Membrane 30 year warranty. Thickness 135 mils (80 mils TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded

TPO sheet seams. Exposed Face color: White

3.2.2.2 Facades:

3.2.2.2.1 Landside: Non-Insulated ACM (aluminum composite material) Color System, three (3) coat, Silver

3.2.2.2.2 GLASS- Insulated, tinted.

3.2.2.3 Passenger Boarding Bridges:

3.2.2.3.1 Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams

3.2.2.4 Curbside Floor Coating: None

3.2.2.5 Canopy: Tempered Glass and Stainless Steel

3.2.2.6 Electronic Displays: Samsung Digital monitors

3.2.2.7 Site Furnishings:

3.2.2.7.1 Benches: Petoskey features: (all complement each other)

Backed Bench
Backless Perforated Bench
Backless Metal Rod Bench
29”, 62”. 78” length
Durability of 3” tube support

3.2.2.7.2 Litter Receptacle:

30-gallon capacity, polyethylene liner included
11-gauge steel
Perforated metal
20in dia. X 42in. h

3.2.2.7.3 Ash Urn:

14-gauge steel
Perforated metal
12in. dia. X 21in. h

3.2.2.8 Exit Stairs: Galvanized Steel, exposed

3.2.3 Concourse F Building Interior

3.2.3.1 Floors: Granite Tile 18”x18” (Luna Pearl)

3.2.3.2 Walls : Quartz tile Wainscot 36”, Painted gypsum board above Wainscot, Stainless steel base.

3.2.2.4 Ceilings: Lay-in Acoustical tile ceiling; LED Lighting. Ceilings Plus - Perforated metal panels with batt insulation laid in, and gypsum ceilings.

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

3.2.3.4 Hold Rooms:

3.2.3.4.1 Floors: Carpet Tile

3.2.3.4.2 Walls : Quartz tile Wainscot 36", Painted gypsum board above Wainscot.

3.2.3.4.3 Column cladding: Stainless Steel

3.2.3.4.4 Ceilings: Acoustical Tile, LED Lighting, metal and gypsum board.

3.2.3.5 Passenger Loading Bridges

3.2.3.5.1 Floor : Carpet

3.2.3.5.2 Base: Rubber

3.2.3.5.3 Walls: Painted Metal Panels

3.2.3.5.4 Ceiling: Metal Tile

3.2.3.5.5 Corner Guards: Stainless Steel

3.2.3.6 Restrooms

3.2.3.6.1 Floor: Quartz Tile

3.2.3.6.2 Walls: Quartz Tile
Terrazzo and Quartz Base
Stainless Steel Corners Guards

3.2.3.6.3 Ceilings: Painted Gypsum Board and LED Lighting

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

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

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

3.2.3.6.7 Fixtures/Accessories:

Water Closets: Wall Mounted – automatic flush valves

Faucets: Hands Free

Soap Dispensers: Hands Free with central soap reservoir

system.

Paper Towel Dispenser: Hands Free

Shelves: Above toilets and urinals (Stainless Steel)

Corner Guards: Stainless Steel

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.

Baby Changing: Koala Kare Type

3.2.3.7 Vertical Circulation

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

3.2.3.7.2 Escalators: Stainless Steel 36", Tempered Glass Rails, Kone.

3.2.4 Concourses F Building Exterior

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

3.2.4.2 Facades:

3.2.4.2.1 Airside: Insulated Metal Panels
Centria Versawall Industrial Panel Series
3" thickness, flat panels embossed
Paint System, three (3) coat minimum

3.2.4.2.2 GLASS- Insulated, tinted.

3.2.4.3 Passenger Boarding Bridges:

3.2.4.3.1 Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams

3.2.4.4 Exit Stairs: Stainless Steel and Aluminum

3.2.5 Concourse E to F Connector

3.2.5.1 Floors: Granite Tile 18"x18" (Luna Pearl)

3.2.5.2 Walls : Quartz tile Wainscot 36", Painted gypsum board above Wainscot

3.2.5.3 Ceilings: Lay-in Acoustical tile ceiling; LED Lighting, metal panels.

3.2.5.4 Column Covers: Stainless Steel

3.2.5.5 Vertical/ Horizontal Circulation

3.2.5.5.1 Elevators: Stainless Steel walls and ceiling, Granite floor, Kone.

3.2.5.5.2 Escalators: Stainless Steel 36", Tempered Glass Rails, Kone.

3.2.5.5.3 Moving Walks: Stainless Steel 36", Tempered Glass Rails, Schindler.

3.2 Concourses T Through E (Departures & AGTS Levels)

3.3.1 Building Interiors

3.3.1.1 Floors: Terrazzo at Concoure 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.

3.3.1.2 Walls : Porcelain and Quartz tile Wainscot 36"; Painted gypsum board above Wainscot.

3.3.1.3 Ceilings: Lay-in Acoustical tile ceiling, metal.

3.3.1.4 Hold Rooms

3.3.1.4.1 Floor: Carpet Tile

3.3.1.4.2 Base: Stainless Steel

3.3.1.4.3 Interior Walls: Quartz tile Wainscot 36" Painted Gypsum board above wainscot.

3.3.1.5 Passenger Boarding Bridges:

3.3.1.5.1 Interior Floor: Carpet

3.3.1.5.2 Base: Rubber

3.3.1.5.3 Interior Walls: Painted Metal Panels

3.3.1.5.4 Ceilings: Metal Tile

3.3.1.5.5 Corner Guards: Stainless Steel

3.3.1.6 Restrooms

3.3.1.6.1 Floor: Quartz Tile

3.3.1.6.2 Walls: Quartz Tile
Terrazzo and Quartz Base
Stainless Steel Corners Guards

3.3.1.6.3 Ceilings: Gypsum Board; LED Lighting

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

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

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

3.3.1.6.7 Fixtures/Accessories
Water Closets: Wall Mounted – automatic flush valves
Faucets: Hands Free
Soap Dispensers: Hands Free with central soap reservoir system
Paper Towel Dispenser: Hands Free
Shelves: Above toilets and urinals (Stainless Steel)
Corner Guards: Stainless Steel
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.
Baby Changing: Koala Kare Type

3.3.1.7 Vertical/Horizontal Circulation

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

3.3.1.7.2 Escalators: Stainless Steel 36", Stainless Steel Rail, Kone.

3.3.1.7.3 Moving Walks: Stainless Steel 36", Tempered Glass Rail, Schindler

3.3.2 Building Exterior

3.3.2.1 Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof Basis of Design- Firestone TPO fully adhered UltraPly TPO XR 135 Platinum Membrane 30 year warranty. Thickness 135 mils (80 mils TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

3.3.2.2 Building Facades:

3.3.2.2.1 Concourses T South, A, B, C (North /South building orientations)

Insulated Metal Panels
2" thickness
Paint System, Medium Grey Metallic #9960

Existing Sheet steel (infill) panels with pencil rib
Painted to match new insulated metal panels system (AATC CONFIRM COLOR USED per Delta).

GLASS- Insulated, tinted.

3.3.2.2.2 Concourse Mid-Points T, C, F /East VCC (East /West Building orientations)

Insuated Metal Panels

Centria Form Wall Architectural Panel Series
2" thickness, flat panels embossed
Paint System, three (3) coats, Bright Silver Metallic #9710

3.3.2.2.3 Concourse Mid-Point D (East /West Building orienetations)
Non-Insulated ACM (aluminum composite material)
Color System, three (3) coat, Silver

GLASS- Insulated, tinted.

3.3.2.3 Passenger Boarding Bridges:

3.3.1.3.1 Exterior Paint: White - Artic White Polane H Polyurethane G64WY8 Sherwin Williams

3.3.1.3.2 Exit Stairs: Stainless Steel

3.4 Rental Car Center

3.4.1 Building Interiors

3.4.1.1 Floors: Terrazzo

3.4.1.2 Walls : Gypsum panels with Stainless Steel base. Smooth finish colored block.

3.4.1.3 Ceiling: Acoustic Ceiling Tile; LED Lighting, Gypsum Board.

3.4.1.4 Columns: Stainless Steel

3.4.1.5 Restrooms:

3.4.1.5.1 Floor: Terrazzo

3.4.1.5.2 Walls: Quartz Tile
Terrazzo and Quartz Base
Stainless Steel Corners Guards

3.4.1.5.3 Ceilings: Gypsum Board and LED Lighting

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

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

3.4.1.5.6 Urinal Screens: Wall Mounted – Stailess Steel-Satin Finish) with continuous mounting bracket

3.4.1.5.7 Fixtures/Accessories:

Water Closets: Wall Mounted – automatic flush valves

Faucets: Hands Free

Soap Dispensers: Hands Free with central soap reservoir system

Paper Towel Dispenser: Hands Free

Corner Guards: Stainless Steel

Shelves: Above toilets and urinals (Stainles Steel)

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.

Baby Changing: Koala Kare Type

3.4.1.6 Vertical Circulation

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

3.4.1.6.2 Escalators: Glass and Stainless Steel 36", Glass Rail, Kone.

3.4.2 Building Exteriors

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

3.4.2.2 Facades: Metal Panels

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

3.5 Sky Train Stations

3.5.1 Building Interiors

3.5.1.1 Floor: Terrazzo

3.5.1.2 Walls: Block or Painted Gypsum board

3.5.1.3 Ceilings: Acoustical Tile/Acoustical panels

3.5.1.4 Columns: Stainless Steel or Gypsum Wrapped

3.5.1.5 Vertical Circulation

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

3.5.1.5.2 Escalators: Stainless Steel 36", Tempered Glass Rail, Kone.

3.5.2 Building Exterior

3.5.2.1 Roofing: Roofing: Roofing Thermoplastic Polyvinyl Chloride Membrane Roof. Basis of Design- Firestone TPO fully adhered UltraPly TPO XR 135 Platinum Membrane 30 year warranty. Thickness 135 mils (80 mils TPO with 55 mils Fleecback) nominal, over rigid insulation, with heat welded TPO sheet seams. Exposed Face color: White

3.5.2.2 Facades: Metal Panels

4.0 Support Facilities

4.1 Cargo

4.1.1 Building Interiors

4.1.1.1 Cargo Operations Floor: Sealed Concrete

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

4.1.1.3 Base: Rubber

4.1.1.4 Interior Walls: Precast, Block or Painted Gypsum board

4.1.1.5 Columns: Block or Gypsum board wrapped

4.1.1.6 Ceilings: Acoustical Tile in offices. Exposed in Operations

4.1.1.7 Corner Guards: Stainless Steel

4.1.1.8 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.

4.1.1.9 Restrooms:

4.1.1.9.1 Floor: Ceramic Tile

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

4.1.1.9.3 Ceilings: Painted Gypsum Board and LED Lighting

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

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

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

4.1.1.9.7 Fixtures/Accessories:

Water Closets: Wall Mounted – automatic flush valves

Faucets: Hands Free

Soap Dispensers: Hands Free with central soap reservoir system

Paper Towel Dispenser: Hands Free

Corner Guards: Stainless Steel

Shelves: Above toilets and urinals – Stainles Steel

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.

Baby Changing: Koala Kare Type

4.1.2 Building Exteriors

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

4.1.2.2 Facades: Precast, CMU, and Metal Panels

4.2 Fire Stations:

4.2.1 Building Interiors

4.2.1.1 Floor: Sealed concrete/tile/carpet

4.2.1.2 Base: Rubber

4.2.1.3 Walls: Block or Painted Gypsum board

4.2.1.4 Columns: Block or Gypsum board wrapped

4.2.1.5 Ceilings: Acoustical Tile

4.2.1.6 Corner Guards: Stainless steel

4.2.2 Building Exteriors

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

4.2.2.2 Facades: Metal Panels, Split Face Concrete Block

4.3 Maintenace

4.3.1 Building Interiors

4.3.1.1 Floor: Sealed concrete/tile/carpet

4.3.1.2 Walls: Block or Painted Gypsum board

4.3.1.3 Ceilings: Acoustical Tile

4.3.1.4 Corner Guards: Stainless steel

4.3.2 Building Exteriors

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

4.3.2.2 Facades: Metal Panels, Split Face Concrete Block

4.4 Miscellaneous

4.4.1 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)

4.4.2 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).

4.4.3 Pre-Fabricated 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

5.0 Appendices

5.1 Appendix No. 1

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.11 Satellite Mast on Metal Deck

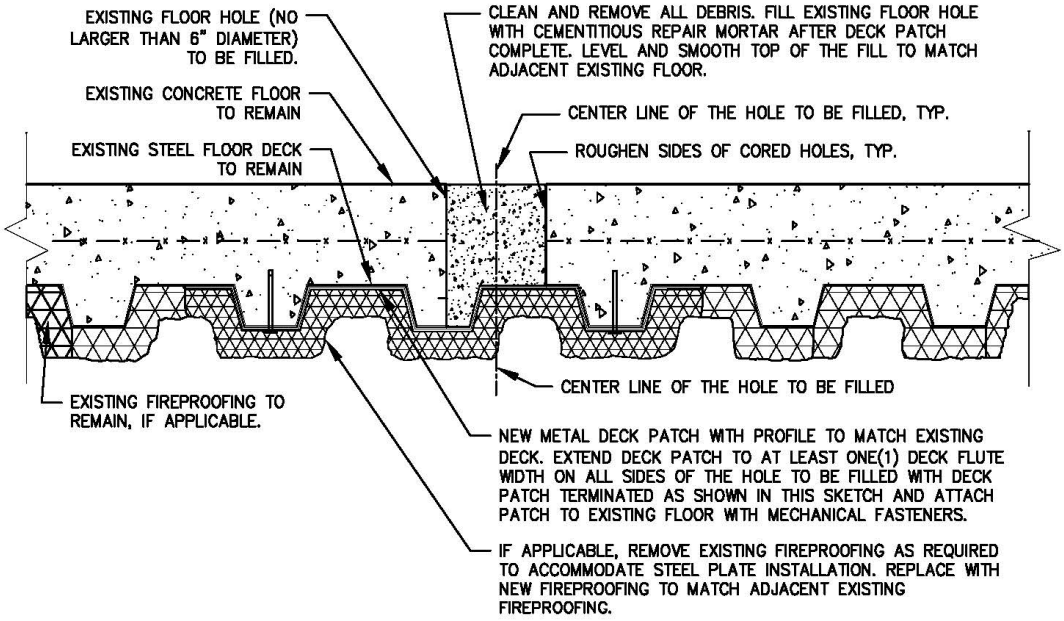
Detail No.1 Concrete on Steel Deck Floor Repair

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:

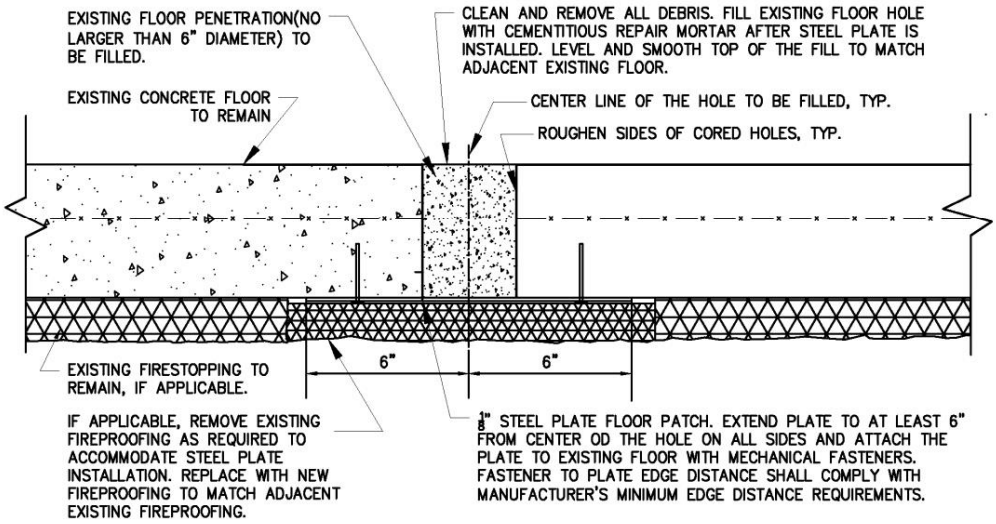
1. The clear spacing of adjacent cores or openings will be less than 3 inches; or
2. The core or opening is proposed for a concrete floor reinforced with prestressed reinforcement; or
3. The greatest dimension for the opening or core proposed exceeds 6 inches.

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	
No.		DATE: 08/20/2013	

Detail No.2 Concrete Floor Repair

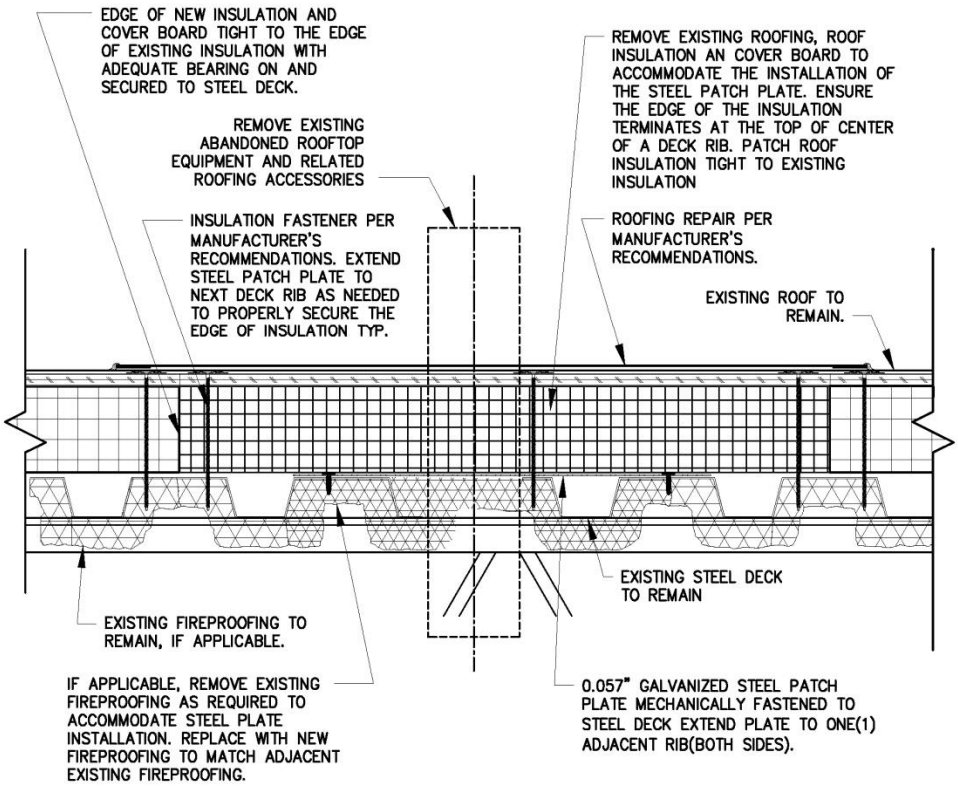


NOTES:

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			DETAIL NO.
DRAWING NAME: CONCRETE FLOOR REPAIR		Hartsfield-Jackson Atlanta International Airport	2
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

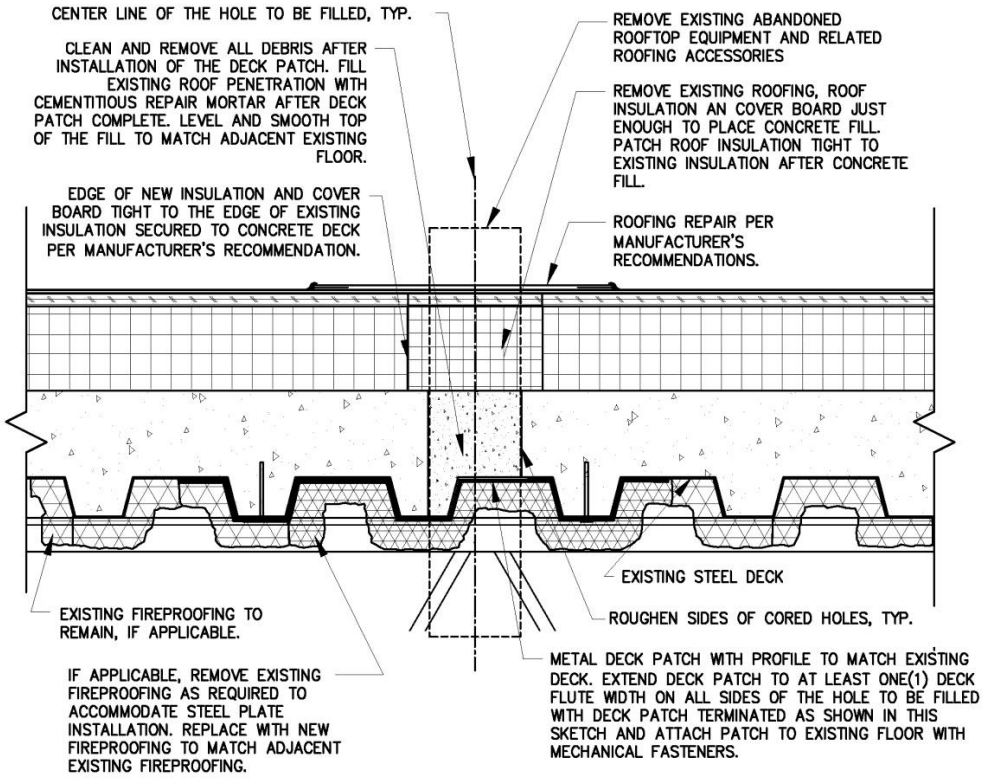


NOTES:

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			DETAIL NO.
DRAWING NAME: STEEL DECK ROOF REPAIR		Hartsfield-Jackson Atlanta International Airport	3
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	
No.		DATE: 03/26/2014	

Detail No.4 Concrete on Steel Deck Roof Repair

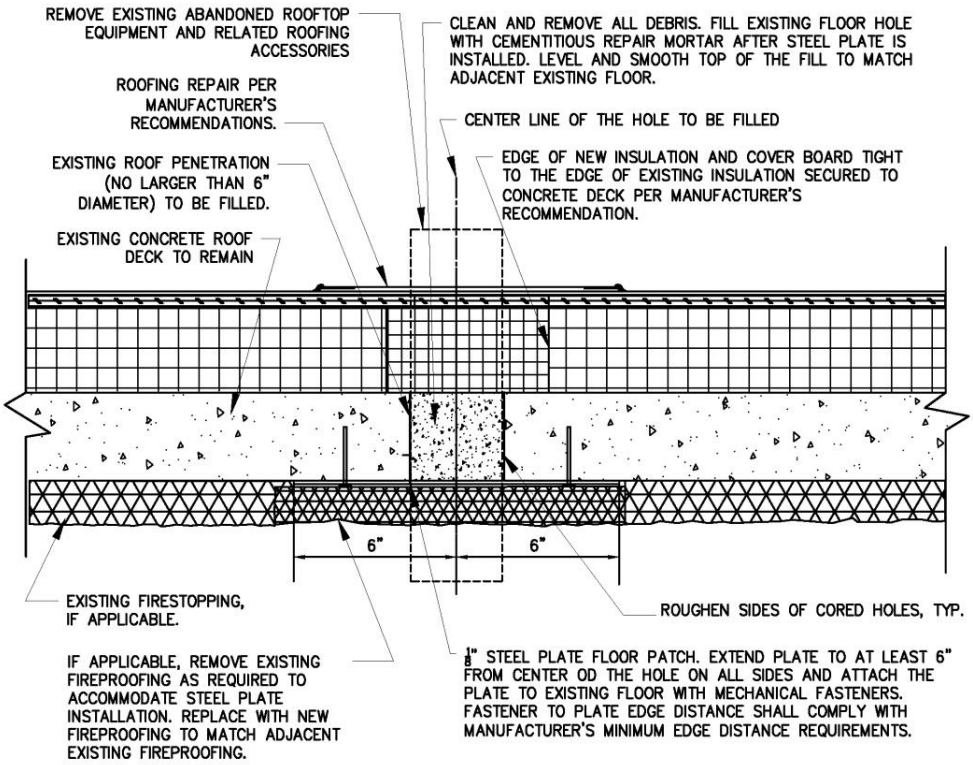


NOTES:

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		Hartsfield-Jackson Atlanta International Airport	DETAIL NO. 4
DRAWING NAME: CONCRETE ON STEEL DECK ROOF 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.5 Concrete Deck Roof Repair

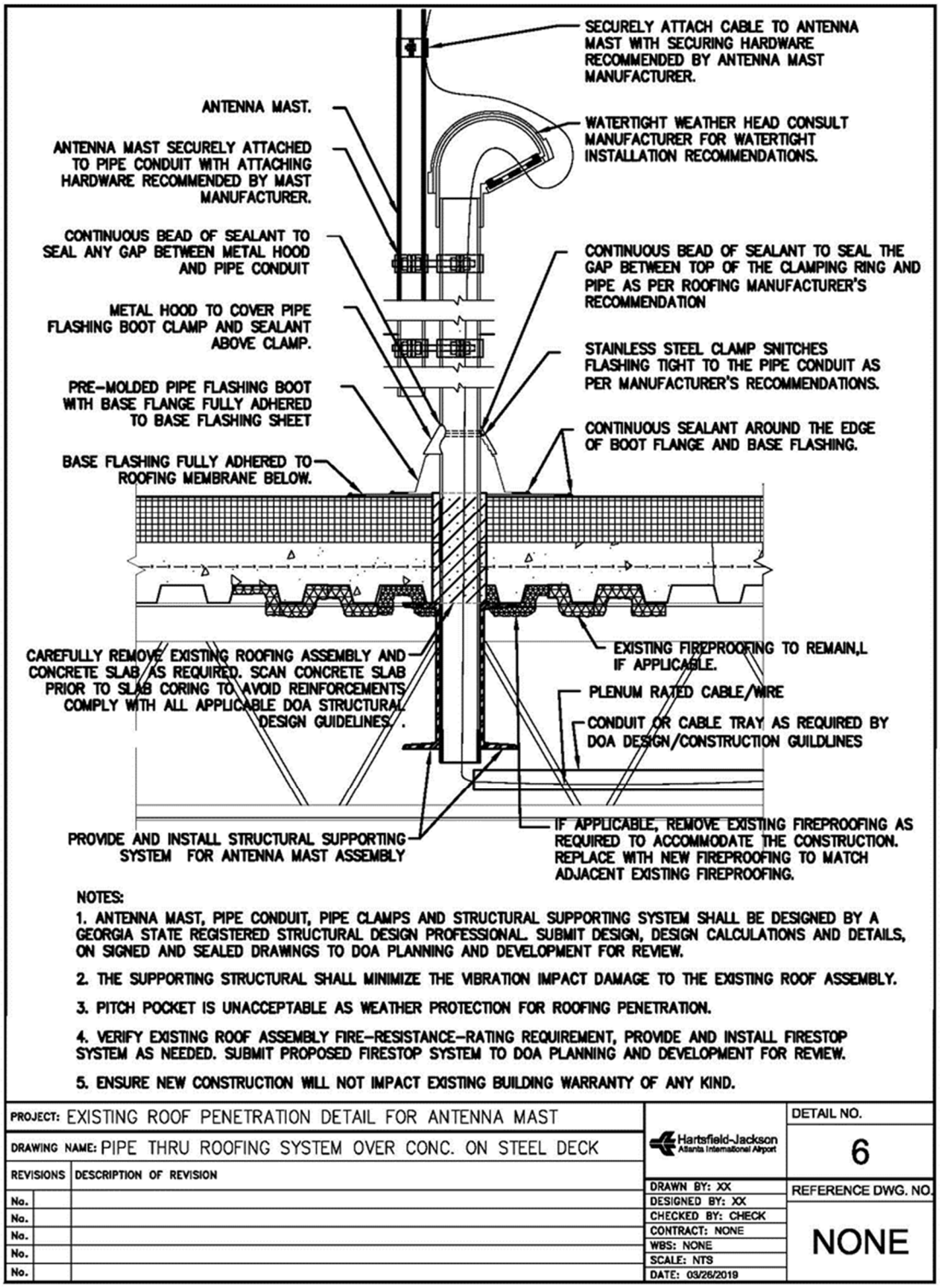


NOTES:

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

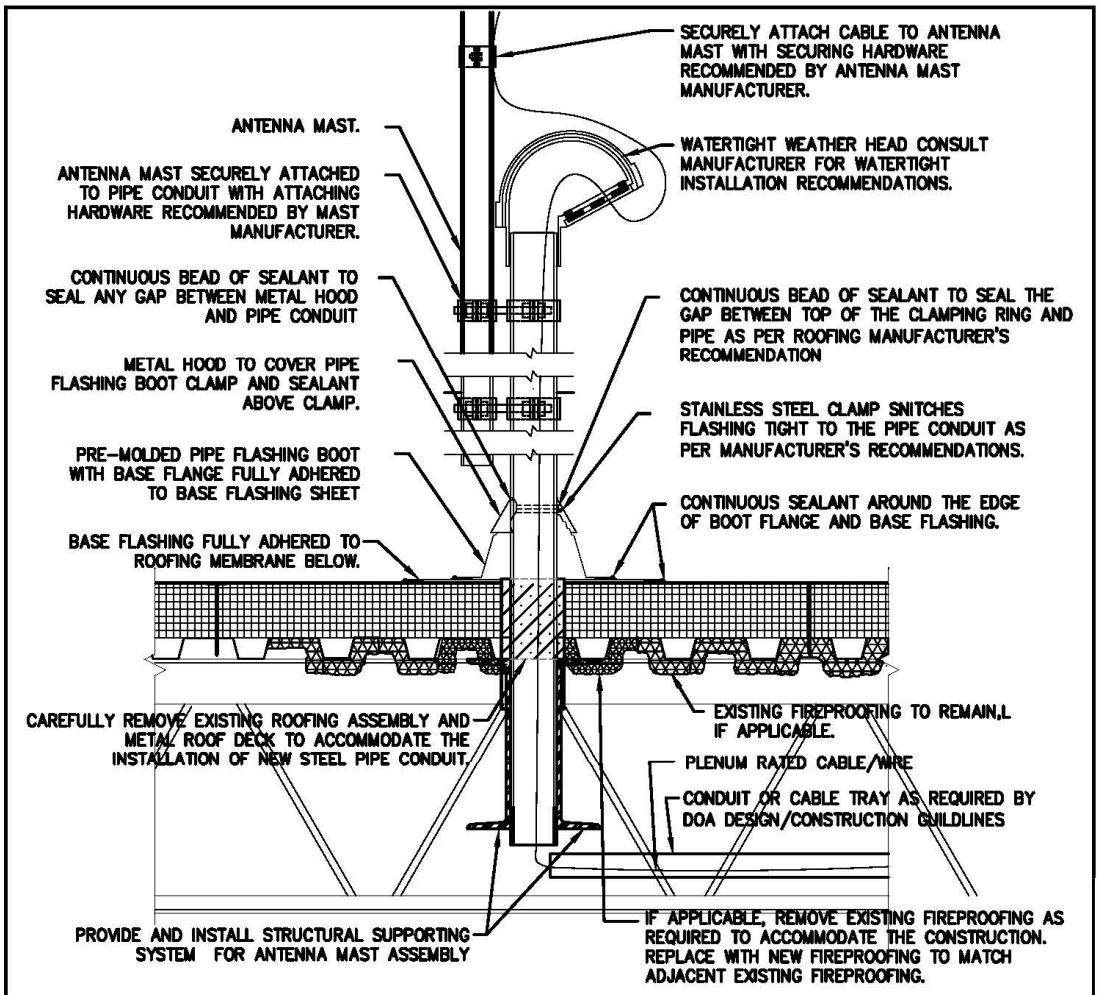


NOTES:

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			DETAIL NO.
DRAWING NAME: PIPE THRU ROOFING SYSTEM OVER CONC. ON STEEL DECK		Hartsfield-Jackson Atlanta International Airport	6
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: 03/26/2019	

Detail No. 7 Pipe Thru Roofing System Over Steel Deck

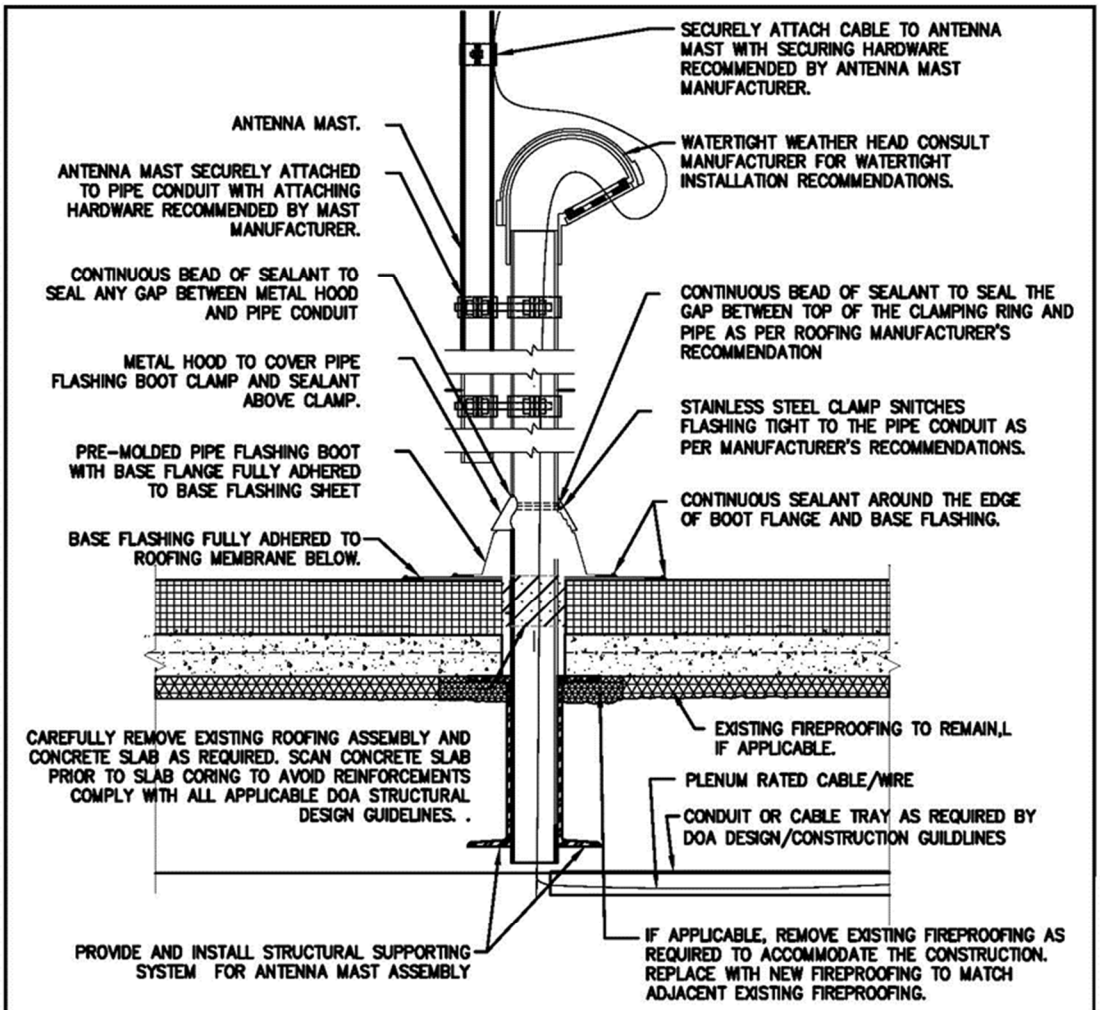


NOTES:

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

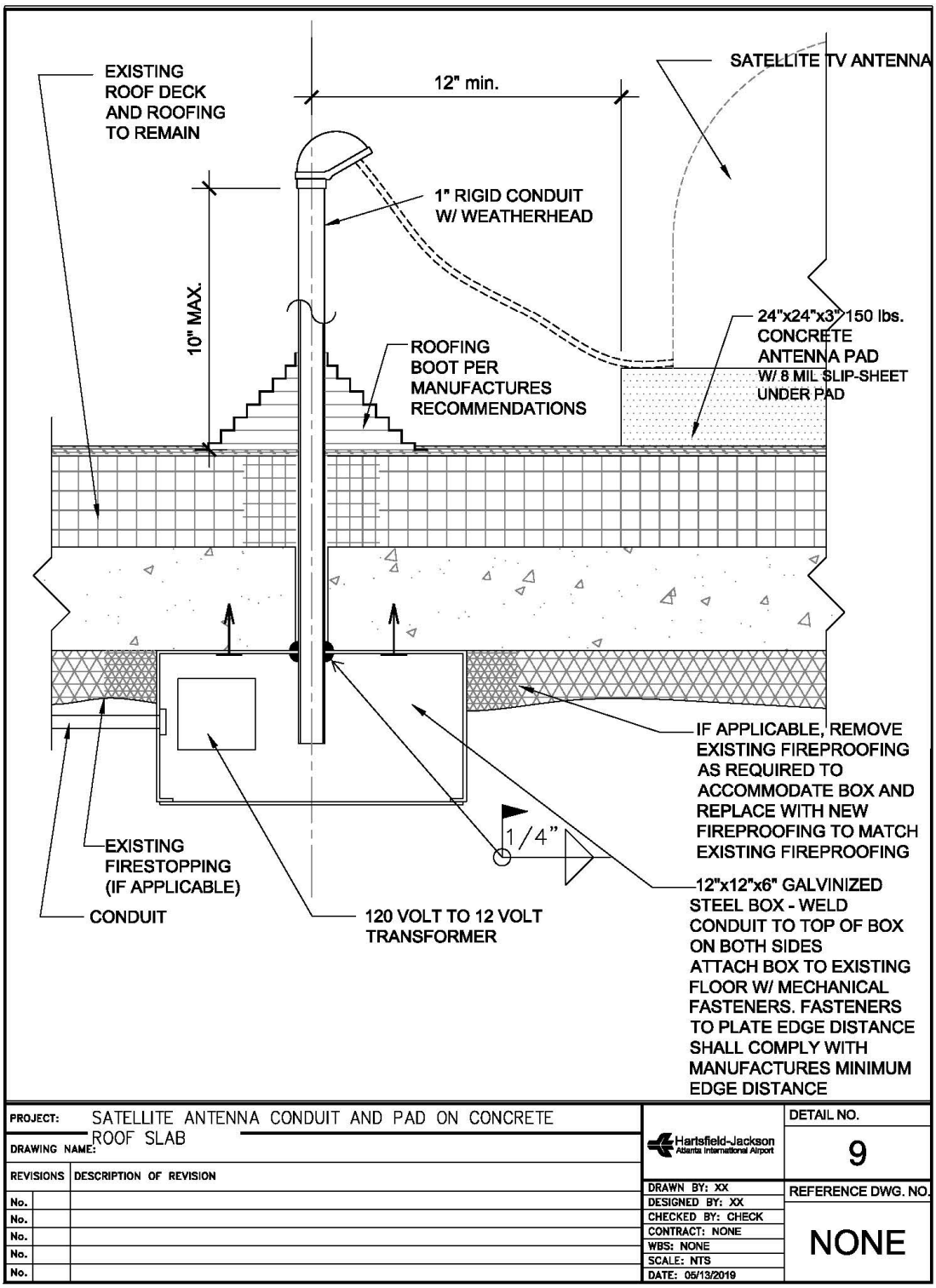


NOTES:

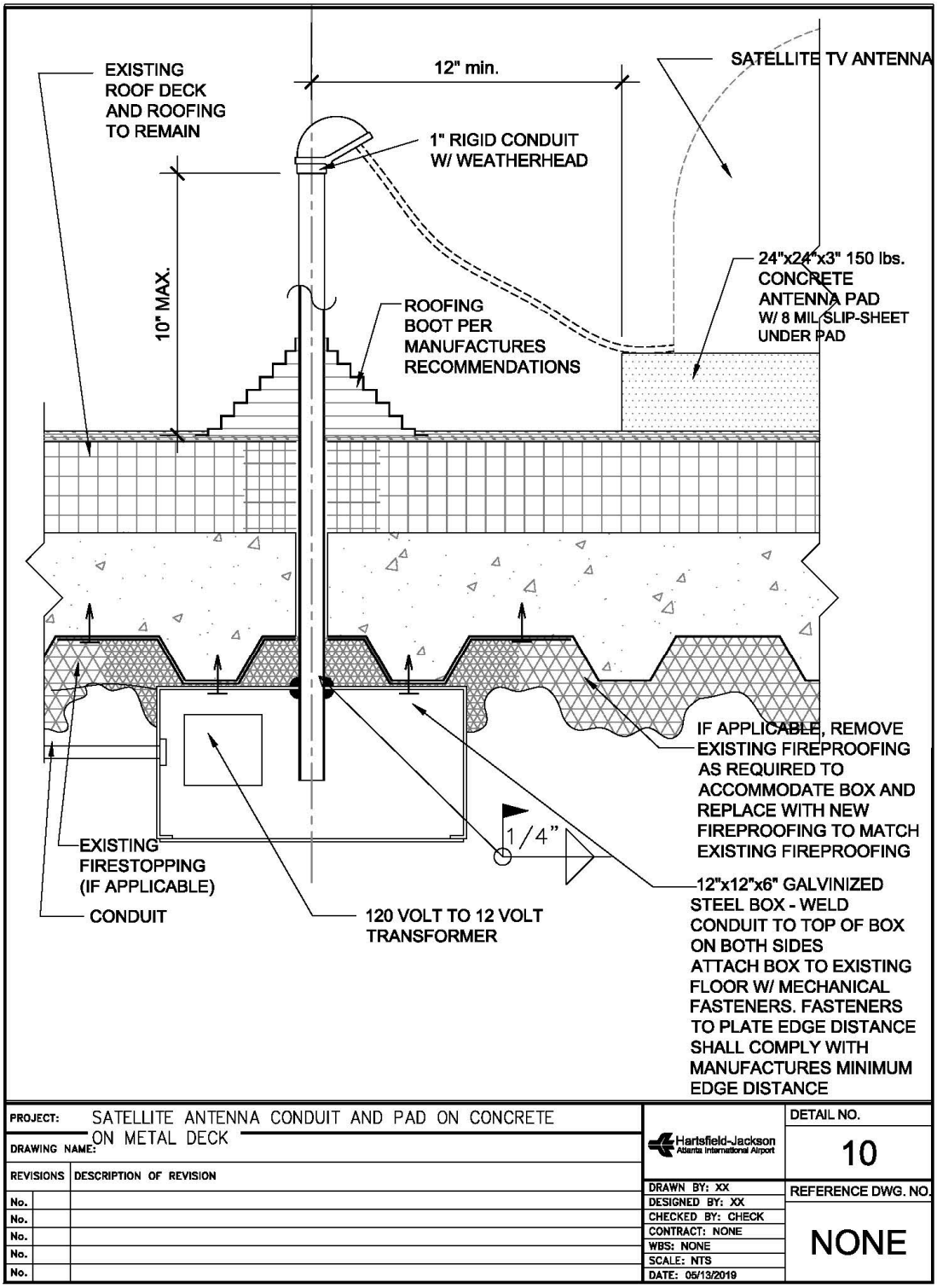
1. ANTENNA MAST, PIPE CONDUIT, PIPE CLAMPS AND STRUCTURAL SUPPORTING SYSTEM SHALL BE DESIGNED BY A GEORGIA STATE REGISTERED STRUCTURAL DESIGN PROFESSIONAL. SUBMIT DESIGN, DESIGN CALCULATIONS AND DETAILS, ON SIGNED AND SEALED DRAWINGS TO DOA PLANNING AND DEVELOPMENT FOR REVIEW.
2. THE SUPPORTING STRUCTURAL 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



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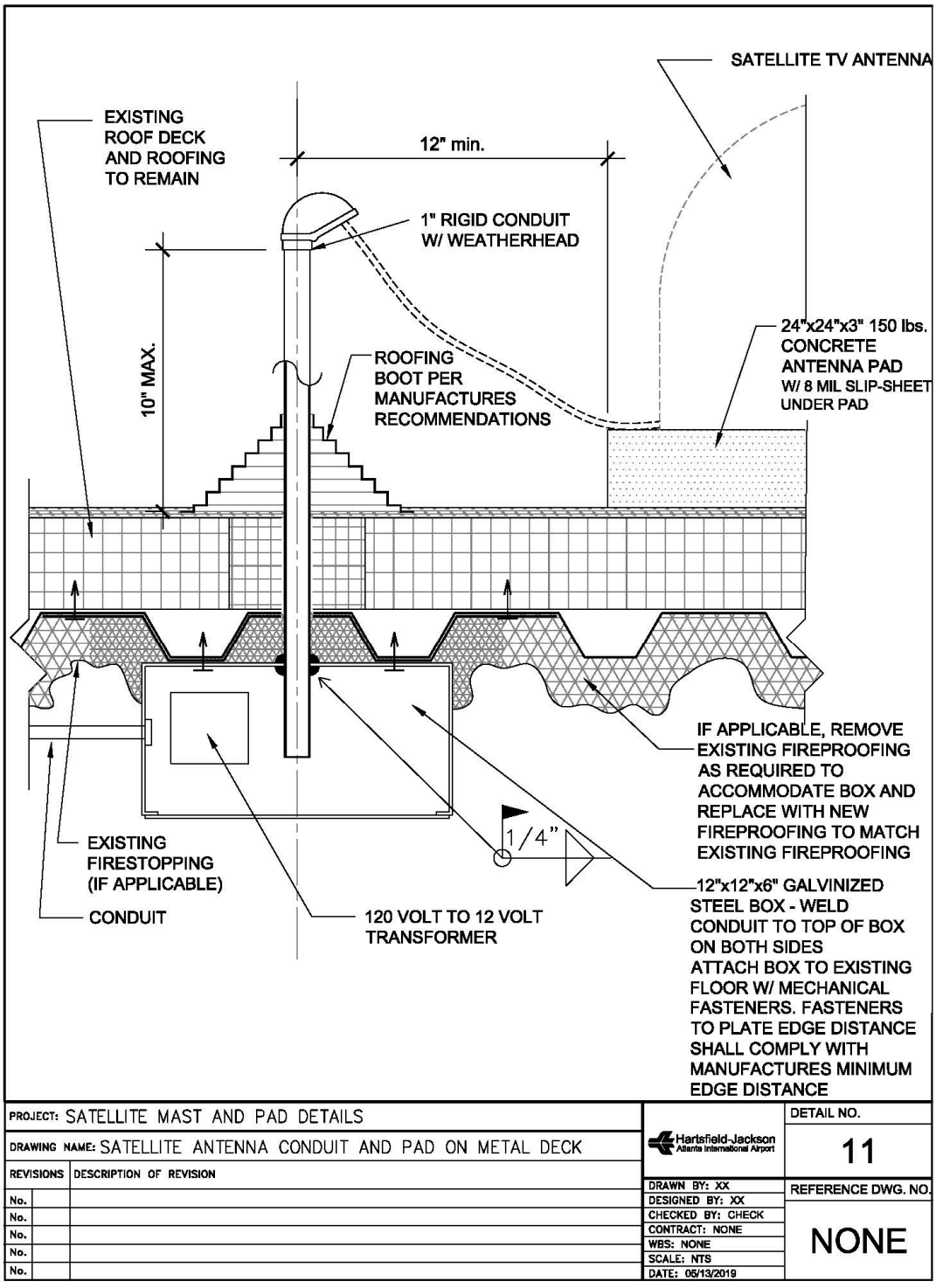

Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Mechanical Engineering

Design Standards
Mechanical

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Design Standards
Mechanical

1.0 Purpose

1.1 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

2.1 Applicable Codes (Building Codes and regulations as adopted by the State of Georgia with amendments)[15]

2.1.1 International Plumbing Code[16]
2.1.2 International Building Code
2.1.3 International Fuel Gas Code
2.1.4 International Mechanical Code
2.1.5 International Energy Conservation Code
2.1.6 National Fire Protection Association (NFPA) Codes
2.1.7 NFPA 70 National Electrical Code
2.1.8 NFPA 90A Standard for the Installation of Air Conditioning and Ventilation Systems
2.1.9 NFPA 90B Standard for the Installation of Warm Air Heating and Air Conditioning Systems
2.1.10 NFPA 96 Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
2.1.11 NFPA 101 Life Safety Code
2.1.12 NFPA 13 Standard for the installation of Sprinkler Systems
2.1.13 NFPA 14 Standpipe and hose systems
2.1.14 NFPA 20 Installation of stationary pumps
2.1.15 Standard Building Code

2.2 Standards

2.2.1 ANSI American National Standards Institute
2.2.2 ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality
2.2.3 ASHRAE 90.1 Energy Standard for Buildings
2.2.4 ASME American Society of Mechanical Engineers
2.2.5 National Green Building Standards

3.0 General Drawing Requirements[17]

3.1 Drawing layout 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 state licensed professional engineer and shall bear his/her seal.

3.2 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.[18]

3.3 Code conflicts shall be resolved by using the more stringent applicable code, unless granted a waiver by DOA.

4.0 Trade Specific Drawing Requirements:[19]

4.1 HVAC

4.1.1 Show all primary and secondary ductwork using double line graphic standards. HVAC plan drawings shall be 1/8" or larger.
4.1.2 Provide sections as required to show inter-trade coordination in space restricted areas (i.e. ceiling plenums, mechanical chases, baggage handling areas, etc.)
4.1.3 Provide mechanical enlarged part plans as required to show equipment, ductwork, and piping in mechanical rooms.
4.1.4 Provide riser diagrams for CHW, HHW, outside air, and exhaust air as required.
4.1.5 Provide HVAC installation details as required.
4.1.6 Provide schedules for all HVAC equipment
4.1.7 Provide air flow balance summations for space (or building) as required to indicate/validate positive pressure relationship between critical building components.
4.1.8 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.
4.1.9 Provide HVAC calculations (load, pump, fan, air flow balance, etc.) for review.
4.1.10 See Table 1 for Operating Parameters.[20]

4.2 Plumbing

4.2.1 Use ¼" scale plans (as a minimum) for all restrooms and food service areas.[21]
4.2.2 Provide riser diagrams for all sanitary waste and vent, grease waste, domestic water systems, and natural gas systems.[22]
4.2.3 Provide plumbing fixture schedules with connection sizes for all sanitary and domestic water systems.
4.2.4 Indicate clearly locations and line sizes of all connections to existing systems.
4.2.5 Indicate rainfall rate used for design and indicate roof square footage for each roof drain and pipe.
4.2.6 Provide schedules for all major plumbing devices including but not limited to, water heaters, pumps, air compressors, etc. Example:
4.2.6.1 Water Heater Schedules should include,, location, storage size, number of elements, KW, etc.
4.2.6.2 Pump Schedule should include, location, service, capacity (GPM), RPM, etc.

4.3 Fire Protection

4.3.1 Provide design criteria drawings, 1/8" scale or larger with existing and new sprinkler head locations, Hazard classification, including density and remote square footage and location of same for all spaces within a design.
4.3.2 Provide piping layout plans for major renovation projects and new construction.
4.3.3 Provide specifications including but not limited to, piping, sprinkler heads, equipment, ETC.
4.3.4 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 AUTO-CADD and PDF format.

5.0 Out Building Design Standards

5.1 Definition

While there is not a hard definition, out buildings are all buildings not associated with or connected to the CPTC. Most of these buildings are outside of the SIDA fence line but some facilities Fire stations, maintenance shops and airline support facilities and cargo facilities can lie within or adjacent to SIDA boundaries.

5.2 Design General

The M/P/FP design criteria for these facilities is too varied and function specific to be able to list. Planners and Designers shall design to the current code requirements as well as best practices for each type of facility. All projects shall comply with the standard requirements outlined in Sections 1 -4 of this document. All out building BMS systems must connect into DOA front end BMS system.[23]

5.3 Design Process

The M/P/FP design specifics need to be developed by the designer and reviewed by the stakeholders throughout the planning/ design process. While the planning process will generate key M/P/FP criteria as it defines the preliminary scope schedule and budget, there are many trade specific details that may not get addressed. It is recommended that designers meet as early as possible with the DOA engineering team to discuss the output of the planning report as the path forward is generated. During these meetings design questions, lessons learned and existing facility conditions can be discussed in a process that is intended to clarify system requirements specific to the individual facility and project.

6.0 General System Descriptions (HVAC)

6.1 Large CPTC Public Spaces HVAC[24]

6.1.1 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.[25]

6.1.2 Large CPTC Public spaces are to be served by medium and low pressure VAV Rooftop RTU or AHUs 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 economized outside air shall be provided. Outside air and return air in mechanical rooms shall be ducted to AHUs.

6.1.3 Provide Single Zone VAV AHUs for these large-open volume public spaces which have relatively uniform heating and cooling load distributions. These AHUs will utilize chilled and hot water from the central plant water loops.

6.2 Zoned CPTC Public Spaces HVAC[26]

6.2.1 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.

6.2.2 Zoned CPTC Public spaces are to be served by medium and low pressure VAV Rooftop AHUs 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. AHUs in locations subject to intake of jet exhaust shall be provided with carbon filtration as described later in the document. If OA route pressure drop is more than 0.75" W.C. consider providing OA injection fan to induce minimum required OA when supply fan VFD is in low speed.

6.2.3 Provide VAV AHUs for these spaces. These AHUs will utilize chilled and hot water from the central water loops. Provide VAV terminal units with hydronic heating.

6.2.4 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.

6.3 Restrooms

6.3.1 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 as a means to allow make-up air into any restroom if required.

6.3.2 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, as a means to allow make-up air into any restroom.

6.4 Hold Bag Screening Facilities

6.4.1 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.

6.4.2 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.

6.4.3 Provide Single Zone VAV (or constant volume) 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 a minimum.

6.5 Computer Rooms

6.5.1 ISD 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.

6.5.2 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.

6.5.3 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.

6.6 Transformer, Substation & Switchgear Rooms

6.6.1 At a minimum, provide ventilation as the load dictates, six (6) air changes per hour is considered minimum ventilation. 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.[27]

6.7 Apron Level Support Areas

6.7.1 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.

6.7.2 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.

6.8 Communication Closets

6.8.1 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.

6.8.2 If the application is critical, a back up fan may be required to provide ventilation in case of a system failure.

6.8.3 Where Base Building AC is not available, (typical on Apron level), provide DX unit or split system AC systems.

6.8.4 In critical spaces, two DX units or back up fan ventilation systems may be required.

6.8.5 Water source heat pump tied into domestic water system is not allowed under any circumstances.

6.8.6 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.

7.0 General System Descriptions (Plumbing)[28]

7.1 Infrastructure consist 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.[29]

7.2 Restrooms[30]

7.2.1 Public restrooms will be ADA accessible with touch free metering low flow fixtures (Per IPC).
7.2.2 All public restrooms will have floor drains in each fixture area.
7.2.3 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.

7.3 Back of House Restrooms[31]

7.3.1 Restrooms will be ADA accessible with low flow fixtures (per IPC)
7.3.2 Restrooms will have floor drains.

7.4 Back of House Break Rooms[32]

7.4.1 Break rooms with sinks can use storage heaters or instant electric water heaters
7.4.2 If cooking is required or a dishwasher is required, a grease trap or interceptor may be required. (See Concessions New Construction/Modifications Design Standards – Mechanical)

7.5 Apron Level Support Areas[33]

7.5.1 If cooking is required or a dishwasher is required a grease trap or interceptor may be required. (See Concessions New Construction/Modifications Design Standards – Mechanical)

8.0 General Systems Descriptions(Fire Protection)[34]

8.1 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.

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

8.3 Large CPTC Public spaces and zoned CPTC public spaces, including restrooms

8.3.1 All sprinkler heads are to be concealed type with color to match ceiling cover.

8.4 Back of House Areas

8.4.1 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.

8.5 Freeze Protection

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

9.0 Tenant Space Design Standards[35]

9.1 Scope of Work

9.1.1 This section describes the minimum design standards and installation requirements for Mechanical systems (M/P/FP) which are installed to serve various tenant spaces located throughout the CPTC.

9.1.2 The Tenant and Designer are responsible for bringing all systems which exist in their space(s) as well as those which are directly dedicated to serving their space(s) up to both current code and DOA standards as herein indicated.

9.1.3 The Designer is responsible for analyzing the impact the tenant modifications will have on the existing systems. The designer is responsible for ensuring that the existing common systems (AHUs, concourse pumps, primary ductwork, CHW/HW piping mains, kitchen grease waste, sanitary mains, domestic water mains, fire protection mains & zones) are not over taxed by the addition of systems required to serve tenant spaces.

9.1.4 Determine if AHUs and Pump systems can handle the additional loads.

9.1.5 TAB the entire AHU system which has been modified to ensure that other tenants have not been adversely affected by the Tenant modifications. TAB to specified summer and winter design conditions if design drawings are available, or current existing maximum air/water flows as determined by pre testing.

9.1.6 Determine that maximum velocities required by codes and standards have not been exceeded in pipe and duct systems.[36]

9.1.7 Determine that AHUs have the spare capacity for any additional loads added.

9.1.8 The Tenant is responsible for making all reasonable modifications to existing systems to meet code minimum requirements, good design practice and DOA standards. A sample of typical modifications includes but is not limited to:

9.1.8.1 Upgrade controls
9.1.8.2 Replace fiber board duct with sheet metal
9.1.8.3 Replace flex duct systems over 10 years old.
9.1.8.4 Replace/repair duct and piping insulation systems
9.1.8.5 Replace M/P/FP piping and ductwork mains as required to meet new loads.
9.1.8.6 Replace AHUs and pumping systems when the additional loads exceed the capacities of existing equipment. (Or provide new system – coordinate with DOA Engineering).[37]
9.1.8.7 Remove any abandoned piping, hangers and ductwork.[38]
9.1.8.8 Replace PVC drainage piping with C. I. or stainless steel.

9.1.8.9 Repair exterior cladding and new insulation to maintain the building envelope integrity.[39]

9.1.9 DOA is the final arbiter of what constitutes reasonable modifications to base building systems.

9.1.10 Refer to Concessions New Construction/Modifications Design Standards – Mechanical Engineering for concession facilities.[40]

9.1.11 The Contractor is responsible for the demolition of all systems not required to serve the space in its final configuration with the exception of active systems serving other spaces passing thru the lease area.[41]

9.1.12 Removal shall include, but not be limited to: all existing piping, conduit, controls, hangers and equipment, etc. used to serve the space regardless of location within or outside the boundary of the lease space. Remove all abandoned rooftop equipment and appurtenances (capping roof openings) and all utilities (CHW/HW Primary/secondary Air, Duct, DW/ sanitary/FP/Storm/Water, etc.) located in the ceiling plenum or chases of adjacent floors. Piping abandoned will be removed back to active main and capped. Cap seal and insulate as required any active utilities. Demo electrical service back to the power panel. Coordinate the removal requirements for any buried piping and conduit with DOA engineering.[42]

9.2 Codes and Standards

9.2.1 All Tenant designs shall be by professional engineers registered in the discipline specific to the trade work indicated on the contract drawings.

9.2.2 All governing codes and standards indicated in the trade sections of this standard will be adhered to by the designers of the tenant construction documents.[43]

9.3 Design Requirements

9.3.1 The following requirements shall be adhered to by designers of tenant spaces:

9.3.2 Designers shall provide due diligence to investigate existing conditions including requesting as-built drawings from AATC and/or DOA as required. The designers shall visit the site and check as-built conditions against previous design drawings.

9.3.3 When existing conditions are concealed behind inaccessible spaces, Designers shall modify drawings during the demolition phase of work as previously concealed utilities are exposed. It is the designers, tenant, contractor and owners responsibility to confirm that the latest revisions of design documents are maintained on site.

9.3.4 Designers shall visit the site to inspect the existing conditions after demolition has occurred, periodically during the new construction to ensure that the design intent is being maintained, prior to the drywall, blockwalls, and ceiling installation

to confirm that on site as-built drawings are correct (prior to concealing) and at the end of construction to provide final punch of the installation, confirming that all systems operate in accordance with the design intent.[44]

9.4 Technical System Descriptions

9.4.1 Existing Mechanical Utility Provisions

Most CPTC spaces are served from a four pipe CHW/HHW distribution system feed from two central plants: one located in the domestic terminal T-CUP and one in the International Concourse E-CUP. The systems are currently run such that chilled water and heating hot water are not simultaneously supplied. The CUP's also do not provide CHW when the OSA temp falls below 60 degrees F.[45]

9.4.2 Lease Space Designations

Each lease space is designated as available for a particular type of tenant. Tenants fall into one of two major categories: Concessions and non concessions. Non concessions tenants are typically airline support service spaces or DOA/CPTC support spaces. Concessionaire spaces are typically categorized in three groups: Food & Beverage, Retail & Specialty Retail. Based on the designation, landlord provided services are typically as follows:

9.4.3 HVAC

9.4.3.1 VAV AHUs with VAV terminal units using hydronic heating coils serve the majority of all tenant spaces within the CPTC. Existing tenant spaces have terminal units providing conditioned air to the space. New spaces typically have primary air trunk ducts with tap points indicated for future use. Existing HWS/HWR piping runs past every space. Existing terminal units have individual run outs to their respective coils.[46]

9.4.3.2 The Designer must compare the cooling /heating capacity being currently delivered to the space with their estimated loads for the new space. If the new loads exceed the existing capacity, then an analysis must be done to determine if the existing AHU, duct, pump and pipe systems can accommodate the additional load.

9.4.3.3 Where it is determined that base building systems cannot accommodate the new loads, dedicated equipment will be the alternate source of HVAC. CHW/HW AHUs connected to the base building hydronic systems are the preferred systems to install as a primary alternate. DX cooling and electric heating RTUs are the secondary option. Coordinate with DOA once the determination that supplemental systems will be required to determine which system alternative will be used.

9.4.3.4 Cooling load allowances (for the purposes of rough calculation) are as follows:

	Food & Beverage	Retail	Specialty Retail
Lighting:	2 W/Sqft	3W/Sqft	2 W/Sqft
Power:	5W/Sqft	1 W/Sqft	1 W/Sqft

9.4.3.5 In food service areas the lighting and power requirements are applied over the entire dinning and kitchen areas. The actual power requirements are typically lower in the dinning areas and higher in the food prep areas. Non concession spaces shall have a load allowance equivalent to specialty retail.

9.4.3.6 In Retail spaces, the lighting and power allowances are averaged over the entire space. Lighting densities are expected to be higher at entrance and over display counters, less in the circulation and back of house areas.

9.4.3.7 Note that HVAC for specialty retail spaces (kiosks located in, and open to, larger public spaces) are assumed to have no directly connected HVAC requirements. Heating and cooling will be dissipated into the systems serving the larger volume space.

9.4.3.8 DDC interface: The base building control infrastructure is based on a JCI Metasys control system. All new controls shall be DDC and shall be BACNET compatible. All new controls shall be compatible with the JCI standard protocols (device naming, addressing, graphic standards) for ATL. All new controls shall be fully integrated with the base building BMS control system. The tenant is responsible for retrofitting the controls to existing equipment serving their spaces to the new standard. (Upgrading the systems will be required any time a renovation project is enacted, regardless of the extent of HVAC work being done).[47]

9.4.3.9 The Tenant DDC system shall be able to operate in stand alone mode if the building DDC system is disabled. The tenant DDC system shall be compatible with the latest communication protocols.

9.4.4 Rooftop Equipment

9.4.4.1 All rooftop equipment will be installed on curbs or rails. Provide details to insure that roofing system integrity is maintained. All roofing work will be performed by certified contractors as to not void any roofing warrantees.

9.4.4.2 Rooftop equipment will have laminated nameplates which will identify the system type (exhaust fan- EF-1, Make-up air unit MAU-1 etc.) as well as the Tenant space it is serving (Joe's Coffee house, Burger Barn, etc). Major equipment capacity information will also be indicated on the equipment.

9.4.4.3 Rooftop equipment will be feed from electrical panels dedicated to the concession space the equipment serves.

9.4.4.4 Rooftop equipment will have lighting protection grounding.

9.4.4.5 Rooftop AHU outside air intake shall be 10 feet or more away from an exhaust source.

9.4.4.6 Cooling coil condensate will be routed to sanitary system (floor sinks, hub drains or mop sinks).

9.4.5 Food and Beverage special requirements: (Refer to "ATL P&D Design Standards: Concessions New Construction/Modifications Design Standards – Mechanical Engineering for concession facilities)[48]

9.4.6 Natural Gas Connection: 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.

9.4.7 Fire Protection: The existing spaces will have an existing sprinkler system that will be modified to meet the new space layout.

10.0 HVAC Materials and Equipment

10.1 Roof-Mounted Air Handling Units (RMU)

10.1.1 Roof-Mounted air handling units shall be custom-made, double-wall units and shall include (as required by application) chilled water cooling coil, hot water pre-heat coil, Camfil Merv 13 high flow bag filters, 85% efficient cartridge filters, 30% efficient pre-filters, centrifugal supply fan, mixing section with dampers, interior access corridor and interior lights. 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. Minimum outside air section shall be provided with a dedicated fan, 30% pre-filters and carbon filters as required. DOA will designate which units will require the minimum outside air filtration. 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, mounted inside the unit and pre-wired to fan motor. Constant speed units shall be provided with motor starter mounted inside unit and pre-wired to fan motor. Interior lights and service receptacles shall be wired to a junction box for single-point 120 volt feed.[49]

10.2 Interior Modular Air Handling Units (AHU)

10.2.1 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 13 high flow bag filters, 85% efficient cartridge filters, 30% efficient pre-filters, centrifugal supply fan, 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.[50]

10.2.2 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.[51]

10.3 Variable Air Volume Boxes (VAV)

10.3.1 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.

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

10.4 Ductwork

10.4.1 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 affect.[52]

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

10.5 Duct Insulation

10.5.1 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.[53]

10.5.2 Duct insulation for supply air, return air, and outside air ducts in exposed unconditioned spaces shall be rigid fiberglass board insulation, 2" thick, 3 lb./cu.ft. density with factory-applied FSK vapor barrier.[54]

10.6 Air Distribution Devices

10.6.1 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.[55]

10.7 Controls

10.7.1 Controls for all new equipment installations and renovation of old systems shall be DDC and shall be fully BACnet compatible. Systems shall connect and be fully integrated with the existing Johnson Controls Metasys system. Maintained and operated by AATC. Graphics shall be seamlessly integrated into the Metasys front end for end user ease of use.[56]

10.7.2 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).[57]

10.7.3 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).[58]

10.7.4 Zone temperature thermostats shall be networked type sensors, communicating on either the SA or BACnet bus.[59]

10.8 Test and Balance

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

10.9 Utility Piping

10.9.1 Chilled Water and Heating Hot Water pipe shall be ASTM A-53 Grade B pipe carbon steel. Piping 2 ½" and smaller shall be threaded and coupled with 150 lb. threaded fittings. Type L hard-drawn copper with solder joint fitting may be used on for piping 2 ½" and smaller with DOA approval. Piping 3" and larger shall be plain end pipe with 150 lb. butt-welded fittings.

10.9.2 Piping headers shall be routed over corridors or common areas for access where possible.[60]

10.9.3 Cooling coil condensate will be routed to sanitary system (floor sinks, hub drains or mop sinks).

10.9.4 Pipe insulation shall be rigid fiberglass pipe insulation with all-service jacket vapor barrier. Piping located outside shall be closed cell covered with aluminum jacketing.[61]

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

10.9.6 Avoid routing CH/HW piping in electrical and MDF-IDF rooms.[62]

11.0 Plumbing Materials and Equipment

11.1 Sanitary, Storm and Kitchen Waste and Vent Piping

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

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

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

11.1.3 Kitchen (greasy) waste, from dishwasher, floor drains, floor sinks, three compartment sink, mop sink and food grinder waste water to exterior grease interceptor shall be stainless steel piping with hub and spigot push on joints. Provide joint restraints as recommended by the manufacturer.[63]

11.2 Domestic Water Piping

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

11.2.2 Fittings 4” and smaller shall be solder using 95/5 lead free solder or press fittings with neoprene “O” ring.[64]

11.2.3 Fittings larger than 4” shall be rolled groove.[65]

11.2.4 Fittings 4” and less shall be press fitting with neoprene “O” ring.[66]

11.3 Natural Gas Piping

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

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

11.3.1.2 Gas piping 2” and smaller shall be threaded.

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

11.3.2 Underground gas piping.

11.3.2.1 Outdoors at building entrance, schedule 40 black steel piping with threaded or socket welded fittings and coated with protective coating and wrapping.

11.3.2.2 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.

11.3.2.3 Below slab piping shall be installed in a trench or be contained with containment piping vented to the exterior.

11.4 Insulation

11.4.1 Domestic cold water, ½” thick fiberglass pipe insulation

11.4.2 Domestic hot and hot water return, 1” thick fiberglass pipe insulation.

11.4.3 Domestic water piping exposed in kitchen or wash down areas shall be ½” for cold and 1” for hot and hot water return closed cell insulation with PVC jacket.

11.4.4 Domestic water piping exposed outdoors or in heavy traffic areas will be a minimum of 1-1/2” with aluminum jacket.[67]

11.4.5 Roof drain body and horizontal piping 1/2” duct wrap.[68]

11.4.6 Sanitary drainage, p-trap and horizontal piping, serving HVAC condensate shall be insulated the same as roof drains and horizontal piping.

11.4.7 P-traps, sanitary piping, kitchen piping and domestic water exposed to freezing shall be heat traces and insulated with aluminum jacket.

11.5 Water Heaters

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

12.0 Fire Protection Materials and Equipment

12.1 Fire Protection Piping

12.1.1 All components of the fire protection systems and installation shall meet NFPA 13 requirements.
12.1.2 Underground piping shall be ductile iron with mechanical joint fittings and thrust blocks or tie-rods.[69]
12.1.3 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. Grooved fittings and couplings which are UL-listed and FM-approved are permitted.[70]
12.1.4 All dry pipe sprinkler systems shall be schedule 40 galvanized steel.

12.2 Fire Protection Equipment

12.2.1 Wet sprinkler systems shall be designed through an alarm check valve in lieu of a straight way check valve with flow switch.
12.2.2 Dry sprinkler system shall be designed through a dry alarm valve with air compressor.
12.2.3 Sound dampening devices are required for all compressor installations (i.e. sound blankets, soundproof enclosures, etc.)[71]

12.3 Sprinkler heads

12.3.1 Concealed type sprinkler heads shall be located in sheet rock ceilings and 2X4 lay-in ceiling (at ¼ points).
12.3.2 Semi-recessed heads shall be used in 2X4 lay-in ceiling (at ¼ points)
12.3.3 Upright heads shall be used for areas without ceiling or for dry systems.

13.0 Appendices[72]

13.1 Appendix A

Standard Multizone Sequence

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

1.0 Occupied-unoccupied mode control:
- 1.1 Air handling unit (AHU) default is a 24/7 run schedule, where supply fan runs continuously.

2.0 Start-stop control:
- 2.1 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.

3.0 Warm up mode control:
- 3.1 The space temperatures shall be monitored and compared to the warm up 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.

4.0 Minimum outside air damper control:
- 4.1 Each AHU shall be provided with a minimum outside air flow (OAF) controller consisting of an air flow measuring station with active damper control.
- 4.2 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.
- 4.3 When not in warm up or cool down mode, the minimum outside air control shall initially open to building minimum of scheduled outside air.
- 4.4 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.
- 4.5 The minimum outside air damper modulates to maintain OAF at OAF SP.
- 4.6 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.

5.0 Discharge air temperature setpoint control (DAT SP):

5.1 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.

5.2 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.

5.3 If outside air temperature (OAT) is greater than 75 F, DAT SP is set to minimum setpoint.

5.4 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.

5.5 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.

6.0 Discharge air temperature control modes:

6.1 Economizer mode (maximum outside air damper):

6.1.1 Whenever the OAT is below the economizer switchover setpoint of 65°F the unit shall operate under the economizer mode.

6.1.2 The economizer outside air damper modulate 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).

6.1.3 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.

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

6.2 Cooling mode

6.2.1 When economizer is not enabled, economizer damper is closed and chilled water modulates for DAT to meet DAT SP.

6.3 Heating mode

6.3.1 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.

6.3.2 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.

7.0 Return damper and fan control:

7.1 Return damper position equals 100% minus the economizer damper position.

7.2 If a return fan exists, it will control to a plenum pressure determined at test and balance.

8.0 Discharge Air Pressure Setpoint Control (DAP SP)

8.1 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.

8.2 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).

8.2.1 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.

8.2.2 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.

8.2.3 If neither condition is true, setpoint remains unchanged.

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

8.2.5 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.

9.0 AHU supply fan control:

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

10.0 Relief fan and damper control:

10.1 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.

11.0 Purge mode control: (RMU units only)

11.1 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%.

12.0 Fan shutdown:

12.1 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.

13.0 Safeties:
- 13.1 A fire alarm shutdown relay will stop the unit upon receiving a signal from the fire alarm system.
- 13.2 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.
- 13.3 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.

14.0 Hard wired interlocks:
- 14.1 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.
- 14.2 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.

15.0 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:
- 15.1 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.
- 15.2 No air flow for 2 minutes or longer.
- 15.3 Smoke or heat detected in the air handling unit.
- 15.4 Drain pan filled with condensate.
- 15.5 Freeze protection thermostat indicating freezing temperatures in air handling unit.
  - 15.5.1 The freeze stat should stop the supply fan, close all outside air dampers, open the hot water valve and chiller water valve.
- 15.6 Supply duct pressure exceeds 3.0 inches w.c. high limit

16.0 Non-shutdown alarms: the control system shall alarm the user interface whenever any of the following conditions occurs:
- 16.1 Discharge air temperature +/- 5 deg F of setpoint for five minutes or longer.
- 16.2 Supply duct static pressure +/- 0.5 in w.c. of setpoint for 5 minutes or longer.
- 16.3 When the supply fan is operating in manual override as determined by fan operation outside the control of the control system.
- 16.4 Supply fan alarm

13.2 **Appendix B**

Single Zone AHU Standard Sequence

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

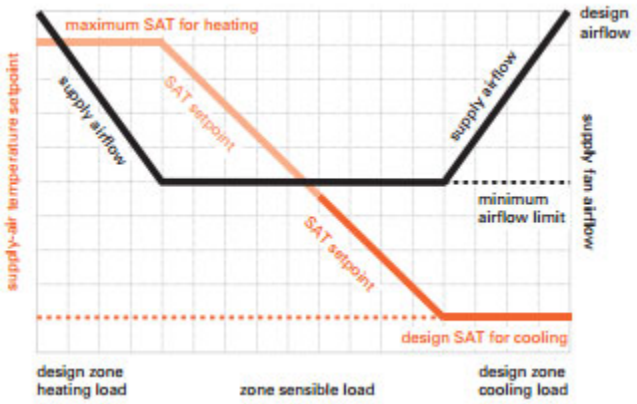
1.0 Start-stop control:
- 1.1 Provide hand-off-auto switch. In auto position, the air handling unit shall start. Upon receiving a start command, the smoke damper shall open, and minimum outside air damper shall open to its minimum position. After the smoke damper and either the maximum outside air or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

2.0 Warm up mode control:
- 2.1 The space temperature shall be monitored and compared to the warm up 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.

3.0 Minimum outside air damper control:
- 3.1 Each AHU shall be provided with a minimum outside air flow (OAF) controller consisting of an air flow measuring station with active damper control.
- 3.2 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.
- 3.3 When not in warm up or cool down mode, the minimum outside air control shall initially open to building minimum of scheduled outside air.
- 3.4 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.
- 3.5 The minimum outside air damper modulates to maintain OAF at OAF SP.
- 3.6 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.

4.0 Return damper and fan control:
- 4.1 Return damper position equals 100% minus the economizer damper position.
- 4.2 If a return fan exists, it will control to a plenum pressure determined at test and balance.

5.0 Zone temperature control (heating/cooling valves and fan speed)
- 5.1 In this sequence, zone temperature can refer to return temperature OR zone temperature depending on the operator selection.
- 5.2 Graphically, the zone temperature control will operate per the below diagram and as described in this section:



5.3 Mode Selection and Operation:

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

5.3.1.1 Discharge Air Temperature Setpoint:

5.3.1.1.1 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).

5.3.1.2 Discharge Air Temperature Control:

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

5.3.1.2.2 The economizer outside air damper modulate 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).

5.3.1.2.3 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.

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

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

5.3.1.2.6 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.

5.3.1.3 Supply Fan Speed:

5.3.1.3.1 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).

5.3.1.3.2 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.

5.3.1.3.3 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.

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

5.3.2.1 Discharge Air Temperature Setpoint:

5.3.2.1.1 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).

5.3.2.2 Discharge Air Temperature Control:

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

5.3.2.2.2 The preheat valve controls discharge air temperature to setpoint.

5.3.2.3 Supply Fan Speed:

5.3.2.3.1 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).

5.3.2.3.2 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.

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

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

6.0 Unoccupied mode control

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

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

6.2.1 Unoccupied cooling enable setpoint = 76 °F

6.2.2 Unoccupied effective cooling setpoint = 77 °F

6.2.3 Unoccupied heating enable setpoint = 68 °F

6.2.4 Unoccupied effective heating setpoints = 67 °F

6.2.5 Unoccupied minimum fan speed = 25%

7.0 Relief fan and damper control:

7.1 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.

8.0 Purge mode control: (RMU units only)

8.1 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.

9.0 Fan shutdown:

9.1 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.

10.0 Safeties:

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

10.2 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.

10.3 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.

11.0 Hard wired interlocks:

11.1 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.

11.2 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.

12.0 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:

12.1 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.

12.2 No air flow for 2 minutes or longer.

12.3 Smoke or heat detected in the air handling unit.

12.4 Drain pan filled with condensate.

12.5 Freeze protection thermostat indicating freezing temperatures in air handling unit.

12.5.1 The freeze stat should stop the supply fan, close all outside air dampers, open the hot water valve and chiller water valve.

12.6 Supply duct pressure exceeds 3.0 inches w.c. high limit

13.0 Non-shutdown alarms: the control system shall alarm the user interface whenever any of the following conditions occurs:

13.1 manual override as determined by fan operation outside the control of the control system.

13.2 Supply fan alarm

13.3 Zone temperature +/- 3 deg F of setpoint.

13.3 **Appendix C**

Standard Terminal Unit Control Sequence

1.0 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.

2.0 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.

3.0 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.

4.0 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.

- 4.1 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:
- 4.2 VAV Counts LCT
- 4.3 Purge-INT
- 4.4 HTGMODE (Interlock)
- 4.5 Warmup-LCT
- 4.6 Schedule-INT
- 4.7 Zone temp warnings for 2.5 deg above effective cooling setpoint or below effective heating setpoint
- 4.8 Delete any no longer in service boxes from the system
- 4.9 Update all graphics including floor plans
- 4.10 Ensure that key flow and temperature setpoints for occupied and unoccupied are exposed. Refer to typical points list and naming convention.
- 4.11 All terminal unit point names must have the air handler and box number included. For example:
  - 4.11.1 RMU-95A-BL-V04.ZN-T or RMU-95A-BL-V04.EFFCLG-SP
    - 4.11.1.1 Points labeled as only ZN-T and EFFCLG-SP without the prefix is not acceptable.

13.4 **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 Facilities – HVAC Operating Parameters

Passenger Facilities
HVAC Operating Parameters

Space/Function	Indoor Design Condition				HVAC Load Data			
	Summer- ^{0}F	% RH	Winter- ^{0}F	% RH	People FT^2/PPL	Outside Air CFM/PPL	Lights Watts/FT^2	Equipment 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
Planning & Development Bureau

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Electrical

Design Standards
Electrical

Table of Contents

Design Standards
Electrical

1.0 Purpose

The primary objective of these standards is to achieve consistency throughout electrical designs for all facilities.

2.0 Construction Drawings

Table 1 presents suggested plans and/or drawings required for a typical electrical job.

Table 1 - Electrical Construction Drawings

Drawing	Scale	Remarks
Electrical Site Plan	1 inch = 20 feet	
Lightning Protection and Counterpoise Composite Plan	1 inch = 20.0 feet	
Grounding Plan	1 inch = 20.0 feet	
Power: One-Line Diagram	--	
Grounding: One-Line Diagram	--	
Power Plans	¼ inch = 1.0 feet	1/8 inch may be used for large spaces
Lighting Plans	¼ inch = 1.0 feet	1/8 inch may be used for large spaces
Special Systems Plans as Required	¼ inch = 1.0 feet	1/8 inch may be used for large spaces
Grounding Details	--	
Low Voltage Switchgear Elevation and Details	--	
Motor Control Center Elevation and Details	--	
Miscellaneous Elementary and Wiring Diagrams	--	
Miscellaneous Details: Lightning Protection	--	
Equipment List	--	
Power Duct Bank Plan and Profile (Civil Work Drawing)	1 inch = 50 feet horizontal	
High Voltage Switchgear, Transformer, Metering Pad Details	--	
Primary Electrical System One-Line Diagram	3/4 inch = 1 foot	
Electric Manhole Plan, Details and Section	--	

Panel schedules
Electrical riser for multi-story buildings
Legend and lighting fixture schedule

Locate all electrical symbols and equipment locations to scale on plan drawings.

3.0 Facilities Master Electrical Drawing Update

3.1 Design Service Providers (DSP) shall update the Department of Aviation's Facilities Master Electrical Drawings whenever a project is performed at the Central Passenger Terminal Complex (CPTC). Facilities Master Electrical Drawings are being developed for each building contained within the CPTC. Once Facilities Master Electrical Drawings have been checked out as detailed in the following procedure, a DOA Electrical Engineering representative shall follow up with the DSP at the end of requested period of time for use drawings to ensure that procedure requirements are being executed. This requested period of time shall include the necessary time to complete design and update Facilities Master Electrical Drawings.

3.2 Definition

3.2.1 Facilities Master Electrical Drawings consist of:
- 3.2.1.1 Single lines diagrams
- 3.2.1.2 Partial single line diagrams
- 3.2.1.3 Electrical room layouts
- 3.2.1.4 Panel schedules
- 3.2.1.5 Panel directories

3.2.2 Each of the above elements represents an area or an entire facility such as a concourse and terminal building located at the CPTC.

3.2.3 A project's final as-built drawings are independent of the Facilities Master Electrical Drawings, but the Facilities Master Electrical Drawings shall be revised to include the changes created by all projects performed at the CPTC. The DSP may check out the Facilities Master Electrical Drawings as described in the following procedure for utilization as the electrical base drawing for a given project performed at the CPTC.

3.3 Procedure

3.3.1 Project Initialization

3.3.1.1 The DSP shall contact DOA's Document Control Department (DC) with a request to obtain Master Facilities Drawings pertinent to a design modification or new construction. It's the DSP's responsibility to identify the Facilities Master Electrical Drawings required for the update.

3.3.1.2 The request shall be accompanied by the following information:
- 3.3.1.2.1 Requestor's name and signature
- 3.3.1.2.2 Requestor's employer and signature
- 3.3.1.2.3 Date of request
- 3.3.1.2.4 Project name
- 3.3.1.2.5 Project description

3.3.1.3 DC shall forward the request to the DOA Electrical Engineering Department for review and approval.

3.3.1.4 The revision number on the issued drawings shall be the current revision number or in general, revision X (such as revision 1 for example).

3.3.1.5 The DSP shall establish a finish date for the completed revised Facilities Master Electrical Drawings. The DSP shall contact the Electrical Engineering Department on the established date to provide status of the

drawings.

3.3.2 Revised Master Facilities Drawings

3.3.2.1 Upon completion of a new construction or renovation project, the DSP shall update the master facilities drawings to include changes per as-built documentation. Revised Master Facilities Drawings shall be delivered to DOA's DC in AutoCAD along with a Signed and Stamped hard copy by a Professional Engineer (P.E.)

3.3.2.2 The revised Master Facilities Drawings shall have the following information included in the revision blocks:

3.3.2.2.1 The new revision number, generally Revision X + 1 enclosed in a triangle.

3.3.2.2.2 The revision date.

3.3.2.2.3 The engineer's initials.

3.3.2.2.4 A brief description of the revision.

3.3.2.2.5 Signed and Stamped by a Professional Engineer (P.E.)

3.3.2.3 Deliverables

3.3.2.3.1 In addition to the required hard copy deliverable for each item listed below, the following deliverables shall also be submitted in the following electronic formats listed below:

3.3.2.3.1.1 Single Line (AutoCAD)

3.3.2.3.1.2 Electrical Room Layouts (AutoCAD)

3.3.2.3.1.3 Panel Schedule (AutoCAD and Excel)

3.3.2.3.1.4 Panel Directories (AutoCAD and Excel)

3.3.2.3.1.5 One hard copy of all items listed in this section

4.0 General Design Requirements

4.1 General

Resolve code conflicts by using the more stringent applicable portion of conflicting codes unless DOA grants a written waiver.

4.1.1 Keep abbreviations to a minimum.

4.1.2 Use only standard technical abbreviations from the ANSI and the IEEE on all drawings.

4.1.3 Single line drawings are required for any project. A riser diagram is not a substitution for a single line diagram however; riser diagrams AND single line diagrams are required for multiple story building. All electrical data such as cable, conduits, and breaker sizes, AIC ratings, metering, interconnection to utilities and downstream devices and other information shall be listed on the single line diagram.

4.2 Wiring

4.2.1 All wiring including phone and data shall be in NEC raceways. EMT may be used for concealed installations but rigid metal conduit (type RMC) should be used for exposed conduit. Only cast metal boxes should be used for exposed installation. EMT with compression fittings can be used in lieu of RMC with prior DOA approval and where the circuit is not subject to any mechanical damage.

Use compression type fittings for EMT conduit. EMT with set screws is not allowed.

4.2.2 Data cables may be installed in cable tray. J hooks are not allowed.

4.2.3 Surface nonmetallic raceways shall not be permitted.

4.2.4 Branch circuit conductors shall be minimum 12 AWG and shall be copper, type THHN/THWN unless otherwise noted. Minimum conduit size shall be ¾".

4.2.5 Control wiring shall be minimum 14 AWG.

4.2.6 No reduced sized neutrals will be allowed. Each single pole over current device shall have its own separate neutral conductor.

4.2.7 Multi-wire branch circuits are not allowed.

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

4.2.9 Metal Clad (MC) Cable shall only be used for final connections to lighting 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.

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

4.2.11 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.

4.2.12 All underground wiring shall be protected by conduit and concrete encasement. Mini-mum burial depth shall be 24".

4.2.13 Do not exceed 5 percent combined voltage drop on feeders and branch circuits if the transformer providing service is located within the facility. If the

4.2.14 Transformer is located exterior to the facility, limit the combined voltage drop for service conductors, feeders, and branch circuits to 5 percent. Individual voltage drop on branch circuits should not exceed 3 percent. Branch circuits supplying sensitive circuits (per NEC 647-4D) should be limited a voltage drop, not exceeding 1 percent to 2 percent. IEEE 1100, Powering and Grounding Sensitive Electronic Equipment, recommends a maximum voltage drop of 1 percent for electronic installations.

4.2.15 Wiring for airfield lighting shall be in polyvinyl chloride conduit schedule 80

4.3 Circuiting

4.3.1 Shared neutral is not allowed.

4.3.2 Branch circuit design for general use power outlets shall be limited to no more than six receptacles per circuit.

4.3.3 Only life safety circuits shall not be connected to the emergency power system.

4.3.4 .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.

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

4.3.6 If any circuits from an existing panel are demolished first use these spare circuits for any new work before using existing spaces or spare circuit breakers.

4.3.7 Include notes on the drawings to instruct the contractor to efficiently use wall space or electrical room space when installing new electrical equipment in order to maintain space for future work.

4.3.8 For very small loads explore the possibility of using existing circuits instead of

proposing a new circuit. Verify the loads on existing circuits if possible and practical.

4.4 Exclusions

4.4.1 No welding or cutting of structural steel for electrical systems is allowed unless specifically approved by DOA.
4.4.2 Trenching of flooring for circuits is not allowed for new circuits. Poke through receptacles are allowed.

4.5 Other Requirements

4.5.1 New Conduits Labeling Requirement: Include requirement for contractor to provide and install labeling for all new conduits that are connected to switchgears, switchboards, panelboards and junction boxes located inside each electrical room. all new junction boxes shall also be labeled. labels shall be (1) inch wide, self-laminating, black letters, "normal" font, font size 36 on yellow continuous tape. labeling shall include power source (name of switchgear, switchboard or panelboard), voltage level, circuit number and load serving. provide label samples to design engineer and construction manager for approval prior to installation.
4.5.2 Prepare elevations and details to show the mounting method for all other equipment such as large transformers, large junction boxes and large control cabinets. Mounting details are not necessary for small wall mounted devices. Indicate mounting height above finished floor or above finished grade.
4.5.3 Specify 4” concrete housekeeping pads for all floor mounted electrical equipment with the exception of electrical equipment installed in the Airfield Lighting Vaults.
4.5.4 Indicate all fire barrier penetrations on electrical plan drawings.
4.5.5 Specify fire stopping rated sealant for penetrations in fire-resistance rated walls, partitions, floors and ceilings in order to maintain the fire-resistance rating. Coordinate with the project architect or consult with an architect for method of sealing and seal-ant type.
4.5.6 Locations, such as offices, data centers, and communications complexes, that use electrically sensitive equipment such as computers, data processing equipment and other similar equipment should be provided with dedicated circuits fed from local dedicated panels as necessary. Dedicated panel boards should be fed from separate feeders to the service entrance if possible.
4.5.7 In general, equipment specified must meet the energy efficiency requirements.
4.5.8 Modifications to electrical equipment require analyses to determine the suitability of equipment’s ability to accommodate new loads.
4.5.9 Field verification of facilities is required prior to additions or modifications of equipment.

5.0 Lighting Systems Design

5.1 Interior Lighting Systems Design
5.1.1 System Drawings:

5.2 Design Philosophy:

5.2.1 Provide adequate, comfortable, and reliable indoor illumination levels appropriate for the tasks to be performed. Lighting levels shall conform to DOA standards (see Required Performance and Features). Levels not covered in this document shall be referenced to the latest Illuminating Engineering Society of North America (IESNA) Lighting Handbook published standards.

5.2.2 All lighting shall be LED.

5.2.3 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 IESNA Lighting Handbook, using the recommended practice for office lighting. 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.

5.2.4 Use natural or day lighting as much as possible, both for energy management and for architectural aesthetics. Provide photo sensitive lighting controls to extinguish selected fixtures or lamps in response to daylight contributions to the space. Utilize task lighting in work stations and consider day lighting from windows and skylights when determining lighting levels for the space. Employ energy management tools such as occupancy sensors, time of day controls or other appropriate means. Energy management should be considered for all spaces.

5.2.5 Lighting fixture maintenance and repair is an important design consideration and can supersede architectural considerations when life cycle cost is considered. Do not locate fixtures where they cannot be safely reached by ladders. Coordinate fixture locations with other disciplines to ensure that equipment or other work will not occupy space below the fixture mounting planes. Coordinate with other disciplines in the reflected ceiling plans in order to avoid equipment interferences. Air handling fixtures may be utilized in coordination with mechanical design. . 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.

5.2.6 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.

5.2.7 Where generator power is available, un-switched fixtures shall be utilized for emergency lighting and may also be designated as ‘night lights’. Keyed switches are not allowed.

5.2.8 Where generator power is unavailable, designate emergency ballasts for emergency lighting. If these lamps need to be switched, provide appropriate note on the drawings to install switched circuits per emergency ballast manufacturer’s published instructions.

5.2.9 Where night lights are required, or where inverter-powered emergency fixtures are part of the general illumination layout, connect these lights to the inverter’s normally-on output. Where possible architecturally, provide dedicated emergency fixtures such that they are not part of the general illumination and connect these lights to the emergency source normally-off output.

5.3 Exterior Lighting Systems Design

5.3.1 In general, exterior building lighting should be switched by photocell with an override switch accessible to qualified maintenance personnel.

5.3.2 Provide the following illumination levels in the areas shown, measured at grade with all fixtures at full brightness, zero sky contribution, 15% variance permissible:
5.3.2.1 5 fc at building entrances, with 1 fc for night emergency egress

5.3.2.2 2 fc at gates and perimeter fences where security assessment is an issue; maintain 4:1 ratio between maxima and minima 4 fc in parking lots, maintain 3:1 ratio, with 2 fc for emergency lighting

5.3.2.3 2 fc along illuminated roadways, with 2 1/2 fc at major intersections

6.0 Receptacle System Design

5.1 System Drawings:

5.1.1 Locate on power plans.

5.2 Design the receptacle system per the following minimum requirements:

5.2.1 In general flush mount outlets in all areas. Surface mounted outlets are allowed in spaces such as warehouses, equipment chases and electrical/mechanical rooms.

5.2.2 Provide dedicated outlets for janitorial equipment in hallways and aisles maximum 50 feet apart; mount at 36 inches above the finished floor, and segregate from other receptacles.

5.2.3 Provide general-purpose outlets in electrical and mechanical rooms; outlets shall be Ground Fault Circuit Interrupter (GFCI) type.

5.2.4 Avoid back to back installation.

5.2.5 Provide general-purpose outlets adjacent to each exterior door; outlets shall be weatherproof and GFCI type.

7.0 Low Voltage Power Systems Design (<600 volts)

7.1 General

This section covers the general power requirements for low voltage systems consisting of systems less than 600 volts.

7.2 Electric Metering and Power Monitoring

7.2.1 Electric metering will be provided at all building service entrances, and at disconnecting means downstream of the service entrances, as necessary to separately meter building and process loads.

7.2.2 The DOA utilizes a power monitoring system consisting of power meters with data connections. The DSP shall include power monitoring scope of work whenever a project is performed at the Central Passenger Terminal Complex (CPTC). The installation and programming of new power monitoring equipment shall be by AATC's preferred contractor. The drawings shall include this specification.

7.2.3 When metering at switchboards/switchgear and panel boards, the meter(s) shall, where feasible, be supplied with the original equipment manufacturer and installed in the equipment.

7.3 Panel boards

7.3.1 System Drawings:

7.3.1.1 Locate on power plan drawings.

7.3.1.2 Provide completed panel schedules on drawings. Each circuit on the panel schedule shall be described to reflect function and location of each load (for example, lighting room xx apron level). Each circuit shall show a

connected, demand or estimated load in KVA whether the circuit is new or existing.

7.3.2 Panel boards shall be as follows:

7.3.2.1 Locate indoors where possible. Avoid rooftop locations.
7.3.2.2 Locate in dedicated electrical rooms where possible; avoid user or passengers spaces. Column type panelboard is not allowed unless approved by DOA engineer.
7.3.2.3 Flush-mount in areas such as user hallways and office spaces. When flush-mounted, provide spare conduits, skirting or other provisions to facilitate future modifications.
7.3.2.4 Surface-mount in all other areas including user storages, warehouses, equipment chases and electrical or mechanical rooms.
7.3.2.5 Avoid sub feed or dual-feed lugs.
7.3.2.6 All busses shall be copper.
7.3.2.7 Avoid individually-mounted sub feed circuit breakers.
7.3.2.8 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 in-stalled as well. It is not permitted for the trip settings to be dialed-down to meet the intent of this Section.
7.3.2.9 Provide Transient Voltage Surge Suppression (TVSS) for all panel boards serving electronic loads.
7.3.2.10 Provide 200% panelboard feeder neutrals and 200% neutral bus when required per harmonic analysis and for all electronic loads.
7.3.2.11 Provide main lugs only when the panelboard is located in the same room with their feeder breaker otherwise, provide main circuit breaker.
7.3.2.12 Connected loads shall not exceed 80% of main circuit breaker rating.

7.4 Low Voltage Switchgear/Switchboards

7.4.1 System Drawings:

7.4.1.1 Locate on power plan drawings.
7.4.1.2 Detail feeder and branch circuit wiring sizes on one-line diagram.
7.4.1.3 Provide load information, voltage, phase, circuit numbering, AIC ratings, mains ratings, load summary, demand load summary, circuit breaker sizes, spare sizes and space information in panel schedules..
7.4.1.4 Provide elevation showing all circuit breaker locations and circuit numbering.
7.4.1.5 Provide additional details on drawings as necessary for construction.

7.4.2 Low Voltage Switchgears/Switchboards shall be as follows:

7.4.2.1 Locate indoors where possible. Avoid outdoor locations.
7.4.2.2 Locate in dedicated electrical rooms accessible only to qualified personnel.
7.4.2.3 Front accessible where possible, except service entrance equipment.
7.4.2.4 For service entrance equipment, provide rear access when possible.
7.4.2.5 Copper main bus; 100 percent capacity full length.
7.4.2.6 Copper neutral bus, if required; 100 percent capacity full length.

7.4.2.7 Copper ground bus; full length.
7.4.2.8 Main and feeder circuit breakers arranged for compression connectors.
7.4.2.9 Provide branch circuit monitoring/embedded metering for all new concession switchboards. Branch circuit monitoring/embedded metering shall be factory pre-wired.
7.4.2.10 Coordinate with DOA Electrical Engineering for the requirements of current transformers (CT's) when adding branch circuit breakers to an existing concession switchboard.
7.4.2.11 All circuit breakers shall be constructed according to NEMA standards.
7.4.2.12 All circuit breakers shall have provisions for lockout/tag out (LOTO).
7.4.2.13 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.
7.4.2.14 When ground fault is required, provide two level protections (main and feeders).
7.4.2.15 Provide service entrance label when required.
7.4.2.16 Provide minimum 20 percent spare capacity.
7.4.2.17 Provide minimum 1-spare circuit breaker of each frame size (excluding main) used.
7.4.2.18 Circuit breakers less than 100 amps shall not be permitted on switchgears or switchboards, unless approved in writing from the DOA Engineering.
7.4.2.19 Provide future bus extension and dedicated space for at least one future section.
7.4.2.20 Provide integral TVSS to meet requirements of NFPA 780, when required.
7.4.2.21 Where draw out circuit breakers are specified, provide manufacturer's overhead lifting device suitable for all circuit breaker sizes and locations.
7.4.2.22 Provide manufacturer's test kit for all circuit breaker types and functions used.
7.4.2.23 All circuit breakers larger than 200 amps shall be tested.
7.4.2.24 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.
7.4.2.25 Provide Main Lug only when the switchboard is located in the same room with their feeder breaker otherwise, provide Main Circuit Breaker.

7.5 Single Line Diagram

7.5.1 System Drawings:

Develop or add to one-line diagram drawing as noted below.

7.5.1.1 Starting at the top of the drawing with the building transformers(s), show all pertinent electrical equipment down to the panel board level. This includes switchboard/switchgear, panel boards, MCCs, generators, transfer switches, uninterruptible power supplies, inverter systems, motors, starters, disconnect switches, etc.
7.5.1.2 For transformers, note the kVA size, primary and secondary voltages, phasing (building service entrance only), and impedance. Show the distribution switchboard/switchgear in "expanded" form. The drawing should detail main breaker, tie breaker, feeder breakers, spare breakers, CT's, PT's, and meter. Note switchboard rated amperage, voltage, and

short circuit capability. Include frame and trip size of all breakers in the gear.

7.5.1.3 Single line diagrams shall be required for each switchboard and motor control center. Partial single line diagrams shall be required for each switchboard showing panelboards.

7.5.1.4 Show starter/breaker/fuse and NEMA ratings for all starters.

7.5.1.5 Include all generators and transfer switches and their respective single line diagrams.

7.5.1.6 Note the service entrance, feeder wire and conduit sizes.

7.6 Low Voltage Dry Type Transformers

7.6.1 System Drawings:

7.6.1.1 Locate on power plan drawings.

7.6.1.2 Provide additional elevation or mounting details as required for construction.

7.6.2 Low Voltage Dry Type Transformers shall be as follows:

7.6.2.1 Energy efficient type; meet NEMA TP-1.

7.6.2.2 Specify transformer to include +2/-4 at 2.5 percent taps.

7.6.2.3 Transformers shall be provided with copper windings, aluminum is not acceptable.

7.6.2.4 Insulation provided in transformers having ratings not exceeding 25 KVA shall have 185 degree centigrade rise rating. Insulation provided in transformers exceeding 25 KVA shall have 220 degree centigrade rise rating. The sizing of step down or step up dry type transformers 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.

7.7 Motors

7.7.1 System Drawings:

7.7.1.1 Locate on power plan drawings.

7.7.2 Motors that are controlled by across the line motor starters and are 25 HP or larger shall include power factor correction capacitors at the motor starter in order to achieve 95 percent power factor. VFD controlled motors are excluded from the power factor correction requirement. Utilize VFD’s with minimal harmonic distortion.

7.7.3 To ensure a minimum standard of quality, identify devices, fittings, fixtures, and equipment on equipment list drawings with their electrical sizes, ratings, manufacturer, and catalog number. This is not necessary for items such as panel boards where complete specifications are written.

7.7.3.1 Identify motor starters on the motor control schedule. 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.

7.7.3.2 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.

7.8 Motor Control Systems

7.8.1 System Drawings:

7.8.1.1 Locate on power plan drawings.
7.8.1.2 Detail on one-line diagram; include all loads, circuit numbering and spaces.
7.8.1.3 Provide elevation showing all starter locations and circuit numbering.
7.8.1.4 Provide additional details, schedules or other information on drawings as necessary for construction.

7.8.2 Motor Control Centers (MCCs) shall be as follows:

7.8.2.1 Locate indoors where possible; avoid outdoor locations.
7.8.2.2 Locate in dedicated electrical rooms accessible only to qualified personnel.
7.8.2.3 Use front accessible where possible.
7.8.2.4 Use copper main bus; 100 percent capacity full length, minimum 600A.
7.8.2.5 Use copper neutral bus, if required; 100 percent capacity full length.
7.8.2.6 Use copper ground bus; full length.
7.8.2.7 Wire MCCs for NEMA Class I, Type B.
7.8.2.8 Circuit protectors, contactors, overload blocks and all accessories shall be NEMA construction.
7.8.2.9 Motor starters shall include overload reset button, red and green, LED type pilot lights - red for “run” mode and green for “stop”.
7.8.2.10 Provide HOA in cover; minimum 2-N/O and 2-N/C auxiliary contacts and individual control power transformer (CPT) if above 150V to ground. Provide fuses for transformer over current protection.
7.8.2.11 CPT, if required, shall be sized for 100 VA spare capacity and include 2-primary and 1-secondary fuses for 120V control.
7.8.2.12 Do not mount panel boards or associated transformers in MCCs.
7.8.2.13 Do not mount variable frequency drives (VFD) in MCCs; VFD’s shall be individually mounted at controlled motor.
7.8.2.14 Provide future bus extension and dedicated space for at least one future vertical section.
7.8.2.15 Provide minimum 20 percent spare capacity.
7.8.2.16 Provide 10 percent spare cubicles for each size provided.

7.9 Variable Frequency Drives

7.9.1 Variable Frequency Drives shall be as follows:

7.9.1.1 Locate indoors where possible; avoid outdoor locations.
7.9.1.2 Typically VFD’s will only be installed when requested by the Mechanical Engineer.

7.9.1.3 Contrary to previous requirements, a manual by-pass circuit is not typically required on a VFD. A by-pass circuit should only be specified after discussing the requirements with the Mechanical Engineer.
7.9.1.4 Do not install VFD's closer than five feet to a FID cabinet.
7.9.1.5 VFD's should be located as near as practical to the motor it controls. The VFD should never be located more than 50 feet from the controlled motor. Disconnect switch with auxiliary contactor shall be provided near the motor.

7.10 Busway Systems

7.10.1 Busway shall be copper with 100% neutral bus minimum with internal ground bus.
7.10.2 Busway shall be totally enclosed in non-ventilated aluminum housing.
7.10.3 Use IP54 or greater for indoor installations and NEMA 3R for outdoor installations.
7.10.4 Busway shall be protected against overcurrent in accordance with the allowable current rating of the busway.
7.10.5 Where busway is used as a feeder, the voltage drop should not exceed 3 percent.
7.10.6 All busway shall be grounded.
7.10.7 Provide expansion fittings for all busways at building expansion joints.
7.10.8 Show the entire busway run on power plan drawings.
7.10.9 Where busway penetrates walls and floors, seal all penetrations with the appropriate fire stopping material to maintain fire rating of walls and floors.

8.0 Lightning Protection Systems Design

8.1 System Drawings:

8.1.1 Show components on Lightning Protection and Counterpoise Composite Plan.
8.1.2 Details as required.
8.1.3 Show lightning protection system connection to the building counterpoise system.
8.1.4 Show lightning protection and ground systems and details on electrical drawings.

8.2 Lightning protection systems shall conform to UL Standard UL 96A requirements and NFPA 780, Installation of Lightning Protection Systems. All structures with lightning protection systems will require a UL Letter of Findings. Note on the drawings which certification is required (UL Letter of Findings, or No Certification required).

8.3 Consultant shall provide direction to contractors to provide UL Master Label for any structure, even in case of building addition or renovation.

9.0 Building Grounding System Design

9.1 System Drawings:

9.1.1 Grounding plans
9.1.2 Grounding one-line
9.1.3 Grounding details
9.1.4 Grounding plans and grounding details to be placed on electrical drawings
9.1.5 Reference Article 250 as a requirement for all grounding work.

9.2 The drawings shall show interconnection of the following:

9.2.1 All metal systems of the building such as:
- 9.2.1.1 Interior and exterior water system
- 9.2.1.2 Metal ductwork
- 9.2.1.3 Building steel and HVAC roof top units (if applicable).
- 9.2.1.4 Lightning protection system
- 9.2.1.5 Made electrodes, etc.
- 9.2.1.6 Building foundation rebar
- 9.2.1.7 Metal roof drains.
- 9.2.1.8 Antennas and Apron light poles.

9.2.2 Where in the electrical system bonding will be required (that is, neutral or ground bushing on transformer).

9.2.3 Where the electrode system connects into the rest of the grounding system.

9.2.4 Any other special requirements for the building grounding system (that is, static or signal grounds).

9.2.5 The size of all required grounding conductors (grounding electrode conductor, equipment grounding conductors, main bounding jumpers, etc.).

9.3 The design shall take into account that 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.

10.0 Design Calculations

10.1 General

10.1.1 All electrical calculations shall be stamped by a Georgia Professional Electrical Engineer. The original stamped signed copy of the calculations shall be provided to DOA as part of the design submittal.

10.1.2 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. Provide one-line diagrams 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.

10.2 Short Circuit, Circuit Breaker Coordination Study and Arc Flash calculations.

10.2.1 Prepare a complete set of short-circuit calculations. When both normal and standby primary feeders serve a facility, provide calculations for both. The calculation shall be performed utilizing the latest EDSA Systems Analysis or SKM software.

10.2.2 Calculations shall consider both three-phase and single-phase to ground fault current on secondary systems. State the base MVA/kVA on the calculations. Prepare protective device coordination graphs that demonstrating 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 the devices in question. Provide a flag on all coordination curves indicating the available short circuit current at each device. Curve plots from the software EDSA shall be used.

10.2.3 Arc Flash calculations shall be in accordance with NFPA 70E.and IEE STD-1584

10.2.4 Provide complete electronic calculation in its original format (i.e. EDSA or SKM

files). Coordination study shall be from the utility transformer to the largest breaker

10.2.5 in the smallest panel. Similar panels can be omitted from the study however; the final report shall indicate the panel names and indicate the word typical to panel's xxxxxx

Electrical System shall be fully coordinated.

10.2.6 Indicate in the coordination sheet, short circuits (with flags), breaker type, settings and scales.

10.2.7 For arc flash, provide calculations for each piece of electrical equipment and provide 3 samples of the arc flash label to DOA for approval.Final report shall be provided in a 3" binder and CD's for electronic files.

10.2.8 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.

10.3 Lighting Calculations

10.3.1 Provide photometric calculations in point-to-point format. Include calculations summary of average footcandles and max to min ratio as a minimum.

10.3.2 Provide photometric drawings for interior, parking lots and parking decks and other locations where applicable.

10.4 Harmonic Analyses Calculations

10.4.1 Prepare harmonic study calculations when significant harmonic (nonlinear) load is added to the distribution or building power system. A harmonic study will also be required when the new load exceeds the recommended voltage or current distortion levels as allowed per by IEEE-519-1992, "Recommended Practices and Requirements for Harmonic Control in Electric Power Systems."

10.4.2 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.

10.5 Engine Generator Sizing Calculations

10.5.1 Prepare engine generator sizing calculations showing the sequence of operation for the various loads that are served from the generator and taking in consideration that the voltage dip shall not exceed 35% for general loads and motors and 20% for critical and electronic loads.

11.0 Branch Circuit Panel board Directories

11.1 Provide schedule under plastic jacket or protective cover for protection from damage or dirt. Hand written schedules are not allowed. As a minimum provide the following:

11.1.1 Number each single pole space. Odd-numbered circuits on left side starting at the top, even on right side starting from the top.

11.1.2 Securely mount directories on inside face of panel board door.

11.1.3 Define briefly, but accurately, nature of connected load (i.e. lighting office number, receptacles, electrical room, etc..)

11.1.4 Provide CPTC official room number locations for all loads and indicate panel name on schedule.

11.1.5 Multi-pole circuits shall utilize all pole space numbers as its circuit identifier, i.e, a three pole circuit will have three space numbers.

12.0 Nameplates

12.1 Provide Nameplates for the following equipment:

12.1.1 Equipment identification nameplates for all normal and emergency (Life Safety, Critical, Legally Required Standby, Optional Standby, and Uninterruptible Power Supply) power electrical equipment including but not limited to, substations,, switchgear, switchboards, panel boards (power, lighting, receptacle), motor control centers, non-fusible disconnect switches (includ-ing individually mounted circuit breakers), fusible disconnect switches, wire ways, bus ducts, cable trays, automatic transfer switches, transformers, uninterruptible power supplies, generators, etc.

12.1.2 For new installations cubicle/space labels for all MCC.

12.1.3 Identify fuse type and size on the cover of fusible equipment

12.1.4 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. Identify soft start on motor starter.

12.1.5 All nameplates shall be engraved. Securely attach engraved nameplates using epoxy adhesive.

12.1.6 No temporary markings are permitted to remain on equipment.

13.0 Color Scheme for Engraved Electrical Nameplate Labels

Table 2 – Nameplate Voltage Color Identifier

System	Label 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).

14.0 Nameplates: Electrical Equipment Identification Methodology

14.1 All new electrical equipment shall have a unique identification number. The identification number shall be annotated on three lines, centered within a nameplate with a minimum ½ inch margin maintained around the outer edges. The methodology used to create an electrical equipment nameplate identification number is outlined in Table 3:

Table 3 – Nameplate Description

Line One	Line one shall list the official H-JAIA 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 room number identification nameplates or for new proposed electrical rooms, the consultant shall contact the H-JAIA DOA planning department to obtain the official room number identification. 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. 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
CB	Cable Bus
CT	Cable Tray
DF	Fusible disconnect Switch
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
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	M	Main Terminal including Atrium
C	Concourse C	T	Concourse T
D	Concourse D		

15.0 Source Identifier Methodology

15.1 Any electrical distribution equipment connected directly to a utility bus (or utility transformer) will be considered a SOURCE. The equipment type identifier shown in table 4 shall be used to identify the source. 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:

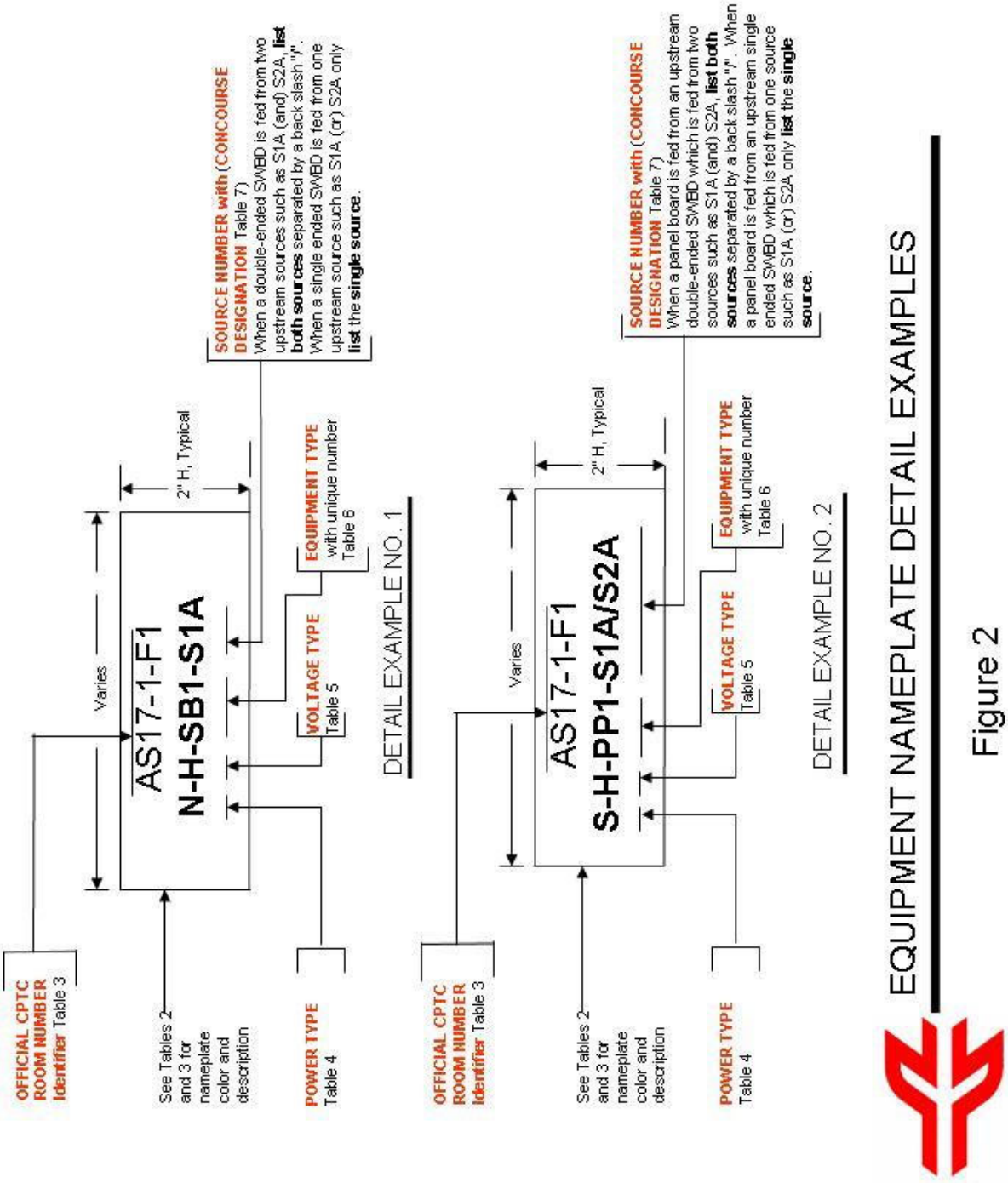
15.2 Example: three Switchgear and two Switchboard's fed directly from the utility bus and all equipment are located in the same CPTC electrical room with the official room number AS17-1-F1: the identifications

Line One Line one shall list the official H-JAIA room number where equipment is physically located. **AS17-1-F1**

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.**

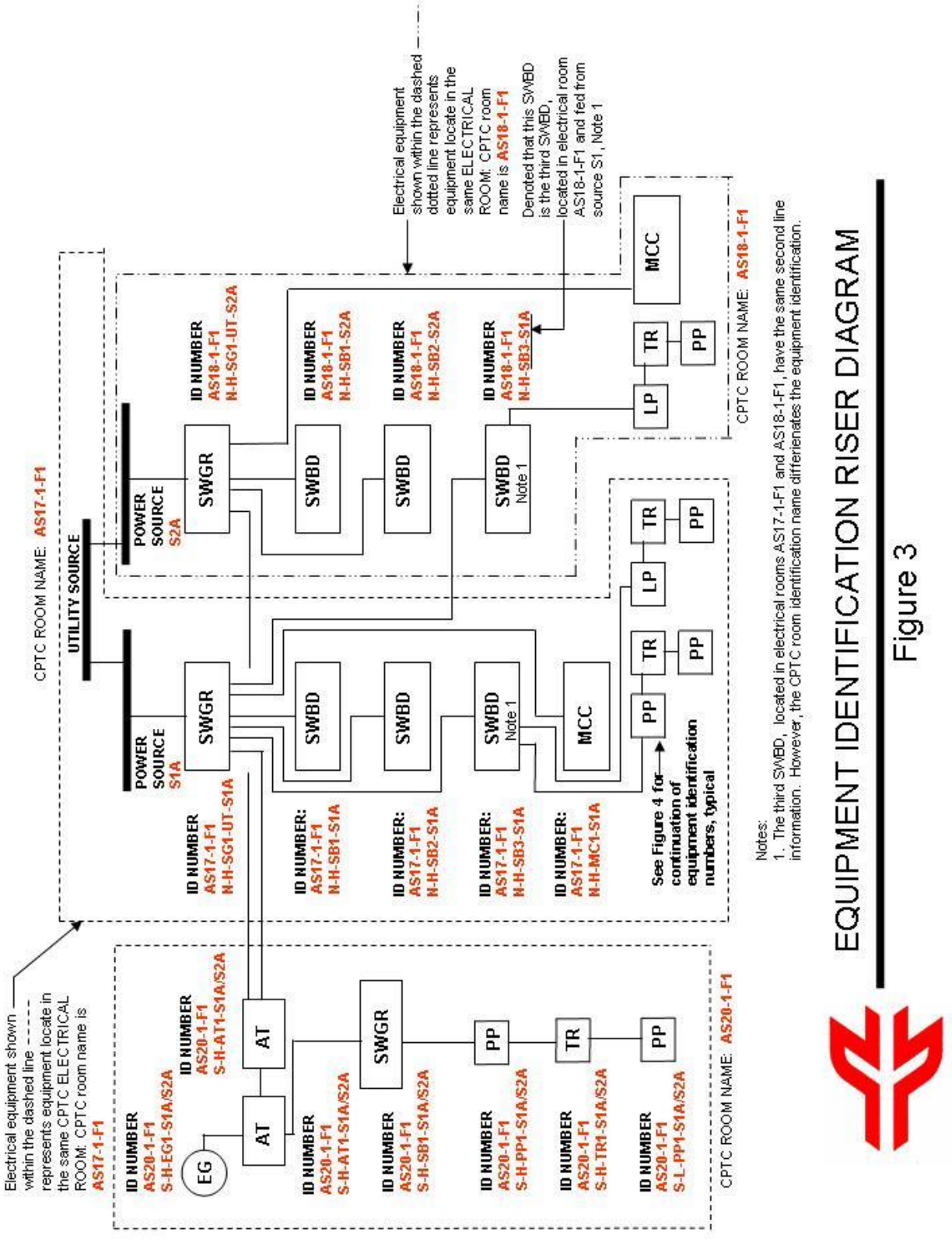
15.2.1 The designation UT will only be used in the equipment identification name at the Main SWGR or SWBD level. This UT identifier shall not appear in the any down stream equipment identification numbers.

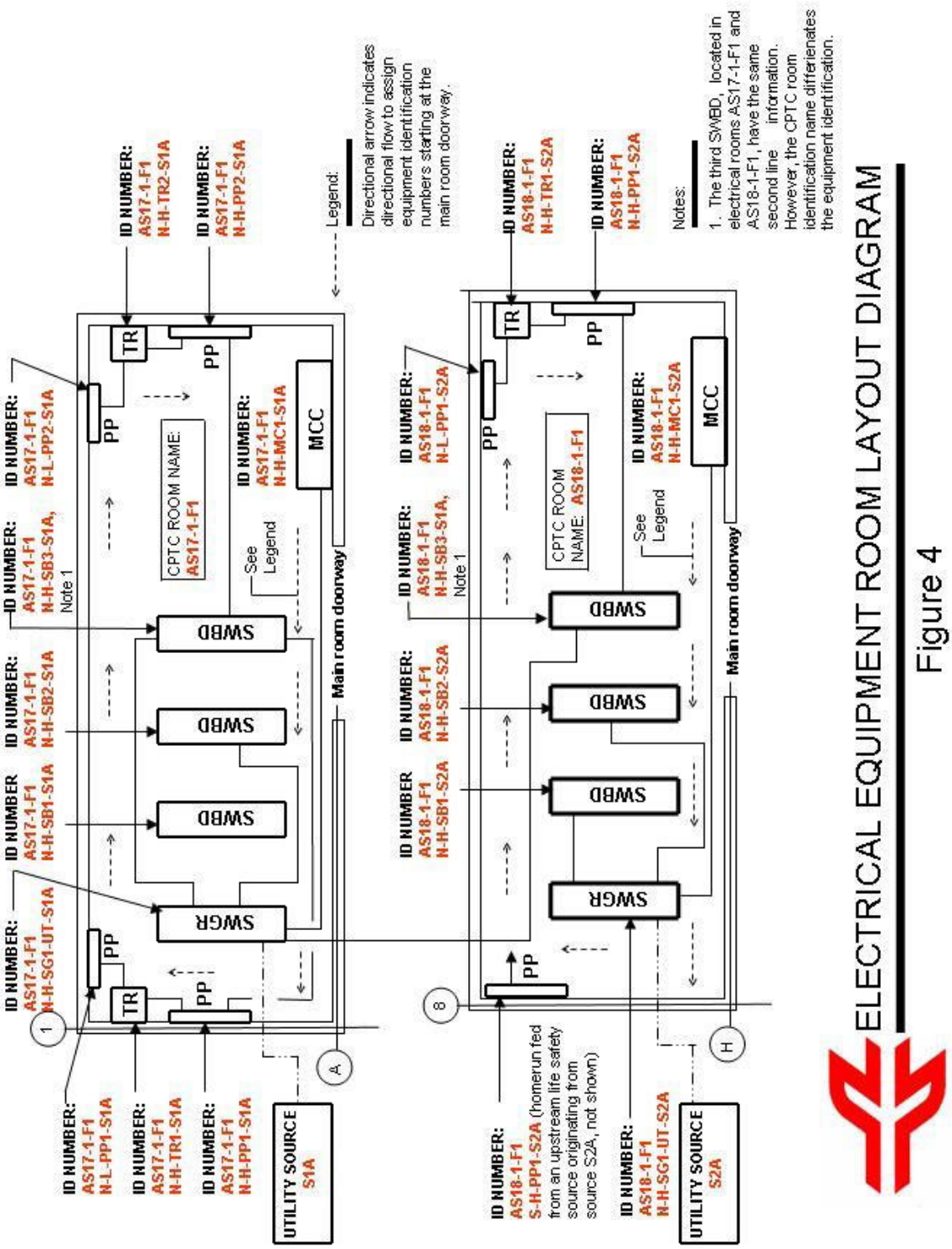
15.2.2 If any downstream equipment is fed from two upstream sources then list both sources separated by a back slash, example S1A/S2A. See Figures 1, 2, 3 and 4 for examples.

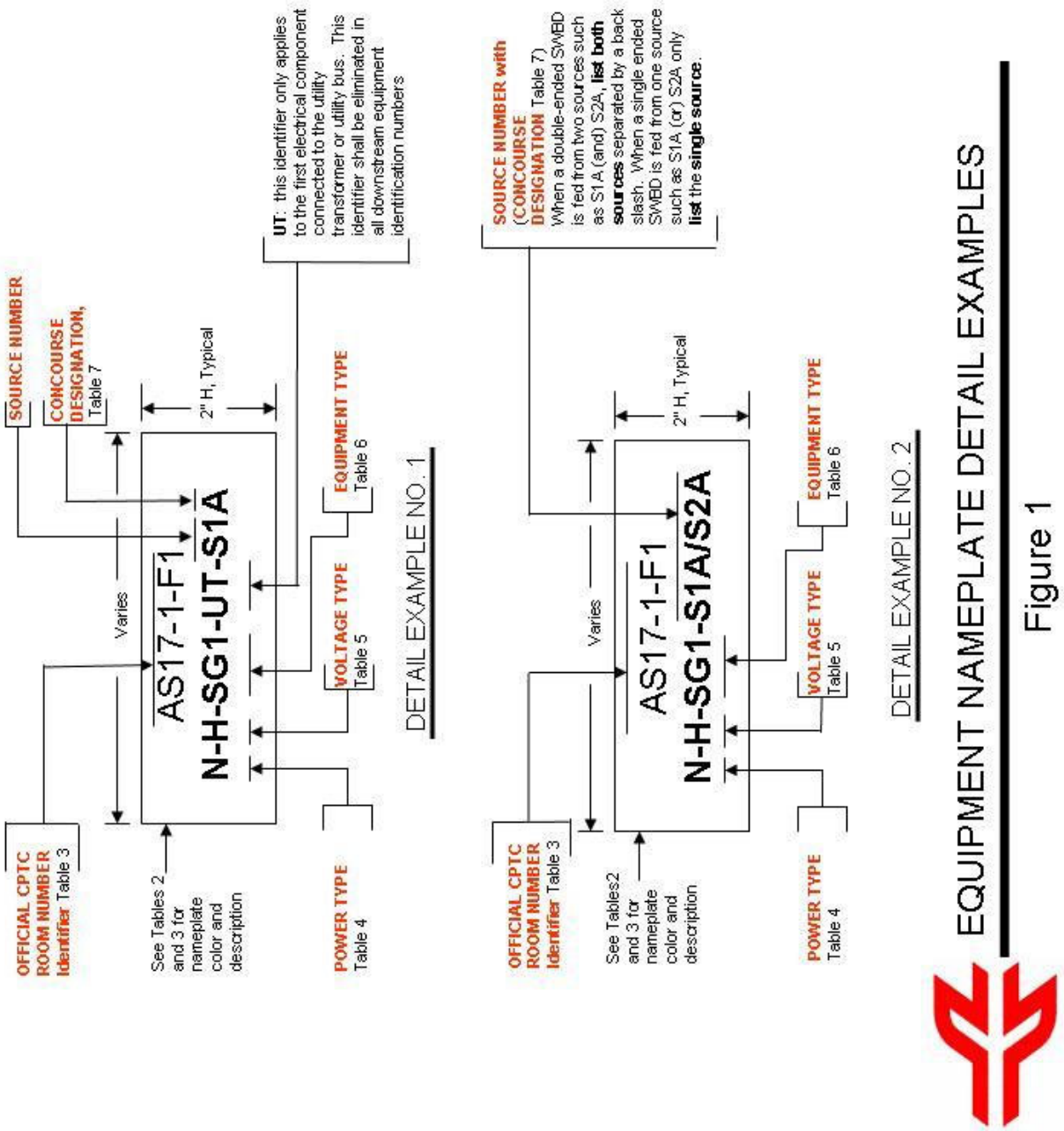


EQUIPMENT NAMEPLATE DETAIL EXAMPLES

Figure 2


EQUIPMENT IDENTIFICATION RISER DIAGRAM
Figure 3
Notes:
1. The third SWBD, located in electrical rooms AS17-1-F1 and AS18-1-F1, have the same second line information. However, the CPTC room identification name differienates the equipment identification.
CPTC ROOM NAME: AS17-1-F1
UTILITY SOURCE
POWER SOURCE S1A
SWGR
SWBD
SWBD
SWBD
SWBD Note 1
MCC
PP
TR
LP
PP
TR
LP
ID NUMBER AS17-1-F1 N-H-SG1-UT-S1A
ID NUMBER: AS17-1-F1 N-H-SB1-S1A
ID NUMBER: AS17-1-F1 N-H-SB2-S1A
ID NUMBER: AS17-1-F1 N-H-SB3-S1A
ID NUMBER: AS17-1-F1 N-H-MC1-S1A
See Figure 4 for continuation of equipment identification numbers, typical
CPTC ROOM NAME: AS18-1-F1
POWER SOURCE S2A
SWGR
SWBD
SWBD
SWBD Note 1
MCC
PP
TR
LP
PP
TR
LP
ID NUMBER AS18-1-F1 N-H-SG1-UT-S2A
ID NUMBER AS18-1-F1 N-H-SB1-S2A
ID NUMBER AS18-1-F1 N-H-SB2-S2A
ID NUMBER AS18-1-F1 N-H-SB3-S1A
Electrical equipment shown within the dashed dotted line represents equipment locate in the same ELECTRICAL ROOM: CPTC room name is AS18-1-F1
Denoted that this SWBD is the third SWBD, located in electrical room AS18-1-F1 and fed from source S1, Note 1
Electrical equipment shown within the dashed line ----- represents equipment locate in the same CPTC ELECTRICAL ROOM: CPTC room name is AS17-1-F1
CPTC ROOM NAME: AS20-1-F1
ID NUMBER AS20-1-F1 S-H-EG1-S1A/S2A
EG
ID NUMBER AS20-1-F1 S-H-AT1-S1A/S2A
AT
AT
ID NUMBER AS20-1-F1 S-H-AT1-S1A/S2A
SWGR
ID NUMBER AS20-1-F1 S-H-SB1-S1A/S2A
PP
ID NUMBER AS20-1-F1 S-H-PP1-S1A/S2A
TR
ID NUMBER AS20-1-F1 S-H-TR1-S1A/S2A
PP
ID NUMBER AS20-1-F1 S-L-PP1-S1A/S2A


ELECTRICAL EQUIPMENT ROOM LAYOUT DIAGRAM
Figure 4
Legend:
Directional arrow indicates directional flow to assign equipment identification numbers starting at the main room doorway.
Notes:
1. The third SWBD, located in electrical rooms AS17-1-F1 and AS18-1-F1, have the same second line information. However, the CPTC room identification name differienates the equipment identification.
ID NUMBER: AS17-1-F1 N-H-TR2-S1A
ID NUMBER: AS17-1-F1 N-H-PP2-S1A
ID NUMBER: AS17-1-F1 N-L-PP2-S1A
ID NUMBER: AS17-1-F1 N-H-SB3-S1A, Note 1
ID NUMBER: AS17-1-F1 N-H-SB2-S1A
ID NUMBER AS17-1-F1 N-H-SB1-S1A
ID NUMBER: AS17-1-F1 N-H-SG1-UT-S1A
ID NUMBER: AS17-1-F1 N-H-MC1-S1A
CPTC ROOM NAME: AS17-1-F1
See Legend
TR
PP
SWBD
SWGR
MCC
Main room doorway
UTILITY SOURCE S1A
ID NUMBER: AS17-1-F1 N-L-PP1-S1A
ID NUMBER: AS17-1-F1 N-H-TR1-S1A
ID NUMBER: AS17-1-F1 N-H-PP1-S1A
ID NUMBER: AS18-1-F1 N-H-TR1-S2A
ID NUMBER: AS18-1-F1 N-H-PP1-S2A
ID NUMBER: AS18-1-F1 N-L-PP1-S2A
ID NUMBER: AS18-1-F1 N-H-SB3-S1A, Note 1
ID NUMBER: AS18-1-F1 N-H-SB2-S2A
ID NUMBER AS18-1-F1 N-H-SB1-S2A
ID NUMBER: AS18-1-F1 N-H-MC1-S2A
CPTC ROOM NAME: AS18-1-F1
ID NUMBER: AS18-1-F1 S-H-PP1-S2A (homerun fed from an upstream life safety source originating from source S2A, not shown)
ID NUMBER: AS18-1-F1 N-H-SG1-UT-S2A
UTILITY SOURCE S2A



EQUIPMENT NAMEPLATE DETAIL EXAMPLES

Figure 1

Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Signage

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(See separate link)

Hartsfield-Jackson Atlanta International Airport
City of Atlanta
Department of Aviation
Bureau of Planning & Development

Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Design CAD Standards

Design Standards
CAD

Table of Contents

Design Standards
CAD

1.0 Overview

1.1 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.

1.2 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.

1.3 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).

1.4 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 Engineering CAD Supervisor:
Ronald King
Ronald.King@atl.com
Phone: 404.382.1259 Fax: 404.765.6386

1.5 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.

1.6 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.

2.1 AutoDesk AutoCAD

AutoDesk products version 2012 or higher are accepted by P & D. P & D currently supports the use of Autodesk 2018 products.

2.1.1 All title blocks must be placed in paper space.

2.1.2 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.

2.1.3 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. Contact

the P&D Engineering CAD Manager for instructions on obtaining a copy of the latest Airport base file.

2.1.4 Drawing entities must be created in full (1:1) scale and placed in model space.

2.1.5 The Z coordinates of all elements must be “0” unless the drawing is in three (3) dimensions.

2.1.6 The application of line widths and colors should always be set through by layer.

2.1.7 The name of the general external reference file must begin with an “X”, i.e. XGRID.DWG, XBASEFILE.DWG, etc.

2.1.8 The final drawings must be zoomed to extents and purged.

2.1.9 All viewports shall be locked.

2.1.10 Do not bind or insert external reference files into the base drawings.

2.1.11 All incidental drawing work must be deleted.

2.1.12 The default coordinate system is the Hartsfield-Jackson International Airport Grid system.

2.2 Sheet Size

2.2.1 The P&D standard engineering drawing size is ANSI D (22” x 34”) for full size sheets. ANSI B (Modified) shall be used when plotting Half Size sheets. Other sizes may be allowed with pre-approval by the P&D Project Manager and the P&D CAD/MAPPING Manager. However, all sheets issued as a complete set shall be the same size.

Size Designation	Vertical	Horizontal	Top Margin and Bottom Margin	Left Margin	Right Margin
ANSI D	22"	34"	1/2”	1 1/2"	1/2"
ANSI B (Modified)	11"	17"	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:

3.1 Scale bar shown on all site plans

3.2 North arrow oriented always to top of page or rotated clockwise

3.3 North arrow maintains the same direction on all plan sheets

3.4 All Civil site plans shall have airport coordinate grid ticks at a 5” spacing to cover the entire project area

3.5 Drawing sequence follows baseline direction (where applicable)

3.6 Details provided by other agencies shall be displayed on single sheets

4.0 CD (Compact Disc) given with Project Contract

P&D will provide a CAD Standard CD for consultants at the time the Project Contract is given that shows the standard project folder organization.

CD will include:

4.1 Cover Sheet
4.2 ATL base map file
4.3 Base Street Names file
4.4 Airport grid ticks (for a variety of scales)
4.5 Drawing Index and Release Status, with instructions file
4.6 Border Sheets
4.7 .DWG Seed File
4.8 ATL Survey Related Files
4.9 Project Status X-Reference
4.10 Project Revision Block
4.11 Pen Settings i.e. .CTB files

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.

5.1 Submit proposed variance to P&D CAD/MAPPING Manager for approval.

6.0 File Naming System

Reference the National CAD Standards (NCS), latest edition, File Naming System.

6.1 Submit proposed variance to P&D CAD/MAPPING Manager for approval.

7.0 Layering

Reference the National CAD Standards (NCS), latest edition, Layering Guidelines.

7.1 Use only NCS layer names. Any difference must be submitted through DOA, P & D for approval.
7.2 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.
7.3 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.
7.4 Drawings must utilize the layer line type, layer color, and layer line weight outlined by the National CAD Standards.
7.5 Use DOA .CTB files to print.

8.0 File Transmittals

8.1 For each submittal you must create a Transmittal.
8.2 The transmittal package type must be Zipped “(*.zip)” using the ETransmit Autodesk feature. This will ensure that a copy of all the elements that make up the project files will be captured.
8.3 All files shall have one root project folder.
8.4 Save and purge drawings prior to etransmit.

8.5 Include options: fonts, textures from materials, files from data links, photometric web files, and sheet set data and files.

8.6 All As-Built should be finished in AutoCAD and clearly marked “As-Built”. A complete set, hard and soft copy, must be submitted.

8.7 PDF’s of individual sheets should also be included in the electronic file submittal.

8.8 CD cover shall be labeled 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.

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

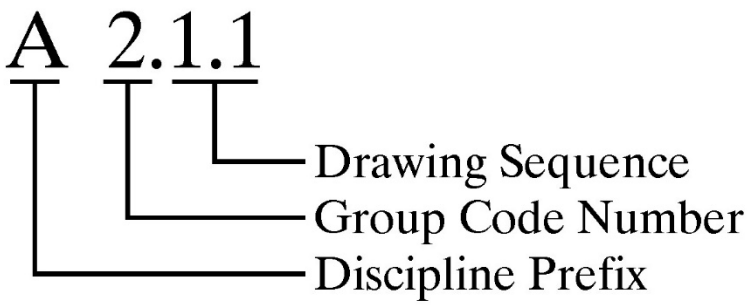
Table of Contents

1.0 **Overview**

1.1 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

2.1 In the DOA Sheet number system, every sheet number consists of discipline prefix, group code number, and drawing sequence.



2.2 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	Striping and Signage Plans
C	23.1.1	Striping 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

3.1 Methodology

3.1.1 The CAD Layer Guidelines are organized as hierarchy. This arrangement accommodates expansion and 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.

3.2 Codes and Groups

The following section details the methodology behind the layer naming conventions and their general use.

3.2.1 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

4.1 File naming for Contract/Construction drawings shall match the Sheet number per this document.

4.2 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 ie: X-Alignment, X-E Contours, X-P Contours etc.

4.3 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.

ATL Planning and Development Bureau Sustainability Standards

Hartsfield-Jackson
Atlanta International Airport

Updated February 2019

TABLE OF CONTENTS

CHAPTER 1
P&D SUSTAINABILITY OVERVIEW

1.1 Background & Structure

Background

As the world's busiest and most efficient airport, Hartsfield-Jackson Atlanta International Airport (ATL) provides services to 150 domestic and 70 international destinations worldwide. ATL is the largest employer in the Metro Atlanta region and is responsible for $34.8 billion of economic impact. The airport has received awards over the years for design, operations, concessions, and construction. ATL's leadership and management is focused on the new ATL Next Capital Improvement Program that will propel ATL into the future with a continuation of world class design & operations, enhanced customer experience, and increased cargo capacity.

The Planning and Development (P&D) Sustainability Standards provides vision and direction for the integration of sustainable design in all projects under the ATL NEXT Capital Improvement Program, and all future airport projects. The P&D Sustainability Standards is specifically for all new constrcution and major renovation projects managed by the Planning and Development Bureau. but supports the overall sustainability goals of the airport. The P&D Sustainability Standards for Planning, Design, and Construction, referenced as the P&D Sustainability Program through out this document, is the foundation for concentrated efforts to make ALL ATL projects as sustainable as possible. It serves as a road map for how Planning, Design, and Construction teams will approach and implement sustainability across all projects.

Structure

Manual || The P&D team developed the P&D Sustainability Manual to bring focus to, and centralize efforts toward, the implementation of environmental design for all projects. This supports the goal of making ATL one of the greenest airport in the world.

Goals || The Sustainability Goals outlined in Chapter 2 serve as the guiding principles to address each impact category, on a project by project basis. Project teams are required to address each Sustainability Goal as it applies to individual projects and document the evaluation throughout each phase of project development.

Standards || The Sustainability Standards for Design and Construction provide design and construction teams a clear path to integration of the P&D Sustainability Goals. Project teams are required to fill out Design and Construction checklists to confirm evaluation.

Checklists || Planning, Design, and Construction Checklists are included in Appendix H. These checklists are included to ensure all actions are taken throughout each phase of a project to properly execute the intent of the Sustainability Program. The P&D Sustainability Team will schedule routine meetings with project managers to review the checklists and document progress.

Team || The P&D Sustainability Implementation Management Team will manage and document successful integration of sustainability into all P&D Projects. The P&D Sustainability Implementation Management Team will manage sustainability throughout the phases of each project. In planning, they will support the Planning Team with Autocase (a web-based tool to evaluate the Triple-Bottom-Line value of a specific design feature, see appendix J, Autocase Evaluation) and ensure the Planning Definition Report (PDR) has all the necessary language. In design, the team will meet with design teams and sustainability consultants regularly to ensure the applicable sustainability goals are integrated into the project design documents. During construction, the P&D Sustainability Team will work with the Contractor Sustainability Coordinator to coordinate documentation collection, site sustainability, sustainability QA, etc. This team will also be responsible for setting up Arc, a platform to score a building's performance after construction (see section 5.2 Arc Implmentation) for all DOA owned and occupied buildings, implementing best practices on small renovation or maintenance projects and relaying information to appropriate parties for data aggregation. This team will manage and enforce sustainability at every phase of the project life cycle – Planning, Design and Construction. The Team will also coordinate with the Asset Management and Sustainability Division to ensure a seamless transition between Design and Construction to Operation and Maintenance to maintain focus on sustainability for the duration of an asset's life cycle.

1.2 Sustainability Vision & Strategy

Vision

The purpose of the P&D Sustainability Standards is to set a foundation for sustainability across all P&D projects and to elevate ATL to become one of the greenest airports, while remaining the busiest and most efficient airport in the world. ATL operates at a very high level and maintains an exceptional customer experience. The P&D Sustainability Standards supports the overall vision and high level goals of the airport as outlined in the 2030 Airport Master Plan and the Sustainability Management Plan.

Sustainability efforts implemented will assist with achieving the following ATL goals:

- Increase Airport Campus Operational Efficiency
- Enhance Customer Experience

The P&D Sustainability Standardsl do this by promoting the following:

- Focus on sustainability features that reduce long term operational expenses (water, energy, waste)
- Whole-Building Life Cycle Analysis
- Triple Bottom Line evaluation on design features.

Sustainability Strategy

The sustainability strategy for P&D is to leverage existing and emerging best practices and technologies to make ATL one of the most sustainable and resilient airports in the world. P&D aims to be innovative in it's approch to sustainable planning and design with careful consideration for material selection, passive lighting and energy strategies, and integrated technologies for performance data collection.

- Strategy #1 – To adopt and implement a set of baseline sustainability goals required across all projects.
- Strategy #2 – For all buildings, at a minimum, to achieve LEED Silver certification with aspirational goals to achieve LEED Platinum certification.
- Strategy #3 – To design all projects for a maximum operational useful life
- Strategy #4 – To certify non-building assets. All Parking Deck Projects will achieve Parksmart and all Civill Infrastructure projects will achieve Envision or Sites certification.
- Strategy #5 - Pursue LEED BD+C and Existing Buildings: Operations and Maintenance Master Sites to streamline the certification process.
- Strategy #6 - Utilize the Arc Preformance-Tracking Platform to monitor building-level and campus-wide sustainability performance.

See Table 1.2

Table 1.2

Below is a summary of the Sustainability Certification requirements for each Project type and minimum required certification levels.

Project Type	Required Certification Level
Buildings	LEED Silver Certification
Parking Garages	Parksmart Bronze Certification
Infrastructure Projects	Envision and SITES Base Level Certification

Requirement vs Goal

CERTIFIED
40 - 49 POINTS

SILVER
50 - 59 POINTS

P&D Sustainability Plan Requirement

GOLD
60 - 79 POINTS

PLATINIUM
80+ POINTS

P&D Sustainability Plan ATL Aspirational Goal

CHAPTER 2
P&D SUSTAINABILITY GOALS

2.0 Chapter Overview

P&D at ATL developed these Sustainability Goals to implement across all projects in support of the overall airport sustainability goals. These goals are a combination of previous ATL goals, City of Atlanta Ordinances and industry best practices. They were compiled with the strategy to get every project type: Building, Parking Garage, and Civil Infrastructure, to attain a minimum Sustainability certification level in the respective Sustainability Standards. **See Table 2.0**

The Sustainability Goals serve as the guiding principles for sustainability on all future P&D projects. Goals will be implemented on a project by project basis and are the foundation for this P&D Sustainability Manual. The intent of these goals is to drive environmental design on every project to the highest potential possible, and track success from planning, design, construction through operations and maintenance. **Reference Exhibit 2.1 for the Sustainability Goals Framework.**

A summary of the Sustainability Goals are as follows and will be defined further in this chapter:

Sustainable Sites (SS)

SS1 Rain Water Management –Follow the City of Atlatnta's Post Development Storm Water Ordinance to address storm water infiltration on a Project by Project basis (Design)

SS2 Heat Island Reduction (Roof) - Utilize TPO ENERGY STAR certified roof with an initial SRI > 82 for low-sloped roof for 100% of roof surface (Design)

SS3 Heat Island Reduction (Nonroof) - Use paving materials with an initial Solar Reflectance (SR) value of >0.33 at installation or a 3-year aged SR value of > 0.28 OR use plants, vegetated shading structures or architectural devices or structures with an initial SR value of >0.33 at installation or a 3-year aged SR value of >0.28 to provide shade on 100% of hardscape area (Design)

Water Efficiency (WE)

WE1 Indoor Potable Water Reduction - Reduce Potable Indoor Water Consumption by 40% (baseline LEEDv4) (Design)

WE2 Outdoor Potable Water Reduction - Reduce Potable Outdoor Water Consumption by 50% (baseline LEEDv4) (Design)

WE3 Water Monitoring - Install Water Monitoring Systems for all major water subsystems (Design)

Energy & Atmosphere (EA)

EA1 Energy Reduction - Reduce Energy Consumption by at least 20% (baseline: ASHRAE 90.1 – 2010) (Achieve through whole building Energy Model) (Design)

EA2 Energy Monitoring - Install Power Monitoring Systems for all energy end uses (Design)

EA3 Renewable Energy - Evaluate the use of renewable energy for at least 12% of total energy usage dependent upon life-cycle costs and benefits achieved

EA4 Construction Related Activity - Implement Construction Activity Policies to encourage the reduction of green house gas emissions from construction related activity (Construction)

EA5 Commissioning - Perform fundamental and enhanced commissioning for all facilities and buildings (Construction)

Material & Resources (MR)

MR1 Waste Diversion - Divert a minimum of 90% of construction and demolition waste from landfill (Construction)

MR2 Sustainable Purchasing Policy - Implement the ATL Sustainable Purchasing Policy to reduce total embodied carbon of all ATL assets and promote material transparency for all building materials.

MR3 Regionally Sourced Materials - Use locally sourced materials when economically feasible (Construction)

Human Health/Indoor Air Quality (HH)

HH1 Indoor VOC and CO_2 Reduction - Use low or no Volatile Organic Compound (VOCs) materials for paints/coatings, adhesives/sealants, flooring, composite wood, ceilings, walls, thermal and acoustical insulation, and furniture (Construction)

HH2 Indoor Air Quality Testing - Perform indoor air quality testing after construction and before occupancy (Construction)

HH3 Quality Views - Achieve a direct line of sight to the outdoors for 75% of all regularly occupied floor area (Design)

HH4 Daylighting - Achieve daylighting for at least 75% of regularly occupied floor area (Design)

HH5 Water Quality - Design Building to accommodate future Water Filtration System to reduce Organic, Inorganic, and Agricultural contaminants, and excessive Water Additives in Drinking Water (Design)

Certifications

Buildings = LEED Silver certification
Parking Garages = Parksmart Bronze certification
Civil Infrastructure = Envision Bronze or SITES Certified certification.

Table 2.0 – Sustainability Breakdown By Project Type

Project Types are broken down as follows:
Buildings: All structures that do not serve as parking garages and/or infrastructure operations as their primary functions.
Parking Garages: All structures that facilitate the temporary storage of on-road vehicles as their primary function.
Civil Infrastructure: All civil infrastructure projects that support transportation, energy, water management, communications, waste management, earth monitoring and measurement networks.

	Buildings				Parking Garages				Infrastructure Projects			
	New Construction		Renovations & Retro-Fits		New Construction		Renovations & Retro-Fits		New Construction		Renovations & Retro-Fits	
	Applies?	Met?	Applies?	Met?	Applies?	Met?	Applies?	Met?	Applies?	Met?	Applies?	Met?
Sustainable Sites												
SS1 Rain Water Management	X		X		X		X		X		X	
SS2 Heat Island Reduction (Roof)	X		X		X		X		X		X	
SS3 Heat Island Reduction (Nonroof)	X		X		X		X		X		X	
Water Efficiency												
WE1 Indoor Potable Water Reduction	X		X		X		X					
WE2 Outdoor Potable Reduction	X		X		X		X		X		X	
WE3 Water Monitoring	X		X		X		X		X		X	
Energy & Atmosphere												
EA1 Energy Reduction	X		X		X		X		X		X	
EA2 Energy Monitoring	X		X		X		X		X		X	
EA3 Renewable Energy	X		X		X		X		X		X	
EA4 Construction Related Activity	X		X		X		X		X		X	
EA5 Commissioning	X		X		X		X		X		X	
Material & Resources												
MR1 Waste Diversion	X		X		X		X		X		X	
MR2 Sustainable Purchasing Policy	X		X		X		X		X		X	
MR3 Regionally Sourced Materials	X		X		X		X		X		X	
Human Health/Indoor Air Quality												
HH1 Indoor VOC & CO_2 Reduction	X		X		X		X					
HH2 Indoor Air Quality Testing	X		X		X		X					
HH3 Quality Views	X											
HH4 Daylighting	X											
HH5 Drinking Water Filtration	X		X		X		X					

Exhibit 2.0
How to Use the Sustainability Goals Framework

- Each Sustainability goal is designated by (Design) or (Construction) based on which project team is responsible for executing the goal requirements.
- The goal applicability table shows which project types the goal applies to.
- The Intent of the goal and explanation for why the goal should be applied to those projects.
- Project teams will, at a minimum, follow the recommended actions to comply with goal requirements.
- Innovative Measures are nonrequired and are considered added value strategies that exceed the Sustainability Goals' baseline to enhance the sustainability of design.
- Implemnation procedures Project Teams need to make throughout the various phases of the project.
- Documentation Project Teams need to submit throughout the various phases of the project.

2.1 Sustainable Sites (SS)

SS1 Rain Water Management

Follow the City of Atlantna's Post Development Storm Water Ordinance to Address Storm Water Infiltration on a Project by Project Basis (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

SS1.1 Intent:

A. To reduce storm water runoff volume and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region

SS1.2 Recommended Actions:

A. Evaluate project site hydrological conditions and determine appropriate Low Impact Development (LID) practices to comply with the City of Atlanta Post Development Storm Water Ordinance

B. Collect all rain water from building and parking garage surfaces for re-use to supplement indoor and outdoor potable water consumption

C. When economically feasible, implement Green Infrastructure to support pretreatment of rainwater before it reaches the Flint River to reduce pollutants and sediment runoff

SS1.3 Innovative Measures:

A. Design project site to achieve Rainwater Management credit under LEED v4

SS1.4 Implementation:

SS1.4.1 Planning:

A. Conduct preliminary evaluations on different Low Impact Development strategies for the project

SS1.4.2 Design:

A. Evaluate different Low Impact Development strategies as well as traditional options

B. Use Autocase for Sites to determine the triple bottom line value of each design

C. Implement design that adheres to COA Post Development Storm Water Ordinance and has the highest benefits for project and the overall ATL campus

SS1.4.3 Construction:

A. Follow design specifications for LID and/or GI features

B. Submit documentation and pictures of final site construction showing Rain Water Management components. Documentation to be submitted to the Sustainability Review Team

SS1.5 Documentation:

A. Rainfall data

B. Rainfall events calculator or calculations for the chosen percentile storm

C. Runoff volume calculations

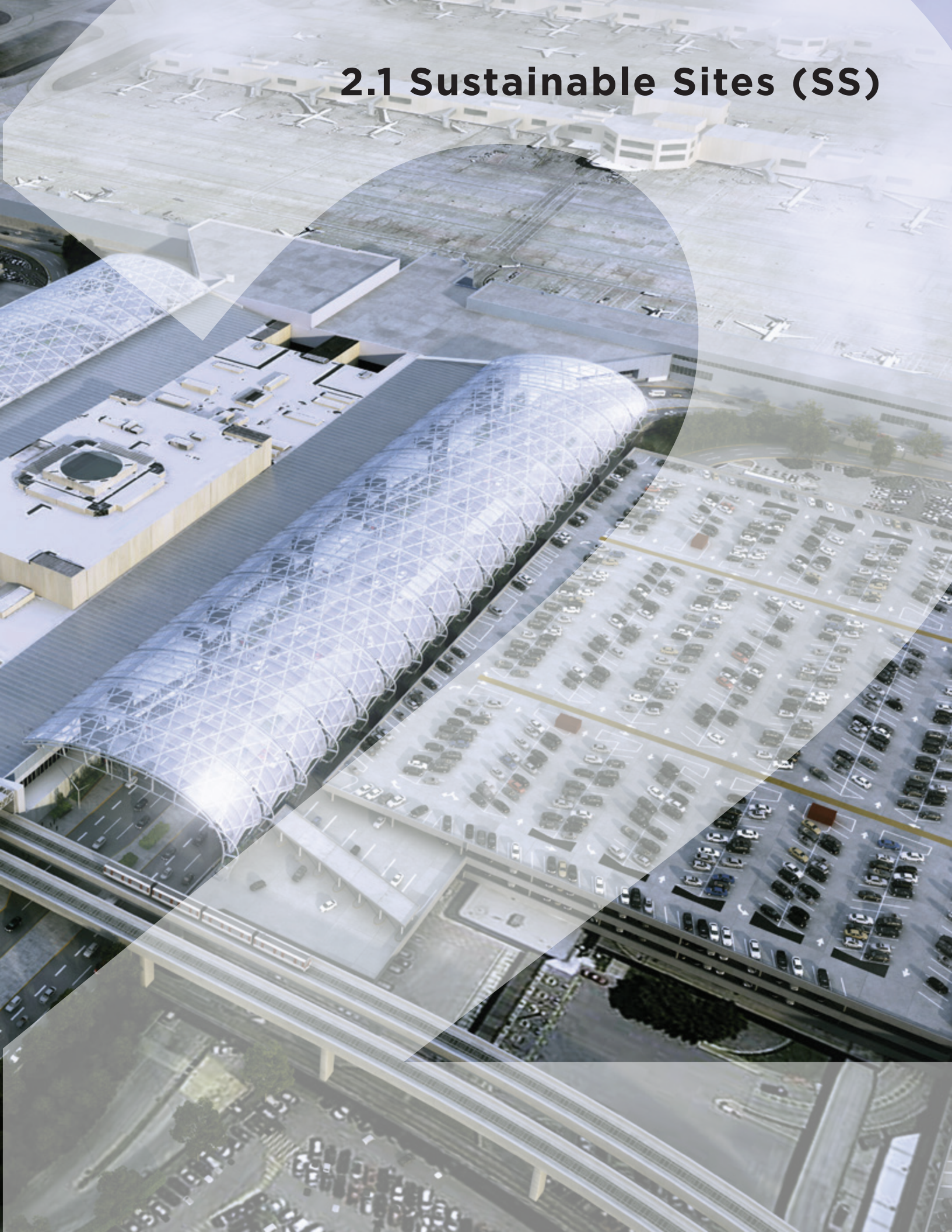
D. Plans, details, or cross sections depicting site conditions and Green Infrastructure (GI) or Low-Impact-Design (LID) strategies, highlighting topography, direction of water flow, and area of site that each facility addresses

E. Narrative confirming measures qualify as GI or LID

F. Calculations for volume of rainwater managed by GI or LID strategies

G. Documents illustrating natural land cover conditions

2.1 Sustainable Sites (SS)



SS1 Rain Water Management

Follow the City of Atlatnta's Post Development Storm Water Ordinance to Address Storm Water Infiltration on a Project by Project Basis (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

SS1.1 Intent:

A. To reduce storm water runoff volume and improve water quality by replicating the natural hydrology and water balance of the site, based on historical conditions and undeveloped ecosystems in the region

SS1.2 Recommended Actions:

A. Evaluate project site hydrological conditions and determine appropriate Low Impact Development (LID) practices to comply with the City of Atlanta Post Development Storm Water Ordinance

B. Collect all rain water from building and parking garage surfaces for re-use to supplement indoor and outdoor potable water consumption

C. When economically feasible, implement Green Infrastructure to support pretreatment of rainwater before it reaches the Flint River to reduce pollutants and sediment runoff

SS1.3 Innovative Measures:

A. Design project site to achieve Rainwater Management credit under LEED v4

SS1.4 Implementation:

SS1.4.1 Planning:

A. Conduct preliminary evaluations on different Low Impact Development strategies for the project

SS1.4.2 Design:

A. Evaluate different Low Impact Development strategies as well as traditional options

B. Use Autocase for Sites to determine the triple bottom line value of each design

C. Implement design that adheres to COA Post Development Storm Water Ordinance and has the highest benefits for project and the overall ATL campus

SS1.4.3 Construction:

A. Follow design specifications for LID and/or GI features

B. Submit documentation and pictures of final site construction showing Rain Water Management components. Documentation to be submitted to the Sustainability Review Team

SS1.5 Documentation:

A. Rainfall data

B. Rainfall events calculator or calculations for the chosen percentile storm

C. Runoff volume calculations

D. Plans, details, or cross sections depicting site conditions and Green Infrastructure (GI) or Low-Impact-Design (LID) strategies, highlighting topography, direction of water flow, and area of site that each facility addresses

E. Narrative confirming measures qualify as GI or LID

F. Calculations for volume of rainwater managed by GI or LID strategies

G. Documents illustrating natural land cover conditions

SS2 Heat Island Reduction (Roof)

Utilize TPO ENERGY STAR Certified Roof with an Initial SRI > 82 for Low-Sloped Roof for 100% of Roof Surface (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

SS2.1 Intent:

A. Reduce heat transfer through roof to reduce demand of mechanically conditioned air and improve energy efficiency.

B. Reduce cooling demand to increase operating life of colling equipment and reduce cost to condition building

SS2.2 Recommended Actions:

A. Select high-reflectance roofing materials with an initial SRI >82 and a 3-year aged SRI >64 for low sloped roofs on 100% of roof surface

B. Include a routine cleaning plan per roof following manufacturer's recommendations

SS2.3 Innovative Measures:

A. In lieu of a TPO white roof, use Extensive Vegetative Roof. An extensive green roof is low in maintenance

B. Design roof system to be a Passive or Active Blue Roof

SS2.4 Implementation:

SS2.4.1 Planning:

A. Include SRI rating for roof materials in Planning Definition Report

SS2.4.2 Design:

A. Review and confirm strategy with Sustainability Review Team.

SS2.4.3 Construction:

A. Submit manufacturer's product data on installed roof materials to Sustainability Review Team and/or documentation for Green Building Certification.

SS2.5 Documentation:

A. Submit manufacturer documentation for selected roof material at design phase to assure compliance with SRI values

SS3 Heat Island Reduction (Nonroof)

Use Paving Materials with an Initial Solar Reflectance (SR) value of >0.33 at Installation or a 3-Year Aged SR Value of > 0.28 OR use Plants, Vegetated Shading Structures or Architectural Devices or Structures with an Initial SR Value of >0.33 at Installation or a 3-Year Aged SR value of >0.28 to Provide Shade on 100% of Hardscape Area (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

SS3.1 Intent:

A. Reduce solar heat gain through dark colored materials resulting in reduced effects on climate

SS3.2 Recommended Actions:

A. Evaluate all non-roof areas of project for heat island reduction.

B. Implement most cosiit-effective combination of shading strategies and high reflective paving materials to meet Intent.

C. Evaluate the use of concrete versus asphalt to increase solar reflective properties and reduce environmental impact associated with asphalt production and material content

SS3.3 Innovative Measures:

A. Install architectural shading devices that can accommodate solar panels.

B. Use 100% concrete for all hardscapes instead of asphalt and,

C. Select a concrete with high recycled-content of supplementary cementitious materials (SCMs)

SS3.4 Implementation:

SS3.4.1 Planning:

A. Include sustainability design requirements to meet Intent in Planning Definition Report

SS3.4.2 Design:

A. Design site to meet goal intent and requirements

B. Evaluate and document the use of concrete versus asphalt to increase solar reflective properties and reduce environmental impact associated with asphalt

C. Evaluate most cost-effective combination of compliant paving material, landscape, and architectural shading structures and devices.

D. Review and confirm strategy with P&D Sustainability Team.

SS3.4.3 Construction:

A. Follow design plans and documents to comply with Intent

B. Submit all manufacturers documentation and landscape plans to P&D Sustainability Team.

SS3.5 Documentation:

A. Site plan(s) with elements and measures, including hardscape area, and area of each nonroof measure

B. Manufacturer's documentation or SR values for paving and shading materials

C. Evaluation analysis of using concrete versus asphalt

A. selected roof material at design phase to assure compliance with SRI values

2.2 Water Efficiency (WE)

WE1 Indoor Potable Water Reduction

Reduce Potable Indoor Water Consumption by 40% (baseline LEED v4) (Design)
Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	
Renovations & Retrofits	x	x	

WE1.1 Intent:

A. Reduce indoor potable water consumption by selecting efficient plumbing fixtures and to reduce indoor potable water use

WE1.2 Recommended Actions:

A. Select the most efficient plumbing fixtures and equipment to meet at a minimum reduction of indoor potable water consumption by 40%

B. Use Indoor Potable Water Reduction Calculator to evaluate cost-efficient strategies

C. Evaluate the use of reclaimed and/or recycled water for non-potable uses such as toilet flushing and process water

D. Evaluate including water processing and filtration systems to reduce potable water consumption

WE1.3 Innovative Measures:

A. Design building to be Net-Zero Water through a combination of:
    1. Rainwater Harvesting
    2. Water recycling and reuse
    3. Grey-water treatment and reuse
    4. Advanced Conservation strategies

WE1.4 Implementation:

WE1.4.1 Planning:

A. Include WE1.2 Recommended Actions in Planning Definition Report

WE1.4.2 Design:

A. Evaluate most cost-efficient design strategy to reduce potable water consumption

B. Fill out Indoor Water Reduction Calculator for estimated design reduction of indoor potable water consumption

C. Evaluate the use of reclaimed or recycled water for non-potable uses such as toilet flushing and process water
    1. Identify estimated annual potable water use for urinals and water closets based on full time equivalents (FTEs) and national averages.
    2. Evaluate economic feasibility of a separate non-potable water delivery system for urinals and water closets.
    3. Identify source of non-potable water and demand based on FTEs

D. Evaluate including water processing and filtration systems to reduce potable water consumption

E. Review and confirm design and evaluations with P&D Sustainability Team

F. Submit preliminary estimated design reduction calculation to P&D Sustainability Team

WE1.4.3 Construction:

A. Select ultra-low flow plumbing fixtures

B. Submit selected manufacturers documentation on fixtures equipment to P&D Sustainability Team before purchase

C. Submit final indoor potable water calculation based on installed fixtures, fittings, and equipment to P&D Sustainability Team

WE1.5 Documentation:

A. Manufacturers documentation on fixtures and equipment

B. Evaluation of using reclaimed or recycled water for non-potable uses

C. Evaluation of water processing and filtration systems

D. Final design Indoor Water Reduction Calculator or documentation for Green Building Certification

WE2 Outdoor Potable Water Reduction

Reduce Potable Outdoor Water Consumption by 50% (baseline LEED v4) (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

WE2.1 Intent:

A. Reduce outdoor potable water use for landscape irrigation and site maintenance

WE2.2 Recommended Actions:

A. Design Landscape that does not require irrigation

B. If irrigation is needed, design system to meet Water Sense Certification requirements.

C. Use reclaimed water to fulfill irrigation needs

D. Use reclaimed water for site maintenance needs

WE2.3 Innovative Measures:

A. Design site to require no irrigation

B. Design site to capture all surface-level rainwater to a collection system to be treated and used for indoor or outdoor uses

WE2.4 Implementation:

WE2.4.1 Planning:

A. Include WE2.2 Recommended Actions in Planning Definition Report

WE2.4.2 Design:

A. Design site to require no irrigation or supplement irrigation and maintenance potable water demand with non-potable water

B. If irrigation is required, design system to be Water Sense Certified

C. Fill out Outdoor Water Reduction Calculator for estimated design reduction of outdoor potable water consumption

D. Estimate water needs for maintenance such as power washing on an annual basis

E. Review and confirm design with P&D Sustainability Team

F. Submit preliminary estimated design reduction calculation to Sustainability Review Team

WE2.4.3 Construction:

A. Follow design requirements to meet outdoor potable water reduction of 50%.

B. If irrigation system is in scope of work, submit selected manufacturers documentation on irrigation system to Sustainability Review Team before purchase

C. Submit final Outdoor Water Reduction Calculation based on final conditions and protocols to P&D Sustainability Team

WE2.5 Documentation:

A. Site plan showing vegetated areas

B. Narrative including plant species and water requirements

C. Narrative for plan to use non-potable water for landscape and maintenance demand

D. Manufacturers documentation for irrigation components if irrigation system is installed.

E. Final Outdoor Water demand calculation

WE3 Water Monitoring

Install Water Monitoring System for all Major Water Subsystems (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

WE3.1 Intent:

A. To measure and track water usage to effectively identify opportunities for additional water savings

WE3.2 Recommended Actions:

A. Install water monitoring system for the following applicable water subsystems:
    1. Irrigation
    2. Indoor plumbing fixtures
    3. Domestic hot water
    4. Boiler with aggregate projected annual water use of 100,000 gallons or more, or boiler of more than 500,000 BtuH (150kW)
    5. Reclaimed water
    6. Other Process water (at least 80% of daily expected water use for process end uses)
    7. All tenant water systems

WE3.3 Innovative Measures:

A. Ensure smart / remote read meters are utilized

WE3.4 Implementation:

WE3.4.1 Planning:

A. Include WE3.2 Recommended Actions in Planning Definition Report

B. Include Water Monitoring System in Project Budget

C. Confirm Fiber access is available to the site of the project

WE3.4.2 Design:

A. Include Water Metering requirements in design to meet goal intent and requirements

B. Submit and confirm design with P&D Sustainability Team Project Manager and/or documentation for Green Building Certifications

WE3.4.3 Construction:

A. Install Water Meters in compliance with design

WE3.5 Documentation:

A. Narrative describing Water Monitoring strategy

B. Remote access to water-metering data

2.3 Energy & Atmosphere (EA)

EA1 Energy Consumption

Reduce Energy Consumption by at least 20% (baseline: ASHRAE 90.1 – 2010) Achieve Through Whole Building Energy Model for Building Projects, Energy Analysis for Parking Garages and Infrastructure Projects (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

EA1.1 Intent:

A. To reduce the environmental, social, and economic harms of excessive energy use by achieving a minimum level of energy efficiency for the building and its systems.

EA1.2 Recommended Actions:

A. Perform an Energy Model analysis for the proposed design as early in the design process (preferable before SD-35%)

B. Evaluate building system synergies and trade-offs

C. Evaluate payback periods and ROI sustainability features

EA1.3 Innovative Measures:

A. Design project(s) to be Net-Zero or Net - Positive Energy by using a combination of strategies below:
   1. High-performance building envelope
   2. Dynamic glass windows
   3. Properly sized heating and cooling equipment
   4. High-efficiency heating and cooling equipment
   5. High-efficiency lighting
   6. Renewable energy sources
   7. Automated Daylighting controls

EA1.4 Implementation:

EA1.4.1 Planning:

A. Conduct Simple Box Energy Model for Buildings, or Estimated Energy Usage for other projects to comply with ISO 50001 standards

B. Include Energy Model in Planning Definition Report (Building Projects only)

C. Include Energy Model costs in budget (Building Projects only)

EA1.4.2 Design:

A. Facilitate an Integrative Design Process and on-going meetings with Stakeholders, P&D Sustainability Team, Building Occupants, Building Maintenance Manager, Architect, Mechanical Engineer, Electrical Engineer, and Plumbing Engineer to evaluate building system synergies and trade offs

B. Update preliminary Energy Model to meet minimum energy reduction percentage (Buildings) or update estimated annual energy usage for parking garages and civil infrastructure projects

C. Perform payback and ROI analysis on building components to deliver most cost- efficient features over the life of the building.

D. Minimize angles and length of HVAC ducts to decrease friction and heat loss and increase efficiency of system

E. Include best practices for air sealing of thermal envelope, air barrier, and air distribution system in construction scope of work

F. Submit and review Energy Model based on final design to P&D Sustainability Team Project Manager

G. Develop comprehensive Operations and Maintenance Manual to ensure optimal performance and maximize life cycle of building components.

EA1 Energy Consumption *Continued*

EA1.4.3 Construction:

A. Follow design requirements to assure building meets specified energy reduction goals

B. Follow best practices for air sealing to reduce air exchange into unconditioned spaces

C. Submit Final Energy Model based on final conditions to Sustainability Review Team

D. Submit manufacturers documentation on all building components after project is completed to Sustainability Review Team.

EA1.5 Documentation:

A. Appendix G energy modeling inputs

B. Input and output reports from energy modeling software

C. Renewable Energy reports (if applicable)

D. Exceptional Calculations (if applicable)

E. Target Finder results

F. Energy consumption and demand for each building end use and fuel type

G. Fuel rates

H. Manufacturer documentation for all building components

EA2 Power Monitoring

Install Power Monitoring System for All Energy End Uses (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

EA2.1 Intent:

A. To support energy management and identify opportunities for additional energy savings by tracking building-level and system-level energy use.

EA2.2 Recommended Actions:

A. Install advanced energy metering for the following:
   1. All whole-building energy sources used by the building; and
   2. Any individual energy end uses that represent 10% or more of the total annual consumption of the building

B. The advanced energy metering must have the following characteristics:
   1. Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location
   2. Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate
   3. The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure
   4. The system must be capable to store all meter data for at least 36 months
   5. The data must be remotely accessible
   6. All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use

EA2.3 Innovative Measures:

A. Create diagnostic action plan to improve energy consumption based on energy monitoring

EA2.4 Implementation:

EA2.4.1 Planning:

A. Include Power Monitoring System in project budget

B. Include Power Monitoring System specifications in Planning Definition Report

C. Confirm Fiber access is available to the project site.

EA2.4.2 Design:

A. Address all whole-building energy sources used by building and any individual energy end uses that represent 10% or more of the total annual consumption of the building

B. Submit Power Monitoring System plan to P&D Sustainability Team

EA2.4.3 Construction:

A. Install Power Monitoring System as designed

B. Confirm system set-up and performance with P&D Sustainability Team

EA2.5 Documentation:

A. List of all advanced meters to be installed, including type, energy source metered

B. Manufacturers documentation

C. Remote access to power monitoring system

EA3 Renewable Energy

Evaluate Use of Renewable Energy for at least 12% of Total Energy Usage Dependent Upon Life-Cycle Costs and Benefits Achieved (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

EA3.1 Intent:

A. To reduce the environmental and economic harms associated with fossil fuel energy by increasing self-supply of renewable energy. Evaluate the use of renewable energy sources to fulfill at least 12% or the total energy demand for the project

EA3.2 Recommended Actions:

A. Conduct payback analysis on the implementation of renewable energy systems including: Solar Photo-Voltaic Systems, Solar Thermal Systems, Geothermal Systems, and Bio-Fuel use for building system energy

B. Review the ATL Solar Master Plan to determine if site is a viable candidate for a solar array.

C. Review municipal, state, and federal tax incentives and rebates for renewable energy systems

D. At a minimum, design structure or site to accommodate future solar array if glare analysis deems design to comply by FAA Regulations

E. Purchase Renewable Energy Credits equivalent to 20% of energy consumption if on-site production is not feasible

EA3.3 Innovative Measures:

A. Include Renewable Energy strategies to cover 100% of the project's estimated annual energy consumption or plans to use energy generated on other projects

EA3.4 Implementation:

EA3.4.1 Planning:

A. Allocate funds for possible renewable energy system integration within Project Energy Efficiency Budget based on national averages of total annual energy use for projects of similar size and function.

B. Include Renewable Energy System Evaluation Protocol in Planning Definition Report

C. Review Tax incentives and rebates available for project and provide to design team

EA3.4.2 Design:

A. Follow Renewable Energy System Evaluation Protocol to determine practicality and economic feasibility of incorporating Renewable Energy Systems into project

B. Determine estimated project total energy demand based off preliminary Energy Model

C. Document, review and submit Renewable Energy System Feasibility Evaluation Report to P&D Sustainability Team

D. If feasible to use Renewable Energy System on project, include in Energy Model (if applicable)

E. Apply for rebates or incentive programs (if applicable)

EA3.4.3 Construction:

A. If Renewable Energy System is included in scope of work, include experienced installation company on project team to perform installation

B. Submit manufacturers documentation on system to Sustainability Review Team

EA3.5 Documentation:

A. Renewable Energy System Evaluation

B. If Renewable Energy System is being used on project:
   1. Renewable system rated capacity
   2. Calculations to determine energy generated
   3. Equivalent cost of renewable energy produced
   4. Documentation of annual energy costs
   5. Rebate or Incentive application
   6. Manufacturer documentation for system

EA4 Construction Related Activity

Implement Construction Activity Policies to Encourage the Reduction of Green House Gas Emissions from Construction Related Activity (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

EA4.1 Intent:

A. Put policies in place to encourage sustainable construction practices that reduce the emission of Green House Gases

EA4.2 Recommended Actions:

A. Follow current version of ATL Sustainable Construction Standards found in Specification General Conditions, Special Requirements

EA4.3 Innovative Measures:

A. Adopt a No Idle policy on all projects

B. Include on-site Construction Sustainability Coordinator to enforce and document Sustainable Construction Policies

EA4.4 Implementation:

EA4.4.1 Planning:

A. Specify inclusion of most current version of the ATL Sustainable Construction Standards found in Specification General Conditions: Special Requirements document in contractor Request for Proposals on all projects

EA4.4.2 Design:

A. Include most current version of ATL Sustainable Construction Standards found in Specification General Conditions, Special Requirements in contractor Request for Proposals on all projects

EA4.4.3 Construction:

A. Implement ATL Sustainable Construction Standards and provide monthly compliance updates as outlined in the ATL Sustainable Construction Standards to the P&D Sustainability Team Project Manager

EA4.5 Documentation:

A. Monthly compliance updates as outlined in the ATL Sustainable Constcruction Standards.

EA5 Commissioning

Perform Fundamental and Enhanced Commissioning for All Facilities and Buildings (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

SS3.1 Intent:

A. To support the design, construction, and operations of a project that meets the Owner's Project Requirements (OPR), and Basis Of Design (BOD) for energy, water, indoor environmental quality, and durability

SS3.2 Recommended Actions:

A. Follow processes for Fundamental Commissioning and Enhanced Commissioning as outlined in the LEED Reference Guide for Building Design and Construction v4

SS3.3 Innovative Measures:

A. Develop monitoring-based procedures and identify points to be measured and evaluated to assess performance of energy- and water-consuming systems.

SS3.4 Implementation:

SS3.4.1 Planning:

A. Include Fundamental and Enhanced Commissioning in project budget

B. Specify Fundamental and Enhanced Comissioning in Planning Definition Report

SS3.4.2 Design:

A. Include Fundamental and Enhanced Commissioning requirements in Scope of Work

SS3.4.3 Construction:

A. Perform Fundamental and Enhanced Commissioning in accordance with Fundamental Commissioning and Verification and Enhanced Commissioning as outlined in the LEED Reference Guide for Building Design and Construction v4

B. Submit all commissioning reports to P&D Sustainability Team Project Manager

SS3.5 Documentation:

A. All required documentation for Fundamental and Enhanced Commissioning in accordance to the LEED Reference Guide for Building Design and

2.4 Materials & Resources (MR)

MR1 Waste Diversion

Divert a Minimum of 90% of the Construction and Demolition Waste from Landfills (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

MR1.1 Intent:

A. To reduce construction and demolition waste disposed of in landfills and incineration facilities by recovering, reusing, and recycling materials

MR1.2 Recommended Actions:

A. Develop and implement a construction and demolition waste management plan:
    1. Establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Specify a 90% diversion rate of the overall project waste that these materials represent
    2. Specify that at a minimum, the top 5 waste streams will be diverted separately and recycled, salvaged, or reused
    3. Describe where the material will be taken and how the recycling facility will process the material

MR1.3 Innovative Measures:

A. Implement a zero-waste strategy during construction

B. Certify project (in addition to initial project certification) under the TRUE Zero Waste Certification Standard (Seee APPENDIX F)

MR1.4 Implementation:

MR1.4.1 Planning:

A. Specify a minimum diversion rate of 90% for construction and demolition waste from landfill by weight in Planning Definition Report

MR1.4.2 Design:

A. Specify a minimum diversion rate of 90% for construction and demolition waste from landfill by weight in scope of work

B. Include recommended diversion strategies in scope of work

C. Fill out estimated diversion rates in Construction and Demolition Waste Calculator once contractor has been awarded project

D. Review and submit estimated diversion rates calculation to Sustainability Review Team

E. Specify the use of a waste diversion tracking technology like Retrac-CONNECT

MR1.4.3 Construction:

A. Create Construction and Demolition Waste Diversion Plan before construction

B. Submit and review Construction and Demolition Waste Diversion Plan with P&D Sustainability Team before construction

C. Supply and review Construction and Demolition Waste Diversion Plan and goals to all sub-contractors and project team

D. Submit Construction and Demolition Waste monthly tracking to P&D Sustainability Team

E. Submit final Construction and Demolition Waste calculation to Sustainability Review Team once project is completed

MR1.5 Documentation:

A. Construction and Demolition Waste Diversion Plan

B. Construction and Demolition Waste Tickets

C. Preliminary estimated Construction and Waste Diversion calculations

D. Final Construction and Waste Diversion calculations

MR2 Sustainable Purchasing Policy

Implement the ATL Sustainable Purchasing Policy as it pertains to Construction to Reduce the Net Embodied Carbon of all Projects

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

MR2.1 Intent:

A. Implement the ATL Sustainble Purchasing Policy for construction and raw materials.

B. Reduce solid waste and energy use

C. Maximize recyclability and the use of recycled content

D. Improve environmental efficiency of facilities, operations, and services

MR2.2 Recommended Actions:

A. Use recycled and environmentally preferable products whenever practical, provided the products perform satisfactorily and are available at a competitive pricing

B. Comply with the requirements for Building Product Disclosure and Optimization – Sourcing of Raw Materials and Building Product Disclosure – Environmental Product Declarations as outlined in the LEED Reference Manual for Building Design and Construction

MR2.3 Innovative Measures:

A. Do not use any materials that contain chemicals found on the International Living Future Institue's Material Red List

MR2.4 Implementation:

MR2.4.1 Planning:

A. Include Clear Language referencing the ATL Sustainable Purchasing Policy and language included under MR 2.2 Recommended Actions

MR2.4.2 Design:

A. Follow the ATL Sustainable Purchsing Policy for material selection for all construction and raw materials.

B. Follow requirements for Building Product Disclosure – Environmental Declarations as outlined in the LEED Reference Manual for Building Design and Construction v4

C. Specify products that meet the standards in both references above.

D. Submit product information for specified materials to Sustainable Review Team

E. Specify Building Product Disclosure – Sourcing Raw Materials as outlined in the LEED Reference Manual for Building Design and Construction version 4 in scope of work

F. Provide the ATL Sustainable Purchasing Policy to Construction Team

MR2 Sustainable Purchasing Policy *Continued*

MR2.4.3 Construction:

A. Purchase building materials specified by design team

B. Purchase raw materials in accordance with Building Product Disclosure – Sourcing Raw Materials as outlined in the LEED Reference Manual for Building Design and Construction v4

C. Submit product information for raw materials to the P&D Sustainability Team Project Manager before purchase to confirm compliance with goal.

D. Submit manufacturers documentation on all building products used for project to P&D Sustainability Team Project Manager

MR2.5 Documentation:

A. Materials and resources building product disclosure and optimization calculator or equivalent tracking tool

B. EPD and LCA reports or compliant summary documents for 100% of products contributing toward credit

C. Corporate sustainability reports for 100% of products contributing toward compliance

MR3 Regionally Sourced Materials

Use Locally Sourced materials When Economically Feasible (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	x
Renovations & Retrofits	x	x	x

MR3.1 Intent:

A. Reduce Green House Gas Emissions attributed to material transportation by using materials sourced within a 300-mile radius of Hartsfield-Jackson Atlanta International Airport

B. Support local economy by purchasing materials manufactured, produced, or harvested within 300-miles of Hartsfield-Jackson Atlanta International Airport

MR3.2 Recommended Actions:

A. Evaluate the potential to incorporate locally sourced materials (within 300-mile radius)

B. Specify locally sourced materials

C. Use Locally Sourced Material Calculator to determine percentage of locally sourced materials by cost

MR3.3 Innovative Measures:

A. No Recommended Actions

MR3.4 Implementation:

MR3.4.1 Planning:

A. Specify preference of materials sourced within 300 miles of HJAIA in Planning Definition Report

MR3.4.2 Design:

A. Evaluate sourcing materials locally and document process

B. Determine materials that are feasible to source locally

C. Determine estimated percentage of locally sourced materials by cost with Locally Sourced Materials Calculator

D. Submit Locally Sourced Materials estimated percentage calculation to P&D Sustainability Team Project Manager

E. Include materials to be locally sourced in scope of work

MR3.4.3 Construction:

A. Procure locally sourced materials in accordance with scope of work specification

B. If cost has changed between design and construction, evaluate alternative options for locally sourced materials

C. If cost to procure materials locally is no longer economically feasible, document evaluation process and submit to Sustainability Review Team

D. Submit final Locally Sourced Materials calculations to Sustainability Review Team

MR3.5 Documentation:

A. Estimated Locally Sourced Materials calculations

B. Final Locally Sourced Materials calculations

C. Documentation showing distance from Hartsfield-Jackson Atlanta International Airport to material origin

2.5 Human Health/ Indoor Environment Quality (HH)

HH1 Invoor VOC and CO2 Reduction

Use Low or No Volatile Organic Compounds (VOCs) Materials for Paints/Coatings, Adhesives/ Sealants, Flooring, Composite Wood, Ceilings, Walls, Thermal and Acoustical Insulation, and Furniture (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	
Renovations & Retrofits	x	x	

HH1.1 Intent:

A. To reduce the impact on human health by using low or no VOC containing materials for paints and coatings, adhesives and sealants, flooring, composite wood, ceilings, walls, thermal and acoustical insulation, and furniture

HH1.2 Recommended Actions:

A. Acheive the threshold level of compliance with emissions and content standards for all catagories identified in the Low Emitting Materials credit as outlined in the LEED Reference Manual for Building Design and Construction v4

B. Use the Low Emitting Materials Calculator to ensure design complies with goal requirements

HH1.3 Innovative Measures:

A. Achieve less than 500 µg/m³ Total Volatile Organic Compounds test results in interior spaces

HH1.4 Implementation:

HH1.4.1 Planning:

A. Include HH1.2 Recommended Actions in Planning Definition Report

HH1.4.2 Design:

A. Specify materials in all categories outlined in goal Intent in scope of work

B. Determine estimated total VOC levels using the Low Emitting Materials Calculator

C. Submit and review estimated total VOC levels calculations with P&D Sustainability Team Project Manager

HH1.4.3 Construction:

A. Use materials specified in scope of work as determined by design team.

B. Complete final Low Emitting Materials calculations

C. Submit final Low Emitting Materials calculations to P&D Sustainability Team Project Manager

D. Submit manufacturers documentation specifying VOC content for all materials in the categories outlined in the Goal Intent to the P&D Sustainability Team Project Manager

HH1.5 Documentation:

A. Provide a list of all materials used with corresponding VOC limits

B. Final Low Emitting Materials calculations

C. Manufacturers documentation specifying VOC content for all materials specified in HH1.2 Recommended Actions

HH2 Indoor Air Quality Testing

Perform Indoor Air Quality Testing After Construction and Before Occupancy (Construction)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	
Renovations & Retrofits	x	x	

HH2.1 Intent:

A. To test and verify the indoor air quality is at healthy levels to ensure occupant health

HH2.2 Recommended Actions:

A. Meet the requirements for Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Manual for Building Design and Construction v4

B. Meet the requirements for Construction Indoor Air Quality Management Plan as outlined in the LEED Reference Manual for Building Design and Construction v4

C. Meet the requirements for Indoor Air Quality Assessment, Option 2, as outlined in the LEED Reference Manual for Building Design and Construction v4

D. Perform CO2 testing after construction to assure safe levels and proper ventilation

HH2.3 Innovative Measures:

A. No recommended actions

HH2.4 Implementation:

HH2.4.1 Planning:

A. Include Indoor Air Quality Testing in project budget

B. Include requirements for Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Manual for Building Design and Construction v4 in Planning Definition Report

C. Include requirements for Construction Indoor Air Quality Management Plan as outlined in the LEED Reference Manual for Building Design and Construction v4 in Planning Definition Report

HH2.4.2 Design:

A. Design building to meet requirements of Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Manual for Building Design & Construction v4

B. Specify a Construction Indoor Air Quality Management Plan in accordance with the LEED Reference Manual for Building Design and Construction v4 in construction scope of work

C. Specify requirements for Indoor Air Quality Assessment, Option 2, as outlined in the LEED Reference Manual for Building Design and Construction v4 in construction Scope of Work

D. Specify requirements for CO2 testing in construction scope of work

E. Review design and construction specifications with P&D Sustainability Team

HH2.4.3 Construction:

A. Follow design to meet the requirements for Enhanced Indoor Air Quality Strategies

B. Implement a Construction Indoor Air Quality Management Plan

C. Submit Construction Indoor Air Quality Management Plan to P&D Sustainability Team before construction starts

D. Conduct Indoor Air Quality Testing as outlined in the LEED Reference Manual for Building Design and Construction v4

E. Submit Indoor Air Quality Testing Report to Sustainability Review Team

F. Conduct CO2 testing after construction is completed

G. Submit CO2 testing results to Sustainability Review Team

HH2 Indoor Air Quality Testing *Continued*

HH2.5 Documentation:

A. Required Documentation for Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Manual for Building Design and Construction v4

B. Construction Indoor Air Quality Management Plan

C. Narrative describing protection measures for absorbent materials

D. Annotated photographs of indoor air and environmental quality measures

E. Record of filtration media

F. Indoor Air Quality Assessment Report

G. CO2 testing Report

HH3 Quality Views

Achieve a Direct LIne of Sight to the Outdoors for 75% of the Regularly Occupied Floor Area (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x		
Renovations & Retrofits	x		

HH3.1 Intent:

A. To give occupants a connection to the natural outdoor environment by providing quality views

HH3.2 Recommended Actions:

A. Achieve a direct line of sight to the outdoors via vision glazing for 75% of all regularly occupied floor area. View glazing must provide a clear image. No obstruction by frits, fibers, patterned glazing, etc. is allowed

B. Additionally, 75% of all regularly occupied floor area must have at least two of the following four kinds of views:

C. Multiple lines of sight to vision glazing in different directions at least 90 degrees apart

D. Views that include at least two of the following:
   1. Flora, fauna, or sky
   2. Movement; and
   3. Objects at least 25 feet (7.5 meters) from the exterior of the glazing

E. Unobstructed views located within the distance of three times the head height of the vision glazing

F. Views with a view factor of 3 or greater, as defined in “Windows and Offices; A Study of Office Worker Performance and the Indoor Environment.”

G. Include in the calculations any permanent interior obstructions. Movable furniture and partitions may be excluded

H. Views into interior atria may be used to meet up to 30% of the required area

HH3.3 Innovative Measures:

A. Meet the requirements for 90% or more of all regularly occupied floor area

HH3.4 Implementation:

HH3.4.1 Planning:

A. Include requirements in accordance with Quality Views as outlined in the LEED Reference Manual for Building Design and Construction v4 in the Planning Definition Report

HH3.4.2 Design:

A. Design building to meet requirements for Quality Views as outlined in the LEED Reference Manual for Building Design and Construction Manual v4

B. Review design with Sustainability Review Team to assure compliance with goals.

HH3.4.3 Construction:

A. Follow design to meet Quality Views Specifications

HH3.5 Documentation:

A. Submit all required documentation in accordance with Quality Views as outlined in the LEED Reference Manual for Building Design and Construction v4

HH4 Daylighting

Achieve Daylighting for at least 75% of the Regularly Occupied Floor Area (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x		
Renovations & Retrofits	x		

HH4.1 Intent:

A. To connect building occupants with the outdoors, reinforce circadian rhythms, and reduce the use of electrical lighting by introducing daylight into the space

HH4.2 Recommended Actions:

A. Provide manual or automatic (with manual override) glare-control devices for all regularly occupied spaces

B. Demonstrate through annual computer simulations that spatial daylight autonomy 300/50% (sDA300/50%) of at least 75% is achieved. Use regularly occupied floor area

HH4.3 Innovative Measures:

A. Achieve Daylighting for 90% or more of all regularly occupied floor area.

B. Implement automated daylight monitoring controls for all lighting in regularly occupied floor area.

C. Implement other features from the Light category of the WELL Building Standard (See Appendix E WELL Building Standard Overview) version 1.

HH4.4 Implementation:

HH4.4.1 Planning:

A. Include guidance to achieve the requirements for Daylight, Option 1, as outlined in the LEED Reference Manual for Building Design and Construction v4 in the Planning Definition Report

HH4.4.2 Design:

A. Design building me meet requirements of Daylighting, Option 1, as outlined in the LEED Reference Manual for Building Design and Construction v4

B. Submit design to demonstrating compliance with Daylight goal to P&D Sustainability Team Project Manager

HH4.4.3 Construction:

A. Follow design to meet Daylight specifications

HH4.5 Documentation:

A. Floor plans highlighting regularly occupied spaces (for Healthcare, regularly occupied perimeter area)

B. List of glare-control devices for all windows with their control mechanism

C. List of compliant spaces with their annual summary values for soda and ASE

D. Geometric plots from simulations.

E. Narrative or output file describing daylight simulation program, simulation inputs, and weather file

HH5 Water Quality
Environment Quality (HH)

Design all drinking water delivery systems to include or accommodate a water filtration system to reduce Organic, Inorganic, and Agricultural Contaminants, and Excessive Water Additives in Drinking Water (Design)

Applies to:

	Buildings	Parking Garages	Infrastructure
New Construction	x	x	
Renovations & Retrofits	x	x	

HH5.1 Intent:

A. To measure and maintain acceptable levels of certain contaminants, disinfectants, disinfection byproducts and fluoride in drinking water

HH5.2 Recommended Actions:

A. Design all drinking water delivery systems (drinking fountains, kitchen sinks, etc) to include or accommodate a water filtration system that assures water quality meets the requirements specified in the following Preconditions of the WELL Building Standard version 1:
    1. 31 Inorganic Contaminants
    2. 32 Organic Contaminants
    3. 33 Agricultural Contaminants
    4. 34 Public Water Additives

HH5.3 Innovative Measures:

A. Monitor water quality on a quarterly basis and have remediation plans in place

HH5.4 Implementation:

HH5.4.1 Planning:

A. Include HH5.2 Recommended Actions in Project Definition Report

B. Include drinking water filtration system in project budget

C. Include future Water Testing in Project Budget

D. Submit Design and narrative outlining Water Filtration Plan to the P&D Sustainability Team Project Manager to confirm compliance

HH5.4.2 Design:

A. Design drinking water delivery system to accommodate future water filtration system that satisfies the maximum contaminant thresholds on the WELL Building Standard version 1 Preconditions outlined in the Goal Recommended Actions

HH5.4.3 Construction:

A. Construct drinking water delivery system in accordance with design

HH5.5 Documentation:

A. Narrative outlining Water Filtration Plan

CHAPTER 3
Process & Implementation

3.0 Chapter Overview:

This Chapter provides a detailed overview of how sustainable design will be executed on all projects for the ATL P&D Bureau, as it relates to planning, design, construction, and operations and maintenance.

The purpose of this sustainability implementation process is to provide a clear, easy and consistent path for addressing sustainability measures across all projects. The process is broken down into phases – Planning, Design, Construction, Operations, and Maintenance. This process is required to be followed on all P&D Department projects. The required action items for each project are listed on pages 50 & 51.

3.1 Implementation Process

01 Planning

1. Conduct Integrated Planning Meeting with all stakeholders to define the Owner's Project Requirements and establish the Basis of Design
2. Select Sustainability Certification Standard to pursue
3. Run a Preliminary Sustainability Scorecard (scorecard type determined by project type – i.e LEED, Parksmart, Envision, etc.)
4. Review / confirm all Sustainability Goals to be implemented into project scope of work
5. Perform an Autocase evaluation for each design feature of the project to determine it's Financial, Social, and Environmentl Net Present Value
6. Perform whole-project Life Cycle Analysis
7. Coordinate and review sustainability implementation plan with Planning Manager, Design Manager, Construction Manager and Asset Management Sustainability Manager
8. Develop appropriate budget to achieve all Sustainability Goals & Certifications
9. Include P&D Sustainability Plan in all RFP and/or RFQ for Design and Construction Services

02 Design

1. Hold Sustainability Charette to discuss Sustainability Implementation Plan and discuss any Sustainability Innovation that can be implemented
2. Perform an energy model analysis to further drive evaluation of design selections to maximize sustainability
3. Revisit Autocase evaluations to prioritize most cost-efficient sustainable design features
4. Update Sustainability Scorecard to confirm all sustainability goals are included in project scope and will be achieved
5. Perform a Sustainability Review at 35% Schematic Design (SD)
6. Perform an Enhanced Commissioning Design Review. This will happen before the design document reaches 50% DD Phase
7. Perform a Sustainability Review at 65% Design Development DD
8. Perform a Sustainability Review at 95% Construction Documents (CD)

03 Construction

1. Assign Construction Sustainability Coordinator
2. Review Sustainability Plan and Final Sustainability Scorecard
3. Advise of health and safety impact of construction equipment and activities. Include impact mitigation measures in contract documents and enforce during construction
4. Develop / submit construction waste management plan
5. Develop / submit indoor air quality management plan
6. Track and document required Sustainability Goals and Sustainability Metrics during construction
7. Perform Indoor Air Quality Testing, including TVOC and CO2 testing and input results in Arc Platform

04 Operations

1. Review AutoCase evaluation reports for project during Planning phase
2. Review Energy Model evaluation reports for project during major design milestones (i.e. 35%, 65%, etc.)
3. AMS team member to attend functional commissioning testing and equipment startup
4. Review all close-out documents (i.e. as-builts, warranties, O&M manuals, recommended maintenance schedule, etc.)
5. Attend Arc transition meeting with P&D. The purpose of this meeting is to transfer Arc platform for project from P&D (construction) to AMS (operations & maintenance)
6. Perform thermal comfort occupancy survey annually
7. Perform TVOC testing per building per Arc testing protocols
8. Perform CO2 testing per building per Arc testing protocols

05 Maintenance

1. Attend building owner training at construction completion / building turnover
2. Review enhanced commissioning design review for coordination with facilities management items
3. Review all close-out documents (i.e. as-builts, warranties, O&M manuals, recommended maintenance schedule, etc.)
4. Attend Arc Transition Meeting with P&D. The purpose of this meeting is to transfer Arc platform for project from P&D (construction) to AMS (operations & maintenance)
5. Automatically operated HVAC system via building automation system to optimize building performance. Calibrate BAS system per manufacturer recommendations
6. Automatically operated lighting system via lighting control system for optimal performance. Calibrate lighting control system based on manufacturer recommendations
7. Coordinate regularly scheduled maintenance for building systems and electronic records of maintenance work and performance improvements
8. Manage Enhanced Commissioning Walk Through (10 months after construction completion). Ensures building is performing optimally

3.2 Sustainable Design Standards

The sustainability standards below are meant to provide consistent direction to design relating to sustainability across all projects. These standards are categorized to provide more guidance to the P&D Sustainability Goals as part of the P&D Sustainability Program with additional general design standards that should be followed as applicable based on project scope and specific parameters.

Part I

GS: GENERAL STANDARDS (Required)

1. Start design process with an Integrative Design Process as outlined in LEED v4.
2. Designate 5% preferred parking spaces for green vehicles in employee and public lots. Green vehicles must have a minimum score of 45 on American Council for an Energy-Efficient Economy (ACEEE).
3. Specify all exterior and airfield lighting to be LED.
4. Paving for surface parking lots to be concrete with compliant SRI Value or asphalt pavement containing at least 25% recycled content material.
5. Concrete or asphalt pavement base aggregate to contain at least 50% recycled content
6. Submit a Landscape Plant Maintenance Plan as part of project landscape plans.
7. Submit an Integrated Pest Management Plan as part of the design process that defines preferred methods for long-term prevention and management of pests without negative environmental impacts.
8. Consult with an FAA-certified airport Horticulturalist or Landscape Architect to verify that plants selected for landscape area will not attract wildlife.
9. Specify new base building HVAC equipment that uses no chlorofluorocarbon (CFC) refrigerants.
10. Specify HVAC equipment that uses refrigerants with low Global Warming Potential (GWP) and Ozone Depletion Potential (ODP).
11. Prohibit the specification of insulation materials that use ozone-depleting chemicals.
12. Prohibit the specification of halons in fire suppression systems.
13. Design buildings with convenient and appropriately sized areas for recyclable collection and removal for a wide variety of waste streams.
14. Design buildings with convenient, accessible, and appropriately sized areas for recyclable storage to support recycling infrastructure (e.g., cardboard balers).
15. Specify identifying signage for all recycling collection and storage areas and equipment.
16. Provide infrastructure to accommodate future Electric Vehicle Charging Stations for at least 6% of all parking, and no less than 6 space.

Part II

A. Sustainable Sites (SS)

1. SS1 Rain Water Management – Follow the City of Atlanta's Post Development Storm Water Management Ordinance to address storm water infiltration on a Project by Project basis

   a. Standards (Required)

      1. Incorporate bio-filtration into storm water detention for storm water quality treatment.
      2. Design onsite detention basins, ditches, ditch checks and other BMPs to accommodate first flush treatment.
      3. Surface parking lot drainage to consist of low-impact storm water treatments (i.e. bio swales, tree pits, pervious pavement, etc.)

   b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

      1. Design buildings and/or facilities to collect and reuse storm water (e.g., building-integrated rainwater harvesting, rainwater cisterns, etc.) and reuse storm water for non-potable uses (e.g., toilet/urinal flushing, machine/vehicle washing, custodial uses, and landscape irrigation in areas not served by reclaimed water) to the extent allowed by the Safe Drinking Water Act of 1974.
      2. Design project to achieve Rainwater Management credit under LEED v4, Option #1, Path #1.
      3. Specify the use of pervious and/or porous pavement and permeable pavers (e.g., pedestrian areas, roadways, shoulders, non-traffic pavements, maintenance roads, utility yards, and surface parking). Specify 20% of total paved surface area to be pervious for surface parking lots.

2. SS2 Heat Island Reduction (Roof) - Utilize TPO ENERGY STAR certified roof with an initial SRI > 82 for low- sloped roof for 100% of roof surface

   a. Standards (Required):

      1. Design a cool roof (high-reflectance roof) with an initial SRI value >82 for roofs with a slope < 2:12 and > 39 for roofs with a slope > 2:12. The cool roof product must be labeled by ENERGY STAR and be based on ASTM E-903 or ASTM C-1549 testing.

   b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

      1. Incorporate non-wildlife attracting vegetated green roof systems (extensive or intensive) to intercept and treat rainwater into design, where feasible.

3. SS3 Heat Island Reduction (Nonroof) - Use paving materials with an initial Solar Reflectance (SR) value of >0.33 at installation or a 3-year aged SR value of >0.28 OR use plants, vegetated shading structures or architectural devices or structures with n initial SR value of >0.33 at installation or a 3-year aged SR value of >0.28 to provide shade on 100% of hardscape area

   a. Standards (Required):

      1. Combine design strategies to reduce site heat island effect. For example, provide shading for dark colored impervious surfaces and light colored/high albedo pavement in areas with no shade.

2. Maximize use of high-albedo concrete in place of black asphalt, where feasible
3. Maximize light colored/high albedo pavement, such as Portland cement concrete, for taxiways, runways, roadways, parking lots, sidewalks, and outdoor plazas, and other paved surfaces that are not under roof or other shading devices. Reflectance must be a minimum of 0.3. ["White" Portland cement – 0.7 to 0.8, typical Portland cement – 0.35 to 0.5, typical asphalt pavement – 0.05 (new) to 0.15 (over 5 years)].

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Use shading structures with compliant SRI values, vegetated roofing, or solar panels on surface level parking or hardscaped pavilions where feasible.

B. Water Efficiency (WE)

1. WE1 Indoor Potable Water Reduction - Reduce Potable Indoor Water Consumption by 40% (baseline LEEDv4)

a. Standards (Required):

1. Specify plumbing fixtures with following maximum flow rates

a. Toilets = 1.28gpf
b. Urinals = 0.8gpf
c. Showerhead = 1.5gpm
d. Faucets w/ motion sensors = 0.5 gpm
e. Kitchen/Breakroom = 1.0gpm

2. Design a non-potable water system (e.g., reclaimed, rainwater) for cooling tower makeup; and/ or capture condensate for use in cooling tower; and/or use pulsed-power electromagnetic water treatment, ultraviolet treatment, or ozone treatment for the cooling tower water.
3. Specify Energy Star labeled appliances (i.e. dishwasher, washing machine, etc.)

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Utilize a water harvesting system to replace potable (other non-potable water uses) and reduce demand on indoor potable water needs.

2. WE2 Outdoor Potable Water Reduction Reduce Potable Outdoor Water Consumption by 50% (baseline LEEDv4)

a. Standards (Required):

1. Specify low-maintenance, drought-tolerant, non-wildlife attracting vegetation in landscape design that does not require irrigation beyond initial plant establishment period.
2. Design landscaped areas, rain gardens, and bio-retention areas to reduce runoff.
3. Limit or eliminate the use of irrigation on turf areas for new landscapes/projects.
4. If irrigation is needed, specify drip irrigation, high-efficiency, smart-sensor technology, sub-soil irrigation systems that have an automated linkage to meteorological data and/or soil moisture content sensors.
5. Minimize the use of non-native and water-intensive species in interior landscape plans.

6. Perform an Estimated Outdoor Water Usage Calculation using plant Evapotranspiration Rates and irrigation (if present) flow rates to determine overall reduction from baseline.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Design landscaping so that irrigation is not needed beyond 2-year establishment period.

3. WE3 Water Monitoring - Install water meters for all major water Subsystems

a. Standards (Required)

1. Install smart meters on all major water subsystems (i.e. irrigation, etc.)

C. Energy and Atmosphere (EA)

1. EA1 Energy Reduction - Reduce Energy Consumption by at least 20% (baseline: ASHRAE 90.1 – 2010) (Achieve through whole building Energy Model)

a. Standards (Required):

1. Design buildings and systems to demonstrate an improvement of 20% compared to baseline for ASHRAE/IESNA 90.1-2010.
2. Design the building envelope and systems to maximize energy performance.
3. Utilize energy modeling to assess design energy performance and identify cost effective energy use optimization strategies. Perform payback analysis during the design phase which demonstrates that energy conservation measures have reasonable payback periods associated with them, and allow for increased project capital costs with the knowledge that both energy and operating costs will be saved long term.
4. Include advanced HVAC equipment and control strategies on both airside and waterside systems to reduce energy consumption. Strategies included but not limited to economizers, energy recovery systems, room temperature setpoint setbacks, Variable Refrigerant Systems, and water and air supply temperature reset schedules.
5. Specify integrated occupancy sensors with heating, ventilation, and air conditioning (HVAC) operation.
6. Provide building automation systems (BAS) for all projects to facilitate the monitoring of energy related processes.
7. Incorporate energy efficient lighting systems (LED). Require individual control devices including occupancy sensors or timers to reduce lighting energy consumption.
8. Specify lighting controls that dim or shut off lights in areas where daylighting is prevalent to maximize the use of daylighting. In single story buildings or at the roof level, incorporate skylights and/or light tubes to increase natural light and reduce artificial light.
9. Specify occupancy sensors where practical to turn off lighting during unoccupied periods. Provide lighting control system that links lighting to flight schedules and occupancy. Provide occupancy sensors to control lighting in areas that are intermittently occupied (e.g., rest rooms, storage areas, stairwells).
10. Specify ENERGY STAR-labeled appliances, electric equipment, and ENERGY STAR computers, monitors, and other applicable IT systems.
11. Integrate daylight harvesting strategy with the Building Automation System (BAS) and lighting control system.

12. Design skylights and/or light tubes in conjunction with daylight dimming controls to reduce daytime lighting requirements.
13. Provide photo-integrated light sensors to dim artificial lights.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Exceed ASHRAE 90.1-2010 efficiency requirements compared against a baseline by 50%. Utilize whole-building energy modeling to calculate.
2. Design building to Net Zero Energy requirements.

2. EA2 Energy Monitoring - Install Power Monitoring System for all energy end uses

a. Standards (Required):

1. Incorporate energy use metering and/or continuous monitoring (sub-metering) devices and energy management control systems into design; including but not limited to the following end uses: lighting systems and controls, constant and variable motor loads, chillers unitary equipment, chilled water and hot water, air and water economizer and heat recovery cycles, air distribution static pressures, ventilation air volumes, boiler efficiencies, building-related process energy systems and equipment, and domestic hot water equipment.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Specify a real-time energy dashboard to display building consumption data.

3. EA3 Renewable Energy - Consider use of renewable energy for at least 12% of total energy usage dependent upon life-cycle costs and benefits achieved

a. Standards (Required):

1. Review the Campus Solar Master Plan for feasibility of incorporating renewable energy into project.
2. Document assessment and payback analysis.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Develop a plan to meet the City of Atlanta Renewable Energy Ordinance.
2. Evaluate the use of geothermal HVAC system.

4. EA5 Commissioning - Perform fundamental and enhanced commissioning for all facilities and buildings

a. Standards (Required):

1. Confirm the commissioning requirements of a third-party rating system such as LEED, which include both fundamental and enhanced commissioning goals are included in specifications.
2. Document assessment

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Specify building envelope commissioning meeting requirements of Enhanced Commissioning credit, Option #2 under LEED v4.

D. Material & Resources (MR)

1. MR2 Sustainable Purchasing Policy - Implement Sustainable Purchasing Policy to promote responsibly produced materials for all projects
   a. Standards (Required):
      1. Follow all items found in the General Strategies of the ATL Sustainable Purchasing Policy
      2. Specify that contractors follow the ATL Sustainable Purchasing Policy.
   b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):
      1. Do not use any materials that contain chemicals found on the International Living Future Institue's Material Red List

2. MR3 Regionally Sourced Materials - Use locally sourced materials when economically feasible
   a. Standards (Required):
      1. Specify furniture materials and products that are recycled, rapidly renewable, local/regional, contain wood materials that are certified (e.g., Forest Stewardship Council [FSC]) within 300-mile radius.
   b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):
      1. Specify and source at least 40% local/regional materials (within 300-mile radius).

E. Human Health / Indoor Air Quality (HH)

1. HH1 Indoor Air Quality - Follow applicable ASHRAE Standards for Ventilation and Thermal Comfort, and minimize and monitor CO2 and Total Volatile Organic Compounds during occupancy.
   a. Standards (Required):
      1. Design buildings to meet the requirements of ASHRAE 55-2010: Thermal Environmental Conditions for Human Occupancy.
      2. Design the HVAC system to meet the minimum ventilation requirements described in the latest version of ASHRAE 62.1-2010: Ventilation for Acceptable Indoor Air Quality. If local building codes are applicable, design the minimum ventilation to satisfy the requirements of the most stringent code or standard.
      3. Specify permanent outdoor air monitoring stations in all air handling units that supply ventilation and connect these stations to the building automation system (BAS).
      4. Design HVAC systems for terminal buildings with carbon dioxide monitoring sensors in all densely occupied spaces and integrate these sensors with the building automation system (BAS).
      5. Secify at least one (1) C02 and Total Volatile Organic Compound (TVOC) sensor per 25,000 sq. ft. in all buildings, installed 4-6 ft. from floor plane, to be integrated with building automation system (BAS) for continuous monitoring of TVOC and CO2 levels post-construction.
      6. All paints, coatings, sealants to be low or zero VOC.
      7. Prohibit smoking lounges.
      8. Specify submittal of documentation of low-VOC material at project close-out with consequences for noncompliance or inability to demonstrate compliance.
      9. Specify low-VOC adhesives and sealants that comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168.

10. Specify low-VOC field applied paints and coating coatings that comply with Green Seal Standards GS-11 and GC-3 and SCAQMD Rule #1113.
11. Specify low-VOC carpet and flooring systems that comply with the Carpet and Rug Institute Green Label Plus program (carpet), Green Label program (cushion), and Floorscore (hard surface flooring).
12. Specify furniture systems and furnishings that are Green Guard certified.
13. Specify wood and agrifiber products with no added urea-formaldehyde resins.
14. Specify products with no-VOC content wherever feasible.
15. Specify specific and defined areas of construction sites for construction employee smoking, outside of any buildings and at least 25 feet from building entrances once the building is enclosed.
16. Design to incorporate Demand Control Ventilation strategies, where possible, to vary the amount of ventilation air based on carbon dioxide levels in the spaces being served by the Air Handling Units.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Specify at least 25% of products by cost (including furnishings, built-in furniture, all interior finishes and finish materials) are Cradle to Cradle™ Material Health Certified with a V2 Gold or Platinum or V3 Bronze, Silver, Gold or Platinum Material Health Score.
2. At least 25% of products by cost (including furnishings, built-in furniture, all interior finishes and finish materials) have no GreenScreen® Benchmark 1, List Translator 1 or List Translator Possible substances over 1,000 ppm, as verified by a qualified Ph.D. toxicologist or Certified Industrial Hygienist.

2. HH3 Quality Views - Achieve a direct line of sight to the outdoors for 75% of all regularly occupied floor area

a. Standards (Required):

1. Provide sky or clerestory lighting in appropriate facilities, such as cargo, etc.
2. Design buildings to have direct lines of sight to outdoors for 75% of regularly occupied spaces.

3. HH4 Daylighting - Achieve daylighting for at least 75% of regularly occupied floor area

a. Standards (Required):

1. Specify spectrally selective glazing to maximize daylight while minimizing heat gain.
2. Specify glazing films and/or coatings to minimize solar heat gain and air conditioning loss, maximize visible light transmittance and penetration, reduce glare, increase privacy, protect installed materials from the sun's ultraviolet rays, and prevent injury and damage from broken glass.
3. Use a daylighting model or calculations to assess foot-candle levels and daylight factors achieved.

4. HH5 Water Quality - Design Building to accommodate future Water Filtration System to reduce Organic, Inorganic, and Agricultural contaminants, and excessive Water Additives in Drinking Water

a. Standards (Required):

1. Specify drinking fountains and water bottle filling stations that are equipped with a carbon filter.
2. For Tenant and Concessions fit outs, specify carbon filters for all kitchen sinks and water supply points used for consumption.

b. Sustainability Innovation (Evaluate for Implementation and Complete Evaluation Template):

1. Design water filtration system to meet requirements of Feature 30 (Fundamental Water Quality) under WELL Building Standard (Version 1.0).

3.3 Sustainable Construction Standards

The P&D Sustainable Construction Standards are General Requirements to be applied to all projects at ATL. These General Conditions are additional guidance to Division 1: Sustainable Requirements, which should be tailored project by project based on the Credits and Prerequisites the project is pursuing for the specified Sustainability Certification.

PART 1 – GENERAL

1.1 SUMMARY

A. Includes general requirements and procedures for compliance with Sustainable Construction Standards.

1. The Contractor shall adhere to all Sustainable Construction Standards in addition to project specific sustainability requirements included in Section 018111 to meet the intended Sustainability Certification Standard (LEED®, Parksmart®, SITES®, Envision®, etc.).

a. Sustainable Construction Progress Reports: Concurrent with each Application for Payment, contractor should, where applicable, submit reports comparing actual construction and purchasing activities with sustainable reports.

b. Contractor shall submit all Project Close-out documentation upon completion of this project to the ATL P&D Sustainability Team Project Manager.

2. Sustainable Construction Standards Submittal Checklist and Supplemental Documents will be available digitally through the ATL P&D Sustainability Team Project Manager.

B. SUBMITTALS

1. General: Sustainable Construction Standards submittals are in addition to the other required project submittals.

a. All Sustainable Construction Standards submittals shall be submitted by the Contractor Sustainability Coordinator to the ATL P&D Sustainability Team Project Manager for approval in coordination with all documentation specified in SECTION 018111

1.2 DEFINITIONS

A. ATL P&D Sustainability Project Manager: Department of Aviation Planning and Development Department Sustainability Program Team member responsible for managing, implementing and enforcing the P&D Sustainability Program through all project phases and coordinating documentation collection for all Submittals found in the ATL Sustainable Construction Standards.

B. Contractor Sustainability Coordinator: An approved member of the Construction Team responsible for all Submittals found in the ATLSustainable Construction Standards and all sustainability Submittals included in SECTION 018111.

C. Sustainable Construction Standards Submittal Checklist: A checklist of all Submittals found in the ATL Sustainable Construction Standards.

PART 2 – CONSTRUCTION TEAM

2.1 SUSTAINABLE CONSTRUCTION TRADES TRAINING

A. Schedule sustainability training with HJAIA P&D Sustainability Team Project Manager for all key construction team members prior to commencement of the construction phase that includes the following concepts:

1. Project-specific Sustainability Certification Standards (LEED®, Parksmart®, SITES®, or Envision®) compliance requirements in SECTION 018111.Sustainable Construction Standards: provide digital access to all attendees.

2. Contractor Sustainability Coordinator: An approved member of the Construction Team responsible for all Submittals found in the ATL Sustainable Construction Standards and all sustainability Submittals included in SECTION 081111.

3. Proactive sustainability: Examples of actions workers can take to be more sustainable while on site, included, but not limited to:

   a. Energy and Water efficient practices.Recycling and proper use of single stream dumpsters (if in use).

B. SUBMITTALS

1. Agenda for Sustainable Construction Trades Training

2. Attendee List

2.2 CONTRACTOR SUSTAINABILITY COORDINATOR

A. The Contractor shall designate a Sustainability Project Coordinator to manage all Sustainable Construction Standards requirements for this project. The Sustainability Coordinator may be either an employee of contractor or consultant hired for this project.

1. The Contractor Sustainability Coordinator shall have a LEED Accredited Professional credential or equivalent green professional credential.

2. The designated Contractor Sustainability Coordinator shall be approved by the P&D Sustainability Team Project Manager.

3. The Contractor Sustainability Coordinator will be responsible for compiling and submitting all sustainability Submittals and required documentation.

4. The Contractor Sustainability Coordinator will submit all submittals and required documentation to the H-JAIA P&D Sustainability Team Project Manager for approval. Sustainability Coordinator to use the provided templates and specified formatting.

5. The Contractor Sustainability Coordinator will submit required Submittals and documentation concurrent with each Application of Payment.

6. Reduction of pay application will be equivalent to the value of work not produced and/or completed based on submittal and documentation verification by the H-JAIA P&D Sustainability Team Project Manager.

B. SUBMITTALS

1. Provide proof of LEED Accredited Professional credential or equivalent credential.

2. Provide proof of Sustainability Contractor experience on LEED or equivalent Sustainability Project experience.

PART 3 – SITE ENVIRONMENTAL MANAGEMENT

3.1 NON-TOXIC LANDSCAPE MAINTENANCE DURING CONSTRUCTION

A. If pesticides are used during construction, only use pesticides with a hazard tier ranking of 3 (least hazardous) as per The City of San Francisco Department of the Environment's (SFE) Hazard Tier Review Process. Guidance can be found here: https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf

B. SUBMITTALS

1. Manufacturer Documentation and MSDS Sheets on all pesticides and fertilizers used on-site.

PART 4 – RESOURCE SELECTION AND PRESERVATION

4.1 CONSTRUCTION TEMPORARY LIGHTING ENERGY EFFICIENCY

A. Reduce temporary lighting energy consumption through the use of energy efficient lighting and operation protocol.

1. Use LED lighting for all temporary construction lighting.

2. Comply with minimum lighting requirements as defined in OSHA Standard 1926.56.

3. Establish a schedule for when lighting is required and develop a policy to reduce lighting when not needed.

4. Coordinate site walk during each phase of construction for P&D Sustainability Team Project Manager.

B. SUBMITTALS

1. Provide bulb wattage for all temporary lighting used throughout construction

4.2 POTABLE WATER USE DURING CONSTRUCTION

A. Develop a Construction Water Use and Monitoring Plan to minimize potable water use during construction.

1. Identify and list all on-site water uses during construction.
2. Identify which uses can be performed utilizing non-potable or reused water.
3. Identify possible sources of non-potable water within the HJAIA Campus.
4. Monitor and report all potable and non-potable water use on site throughout the duration of the project.

B. SUBMITTALS

1. Construction Water Use and Re-Use Log Template to be provided electronically.

4.3 CONSTRUCTION AND DEMOLITION WASTE DIVERSION

A. Divert a minimum of 90% of construction and demolition waste from landfills.

1. Establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent.
2. Specify that at least 5 material waste streams will be collected and diverted separately. Describe where the material will be taken and how the recycling facility will process the material.
3. Reuse material on site whenever possible.
4. Work with project manager to enter waste diversion information in to a waste tracking platform such as RE-TRAC CONNECT®.
5. Follow LEED Reference Manual for Building Design and Construction version 4: Construction and Demolition Waste Management credit language, regardless of project type.

B. SUBMITTALS

1. Waste Tickets from haulers and waste management companies
2. Calculations on reuse in accordance with LEED Reference Manual for Building Design and Construction version 4: Construction and Demolition Waste Management Credit.
3. LEED Reference Manual for Building Design and Construction version 4: Construction and Demolition Waste Management Credit Required Documentation.

PART 5 – CONSTRUCTION VEHICLES AND EQUIPMENT

5.1 CONSTRUCTION VEHICLES AND EQUIPMENT GENERAL REQUIREMENTS

A. Construction shall not proceed until the contractor submits a list of all diesel on-road vehicles, non-road construction equipment, and generators to be used on-site to be confirmed by the P&D Sustainability Program Implementation Team. The list shall include the following:

1. Contractor and subcontractor name and address, including a contact person responsible for vehicles and/or equipment.

2. Equipment type, equipment manufacturer, equipment serial number, engine manufacturer, engine model year, engine certification (Environmental Protection Agency (EPA) Tier Emission rating), horsepower, engine family number, engine serial number, and expected fuel usage and hours of operation.

3. For any emission control technology installed: technology type, serial number, make, model, manufacturer, EPA/ California Air Resources Board (CARB) verification number, Tier level, installation date and hour-meter reading on installation date.

B. If the contractor subsequently needs to bring equipment on-site not on the list approved by the P&D Sustainability Team, the contractor shall submit written notification within 24 hours that attests the equipment complies with all contract conditions and provide information requested in 5.1 A

C. All diesel equipment shall comply with the pertinent local, state, and federal regulations relative to exhaust emission controls safety, or the requirements of this document, whichever is more stringent at the time of construction.

D. The contractor shall establish generator sites and truck-staging zones for vehicles waiting to load or unload materials on-site, when possible. Such zones shall be located where exhausted air pollutants have least impact on adjacent properties, the public, and surrounding structures' air intake systems.

5.2 CONSTRUCTION VEHICLE AND EQUIPMENT MAINTENANCE

A. Contractor shall designate an area for vehicle maintenance. Do not perform construction vehicle and equipment maintenance and repairs outside of designated areas.

1. When possible, conduct maintenance activities under cover.

2. Maintain a log of all vehicle repairs and maintenance.

3. Ensure that hazardous wastes are recycled and/or disposed safely per local, state and federal regulations.

4. Create a Spill Response Plan for cleanup of chemical, fuel or oil spills.

5. When available, use environmentally friendly chemicals and processes.

B. SUBMITTALS

1. Prior to construction, submit The Spill Response Plan.

2. At the end of the project or upon request, submit a log of maintenance and repairs conducted on construction vehicles used during construction.

5.3 ROADWAY PRESERVATION DURING CONSTRUCTION

A. Ensure all surrounding roadways used by the project site are not damaged by construction activity.

1. Any existing road weight limit restrictions limit must be followed by construction-related vehicles operating on airport and public roadways.

2. Equipment with tractor treads are prohibited on public roadways.

3. Immediately report all Incidents and Accidents to ensure roadway is preserved, and if damaged, is repaired within a reasonable timeframe.

B. SUBMITTALS

1. Prior to construction, submit a list of construction vehicles operating on public roadways and the maximum load it could possibly transport

2. Prior to construction, submit a written policy that will be used to communicate that equipment with tractor treads shall not be driven on airport or public roadways

3. Immediately submit Accident and Incident reports (if applicable).

5.4 CONSTRUCTION VEHICLE IDLING PLAN

A. Implement a Vehicle Idling Inspection Program and document findings or results.

1. During periods of inactivity, idling of diesel on-road vehicles and non-road equipment shall be minimized and shall not exceed fifteen consecutive minutes.

2. Post signage for no vehicle idling in sensitive areas, such as areas within 100 feet of building air-intake systems.

B. SUBMITTALS

1. Prior to construction, submit an inventory of vehicles using alternative idle reduction technologies.

2. At the end of the project and upon request, vehicle Anti Idling Program inspection logs.

3. Prior to construction, submit a site plan that identifies areas where signage will be installed communicating idling expectations.

4. Prior to construction, provide a sample of Anti-Idling signage detail to be used in sensitive areas.

C. EXEMPTIONS

1. See: Part 5 EXEMPTIONS E4-E9

5.5 LOW EMISSION ON-ROAD CONSTRUCTION VEHICLES

A. All on-road construction vehicles on site for more than 10 total days must have either (1) engines that meet EPA 2010 on-road emission standards (TIER 4) or (2) emission control technology verified by the EPA or the CARB to meet the EPA 2010 on-road emission standards (TIER 4), such as Selective Catalytic Reduction (SCR) systems, to reduce Nitrogen Oxide (NOx) emissions.

1. Develop an inventory of construction vehicles, which includes vehicle type, horsepower rating, fuel type, and overall fuel usage during each phase of construction. In addition, on-road vehicle records should show official registrations, manufacturer, model and model-year.

2. The contractor is encouraged to use alternative fuels to further reduce NOx emissions including zero NOx technology (i.e., Electric) or near zero NOx technology (i.e., natural gas or propane) when reasonably available.

B. Upon confirming that the diesel on-road construction vehicle meets one of the criteria in 5.5: A., ATL will issue a compliance sticker.

1. All equipment on site shall display the compliance sticker in a visible, external location as designated by ATL.

C. SUBMITTALS

1. Prior to construction, submit an inventory of vehicles that will be used for each phase of construction. Submit updates as needed.

a. All information included in 5.5 A.: Data for on-road construction vehicles

b. Written confirmation from the contractor that only on-road construction vehicles meeting EPA TIER 4 NOx emission levels will be used for the construction project unless otherwise exempt.

D. EXEMPTIONS

1. See: PART 5 EXEMPTIONS E1-E3

5.6 LOW EMISSION NON-ROAD CONSTRUCTION EQUIPMENT

A. All non-road construction equipment on-site for more than 10 total days must have either (1) engines meeting EPA Tier 3 non-road emission standards or (2) repowered engines meeting EPA Tier 3 non-road emission standards or (3) emission control technology verified by EPA of CARB for use with non-road engines to reduce NOx emissions.

1. Develop an inventory of non-road construction equipment include type, horsepower rating, fuel type, fuel usage and hours of operation during each phase of construction. The contractor shall maintain records of manufacturer, model and model-year of equipment.

2. The contractor is encouraged to use alternative fuels to further reduce NOx emissions including zero NOx technology (i.e., Electric) or near zero NOx technology (i.e., natural gas or propane) when reasonably available.

B. Upon confirming that the diesel non-road construction equipment has met one of the criteria in 5.6: A, ATL will issue a compliance sticker.

1. All equipment on site shall display the compliance sticker in a visible, external location as designated by ATL.

C. SUBMITTALS

1. Prior to construction, submit an inventory of non-road construction equipment that will be used for each phases of construction. Submit updates as needed.

    a. All information included in 5.6 A.: Data for non-road construction equipment.

    b. Written confirmation from the contractor that only non-road construction equipment meeting at least EPA TIER 3 NOx emission levels will be used for the construction project unless otherwise exempt.

2. At the end of the project and upon request, submit a log of maintenance and repairs conducted on all construction equipment used during construction.

D. EXEMPTIONS

1. See: PART 5 EXEMPTIONS E1-E3

5.7 LOW EMISSION PORTABLE DIESEL GENERATORS

A. All portable diesel generators on site for more than 10 total days must have either (1) engines meeting at least the EPA Tier 2 non-road emission standards or (2) repowered engines meeting EPA Tier 2 non-road emission standards or (3) emission control technology verified by EPA of CARB for use with non-road engines to reduce NOx emissions.

1. Develop an inventory of portable diesel generators, which includes type, horsepower rating, fuel type, fuel usage and hours of operation during each phase of construction. The contractor shall maintain records of manufacturer, model and model-year of equipment.

2. The contractor is encouraged to use electricity from the power grid as an alternative to portable diesel generators when reasonably available to further reduce localized NOx emissions.

B. SUBMITTALS

1. Prior to construction, submit an inventory of all portable diesel generators that will be used during construction and a plan that identifies portions of the project that may be reasonably completed using the electric grid power as an alternative to diesel generators. Submit updates as needed.

    a. All information included in 5.7 A.: Data for portable diesel generators

    b. Written confirmation from the contractor that only diesel generators meeting at least EPA TIER 2 NOx emission levels will be used for the construction project unless otherwise exempt.

C. EXEMPTIONS

1. See PART 5 EXEMPTIONS E1-E3

PART 5 – EXEMPTIONS

E1. APPLIES TO: 5.5, 5.6, and 5.7

If the contractor can prove to ATL's satisfaction that for a particular class of on-road diesel vehicle, diesel non-road construction equipment, or diesel generator, that (1) no alternative equipment with the specified TIER level is available, (2) it is not technically feasible to meet the control level specified above with a verified device, or (3) installing the control device would create a safety hazard or impair visibility for the operator, then the contractor may, with ATL's written approval, drop down to a lower level of Tier rating. For any approved lower level-Tier equipment, the contractor shall provide a plan describing steps to minimize NOx emissions whenever a forecast projects the Air Quality Index will exceeding 100 for Atlanta. https://airgeorgia.org

E2. APPLIES TO: 5.5, 5.6, and 5.7

ATL may create an exemption when there is a compelling emergency need to use diesel vehicles or engines that do not meet the contract conditions for emissions controls. An example would be the need to rescue vehicles or other equipment to prevent or remedy harm to human beings or nearby property. Meeting contract deadlines, failure to rent equipment in a timely manner, planned unavailability, or lack of advance planning are not considered compelling emergencies.

E3. APPLIES TO: 5.5, 5.6, and 5.7

ATL may provide an exemption lasting no more than 30 days to a contractor, if the contractor can prove with valid documentation and to ATL's satisfaction that the appropriate emission control equipment has been ordered in a timely manner after the bid was awarded, but has yet to be installed due to delays attributable to the equipment manufacturer and beyond control of the contractor. The contractor must install the retrofit as soon as practicable once it has been delivered, and shall submit proof thereof when installation is complete. Provided, however, that such exemption shall not be available to a contractor who already owns an equivalent piece of equipment that meets the engine requirements for the project, as the contractor may use that piece of equipment.

E4. APPLIES TO: 5.4

When an on-road diesel vehicle or non-road construction equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control.

E5. APPLIES TO: 5.4

To bring the on-road diesel vehicle, non-road construction equipment, or generator to the manufacturer's recommended operating temperature.

E6. APPLIES TO: 5.4

When there are regulations requiring temperature control for driver or passenger comfort and there are no auxiliary power sources available to provide temperature control.

E7. APPLIES TO: 5.4

When it is necessary to operate auxiliary equipment located in or on the diesel vehicle or construction equipment, to accomplish the intended use of the vehicle or equipment (for example, cranes and cement mixers).

E8. APPLIES TO: 5.4

When the on-road diesel vehicle, non-road construction equipment, or generator is being repaired, if idling is necessary for such a repair.

E9. APPLIES TO: 5.4

When the on-road diesel vehicle, non-road construction equipment, or generator is queued for inspection, if idling is necessary for such inspection.

3.4 Sustainable Purchasing Policy

1. PURPOSE

The Hartsfield-Jackson Atlanta International Airport (ATL) is committed to prioritizing the integration of sustainable design practices and principles into all projects managed by the Planning and Development Bureau (P&D). The sourcing, manufacturing, transportation, and disposal of the materials used for structures and infrastructure have a measurable impact on human heath, the environment, and the economic stability of the community in which these projects are located. The specification of products that have reduced adverse effects on human health and the environment when compared with competing products can have significant positive impacts with little to no additional costs to the owner.

The ATL Sustainable Purchasing Policy for Design and Construction (SPP) is intended to be a guiding document for project teams to identify products that follow leading industry standards for sustainable materials into all ATL projects. At a minimum, design and construction teams will evaluate the specification of products that meet the referenced standards for all construction materials and include all building materials that pose no additional cost compared to alternatives that do not meet the criteria of the applicable sustainability standards. Additionally, when feasible, project teams will not use materials containing chemicals found on the International Living Future Institute's (ILFI) Materials Red List to the highest extent possible.

2. OBJECTIVES

ATL's sustainable purchasing objectives include acquisitions that:

A. Conserve natural resources
B. Reduce the Embodied Carbon of all assets
C. Reduce the use of water and energy
D. Minimize environmental impacts such as pollution and emissions
E. Eliminate or reduce toxics that create hazards to employees and passengers
F. Support strong recycling efforts and utilize products where a high likelihood of recycling exists (e.g. steel and concrete)
G. Reduce materials that are placed in landfills
H. Reduce transportation-related emissions by using locally sourced products
I. Increase the use and availability of environmentally preferable products
J. Encourage vendors to reduce environmental impacts in their production and distribution systems
K. Evaluate short-term and long-term cost in comparing product alternatives when feasible including total cost expected during the time a product is owned, extended warranties, operation, supplies, maintenance.

3. GENERAL REQUIREMENTS

A. Utilize 3rd party product databases such as mindful Materials or UL SPOT to identify materials that meet sustainable product certification.

B. For all new construction building and parking deck projects: Conduct Whole Building Life Cycle Assessments during design to identify all opportunities to reduce the total amount of embodied carbon. Whole Building Life Cycle Analysis should follow the criterial of Building-Lifecycle Impact Reduction credit, Option 4 in the LEED v4 Reference Manual for Building Design and Construction.

C. LEED projects: Pursue all 3 Building Product Optimization and Disclosure credits in the LEED v4 Reference Manual for Building Design and Construction

D. Require that all manufactures supply Environmental Product Declarations for all building materials.

E. Inform all manufacturers that purchasing decisions will be made based on sustainable criteria.

4. DEFINITIONS

A. Business and Institutional Furniture Manufacturers Association (BIFMA)

BIFMA develops, maintains, and publishes safety and performance standards for furniture products.

B. Cradle to Cradle Certified:

The Cradle to Cradle Certified™ Product Standard guides designers and manufacturers through a continual improvement process that looks at a product through five quality categories — material health, material reutilization, renewable energy and carbon management, water stewardship, and social fairness. A product receives an achievement level in each category — Basic, Bronze, Silver, Gold, or Platinum — with the lowest achievement level representing the product's overall mark.

C. ECO LOGO Certified

ECOLOGO Certified products, services and packaging are certified for reduced environmental impact. ECOLOGO Certifications are voluntary, multi-attribute, lifecycle based environmental certifications that indicate a product has undergone rigorous scientific testing, exhaustive auditing, or both, to prove its compliance with stringent, third-party, environmental performance standards.

D. Embodied Carbon

Embodied carbon refers to carbon dioxide emitted during the manufacture, transport and construction of building materials, together with end of life emissions.

E. ENERGY STAR

A program which provides certification to buildings and consumer products which meet certain standards of energy efficiency

F. Environmental Product Declaration

An Environmental Product Declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about the life-cycle environmental impact of products. As a voluntary declaration of the life-cycle environmental impact, having an EPD for a product does not imply that the declared product is environmentally superior to alternatives.

G. Forest Stewardship Council (FSC)

The term "independently certified forest products" refers to those products originating in a forest that an independent third party has certified as well-managed and sustainable. Forest certification validates on-the-ground operations employing the best management practices at a specific forest to ensure the long-term health of the total forest ecosystem. A forestry operation that meets FSC standards protects forest ecosystems, water quality, wildlife habitats and local communities. To ensure the integrity of the certification, the wood and fiber from certified forests are tracked through the commercial chain from logging sites to retailers and to the end user.

H. Green Label Plus

Green Label Plus is an independent testing program that identifies carpet, adhesives, and cushion with very low emissions of VOCs to help improve indoor air quality. It is an outgrowth of, and enhancement to the CRI Green Label Testing program.

I. GREEN SQUARED

Green Squared is an initiative by the North American tile industry to recognize and certify sustainable products. Different from other programs, Green Squared takes a multi-attribute sustainability standard for tile and tile installation materials

J. GREENGUARD

GREENGUARD Certification is part of UL Environment, a business unit of UL (Underwriters Laboratories). GREENGUARD Certification helps manufacturers create--and helps buyers identify--interior products and materials that have low chemical emissions, improving the quality of the air in which the products are used.

K. GREEN SEAL

Green Seal is a non-profit environmental standard development and certification organization. Its flagship program is the certification of products, services, restaurants, and hotels. Certification is based on Green Seal standards, which contain performance, health, and sustainability criteria.

L. International Living Future Institute's Materials Red List

The materials red list (commonly shortened to simply "red list") is a compilation of harmful-to-humans chemicals and materials compiled by the International Living Future Institute (ILFI) as part of its Living Building Challenge. It is subject to change based on emerging scientific knowledge, but currently includes:

1. Asbestos
2. Cadmium
3. Chlorinated polyethylene and chlorosulfonated polyethlene
4. Chlorofluorocarbons (CFCs)
5. Chloroprene (neoprene)
6. Formaldehyde (added)
7. Halogenated flame retardants
8. Hydrochlorofluorocarbons (HCFCs)
9. Lead (added)
10. Mercury
11. Petrochemical fertilizers and pesticides
12. Phthalates
13. Polyvinyl chloride (PVC)
14. Wood treatments containing creosote, arsenic or pentachlorophenol

For a comprehensive list that break down each material in more detail, visit: https://living-future.org/declare/declare-about/red-list/

M. mindful MATERIALS

The mindful MATERIALS Library, powered by Origin, is a searchable database where users can find architectural building products that have various transparency and sustainability attributes. Users can access specific product data from all participating manufacturers in the mM Library.

N. Rapidly Renewable Materials

Rapidly renewable materials include linseed, straw, cotton, wheat, sunflowers, natural rubber, bamboo, and cork. These feedstocks are often used in green building products, like linoleum, straw bales, cotton batt insulation, wheatboard panels, bamboo cabinetry, cork flooring, soy-based foam release agents, and fabrics

O. Recycled Content

Recycled content refers to the portion of materials used in a product that have been diverted from the solid waste stream.

1. Post-Consumer Recycled Content

   Once a material or finished product has served its intended use and has been diverted or recovered from waste destined for disposal, it is then considered "post-consumer." Having completed its life as a consumer item, it can then be recycled as such.

2. Pre-Consumer Recycled Content

   Pre-consumer material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind or scrap generated in a process and capable of being reclaimed within the same process that generated it.

P. Regional Material

Materials that are harvested, manufactured, and purchased locally.

The distance defined as local varies based on Sustainability Rating System and Version. For LEED Building Design and Construction v2009, the distance is 500 miles. For LEED Building Design and Construction v4, the distance is 100 miles. For Parksmart, the distance is 300 miles.

Q. UL SPOT

UL SPOT is a web-based product sustainability information tool that facilitates the selection of credible green products and enables the design community to apply that information into the Building Information Modeling (BIM) workflow.

R. Volatile organic compounds (VOCs)

Organic chemicals compounds with a high vapor pressure at normal room temperatures, many of which have short- and long-term adverse health effects.

3.5 Sustainability Implementation Checklists

A. Project Set-Up Checklist

General Project Info	
Project Name:	
WBS#:	
WBS Link:	
Project Location:	
Documentation Location:	

Project Team	Name	Email
Project Manager:		
Planning Manager:		
Design Manager:		
P&D Sustainability Team Champion:		
Construction Sustainability Coordinator:		
Sustainability Consultant:		

Project Specifics	
Project Type:	
Approximate Size:	
Sustainability Certification:	
Expected Certification Level:	
Registration Number:	

Project Description

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	**Integrative Planning Meeting**	Conduct an Integrative Planning Meeting at the beginning of the planning process to establish project goals, Owners Project Requirements, and the Basis of Design. The following stakeholders will be involved: Owner, Future Occupants, Project Manager, Design Manager, P&D Sustainability Team Project Manager, relevant P&D team memebers, AMS Team Member.				
2	**Integrative Planning Meeting**	Define and formalize Owner Project Requirements to be included in the Project Definition Report.				
3	**Integrative Planning Meeting**	Define and formalize Basis of Design to be included in the Project Definition Report.				
4	**Integrative Planning Meeting**	Define Sustainability Certification Standard to be pursued.				
5	**Integrative Planning Meeting**	Develop preliminary Sustainability Certification Standard Checklist.				
6	**Specification**	Include language referencing the inclusion and implementation of the ATL P&D Bureau Sustainability Standards for all Projects				
7	**Autocase Evaluation**	Conduct preliminary Autocase evaluations on Low-Impact Development designs to address on-site rain water management to fulfill Recommended Actions of SS1 Rain Water Management.				
8	**Autocase Evaluation**	Conduct preliminary Autocase evaluations on heat island reduction strategies for building roof structures to fulfill Recommended Actions of SS2 Heat Island Reduction (Roof).				
9	**Autocase Evaluation**	Conduct preliminary Autocase evaluations on heat island reduction strategies for project site to fulfill Recommended Actions of SS3 Heat Island Reduction (Nonroof).				
10	**Energy Modeling**	Conduct a preliminary "simple box" energy model to identify early on expected energy usage, building system synergies, and optimization assessments.				
11	**Autocase Evaluation**	Evaluate the inclusion of Renewable Energy Production into the project to fulfill the Recommended Actions of EA3 Renewable Energy.				
12	**Plan Review**	Specify a Sustainability Certifcation Standard Design Review by the design team Sustainability Consultant at 35%, 65%, 95% Design Drawings and IFC Documents to ensure all requirements of specific Sustainability Certification Standard are included in design documents.				
13	**Life Cycle Analysis**	Conduct a full project Life-Cycle Analysis as early on in the project as possible				

C. Design Evaluation Checklist

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	Integrative Design Charrette	Conduct an Integrative Design Charrette to kick off the design process to review Owners Project Requirements, Basis of Design, Planning Definition Report, Preliminary Autocase Evaluations, Sustainability Standard Checklist, and preliminary energy model (if applicable), with the following stake holders: Owners, Future Occupants, Project Manager, Design Manager, P&D Sustainability Team Project Manager, relevant P&D team memebers, AMS and Sustainabililty Consultant.				
2	SS1 - Rain Water Management	Review and update the Autocase evaluation for the inclusion of Low Impact Development Strategies and Supportive Green Infrasructure into the project site design				
3	SS2 - Heat Island Reduction (Roof)	Review and update the Autocase evaluation for the inclusion of a compliant TPO White Roof, Green Roof, or Blue Roof				
4	SS3 - Heat Island Reduction (Nonroof)	Review and update the Autocase evaluation for the inclusion of heat island reduction strategies into the project site design				
5	WE1 - Indoor Potable Water Reduction	Design project indoor potable water system to achieve a 40% reduction from LEED v4 baseline. Complete Indoor Potable Water Reduction calculator.				
6	WE2 - Outdoor Potable Water Reduction	Design landscape to achieve at least a 50% reduction from LEED v4 baseline - Complete Outdoor Potable Water Reduction Calculator.				
7	WE3 - Water Monitoring	Include a compliant water metering system in project design.				
8	EA1 - Energy Reduction	Update preliminary Energy Model as design progresses and confirm at least a 20% reduction from ASHRAE 90.1 - 2010 Baseline. Energy Model should be updated at major design milestones (i.e. 35%, 65%, 95%, etc.)				
9	EA1 - Energy Reduction	Fill out estimated annual energy consumtion form for ISO 50001 and provide to Asset Utility Manager.				
10	EA2 - Energy Monitoring	Include a compliant energy monitoring system in project design.				
11	EA3 - Renewable Energy	Review and update Renewable Energy Production Evalutation.				
12	EA5 - Commissioning	Include Fundamental and Enhanced Commissioning in project budget and scope of work.				
13	MR1 - Waste Diversion	Confirm project will use Waste Diversion Tracking Technology like Retrac-CONNECT (or equal)				
14	MR1 - Waste Diversion	Confirm project will achieve a minimum of 90% construction and demolition waste diversion rate from landfills.				
15	MR2 - Sustainable Purchasing Policy	Confirm project is adhering to standards detailed in ATL's Sustainable Purchasing Policy as it applies to product specification.				
16	MR3 - Regionally Sourced Materials	Confirm Project has evaluated the use of regionally sourced materials. Materials that are sourced within a 300 mile radius.				
17	HH1 Indoor VOC and CO2 Reduction	Confirm compliant materials are specified in construction documents.				
18	HH2 Indoor Air Quality Testing	Confirm project is designed for Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Guide for BD+C v4.				
19	HH2 Indoor Air Quality Testing	Confirm budget allocation for Indoor Air Quality Assessment, as outlined in LEED Reference Guide for BD+C v4.				
20	HH2 Indoor Air Quality Testing	Confirm construction team is aware of TVOC and CO2 testing will performed by P&D Sustainability Team after construction.				
21	HH3 - Quality Views	Confirm Quality Views as outlined in the LEED Reference Guide for BD+C v4 will be achieved through proper design.				
22	HH4- Daylighting	Confrim Daylighting as outlined in the LEED Referernce Guide for BD+C v4 will be achieved through proper design.				
23	HH5 - Water Quality	Confrim compliant water filtration system is included for all drinking water stations and kitchen sinks.				
24	Sustainable Design Standards - General Requirements	Confirm all General Requirements, as outlined in the ATL Sustainability Design Standards are evaluated, included and documented.				
25	Life Cycle Analysis	Complete a full Life Cycle Analysis for the project and update at 35%, 65%, 95% Design Drawings and Final Bid Set				
26	Sustainability Consultant Plan Reviews	Review Design Documents for Sustainability Certification Standard Compliance for 35%, 65%, 95% Design Drawings, and Final Bid Set				

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	2.1 SUSTAINABLE CONSTRUCTION TRADES	Agenda for Sustainable Construction Trades Training				
2	2.1 SUSTAINABLE CONSTRUCTION TRADES TRAINING	Attendee List				
3	2.2 CONTRACTOR SUSTAINABILITY COORDINATOR	Provide proof of LEED AP Credential or Equivalent				
4	2.2 CONTRACTOR SUSTAINABILITY COORDINATOR	Provide proof of Sustainability Contractor Coordinator experience on LEED or equivalent Sustainability Project Expereince				
5	3.1 Non-Toxic Landscape Maintenance During Construction	Manufacturer documentation and MSDS sheets on all pesticides and fertilizers used on-site				
6	4.1 Construction Temporary Lighting Energy Efficiency	Buld wattage and count for all temporary lighting used throughout Construction				
7	4.1 Construction Temporary Lighting Energy Efficiency	Schedule on-site visits to confirm ltemporary lighting during each construction phase				
8	4.2 Potable Water Use During Construction	Construction Water Use and Re-Use Log Template				
9	4.3 Construction and Demolition Waste Diversion	Waste Tickets from haulers and Waste Management Companies				
10	4.3 Construction and Demolition Waste Diversion	Calculations on reuse in accordance with LEED Reference Manual for Building Design and Construction v4: Construction Demolition and Waste Management Credit.				
11	4.3 Construction and Demolition Waste Diversion	LEED Reference Manual for Building Design and Construction v4: Construction Demolition and Waste Management Credit Required Documentation.				
12	4.4 Material Selection	Manufacturer documentation on all purchased materials				
13	4.5 Construction Indoor Air Quality Management Plan	IAQ Management Plan in accordance with the LEED v4 Standards				
14	4.5 Construction Indoor Air Quality Management Plan	For areas being renovated: supply a statement explaining the protection of existing air systems				
15	4.5 Construction Indoor Air Quality Management Plan	TVOC and CO2 Test Report				
16	5.1 Construction Vehicles and Equipment	Spill Response Plan				
17	5.1 Construction Vehicles and Equipment	Log of maintenance and repairs conducted on construction vehicles and equiptment used during construction.22:23				

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	P1.0	Include AMS Team in Integrative Planning Session to establish Basis of Design and Owner Project Requirements				
2	P2.0	Review Autocase Evaluation Reports for Project During Planning Phase				
3	D1.0	Review Energy Model evaluation reports for project during major design milestones (i.e. 35%, 65%, etc.)				
4	D2.0	Review Enhanced Commissioning design review for coordination with facilities management items				
5	C1.0	Attend Functional commissioning testing and equipment startup				
6	C2.0	Attend Building Owner training at construction completion / building turnover				
7	C3.0	Review all close-out documents (i.e. as builts, warranties, O+M manuals, recommended maintenance schedule, etc.)				
8	C4.0	Coordinate Arc transition with P&D in preparation for EBOM Perfromance Pathway Certification				
9	OM1.0	Manage Enhanced Commissioning Walk Through 10 months after construction completion and ensure all systems are performing optimally				
10	OM2.0	Perform Thermal Comfort Occupancy Survey annually				
11	OM2.1	Perform Employee Satisfaction Survey annually				
12	OM2.2	Coordinate CO2 testing for building per Arc testing protocols				
13	OM2.3	Coordinate TVOC testing for building per Arc testing protocols				
14	OM3.0	Calibrate Building Automation System to optimize building systems performance				
15	OM3.1	Calibrate Lighting Control System for oprimal performance				
16	OM4.0	Coordinate regularly scheduled maintenance for build systems and electronic records of maintenance work/improvements				
17	OM5.0	Identify all credits to pursure for EBOM Certification				

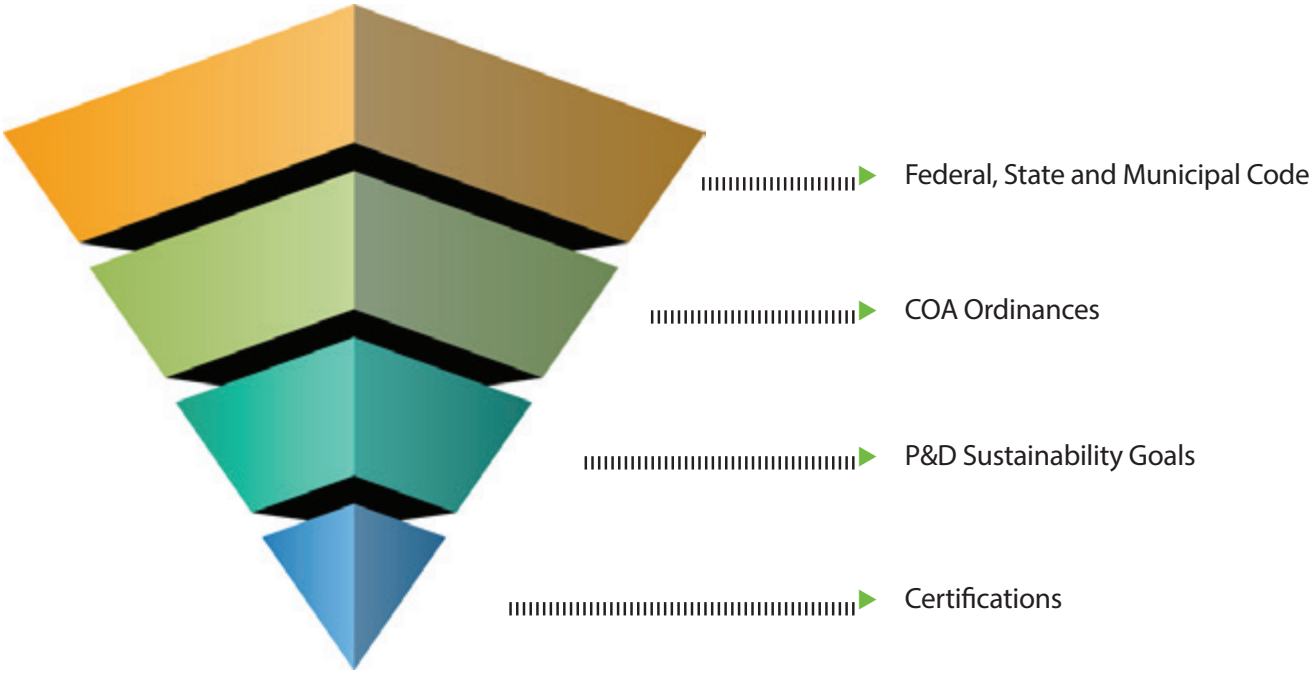
CHAPTER 4
Regulations & Certifications

4.0 Chapter Overview

This chapter highlights the City of Atlanta Regulations and Sustainability Certification Standards that all projects at ATL will follow. The chapter is broken down into two sections - Regulations and Certifications. Regulations will be addressed according to the Hierarchy diagrammed in Table 4.1. Regulations will take precedence over all Sustainability Certifications or Sustainability Goal requirements. Certifications are broken down by project type as follows – Buildings, Parking Garages and Infrastructure.

All projects will strive to achieve the highest level of certification in the appropriate Sustainable Certification Standard. The Regulations and Sustainability Certifications cited in the Sustainability Plan are only as current as the publication date of this document. Updates to Regulations and Sustainability Certifications will be made by governing entities and/or government agencies. Project teams should reference the most up to date Regulations and Sustainability Certifications available.

Table 4.1: Regulation Hierarchy



4.1 Sustainability Regulations

This section outlines the City of Atlanta ordinances and sustainability policies that ATL will follow and set forth as a priority on all projects in which each ordinance applies. Project Managers should confirm, before a project starts, that the most current version of all City of Atlanta ordinances and policies, and any new city, state, or federal regulations are included. This section is in no way a comprehensive list of all applicable codes and regulations that project teams need to follow and the descriptions below are overviews and not replacements for the official City of Atlanta ordinances and policies.

City of Atlanta Sustainable Development Design Guidelines

The City of Atlanta Sustainable Development Design Guidelines state that all new Structures over 5000 square feet must achieve a LEED Silver certification and that all existing buildings must achieve a LEED Existing Buildings: Operations and Maintenance Silver certification. Certain building types are exempt from meeting LEED certification such as parking garages, warehouses and other low-occupancy buildings.

Regardless of exemption qualifications, all buildings, not including parking garages, will evaluate the feasibility of achieving the highest level of LEED certification possible.

Post Development Stormwater Management Ordinance

The City of Atlanta Post-Development Stormwater Management Ordinance requires that project teams must retain the first 1" of rainfall generated from a single storm on-site to maintain pre-development site hydrology, in addition to several other requirements. Refer to Post Development Stormwater Management Ordinance for full specifications and requirements. Project teams will approach this goal on a project by project basis, or in conjunction with development or redevelopment projects within the ATL campus that plan to use a combined strategy to meet the ordinance.

4.2: Sustainability Certifications

Sustainability Certifications are 3rd party verification systems that certify projects based on a framework of industry best practices and are internationally benchmarked. ATL has voluntarily committed to pursue these Sustainability Certifications to showcase commitment to sustainability on an airport-wide scale. This section outlines certification type and level for each project type. The Chapter is broken up into three parts:

- Section 4.2.1: Sustainability Certification Standards for Buildings
- Section 4.2.2: Sustainability Certification for Parking Garages
- Section 4.2.3: Sustainability Certification Standards for Civil Infrastructure Projects

All projects will strive to achieve the highest level of certification in the appropriate Sustainability Certification and will, at a minimum, achieve the levels of certification outlined throughout this Section.

Buildings are defined as follows:
All structures that do not serve as parking garages or infrastructure operations as their primary functions.

Parking Garages are defined as follows:
All structures that facilitate the temporary storage of on-road vehicles as their primary function.

Civil Infrastructure Projects are defined as follows:
All civil infrastructure projects that support transportation, energy, water management, communications, waste management, earth monitoring and measurement networks.

The ATL Planning & Development Department should determine which Sustainability Certifications apply to each project based on the Concept Review Form and reference the appropriate section below for further guidance.

Reference Table 4.2

Table 4.2: Sustainability Goal Certification Applicability Matrix

Shows the applicability of the Sustainability Goals (listed in Chapter 2) to all available Sustainability Certifications used to validate sustainability goals.

	LEED NC v4	LEED EBOM v4	LEED Commercial Interiors v4	WELL Building Standard	Parksmart	Envision	SITES
Sustainable Sites							
SS1 Rain Water Management	●	●			●	●	●
SS2 Heat Island Reduction (Roof)	●	●			●		
SS3 Heat Island Reduction (Nonroof)	●	●			●	●	●
Water Efficiency							
WE1 Indoor Potable Water Reduction	●	●	●		●		
WE2 Outdoor Potable Reduction	●	●			●	●	●
WE3 Water Monitoring	●	●	●			●	●
Energy & Atmosphere							
EA1 Energy Reduction	●	●			●		
EA2 Energy Monitoring	●	●	●			●	
EA3 Renewable Energy			●				
EA4 Construction Related Activity	●				●	●	●
EA5 Commissioning	●	●	●		●	●	
Material & Resources							
MR1 Waste Diversion	●	●	●		●	●	●
MR2 Sustainable Purchasing Policies	●	●	●		●	●	●
MR3 Regionally Sourced Materials					●	●	●
Human Health/Indoor Air Quality							
HH1 Indoor VOC & CO2 Reduction	●	●	●	●	●		
HH2 Indoor Air Quality Testing	●	●	●	●			
HH3 Quality Views	●	●	●	●			
HH4 Daylighting	●	●	●	●			
HH5 Drinking Water Filtration				●			

4.3 LEED Certification Standards for Buildings

LEED Overview

Developed by the U.S. Green Building Council, LEED is a framework for identifying, implementing, and measuring green building and neighborhood design, construction, operations, and maintenance. LEED is a voluntary, market-driven, consensus-based tool that serves as a guideline and assessment mechanism. LEED rating systems address commercial, institutional, and residential buildings and neighborhood developments.

At ATL, all future projects will achieve at least LEED Silver Certification with the aspirational goal of achieving LEED Platinum

LEED Campus at the Hartsfield-Jackson Atlanta International Airport

ATL is wrapping up the submission of several LEED v4 credits which can be applied to all LEED v4 BD+C projects throughout the campus. Once established and approved, project teams will be provided with a library of pre-approved credits that can be applied to a building's LEED certification based on its location within the campus. These pre-approved credits, in conjunction with commitment to the Sustainability Goals should give project teams a stronger foundation for achieving LEED Gold certification for all projects. LEED Campus yields many benefits. For one, all buildings on the grounds share one approach to site management, simplifying the site management process by streamlining and unifying campus-wide policies and plans.

LEED for Building Design and Construction (NC) Buildings that are New Construction or Major Renovation. In addition, at least 60% of the project's gross floor area must be complete by the time of certification (except for LEED BD+C: Core and Shell).

LEED Existing Buildings: Operations and Mainenance: Existing Buildings that are not undergoing any major renovations and plan to maximize system and operational efficiency.

Checklist 4.2.1 is a template of how the Sustainability Goals translate into points in the LEED v4 BD+C: NC rating system. Project teams should use this as a starting point for project design and certification for all projects pursuing this rating system.

CERTIFIED
40 - 49 POINTS

SILVER
50 - 59 POINTS

P&D Sustainability Plan Requirement

GOLD
60 - 79 POINTS

PLATINIUM
80+ POINTS

P&D Sustainability Plan ATL Aspirational Goal

LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name:
Date:

Y	?	N			
1			Credit	Integrative Process	1

0	0	0	**Location and Transportation**		16
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Green Vehicles	1

5	0	0	**Sustainable Sites**		10
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
			Credit	Open Space	1
3			Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1

7	2	0	**Water Efficiency**		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
4	2		Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

15	15	0	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
8	10		Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
			Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

6	7	0	**Materials and Resources**		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	5		Credit	Building Life-Cycle Impact Reduction	5
2			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

11	4	0	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
	1		Credit	Thermal Comfort	1
	2		Credit	Interior Lighting	2
2			Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

6	0	0	**Innovation**		6
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

4	0	0	**Regional Priority**		4
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1

55	28	0	**TOTALS**	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

4.4 Parksmart Certification for Parking Garages

Parksmart is the world's only rating system defining and recognizing sustainable practices in parking structure management, programming, design, and technology. An industry-driven, field-tested road map for high-performance new and existing parking garages, Parksmart recognizes forward-thinking facilities working today to shape tomorrow's transportation ecosystem. Parksmart is a voluntary, consensus-driven standard promoting an integrated approach enabling parking structures to achieve.

Reference Checklist 4.2B

Checklist 4.2B is a template of how the Sustainability Goals translate into points in Parksmart. Project teams should use this as a starting point for project design and certification for all projects pursuing this rating system.

WHEN TO USE THE PARKSMART RATING SYSTEM:

Project teams should use the Parksmart Rating System on all parking garage new construction and renovation projects at the Hartsfield-Jackson Atlanta International Airport and, at a minimum, achieve Bronze level certification as well as a minimum of 20 points in the Management, Programs, and Technology and Structure Design Categories.

Checklist 4.4 Parksmart Sustainability Goal Template

Project Name:
Date:

Parksmart
Project Checklist

Y	?	N		Possible Points
30	12	0	**Management**	**90**
			Parking Pricing	6
			Shared Parking	6
			TMO/TMA	4
			Recycyling Program	4
2			Sustainable Purchasing Program	2
			Proactive Operational Maintenance	6
			Cleaning Procedures - Occupied Spaces	2
6			Cleaning Procedures - Parking Decks	6
8			Building Systems Commissioning	8
6			Construction Waste Management	6
	6		Regional Materials	6
			Regional Labor	4
	6		Reused/Repurposed/Recycled Materials	6
			Third Party Sustainability Certification	12
			Credentialed Management	4
8			Life-cycle Assessment	8

0	0	0	**Programs**	**64**
			Placemaking	6
			Access to Mass Transit	4
			Wayfinding Systems - External	4
			Wayfinding Systems - Internal	4
			Traffic Flow Plan	4
			Carshare Program	6
			Rideshare Program	6
			Low-emitting and Fuel-efficient Vechiles	4
			Alternative Fuel Vechiles	6
			Alternative Fuel Fleet Vechiles	4
			Bicycle Parking	6
			Bicycle Sharing/Rental	6
			Marketing/Educational Program	4

Y	?	N		Possible Points
24	18	0	**Technology and Structure Design**	**88**
			Idle Reduction Payment Systems	4
			Fire Supression Systems	2
2			No/Low VOC Coatings, Paints, Sealants	2
			Tire Inflation Stations	2
			EV Charging Stations	6
6			HVAC Systems - Occupied Spaces	6
			Ventilation Systems - Parking Decks	6
			Lighting Controls	8
			Energy-efficient Lighting System	8
6			Stormwater Management	6
	4		Rainwater Harvesting	4
	2		Greywater Reuse	2
2			Indoor Water-efficiency	2
2			Water-efficient Landscaping	2
6			Roofing Systems	6
	12		Renewable Energy Generation	12
			Design for Durability	6
			Energy Resiliency - Storage	4

6	0	0	**Innovation**	**6**
			Innovative Approach	6

60	0	0	**Parksmart Award Levels / Existing Facilities**	
			Certification Level	Points
			Parksmart Pioneer	90+

60	0	0	**Parksmart Award Levels / New Construction**	
			Certification Level	Points
			Parksmart Bronze	110-134
			Parksmart Silver	135-159
			Parksmart Gold	160+

54	30	0	Possible Points:	**248**

4.5 Envision and SITES Certification for Civil Infrastructure Projects

Envision

Envision is a sustainability rating system and planning guide for introducing sustainability considerations into infrastructure projects. Recognizing the serious need for infrastructure to incorporate issues of sustainability, Envision evaluates, grades, and gives recognition to infrastructure projects that make exemplary progress and contribute to a more sustainable future. In this regard, Envision assesses not only individual project performance, but how well projects contribute to the efficiency and long-term sustainability of the communities they serve.

SITES

The SITES rating system helps conserve, restore and create the benefits provided by healthy ecosystems. Using the SITES rating system, projects are planned, designed and developed in a way that protects and enhances the benefits people derive from healthy, functioning landscapes through practices, such as carbon storage, crop pollination and flood mitigation. SITES sets standards for sustainable land use for a wide range of development projects with or without buildings–from open spaces, streetscapes and plazas, to commercial, residential and industrial projects. As a complement to USGBC's LEED green building rating system, SITES addresses the market's need for a way to quantify and rate the sustainable use and performance of land sites.

Reference Checklist 4.3 and 4.4

Checklist 4.3 and 4.4 are templates of how the Sustainability Goals translate into points in the Envision and SITES Rating Systems. Project teams should use this as a starting point for project design and certification for all projects pursuing these rating systems.

WHEN TO USE THE ENVISION AND SITES RATING SYSTEMS:

Project teams should implement the Envision or SITES Rating Systems on all major civil infrastructure improvement projects at ATL except for:

- Any civil infrastructure work that will be included in a LEED project.
- Any civil infrastructure work that will be included in a Parksmart project.
- Minor infrastructure projects

Project teams should familiarize themselves with the Envision and SITES framework before design work begins to fully understand the goals of each rating system, and the approach of incorporating sustainable design features into the project.

Checklist 4.5A Envision Sustainability Goal Template

Project Name:
Date:

Envision Checklist
Project Checklist

Y	?	N		Maximum Available Points
0	0	0	**Quality of Life**	181
			1.1 Improve community quality of life	25
			1.2 Stimulate sustainable growth and development	16
			1.3 Develop local skills and capabilities	15
			2.1 Enhance public health and safet	16
			2.2 Minimize noise and vibration	11
			2.3 Minimize light pollution	11
			2.4 Improve community mobility and access	14
			2.5 Encourage alternative modes of transportation	15
			2.6 Improve site accessibility, safety and wayfinding	15
			3.1 Preserve historic and cultural resources	16
			3.2 Preserve views and local character	14
			3.3 Enhance public space	13
24	0	0	**Leadership**	121
			1.1 Provide effective leadership and commitment	17
14			1.2 Establish a sustainability management system	14
			1.3 Foster collaboration and teamwork	15
			1.4 Provide for stakeholder involvement	14
			2.1 Pursue by-product synergy opportunities	15
			2.2 Improve infrastructure integration	16
10			3.1 Plan for long-term monitoring and maintenance	10
			3.2 Address conflicting regulations and policies	8
			3.3 Extend useful life	12
6	0	0	**Climate & Risk**	122
			1.1 Reduce greenhouse gas emissions	25
			1.2 Reduce air pollutant emissions	15
			2.1 Assess climate threat	15
			2.2 Avoid traps and vulnerabilities	20
			2.3 Prepare for long-term adaptability	20
			2.4 Prepare for short-term hazards	21
6			2.5 Manage heat islands effects	6

Y	?	N		Maximum Available Points
49	130	0	**Resource Allocation**	182
2	16		1.1 Reduce net embodied energy	18
6	3		1.2 Support sustainable procurement practices	9
5	9		1.3 Use recycled materials	14
	19		1.4 Use regional materials	10
8	3		1.5 Divert waste from landfills	11
	6		1.6 Reduce excavated materials taken off site	6
			1.7 Provide for deconstruction and recycling	12
3	15		2.1 Reduce energy consumption	18
	20		2.2 Use renewable energy	20
11			2.3 Commission and monitor energy systems	11
4	17		3.1 Protect fresh water availability	21
4	17		3.2 Reduce potable water consumption	21
6	5		3.3 Monitor water systems	11
28	21	0	**Natural World**	203
			1.1 Preserve prime habitat	18
			1.2 Protect wetlands and surface water	18
			1.3 Preserve prime farmland	15
			1.4 Avoid adverse geology	5
			1.5 Preserve floodplain functions	14
			1.6 Avoid unsuitable development on steep slopes	6
			1.7 Preserve greenfields	23
	21		2.1 Manage stormwater	21
			2.2 Reduce pesticide and fertilizer impacts	9
18			2.3 Prevent surface and groundwater contamination	18
			3.1 Preserve species biodiversity	16
			3.2 Control invasive species	11
10			3.3 Restore disturbed soils	10
			3.4 Maintain wetland and surface water functions	19
107	151	0	All Possible Points:	809

Checklist 4.5B SITES Sustainability Goal Template

SITES version 2
Project Checklist
HJAIA P&D Sustainability Goals Checklist Template

Project Name:
Date:

Y	?	N			
0	**0**	**0**	**Site Context**		**13**
Y			Prereq	Limit Development on Farmland	0
Y			Prereq	Protect Flood Plain Functions	0
Y			Prereq	Conserve Aquatic Functions	0
Y			Prereq	Conserve habitats for Threatened and Endangered Species	0
			Credit	Redevelop Degraded Sites	6
			Credit	Locate Projects Within Existing Developed Areas	4
			Credit	Connect to Multi-Modal Transit Networks	3
3	**0**	**0**	**Pre-Design Assessment + Planning**		**3**
Y			Prereq	Use an integrative design process	0
Y			Prereq	Conduct a pre-design site assessment	0
Y			Prereq	Designate and Communicate VSPZs	0
3			Credit	Engage Users and Stakeholders	3
0	**17**	**0**	**Site Design - Water**		**23**
Y			Prereq	Manage Precipitation On Site	0
Y			Prereq	Reduce Water Use for Landscape	0
	6		Credit	Manage Precipitation Beyond Baseline	6
	6		Credit	Reduce Outdoor Water Use	6
	5		Credit	Design Functional Stormwater Features as Amenities	5
	6		Credit	Restore Aquatic Ecosystems	6
4	**16**	**0**	**Site Design - Soil + Vegetation**		**40**
			Prereq	Create and Communicate a Soil Management Plan	0
			Prereq	Control and Manage Invasive Plants	0
			Prereq	Use Appropriate Plants	0
	6		Credit	Conserve Healthy and Appropriate Vegetation	6
			Credit	Conserve Special Status Vegetation	4
	6		Credit	Conserve and Use Native Plants	6
			Credit	Conserve and Restore native Plant Communities	6
			Credit	Optimize Biomass	6
4			Credit	Reduce Urban Heat Island Effects	4
	4		Credit	Use Vegetation to Minimize Building Energy Use	4
			Credit	Reduce the Risk of Catastrophic Wildfire	4
12	**20**	**0**	**Site Design - Materials Selection**		**41**
			Prereq	Eliminate the Use of Wood From Threatened Tree Species	0
			Credit	Maintain On-site Structures and Paving	4
			Credit	Design for Adaptability and Disassembly	4
4			Credit	Use Salvaged Materials and Plants	4
4			Credit	Use Recycled Content Materials	4
	5		Credit	Use Regional Materials	5
	5		Credit	Support Responsible Extraction of Raw Materials	5
4			Credit	Support Transparency and Safer Chemistry	5
	5		Credit	Support Sustainability in Materials Manufacturing	5
	5		Credit	Support Sustainability in Plant Production	5

0	**0**	**0**	**Site Design - Human Health + Well-Being**		**30**
			Credit	Protect and Maintain Cultural and Historic Places	3
			Credit	Provide Optimum Site Accessibility, Safety, and Wayfinding	2
			Credit	Promote Equitable Site Use	2
			Credit	Support Mental Restoration	2
			Credit	Support Physical Activity	2
			Credit	Support social connection	2
			Credit	Provide on-site food production	4
			Credit	Reduce light pollution	4
			Credit	Encourage fuel efficient and multi-modal transportation	4
			Credit	Minimize Exposure to Environmental Tobacco Smoke	2
			Credit	Support Local Economy	3
4	**0**	**0**	**Construction**		**17**
Y			Prereq	Communicate and Verify Sustainable Construction Practices	0
Y			Prereq	Control and Retain Construction Pollutants	0
Y			Prereq	Restore Soils Disturbed During Construction	0
			Credit	Restore Soils Disturbed by Previous Developments	5
4			Credit	Divert Construction and Demolition Materials from Disposal	4
			Credit	Divert Reusable Vegetation, Rocks, and Soil from Disposal	4
			Credit	Protect Air Quality During Construction	4
0	**4**	**0**	**Operations and Maintenance**		**22**
Y			Prereq	Plan for Sustainable Site Maintenance	0
Y			Prereq	Provide for Storage and Collection of Recyclables	0
			Credit	Recycle Organic Matter	5
			Credit	Minimize Pesticide and Fertilizer Use	5
			Credit	Reduce Outdoor Energy Consumption	4
	4		Credit	Use Renewable Sources for Landscape Electricity Consumption	4
			Credit	Protect Air Quality During Landscape Maintenance	4
0	**0**	**0**	**Education + Performance Monitoring**		**11**
			Credit	Promote Sustainability Awareness and Education	4
			Credit	Develop and Communicate a Case Study	3
			Credit	Plan to Monitor and Report Site Performance	4
0	**9**	**0**	**Innovation and Exemplary Performance**		**9**
	9		Credit	Use Renewable Sources for Landscape Electricity Consumption	

23	**66**	**0**	**TOTALS**	Possible Points: **200**

Certified: 70-84 points, **Silver:** 85 to 99 points, **Gold:** 100 to 134 points, **Platinum:** 135 to 200

CHAPTER 5
Sustainability Tracking & Scorecard

5.0 Chapter Overview

The Hartsfield-Jackson Atlanta International Airport Department of Aviation Planning and Development Department, in conjunction with the ATL DOA Asset Management Division will use a combination of industry-best technologies and products to track, monitor, and monetize sustainable development features.

5.1 Tracking Process and Sustainability Metrics

To gauge the success of P&D Sustainability Plan, the P&D Sustainability Team will track the implementation of the Sustainability Goals from the planning stage of a project, through the end of construction. This process includes the followings steps:

- Conducting preliminary estimations during planning
- Updating these evaluations through the design phase
- Tracking required documentation during construction
- Submitting final calculations at the end of construction
- Uploading project information in an airport wide sustainability scoring system
- Conducting a project hand-off meeting with the Asset Management Department

This process will aid in forecasting progress towards the Airport-wide Sustainability goals of:

- Reducing Energy Consumption by 20% by 2020
- Reducing Potable Water Consumption by 20% by 2020
- Reducing Green House Gas Emissions by 20% by 2020
- Become a zero-waste zone and divert 90% of waste from landfills by 2020

Reference Table 5.1

Table 5.1 lists out all sustainability metrics that will be tracked on an ongoing basis.

Table 5.1 Sustainability Metric Tracking Matrix

The Sustainability Metric Tracking Matrix is a tool developed by the ATL Planning and Development department to assure that all sustainability metrics are tracked at each appropriate phase. Each project will establish a threshold, target or baseline in the planning phase. From there the design team will perform all necessary calculations and preliminary work to assure success and execution of construction team. After construction, monitoring sustainability metrics will provide valuable data to evaluate success of design features, reallocation of budget to focus on underperforming categories, and pinpoint specific maintenance and operation needs. The data collected post-construction will also be used to help generate an Arc score and pursue a LEED Existing Building and Maintenance certification in the most cost-efficient way possible.

Sustainability Metrics	Unit of Measurement	Associated Sustainability Goal	Tracking Milestones			
			Planning	Design	Construction	Post-Construction
Indoor water- Potable	Gallons	WE1- Indoor Potable Water Reduction	Sustainability Goals	Calculation	Submittal/ Final calculations	Water Meters
Outdoor Water -Potable	Gallons	WE3	Sustainability Goals	Calculation	Submittal/ Final calculations	Water Meters
Surface Water Management	Annual rainfall in inches retained on site	Runoff (inches)	Sustainability Goals	Calculation	Submittal/ Final calculations	Run-off monitoring
Lighting Power Density - Interior	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
Lighting Power Density - Exterior	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
HVAC Energy Consumption	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
End-User Energy Consumption	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
Renewable Energy Production	MW	Increase by 5%	Sustainability Goals	Design Calculations	Submittal	Electric Meters/BIMs
Construction Waste Diversion	TONS	Divert 90% of C & D waste	Sustainability Goals	Calculation	Waste Tickets	-
Material Re-Use	% of existing Square Feet	Divert 90% of C & D waste	Sustainability Goals	Calculation	Submittal/ Final calculations	-
Construction Onsite Recyclable Program (Non-Related)	Pounds	Divert 90% of C & D waste	Sustainability Goals	Contract Language	Submittal	-
Responsibly Produced Materials	% of material cost	Use sustainably produced materials in accordance with LEED v4	Sustainability Goals	Calculation	Submittal	-
Regional Materials (sourced 500 miles)	% of material cost	Use Regionaly sourced materials where economically	Sustainability Goals	Calculation	Submittal	-
Employee Commute	# of daily trips	Reduce emissions from construction related activity	Sustainability Goals	Protocol	-	Survey
Public Transportation Use	# of daily trips	Reduce emissions from construction related activity	Sustainability Goals	Protocol	-	Survey
Construction Equipment	MTCO2e (daily emissions)	Reduce emissions from construction related activity	Sustainability Goals	Contract Language	Submittal	
Indoor Air Quality	TVOCs + CO2	Indoor Air Quality Testing	Sustainability Goals	Contract Language	Const. IAQ Plan	IAQ Test
Access to Outdoor Views	75% of regularly occupied spaces have direct line of sight to outdoors	75% of Occupied Space	Sustainability Goals	Calculation	Verification/ Submittal	-
Daylighting	Luminaires/ Color Rendering Index	75% of Occupied Space	Sustainability Goals	Calculation	Submittal	Protocol

5.2 ARC Implementation

Arc is a tracking system developed by Green Building Certification Inc. to drive buildings towards continuing sustainability efforts past their initial certification. Arc will be used as the tracking tool for the P&D Sustainability Plan.

Arc will track and score buildings in each of the 5 categories outlined below. These scores will add up to give each building a score out of 100, each score will feed into an airport-wide performance score through the LEED for Communities Platform

Arc will:

- Be used as a benchmark of all airport sustainability measures and improvements, as well as a score to compare to local and global average scores for similar building types
- Help identify consistencies in improvements and lead to more educated evaluation during the planning phase of major retrofit and new construction projects.
- If implemented in-line with a separate tracking system for planning through construction, all activities and resources used for the building's useful-life will be tracked and accounted for.
- Help a building achieve LEED Existing Buildings: Operations and Maintenance (LEED: EBOM) certification through continued performance evaluation measures*.

This approach to tracking will give ATL the opportunity to gauge sustainability on a level that exceeds traditional building certification by including infrastructure and site improvements into a campus wide certification.

See Appendix I for Arc Implementation Roadmaps

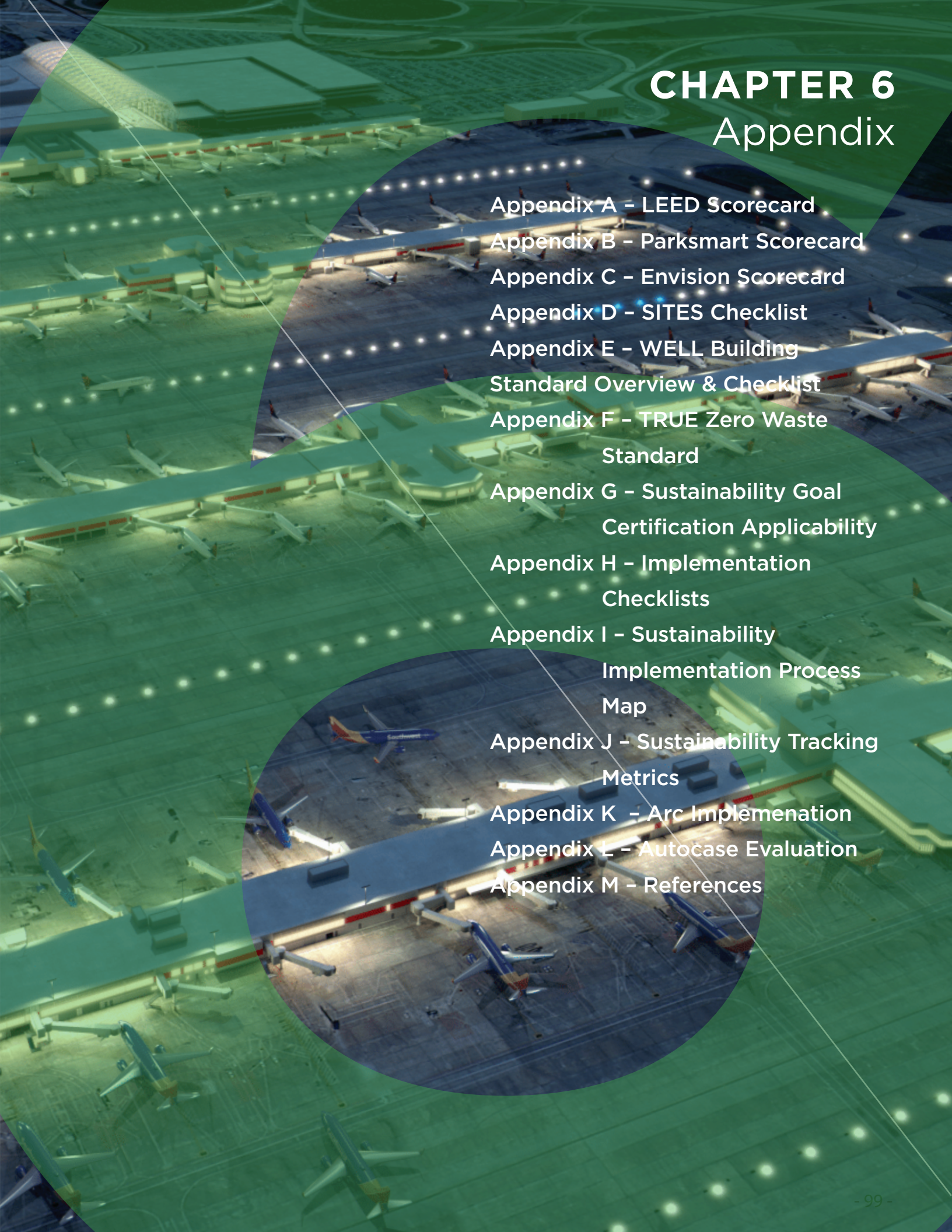
Arc Category	Possible Points		Related LEED Category
Base Points	10	-	Not Applicable
Energy	33	33	Energy & Atmosphere
Water	15	11	Water Efficiency
Waste	8	13	Materials & Resources
Transportation	14	16	Location & Transportation
Human Experience	20	16	Indoor Environmental Quality
Total Possible Points	100	100	Total Possible Points

*Achieving LEED EBOM certification will help facilitate ATL compliance with City of Atlanta Green Building - Ordinance for Existing Buildings as well as assure the buildings are performing to their designed capacities to achieve the highest return on investment.

5.3 LEED for Communities Airport Performance Score

ATL has become the first Airport in the world to be awarded precertification under the LEED for Communities Performance Platform.

LEED for Communities is a comprehensive performance-based certification for campus-wide sustainability that scores projects in Energy, Water, Waste, Transportation, and Human Experience. Utilizing the standard metrics found within the rating system, and adding additional metrics specific to the unique functions and operations of an airport, ATL will work to establish a baseline Airport Performance Score for it's 4600-acre campus. Once a baseline score is established, ATL will continue to input data to track progress and improve upon it's initial score. Additionally, this score will be used to benchmark sustainability to other airports globally. This approach to Airport-wide monitoring shifts the focus from design to performance and will enable ATL to identify strategies to improve overall sustainability. The P&D Sustainability Team, and Asset Management and Sustainability Division will collectively compile data for all established metrics for the Airport Performance Score to generate the baseline score and continually report on changes to ATL stakeholders. This information will be used to educate project teams to make informed design decisions that will produce projects that will contribute to the overall sustainability of the Airport.



CHAPTER 6
Appendix

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LEED v4 for BD+C: New Construction and Major Renovation

Project Checklist

Project Name:
Date:

Y	?	N			
1			Credit	Integrative Process	1

0	0	0	**Location and Transportation**		16
			Credit	LEED for Neighborhood Development Location	16
			Credit	Sensitive Land Protection	1
			Credit	High Priority Site	2
			Credit	Surrounding Density and Diverse Uses	5
			Credit	Access to Quality Transit	5
			Credit	Bicycle Facilities	1
			Credit	Reduced Parking Footprint	1
			Credit	Green Vehicles	1

5	0	0	**Sustainable Sites**		10
Y			Prereq	Construction Activity Pollution Prevention	Required
			Credit	Site Assessment	1
			Credit	Site Development - Protect or Restore Habitat	2
			Credit	Open Space	1
3			Credit	Rainwater Management	3
2			Credit	Heat Island Reduction	2
			Credit	Light Pollution Reduction	1

7	2	0	**Water Efficiency**		11
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
2			Credit	Outdoor Water Use Reduction	2
4	2		Credit	Indoor Water Use Reduction	6
			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

15	15	0	**Energy and Atmosphere**		33
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
6			Credit	Enhanced Commissioning	6
8	10		Credit	Optimize Energy Performance	18
1			Credit	Advanced Energy Metering	1
			Credit	Demand Response	2
	3		Credit	Renewable Energy Production	3
			Credit	Enhanced Refrigerant Management	1
	2		Credit	Green Power and Carbon Offsets	2

6	7	0	**Materials and Resources**		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
	5		Credit	Building Life-Cycle Impact Reduction	5
2			Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
2			Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
	2		Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

11	4	0	**Indoor Environmental Quality**		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
3			Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
2			Credit	Indoor Air Quality Assessment	2
	1		Credit	Thermal Comfort	1
	2		Credit	Interior Lighting	2
2			Credit	Daylight	3
1			Credit	Quality Views	1
	1		Credit	Acoustic Performance	1

6	0	0	**Innovation**		6
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

4	0	0	**Regional Priority**		4
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1
1			Credit	Regional Priority: Specific Credit	1

55	28	0	**TOTALS**	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Appendix B – Parksmart Scorecard

Project Name:
Date:

Parksmart
Project Checklist

Y	?	N		Possible Points
30	12	0	**Management**	**90**
			Parking Pricing	6
			Shared Parking	6
			TMO/TMA	4
			Recycling Program	4
2			Sustainable Purchasing Program	2
			Proactive Operational Maintenance	6
			Cleaning Procedures - Occupied Spaces	2
6			Cleaning Procedures - Parking Decks	6
8			Building Systems Commissioning	8
6			Construction Waste Management	6
	6		Regional Materials	6
			Regional Labor	4
	6		Reused/Repurposed/Recycled Materials	6
			Third Party Sustainability Certification	12
			Credentialed Management	4
8			Life-cycle Assessment	8
0	0	0	**Programs**	**64**
			Placemaking	6
			Access to Mass Transit	4
			Wayfinding Systems - External	4
			Wayfinding Systems - Internal	4
			Traffic Flow Plan	4
			Carshare Program	6
			Rideshare Program	6
			Low-emitting and Fuel-efficient Vechiles	4
			Alternative Fuel Vechiles	6
			Alternative Fuel Fleet Vechiles	4
			Bicycle Parking	6
			Bicycle Sharing/Rental	6
			Marketing/Educational Program	4

Y	?	N		Possible Points
24	18	0	**Technology and Structure Design**	**88**
			Idle Reduction Payment Systems	4
			Fire Supression Systems	2
2			No/Low VOC Coatings, Paints, Sealants	2
			Tire Inflation Stations	2
			EV Charging Stations	6
6			HVAC Systems - Occupied Spaces	6
			Ventilation Systems - Parking Decks	6
			Lighting Controls	8
			Energy-efficient Lighting System	8
6			Stormwater Management	6
	4		Rainwater Harvesting	4
	2		Greywater Reuse	2
2			Indoor Water-efficiency	2
2			Water-efficient Landscaping	2
6			Roofing Systems	6
	12		Renewable Energy Generation	12
			Design for Durability	6
			Energy Resiliency - Storage	4
6	0	0	**Innovation**	**6**
			Innovative Approach	6

60	0	0	**Parksmart Award Levels / Existing Facilities**	
			Certification Level	Points
			Parksmart Pioneer	90+

60	0	0	**Parksmart Award Levels / New Construction**	
			Certification Level	Points
			Parksmart Bronze	110-134
			Parksmart Silver	135-159
			Parksmart Gold	160+

54	30	0	Possible Points:	248

Appendix C – Envision Scorecard

Project Name:
Date:

Envision Checklist
Project Checklist

Y	?	N		Maximum Available Points
0	0	0	**Quality of Life**	181
			1.1 Improve community quality of life	25
			1.2 Stimulate sustainable growth and development	16
			1.3 Develop local skills and capabilities	15
			2.1 Enhance public health and safet	16
			2.2 Minimize noise and vibration	11
			2.3 Minimize light pollution	11
			2.4 Improve community mobility and access	14
			2.5 Encourage alternative modes of transportation	15
			2.6 Improve site accessibility, safety and wayfinding	15
			3.1 Preserve historic and cultural resources	16
			3.2 Preserve views and local character	14
			3.3 Enhance public space	13
24	0	0	**Leadership**	121
			1.1 Provide effective leadership and commitment	17
14			1.2 Establish a sustainability management system	14
			1.3 Foster collaboration and teamwork	15
			1.4 Provide for stakeholder involvement	14
			2.1 Pursue by-product synergy opportunities	15
			2.2 Improve infrastructure integration	16
10			3.1 Plan for long-term monitoring and maintenance	10
			3.2 Address conflicting regulations and policies	8
			3.3 Extend useful life	12
6	0	0	**Climate & Risk**	122
			1.1 Reduce greenhouse gas emissions	25
			1.2 Reduce air pollutant emissions	15
			2.1 Assess climate threat	15
			2.2 Avoid traps and vulnerabilities	20
			2.3 Prepare for long-term adaptability	20
			2.4 Prepare for short-term hazards	21
6			2.5 Manage heat islands effects	6

Y	?	N		Maximum Available Points
49	130	0	**Resource Allocation**	182
2	16		1.1 Reduce net embodied energy	18
6	3		1.2 Support sustainable procurement practices	9
5	9		1.3 Use recycled materials	14
	19		1.4 Use regional materials	10
8	3		1.5 Divert waste from landfills	11
	6		1.6 Reduce excavated materials taken off site	6
			1.7 Provide for deconstruction and recycling	12
3	15		2.1 Reduce energy consumption	18
	20		2.2 Use renewable energy	20
11			2.3 Commission and monitor energy systems	11
4	17		3.1 Protect fresh water availability	21
4	17		3.2 Reduce potable water consumption	21
6	5		3.3 Monitor water systems	11
28	21	0	**Natural World**	203
			1.1 Preserve prime habitat	18
			1.2 Protect wetlands and surface water	18
			1.3 Preserve prime farmland	15
			1.4 Avoid adverse geology	5
			1.5 Preserve floodplain functions	14
			1.6 Avoid unsuitable development on steep slopes	6
			1.7 Preserve greenfields	23
	21		2.1 Manage stormwater	21
			2.2 Reduce pesticide and fertilizer impacts	9
18			2.3 Prevent surface and groundwater contamination	18
			3.1 Preserve species biodiversity	16
			3.2 Control invasive species	11
10			3.3 Restore disturbed soils	10
			3.4 Maintain wetland and surface water functions	19
107	151	0	All Possible Points:	809

Appendix D – SITES Scorecard

SITES version 2
Project Checklist
HJAIA P&D Sustainability Goals Checklist Template

Project Name:
Date:

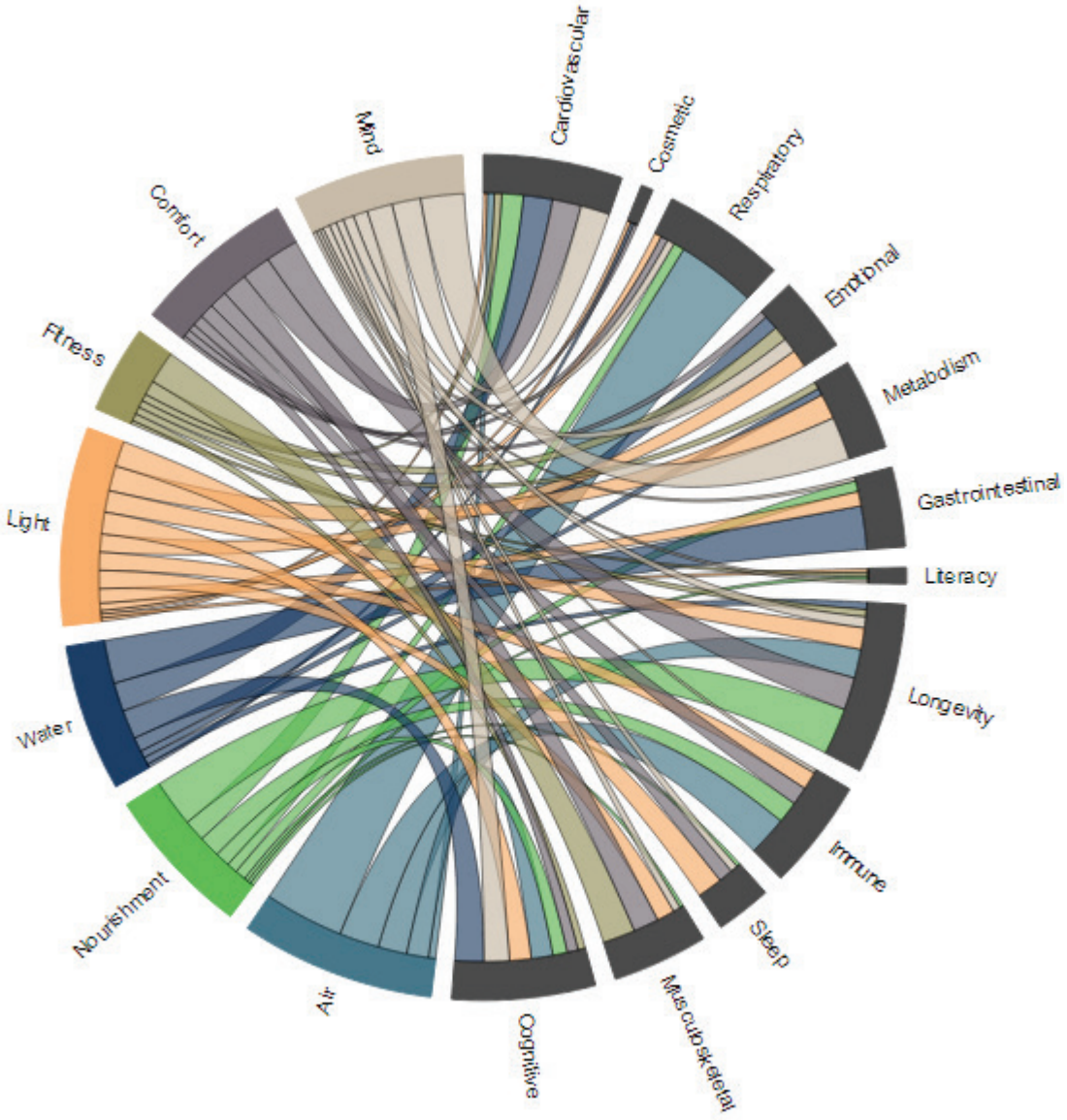
Y	?	N				
0	**0**	**0**	**Site Context**			**13**
Y			Prereq	Limit Development on Farmland		0
Y			Prereq	Protect Flood Plain Functions		0
Y			Prereq	Conserve Aquatic Functions		0
Y			Prereq	Conserve habitats for Threatened and Endangered Species		0
			Credit	Redevelop Degraded Sites		6
			Credit	Locate Projects Within Existing Developed Areas		4
			Credit	Connect to Multi-Modal Transit Networks		3
3	**0**	**0**	**Pre-Design Assessment + Planning**			**3**
Y			Prereq	Use an integrative design process		0
Y			Prereq	Conduct a pre-design site assessment		0
Y			Prereq	Designate and Communicate VSPZs		0
3			Credit	Engage Users and Stakeholders		3
0	**17**	**0**	**Site Design - Water**			**23**
Y			Prereq	Manage Precipitation On Site		0
Y			Prereq	Reduce Water Use for Landscape		0
	6		Credit	Manage Precipitation Beyond Baseline		6
	6		Credit	Reduce Outdoor Water Use		6
	5		Credit	Design Functional Stormwater Features as Amenities		5
	6		Credit	Restore Aquatic Ecosystems		6
4	**16**	**0**	**Site Design - Soil + Vegetation**			**40**
			Prereq	Create and Communicate a Soil Management Plan		0
			Prereq	Control and Manage Invasive Plants		0
			Prereq	Use Appropriate Plants		0
	6		Credit	Conserve Healthy and Appropriate Vegetation		6
			Credit	Conserve Special Status Vegetation		4
	6		Credit	Conserve and Use Native Plants		6
			Credit	Conserve and Restore native Plant Communities		6
			Credit	Optimize Biomass		6
4			Credit	Reduce Urban Heat Island Effects		4
	4		Credit	Use Vegetation to Minimize Building Energy Use		4
			Credit	Reduce the Risk of Catastrophic Wildfire		4
12	**20**	**0**	**Site Design - Materials Selection**			**41**
			Prereq	Eliminate the Use of Wood From Threatened Tree Species		0
			Credit	Maintain On-site Structures and Paving		4
			Credit	Design for Adaptability and Disassembly		4
4			Credit	Use Salvaged Materials and Plants		4
4			Credit	Use Recycled Content Materials		4
	5		Credit	Use Regional Materials		5
	5		Credit	Support Responsible Extraction of Raw Materials		5
4			Credit	Support Transparency and Safer Chemistry		5
	5		Credit	Support Sustainability in Materials Manufacturing		5
	5		Credit	Support Sustainability in Plant Production		5
0	**0**	**0**	**Site Design - Human Health + Well-Being**			**30**
			Credit	Protect and Maintain Cultural and Historic Places		3
			Credit	Provide Optimum Site Accessibility, Safety, and Wayfinding		2
			Credit	Promote Equitable Site Use		2
			Credit	Support Mental Restoration		2
			Credit	Support Physical Activity		2
			Credit	Support social connection		2
			Credit	Provide on-site food production		4
			Credit	Reduce light pollution		4
			Credit	Encourage fuel efficient and multi-modal transportation		4
			Credit	Minimize Exposure to Environmental Tobacco Smoke		2
			Credit	Support Local Economy		3
4	**0**	**0**	**Construction**			**17**
Y			Prereq	Communicate and Verify Sustainable Construction Practices		0
Y			Prereq	Control and Retain Construction Pollutants		0
Y			Prereq	Restore Soils Disturbed During Construction		0
			Credit	Restore Soils Disturbed by Previous Developments		5
4			Credit	Divert Construction and Demolition Materials from Disposal		4
			Credit	Divert Reusable Vegetation, Rocks, and Soil from Disposal		4
			Credit	Protect Air Quality During Construction		4
0	**4**	**0**	**Operations and Maintenance**			**22**
Y			Prereq	Plan for Sustainable Site Maintenance		0
Y			Prereq	Provide for Storage and Collection of Recyclables		0
			Credit	Recycle Organic Matter		5
			Credit	Minimize Pesticide and Fertilizer Use		5
			Credit	Reduce Outdoor Energy Consumption		4
	4		Credit	Use Renewable Sources for Landscape Electricity Consumption		4
			Credit	Protect Air Quality During Landscape Maintenance		4
0	**0**	**0**	**Education + Performance Monitoring**			**11**
			Credit	Promote Sustainability Awareness and Education		4
			Credit	Develop and Communicate a Case Study		3
			Credit	Plan to Monitor and Report Site Performance		4
0	**9**	**0**	**Innovation and Exemplary Performance**			**9**
	9		Credit	Use Renewable Sources for Landscape Electricity Consumption		
23	**66**	**0**	**TOTALS**		Possible Points:	**200**

Certified: 70-84 points, **Silver:** 85 to 99 points, **Gold:** 100 to 134 points, **Platinum:** 135 to 200

Appendix E – WELL building Standard Overview & Checklist

The WELL Building Standard® is a performance-based system for measuring, certifying, and monitoring features of the built environment that impact human health and wellbeing, through air, water, nourishment, light, fitness, comfort, and mind. WELL is managed and administered by the International WELL Building Institute (IWBI), a public benefit corporation whose mission is to improve human health and wellbeing through the built environment. WELL is grounded in a body of medical research that explores the connection between the buildings where we spend more than 90 percent of our time, and the health and wellness of its occupants. WELL Certified™ spaces and WELL Compliant™ core and shell developments can help create a built environment that improves the nutrition, fitness, mood, and sleep patterns.

This Diagram shows the complex relationships between human health and the built environment, according to the IWBI



Appendix E – WELL building Standard Overview & Checklist

Project Name:
Date:

Well Building Standard: New and Existing Buildings
Project Checklist

Y/N	Air	Precondition or Optimization
	Air quality standards	P
	Smoking ban	P
	Ventilation effectiveness	P
	VOC reduction	P
	Air filtration	P
	Microbe and mold control	P
	Construction pollution management	P
	Healthy entrance	P
	Cleaning protocol	P
	Pesticide management	P
	Fundamental material safety	P
	Moisture management	P
	Air flush	O
	Air infiltration management	O
	Increased ventilation	O
	Humidity control	O
	Direct source ventilation	O
	Air quality monitoring and feedback	O
	Operable windows	O
	Outdoor air systems	O
	Displacement ventilation	O
	Pest control	O
	Advanced air purification	O
	Combustion minimization	O
	Toxic material reduction	O
	Enhanced material safety	O
	Antimicrobial activity for surfaces	O
	Cleanable environment	O
	Cleaning equipment	O

Y/N	Water	Precondition or Optimization
	Fundamental water quality	P
	Inorganic contaminants	P
	Organic contaminants	P
	Agricultural contaminants	P
	Public water additives	P
	Periodic water quality testing	O
	Water treatment	O
	Drinking water promotion	O

Y/N	Nourishment	Precondition or Optimization
	Fruits and vegetables	P
	Processed foods	P
	Food allergies	P
	Hand washing	P
	Food contamination	P
	Artificial ingredients	P
	Nutritional information	P
	Food advertising	P
	Safe food preparation materials	O
	Serving sizes	O
	Special diets	O
	Responsible food production	O
	Food storage	O
	Food production	O
	Mindful eating	O

Y/N	Light	Precondition or Optimization
	Visual lighting design	P
	Circadian lighting design	P
	Electric light glare control	P
	Solar glare control	P
	Low-glare workstation design	O
	Color quality	O
	Surface design	O
	Automated shading and dimming control	O
	Right to light	O
	Daylight modeling	O
	Daylighting fenestration	O

Y/N	Fitness	Precondition or Optimization
	Interior fitness circulation	P
	Activity incentive programs	P
	Structured fitness opportunities	O
	Exterior active design	O
	Physical activity spaces	O
	Active transportation support	O
	Fitness equipment	O
	Active furnishings	O

Y/N	Comfort	Precondition or Optimization
	Accessible design	P
	Ergonomics: visual and physical	P
	Exterior noise intrusion	P
	Internally generated noise	P
	Thermal comfort	P
	Olfactory comfort	O
	Reverberation time	O
	Sound masking	O
	Sound reducing surfaces	O
	Sound barriers	O
	Individual thermal control	O
	Radiant thermal comfort	O

Y/N	Mind	Precondition or Optimization
	Health and wellness awareness	P
	Integrative design	P
	Post-occupancy surveys	P
	Beauty and design I	P
	Biophilia I - qualitative	P
	Adaptable spaces	O
	Healthy sleep policy	O
	Business travel	O
	Building health policy	O
	Workplace family support	O
	Self-monitoring	O
	Stress and addiction treatment	O
	Altruism	O
	Material transparency	O
	Organizational transparency	O
	Beauty and design II	O
	Biophilia II - quantitative	O

0	Innovation	Precondition or Optimization
	Innovation I	O
	Innovation II	O
	Innovation III	O
	Innovation IV	O
	Innovation V	O

	WELL Building Standard Award Levels	
	Certification Level	Optimization Requirement
	Silver	None
	Gold	40% Optimizations
	Platinum	80% Optimizations

Appendix F – TRUE Zero Waste Standard

TRUE is a whole systems approach aimed at changing how materials flow through society, resulting in no waste. TRUE encourages the redesign of resource life cycles so that all products are reused.

TRUE promotes processes that consider the entire lifecycle of products used within a facility. With TRUE, your facility can demonstrate to the world what you're doing to minimize your waste output.

Support public health & ecosystems
With TRUE, you support systems that encourage material reuse and recycling. TRUE is your tool to help eliminate pollution — in our air, water and land — which threaten public health and ecosystems.

Cut your ecological footprint
By participating in TRUE Zero Waste certification, facilities commit to reducing materials, using recycled and more benign materials, longer product lives, reparability and ease of disassembly at end of life.

Advance a green economy
TRUE promotes positive forces for environmental and economic sustainability in the built environment by protecting the environment, reducing costs and producing jobs throughout our economy.

Appendix G - Sustainability Goal Certification Applicability Matrix

	SITES	Envision	Parksmart	WELL Building Standard	LEED Commercial Interiors v4	LEED EBOM v4	LEED NC v4
Sustainable Sites							
SS1 Rain Water Management	●	●	●			●	●
SS2 Heat Island Reduction (Roof)			●			●	●
SS3 Heat Island Reduction (Nonroof)	●	●	●			●	●
Water Efficiency							
WE1 Indoor Potable Water Reduction			●		●	●	●
WE2 Outdoor Potable Reduction	●	●	●			●	●
WE3 Water Monitoring	●	●			●	●	●
Energy & Atmosphere							
EA1 Energy Reduction			●			●	●
EA2 Energy Monitoring		●			●	●	●
EA3 Renewable Energy					●		
EA4 Construction Related Activity	●	●	●				●
EA5 Commissioning		●	●		●	●	●
Material & Resources							
MR1 Waste Diversion	●	●	●		●	●	●
MR2 Sustainable Purchasing Policies	●	●	●		●	●	●
MR3 Regionally Sourced Materials	●	●	●				
Human Health/Indoor Air Quality							
HH1 Indoor VOC & CO2 Reduction			●	●	●	●	●
HH2 Indoor Air Quality Testing				●	●	●	●
HH3 Quality Views				●	●	●	●
HH4 Daylighting				●	●	●	●
HH5 Drinking Water Filtration				●			

Appendix H – Implementation Checklists

A. Project Set-Up Checklist

General Project Info	
Project Name:	
WBS#:	
WBS Link:	
Project Location:	
Documentation Location:	

Project Team	Name	Email
Project Manager:		
Planning Manager:		
Design Manager:		
P&D Sustainability Team Champion:		
Construction Sustainability Coordinator:		
Sustainability Consultant:		

Project Specifics	
Project Type:	
Approximate Size:	
Sustainability Certification:	
Expected Certification Level:	
Registration Number:	

Project Description

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	Integrative Planning Meeting	Conduct an Integrative Planning Meeting at the beginning of the planning process to establish project goals, Owners Project Requirements, and the Basis of Design. The following stakeholders will be involved: Owner, Future Occupants, Project Manager, Design Manager, P&D Sustainability Team Project Manager, relevant P&D team memebers, AMS Team Member.				
2	Integrative Planning Meeting	Define and formalize Owner Project Requirements to be included in the Project Definition Report.				
3	Integrative Planning Meeting	Define and formalize Basis of Design to be included in the Project Definition Report.				
4	Integrative Planning Meeting	Define Sustainability Certification Standard to be pursured.				
5	Integrative Planning Meeting	Develop preliminary Sustainability Certification Standard Checklist.				
6	Specification	Include language referencing the inclusion and implementation of the ATL P&D Bureau Sustainability Standards for all Projects				
7	Autocase Evaluation	Conduct preliminary Autocase evaluations on Low-Impact Development designs to address on-site rain water management to fulfill Recommended Actions of SS1 Rain Water Management.				
8	Autocase Evaluation	Conduct preliminary Autocase evaluations on heat island reduction strategies for building roof structures to fulfill Recommended Actions of SS2 Heat Island Reduction (Roof).				
9	Autocase Evaluation	Conduct preliminary Autocase evaluations on heat island reduction strategies for project site to fulfill Recommended Actions of SS3 Heat Island Reduction (Nonroof).				
10	Energy Modeling	Conduct a preliminary "simple box" energy model to identify early on expected energy usage, building system synergies, and optimization assessments.				
11	Autocase Evaluation	Evaluate the inclusion of Renewable Energy Production into the project to fulfill the Recommended Actions of EA3 Renewable Energy.				
12	Plan Review	Specify a Sustainability Certifcation Standard Design Review by the design team Sustainability Consultant at 35%, 65%, 95% Design Drawings and IFC Documents to ensure all requirements of specific Sustainability Certification Standard are included in design documents.				
13	Life Cycle Analysis	Conduct a full project Life-Cycle Analysis as early on in the project as possible				

C. Design Evalaution Checklist

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	Integrative Design Charrette	Conduct an Integrative Design Charrette to kick off the design process to review Owners Project Requirements, Basis of Design, Planning Definition Report, Preliminary Autocase Evaluations, Sustainability Standard Checklist, and preliminary energy model (if applicable), with the following stake holders: Owners, Future Occupants, Project Manager, Design Manager, P&D Sustainability Team Project Manager, relevant P&D team memebers, AMS and Sustainabililty Consultant.				
2	SS1 - Rain Water Management	Review and update the Autocase evaluation for the inclusion of Low Impact Development Strategies and Supportive Green Infrasructure into the project site design				
3	SS2 - Heat Island Reduction (Roof)	Review and update the Autocase evaluation for the inclusion of a compliant TPO White Roof, Green Roof, or Blue Roof				
4	SS3 - Heat Island Reduction (Nonroof)	Review and update the Autocase evaluation for the inclusion of heat island reduction strategies into the project site design				
5	WE1 - Indoor Potable Water Reduction	Design project indoor potable water system to achieve a 40% reduction from LEED v4 baseline. Complete Indoor Potable Water Reduction calculator.				
6	WE2 - Outdoor Potable Water Reduction	Design landscape to achieve at least a 50% reduction from LEED v4 baseline - Complete Outdoor Potable Water Reduction Calculator.				
7	WE3 - Water Monitoring	Include a compliant water metering system in project design.				
8	EA1 - Energy Reduction	Update preliminary Energy Model as design progresses and confirm at least a 20% reduction from ASHRAE 90.1 - 2010 Baseline. Energy Model should be updated at major design milestones (i.e. 35%, 65%, 95%, etc.)				
9	EA1 - Energy Reduction	Fill out estimated annual energy consumtion form for ISO 50001 and provide to Asset Utility Manager.				
10	EA2 - Energy Monitoring	Include a compliant energy monitoring system in project design.				
11	EA3 - Renewable Energy	Review and update Renewable Energy Production Evalutation.				
12	EA5 - Commissioning	Include Fundamental and Enhanced Commissioning in project budget and scope of work.				
13	MR1 - Waste Diversion	Confirm project will use Waste Diversion Tracking Technology like Retrac-CONNECT (or equal)				
14	MR1 - Waste Diversion	Confirm project will achieve a minimum of 90% construction and demolition waste diversion rate from landfills.				
15	MR2 - Sustainable Purchasing Policy	Confirm project is adhering to standards detailed in ATL's Sustainable Purchasing Policy as it applies to product specification.				
16	MR3 - Regionally Sourced Materials	Confirm Project has evaluated the use of regionally sourced materials. Materials that are sourced within a 300 mile radius.				
17	HH1 Indoor VOC and CO2 Reduction	Confirm compliant materials are specified in construction documents.				
18	HH2 Indoor Air Quality Testing	Confirm project is designed for Enhanced Indoor Air Quality Strategies as outlined in the LEED Reference Guide for BD+C v4.				
19	HH2 Indoor Air Quality Testing	Confirm budget allocation for Indoor Air Quality Assessment, as outlined in LEED Reference Guide for BD+C v4.				
20	HH2 Indoor Air Quality Testing	Confirm construction team is aware of TVOC and CO2 testing will performed by P&D Sustainability Team after construction.				
21	HH3 - Quality Views	Confirm Quality Views as outlined in the LEED Reference Guide for BD+C v4 will be achieved through proper design.				
22	HH4- Daylighting	Confrim Daylighting as outlined in the LEED Referernce Guide for BD+C v4 will be achieved through proper design.				
23	HH5 - Water Quality	Confrim compliant water filtration system is included for all drinking water stations and kitchen sinks.				
24	Sustainable Design Standards - General Requirements	Confirm all General Requirements, as outlined in the ATL Sustainability Design Standards are evaluated, included and documented.				
25	Life Cycle Analysis	Complete a full Life Cycle Analysis for the project and update at 35%, 65%, 95% Design Drawings and Final Bid Set				
26	Sustainability Consultant Plan Reviews	Review Design Documents for Sustainability Certification Standard Compliance for 35%, 65%, 95% Design Drawings, and Final Bid Set				

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	2.1 SUSTAINABLE CONSTRUCTION TRADES	Agenda for Sustainable Construction Trades Training				
2	2.1 SUSTAINABLE CONSTRUCTION TRADES TRAINING	Attendee List				
3	2.2 CONTRACTOR SUSTAINABILITY COORDINATOR	Provide proof of LEED AP Credential or Equivalent				
4	2.2 CONTRACTOR SUSTAINABILITY COORDINATOR	Provide proof of Sustainability Contractor Coordinator experience on LEED or equivalent Sustainability Project Expereince				
5	3.1 Non-Toxic Landscape Maintenance During Construction	Manufacturer documentation and MSDS sheets on all pesticides and fertilizers used on-site				
6	4.1 Construction Temporary Lighting Energy Efficiency	Buld wattage and count for all temporary lighting used throughout Construction				
7	4.1 Construction Temporary Lighting Energy Efficiency	Schedule on-site visits to confirm ltemporary lighting during each construction phase				
8	4.2 Potable Water Use During Construction	Construction Water Use and Re-Use Log Template				
9	4.3 Construction and Demolition Waste Diversion	Waste Tickets from haulers and Waste Management Companies				
10	4.3 Construction and Demolition Waste Diversion	Calculations on reuse in accordance with LEED Reference Manual for Building Design and Construction v4: Construction Demolition and Waste Management Credit.				
11	4.3 Construction and Demolition Waste Diversion	LEED Reference Manual for Building Design and Construction v4: Construction Demolition and Waste Management Credit Required Documentation.				
12	4.4 Material Selection	Manufacturer documentation on all purchased materials				
13	4.5 Construction Indoor Air Quality Management Plan	IAQ Management Plan in accordance with the LEED v4 Standards				
14	4.5 Construction Indoor Air Quality Management Plan	For areas being renovated: supply a statement explaining the protection of existing air systems				
15	4.5 Construction Indoor Air Quality Management Plan	TVOC and CO2 Test Report				
16	5.1 Construction Vehicles and Equipment	Spill Response Plan				
17	5.1 Construction Vehicles and Equipment	Log of maintenance and repairs conducted on construction vehicles and equiptment used during construction.22:23				

	Item	Description	Started	Completed	Documentation Completed?	Notes
1	P1.0	Include AMS Team in Integrative Planning Session to establish Basis of Design and Owner Project Requirements				
2	P2.0	Review Autocase Evaluation Reports for Project During Planning Phase				
3	D1.0	Review Energy Model evaluation reports for project during major design milestones (i.e. 35%, 65%, etc.)				
4	D2.0	Review Enhanced Commissioning design review for coordination with facilities management items				
5	C1.0	Attend Functional commissioning testing and equipment startup				
6	C2.0	Attend Building Owner training at construction completion / building turnover				
7	C3.0	Review all close-out documents (i.e. as builts, warranties, O+M manuals, recommended maintenance schedule, etc.)				
8	C4.0	Coordinate Arc transition with P&D in preparation for EBOM Perfromance Pathway Certification				
9	OM1.0	Manage Enhanced Commissioning Walk Through 10 months after construction completion and ensure all systems are performing optimally				
10	OM2.0	Perform Thermal Comfort Occupancy Survey annually				
11	OM2.1	Perform Employee Satisfaction Survey annually				
12	OM2.2	Coordinate CO2 testing for building per Arc testing protocols				
13	OM2.3	Coordinate TVOC testing for building per Arc testing protocols				
14	OM3.0	Calibrate Building Automation System to optimize building systems performance				
15	OM3.1	Calibrate Lighting Control System for oprimal performance				
16	OM4.0	Coordinate regularly scheduled maintenance for build systems and electronic records of maintenance work/improvements				
17	OM5.0	Identify all credits to pursure for EBOM Certification				

Appendix I –Sustainabilitity Implementation Process Map

01 Planning

1. Conduct Integrated Planning Meeting with all stakeholders to define the Owner's Project Requirements and establish the Basis of Design
2. Select Sustainability Certification Standard to pursue
3. Run a Preliminary Sustainability Scorecard (scorecard type determined by project type – i.e LEED, Parksmart, Envision, etc.)
4. Review / confirm all Sustainability Goals to be implemented into project scope of work
5. Perform an Autocase evaluation for each design feature of the project to determine it's Financial, Social, and Environmentl Net Present Value
6. Perform whole-project Life Cycle Analysis
7. Coordinate and review sustainability implementation plan with Planning Manager, Design Manager, Construction Manager and Asset Management Sustainability Manager
8. Develop appropriate budget to achieve all Sustainability Goals & Certifications
9. Include P&D Sustainability Plan in all RFP and/or RFQ for Design and Construction Services

02 Design

1. Hold Sustainability Charette to discuss Sustainability Implementation Plan and discuss any Sustainability Innovation that can be implemented
2. Perform an energy model analysis to further drive evaluation of design selections to maximize sustainability
3. Revisit Autocase evaluations to prioritize most cost-efficient sustainable design features
4. Update Sustainability Scorecard to confirm all sustainability goals are included in project scope and will be achieved
5. Perform a Sustainability Review at 35% Schematic Design (SD)
6. Perform an Enhanced Commissioning Design Review. This will happen before the design document reaches 50% DD Phase
7. Perform a Sustainability Review at 65% Design Development DD
8. Perform a Sustainability Review at 95% Construction Documents (CD)

03 Construction

1. Assign Construction Sustainability Coordinator
2. Review Sustainability Plan and Final Sustainability Scorecard
3. Advise of health and safety impact of construction equipment and activities. Include impact mitigation measures in contract documents and enforce during construction
4. Develop / submit construction waste management plan
5. Develop / submit indoor air quality management plan
6. Track and document required Sustainability Goals and Sustainability Metrics during construction
7. Perform Indoor Air Quality Testing, including TVOC and CO2 testing and input results in Arc Platform

04 Operations

1. Review AutoCase evaluation reports for project during Planning phase
2. Review Energy Model evaluation reports for project during major design milestones (i.e. 35%, 65%, etc.)
3. AMS team member to attend functional commissioning testing and equipment startup
4. Review all close-out documents (i.e. as-builts, warranties, O&M manuals, recommended maintenance schedule, etc.)
5. Attend Arc transition meeting with P&D. The purpose of this meeting is to transfer Arc platform for project from P&D (construction) to AMS (operations & maintenance)
6. Perform thermal comfort occupancy survey annually
7. Perform TVOC testing per building per Arc testing protocols
8. Perform CO2 testing per building per Arc testing protocols

05 Maintenance

1. Attend building owner training at construction completion / building turnover
2. Review enhanced commissioning design review for coordination with facilities management items
3. Review all close-out documents (i.e. as-builts, warranties, O&M manuals, recommended maintenance schedule, etc.)
4. Attend Arc Transition Meeting with P&D. The purpose of this meeting is to transfer Arc platform for project from P&D (construction) to AMS (operations & maintenance)
5. Automatically operated HVAC system via building automation system to optimize building performance. Calibrate BAS system per manufacturer recommendations
6. Automatically operated lighting system via lighting control system for optimal performance. Calibrate lighting control system based on manufacturer recommendations
7. Coordinate regularly scheduled maintenance for building systems and electronic records of maintenance work and performance improvements
8. Manage Enhanced Commissioning Walk Through (10 months after construction completion). Ensures building is performing optimally

Appendix J –Sustainability Tracking Metrics

Categories	Item #	Sustainability Metrics	Unit of Measurement	Associated Sustainability Goal	Tracking Milestones			
					Planning	Design	Construction	Post-Construction
Water	1	Indoor water- Potable	Gallons	WE1 - Indoor Potable Water Reduction	Sustainability Goals	Calculation	Submittal/ Final calculations	Water Meters
	2	Outdoor Water -Potable	Gallons	WE3	Sustainability Goals	Calculation	Submittal/ Final calculations	Water Meters
	3	Surface Water Management	Annual rainfall in inches retained on site	Runoff (inches)	Sustainability Goals	Calculation	Submittal/ Final calculations	Run-off monitoring
Energy	4	Lighting Power Density - Interior	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
	5	Lighting Power Density - Exterior	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
	6	HVAC Energy Consumption	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
	7	End-User Energy Consumption	kWh	Reduce energy by 20%	Sustainability Goals	Energy Model	Submittal	Electric Meters/BIMs
	8	Renewable Energy Production	MW	Increase by 5%	Sustainability Goals	Design Calculations	Submittal	Electric Meters/BIMs
Material & Resources	9	Construction Waste Diversion	TONS	Divert 90% of C & D waste	Sustainability Goals	Calculation	Waste Tickets	-
	10	Material Re-Use	% of existing Square Feet	Divert 90% of C & D waste	Sustainability Goals	Calculation	Submittal/ Final calculations	-
	11	Construction Onsite Recyclable Program (Non-Related)	Pounds	Divert 90% of C & D waste	Sustainability Goals	Contract Language	Submittal	-
	12	Responsibly Produced Materials	% of material cost	Use sustainably produced materials in accordance with LEED v4	Sustainability Goals	Calculation	Submittal	-
Transportation	13	Regional Materials (sourced 500 miles)	% of material cost	Use Regionaly sourced materials where economically	Sustainability Goals	Calculation	Submittal	-
	14	Employee Commute	# of daily trips	Reduce emissions from construction related activity	Sustainability Goals	Protocol	-	Survey
	15	Public Transportation Use	# of daily trips	Reduce emissions from construction related activity	Sustainability Goals	Protocol	-	Survey
	16	Construction Equipment	MTCO2e (daily emissions)	Reduce emissions from construction related activity	Sustainability Goals	Contract Language	Submittal	
Human Experience	17	Indoor Air Quality	TVOCs + CO2	Indoor Air Quality Testing	Sustainability Goals	Contract Language	Const. IAQ Plan	IAQ Test
	18	Access to Outdoor Views	75% of regularly occupied spaces have direct line of sight to outdoors	75% of Occupied Space	Sustainability Goals	Calculation	Verification/ Submittal	-
	19	Daylighting	Luminaires/ Color Rendering Index	75% of Occupied Space	Sustainability Goals	Calculation	Submittal	Protocol

Appendix K – Arc Implementation: New Construction

Implementing Arc on New Construction Projects

The responsibilities of implementing Arc and assuring its success will be managed by a collaborative effort between the P&D Sustainability Team and the Asset Management and Sustainability Division

1. In the planning stage of a new construction project, the planning team will clearly outline design features that need to be in place for LEED Existing Building Operations and Maintenance Silver certification and include them in the Sustainable Goals in the design RFP package.

2. The project manager will insure language clearly outlines the project start up responsibilities for Arc after construction is completed.

3. After project registration fees are paid for initial LEED certification the P&D team will assign project team members to Arc and begin to upload any relevant information collected during design phase.

4. As applicable base point credits are uploaded to LEED Online throughout construction, these credits will also be uploaded to Arcautomatically.

5. General Contractor will submit Construction Indoor Air Quality Plan or adhere to P&D Construction Indoor Air Quality Plan (whichever is more stringent) as part of proposal to ensure compliance.

6. General Contractor and the P&D Sustainability Team will perform Indoor Air Quality Testing in accordance to Arc and LEED v4 specifications.

7. P&D Sustainability Team Project Manager will connect building smart meters to Arc for Water and Energy consumption data

8. P&D Sustainability Team Project Manager will upload any applicable LEED Campus Credits into Arc

9. After construction is completed, the P&D Sustainability Team Project Manager will assure all responsibilities of Arc are completed and fill out the Arc task checklist.

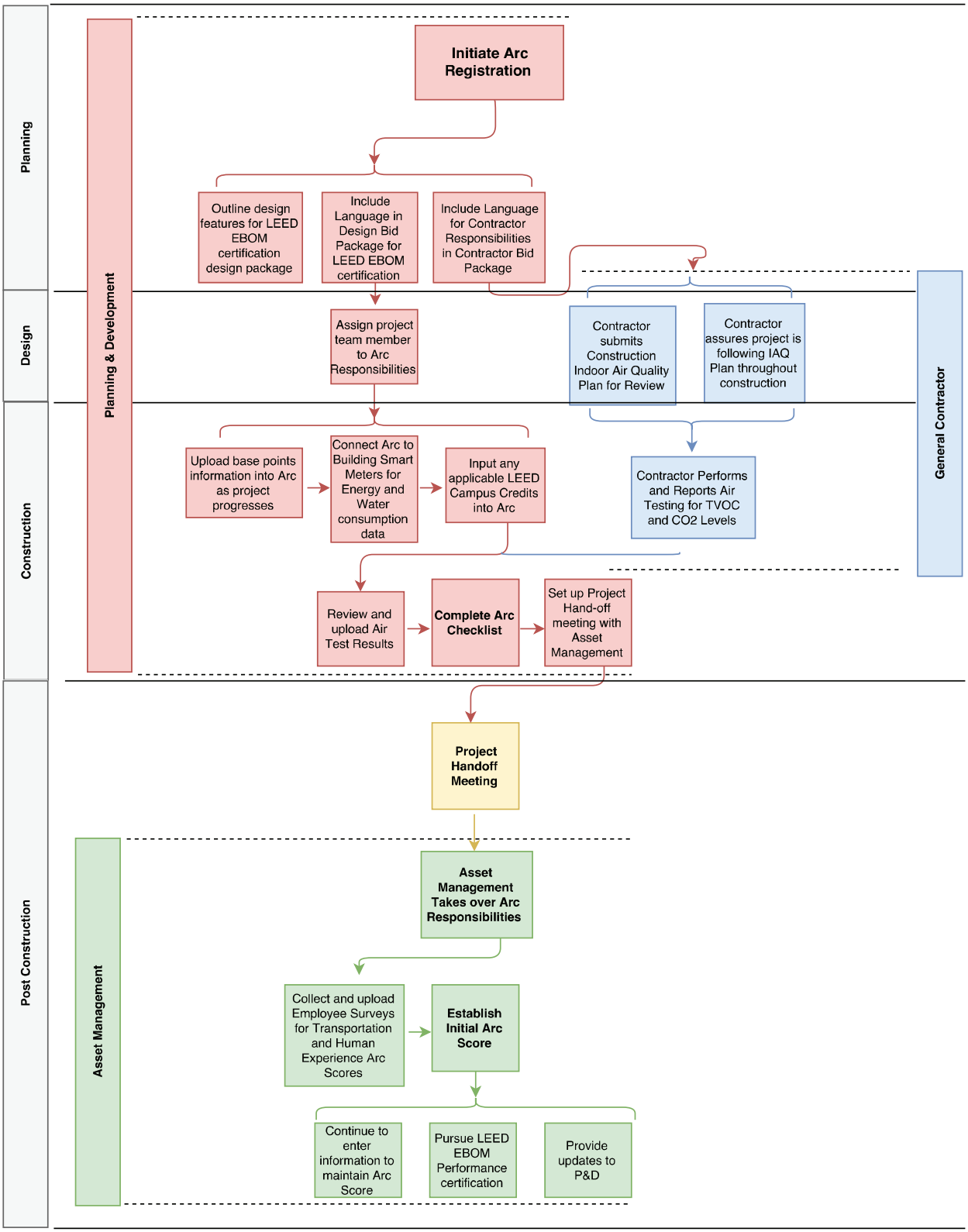
10. The P&D Sustainability Team Project Manager will then meet with the Asset Management Arc Manager and review the project and task checklist.

11. After the hand-off, Asset Management will assign a project manager of each building and collect all remaining information needed to complete the Arc score.

12. Once the initial Arc score has been established, Asset management will continue to input date into Arc to maintain an up to date Arc score and begin to input information to pursue a LEED EBOM Performance certification

13. The Asset management PM will provide updates on Arc score to P&D PM for data evaluation on future design strategies.

Implementing Arc on New Construction



Appendix K – Arc Implementation: Existing Buildings

Implementing Arc for Existing Buildings

The responsibilities of implementing Arc and assuring its success will be broken up between the Planning and Development department and the Asset Management department based on task.

1. The P&D Sustainability Team Project Manager will initiate the process by registering the project in Arc.

2. The P&D Sustainability Team PM will fill out the Arc Set-up and Occupancy Tabs for the project

3. The P&D Sustainability Team PM will arrange Air Quality Testing for TVOC and CO_2 Levels

4. After testing results have been collected, the P&D Sustainability Team PM will input information in the Arc templates and upload them to Arc.

5. The P&D Sustainability Team PM will investigate if smart meters or Energy Star Portfolio Manager are currently in use on project.

6. The P&D Sustainability Team PM will collect Energy and Water usage data to generate the initial Arc score for those respective categories.

7. The P&D Sustainability Team PM will collect waste reports and input into Arc

8. The P&D Sustainability Team PM will hand out the initial round of surveys to generate the Transportation and Human Experience Scores.

9. The P&D Sustainability Team PM will complete Arc Checklist and set up Project-Handoff meeting with Asset Management Project Manager.

10. The Project-Handoff meeting will take place, the P&D PM will review Arc Status, Arc Checklist and discuss LEED EBOM Certification.

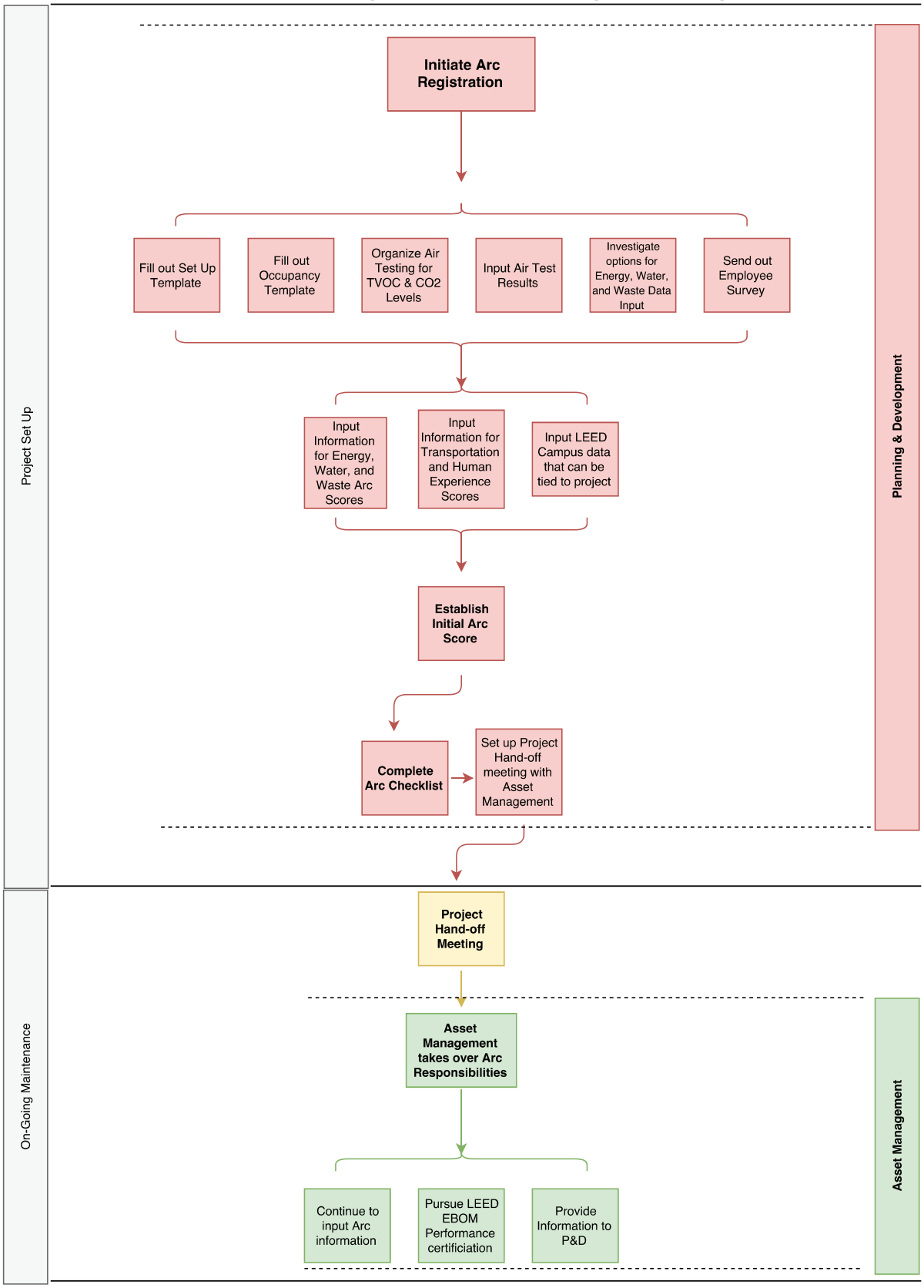
11. The Asset Management PM will take over Arc responsibilities.

12. The Asset Management PM will continue to input all Arc information on a monthly or annual basis depending on strategy.

13. The Asset Management PM will begin to pursue LEED EBOM performance certification through Arc.

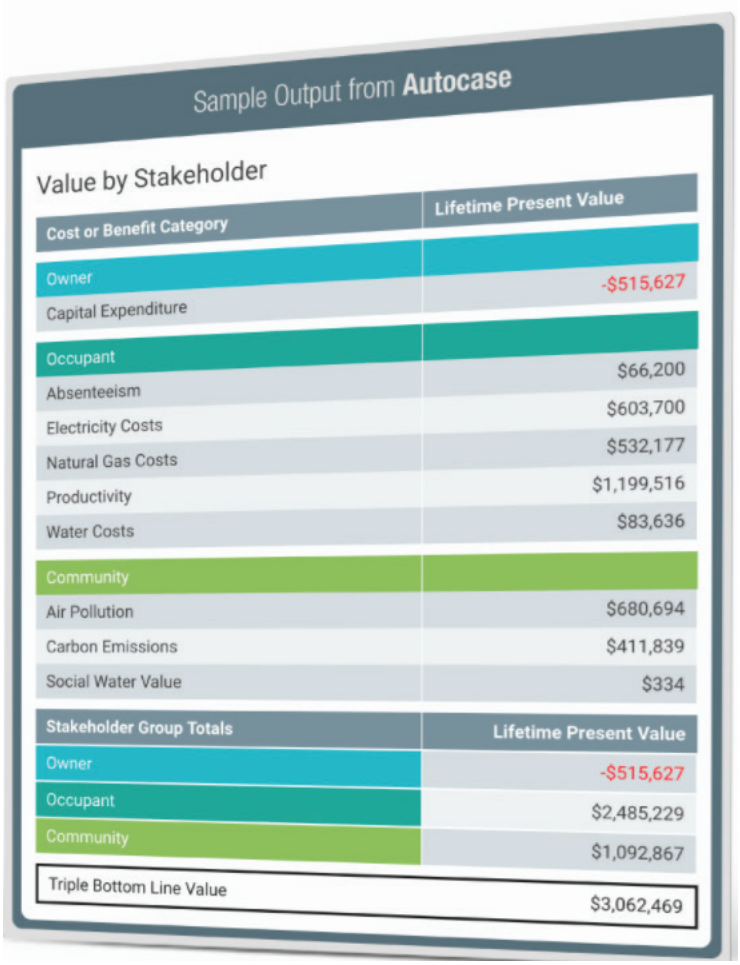
14. The Asset management PM will provide updates on Arc score to P&D PM for data

Implementing Arc on Existing Buildings



Appendix L - Autocase Evaluations

Autocase is a web-based platform providing economic analysis to inform Sustainable Design and Resilience through Triple Bottom Line Cost Benefit Analysis (TBA-CBA). (TBL-CBA) is a systematic, evidence-based economic business case framework that uses best practice Cost Benefit Analysis (CBA) and Life Cycle Cost Analysis (LCCA) techniques to quantify and attribute monetary values to the Triple Bottom Line (TBL) impacts resulting from an investment.
Autocase will be used on all new construction and major renovation projects at HJAIA to evaluate the most impactful design features while focusing on cost-efficiency.



Sample Output from **Autocase**

Value by Stakeholder

Cost or Benefit Category	Lifetime Present Value
Owner	
Capital Expenditure	-$515,627
Occupant	
Absenteeism	$66,200
Electricity Costs	$603,700
Natural Gas Costs	$532,177
Productivity	$1,199,516
Water Costs	$83,636
Community	
Air Pollution	$680,694
Carbon Emissions	$411,839
Social Water Value	$334

Stakeholder Group Totals	Lifetime Present Value
Owner	-$515,627
Occupant	$2,485,229
Community	$1,092,867
Triple Bottom Line Value	$3,062,469

Appendix M – References

(Chapter 2: Sustainability Goals References)

Sustainable Sites

SS1 Rain Water Management:

1. City of Atlanta Post Development Stormwater Management Ordinance – City of Atlanta, 2013
2. Sustainable Sites: Rainwater Management, pp. 183, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
3. Sustainable Sites: Rainwater Management, pp. 75, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
4. 3.2.3: Stormwater Management, pp.53 Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. Section C: Technology and Structure Design, Measure 10: Stormwater Management, pp. 131, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
6. Natural World: NW2.1 Manage Stormwater, pp.120, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

SS2 Heat Island Reduction (Roof)

1. Sustainable Sites: Heat Island Reduction, pp.197, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Sustainable Sites: Heat Island Reduction, pp.85, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. 3.2.2.4.1 Heat Island Effect, pp.49, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
4. Section C: Technology and Structure Design, Measure 15: Roofing, pp.142, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
5. Climate and Risk: CR2.5 Manage Heat Island Effect, pp.152, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

SS3 Heat Island Reduction (Nonroof):

1. Sustainable Sites: Heat Island Reduction, pp.197, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Sustainable Sites: Heat Island Reduction, pp.85, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. 3.2.2.4.2 Heat Island Effect, pp.50, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
4. Climate and Risk: CR2.5 Manage Heat Island Effect, pp.152, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

Water Efficiency

WE1 Indoor Potable Water Reduction

1. Water Efficiency: Indoor Water Use Reduction, pp.297, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Water Efficiency: Indoor Water Use Reduction, pp.169, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Water Efficiency: Indoor Water Use Reduction, pp.103, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.4: Water, pp.119, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 3: Water, pp.50, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
6. Section C: Technology and Structure Design, Measure 13: Indoor Water Efficiency, pp.138, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016

WE2 Outdoor Potable Water Reduction

1. Water Efficiency: Outdoor Water Use Reduction, pp.287, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Water Efficiency: Outdoor Water Reduction, pp.155, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. 3.4.8: Irrigation, pp.136, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
4. Section A: Management, Measure 8: Cleaning Procedures – Parking Deck, pp.25; Section C: Technology and Structure Design, Measure 11: Rainwater Harvesting, pp.134; Section C: Technology and Structure Design, Measure 12: Greywater Reuse, pp.136; Section C: Technology and Structure Design, Measure 14: Water Efficient Landscaping, pp.140, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
5. Resource Allocation, RA3.1: Protect Fresh Water Availability, pp.94; Resource Allocation, RA3.2: Reduce Potable Water Consumption, pp.96, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

WE3 Water Monitoring

1. Water Efficiency: Outdoor Water Metering, pp.311, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Water Efficiency: Water Metering, pp.181, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. 3.4.7: Metering, pp.134, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
4. 3.3.4: Metering, pp.60, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
5. Resource Allocation, RA3.3: Monitor Water Systems, pp.98, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

Energy and Atmosphere

EA1 Energy Reduction

1. Energy and Atmosphere: Optimize Energy Performance, pp.405, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Energy and Atmosphere: Optimize Energy Performance, pp.261, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Energy and Atmosphere: Optimize Energy Performance, pp171, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.3.1: Energy Performance, pp. 64, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 2: Energy, pp.31, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
6. Section C: Technology and Structure Design, Measure 6: HVAC Systems – Occupied Spaces, pp.111; Section C: Technology and Structure Design, Measure 8: Lighting Controls, pp.123; Section C: Technology and Structure Design, Measure 9: Energy-Efficient Lighting System, pp.126, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
7. Resource Allocation: RA 2.1: Reduce Energy Consumption, pp.88, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

EA2 Energy Monitoring

1. Energy and Atmosphere: Advanced Energy Monitoring, pp.413, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Energy and Atmosphere: Advanced Energy Monitoring, pp.267, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Energy and Atmosphere: Advanced Energy Monitoring, pp.179, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.3.3: Metering, Measurement and Verification, pp.79, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 2.1: Energy Sub-metering, pp.31, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017

EA3 Renewable Energy

1. Energy and Atmosphere: Renewable Energy Production, pp.429; Energy and Atmosphere: Green Power and Carbon Offsets, pp.453, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Energy and Atmosphere: Renewable Energy and Carbon Offsets, pp.285, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Energy and Atmosphere: Renewable Energy Production, pp.187, Energy and Atmosphere: Green Power and Carbon Offsets, pp.207, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.3.9: Renewable Sources of Energy, pp.114, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. Section C: Technology and Structure Design, Measure 16: Renewable Energy Generation, pp. 149; Section C: Technology and Structure Design: Measure 18: Energy Resiliency – Storage, pp.157, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
6. Resource Allocation, RA 2.2: Use Renewable Energy, pp.90, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

EA4 Construction Related Activities

1. Sustainable Sites: Construction Activity Pollution Prevention, pp.139; Materials and Resources: Building Lifecycle Impact Reduction, pp.495; Materials and Resources: LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. 3.1.2: Clean Diesel Practices, pp.23; 3.5.3 Reuse of Existing Structures, 99.146; 3.5.6 Resource Conservation, pp.153, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
3. 4.3: Deconstruction, Disassembly, and Reassembly, pp.66; 4.6: Reuse of Non-structural Elements, pp.71, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
4. Section A: Management, Measure 11: Regional Materials for New Construction, Rehabilitation, or Retrofit, pp.35; Section A: Management, Measure 12: Regional Labor for New Construction, Rehabilitation, or Retrofit, pp.37, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
5. Resource Allocation, RA1.1: Reduce Net-Embodied Energy, pp.74; Resource Allocation, RA 1.3: Use Recycled Materials, pp.78; Resource Allocation, RA1.4: Use Regional Materials, pp.80; Resource Allocation, RA1.6: Reduce Excavated Materials Taken Off-Site, pp.84; Resource Allocation, RA1.7: Provide for Deconstruction and Recycling, pp.86; Climate and Risk, CR1.2: Reduce Air Pollutant Emission, pp.142; Climate and Risk, CR2.1 Assess Climate Threat, pp.144, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

EA5 Fundamental and Enhanced Commissioning

1. Energy and Atmosphere: Fundamental Commissioning and Verification, pp.321; Energy and Atmosphere: Enhanced Commissioning, pp.387, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Energy and Atmosphere: Existing Building Commissioning – Analysis, pp.231; Energy and Atmosphere: Existing Building Commissioning – Implementation, pp.245; Energy and Atmosphere: Ongoing Commissioning, pp.253, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Energy and Atmosphere: Fundamental Commissioning and Verification, pp.125; Energy and Atmosphere: Enhanced Commissioning, pp.159, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.1.3: Commissioning, pp.29, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 1.4 Commissioning, pp.24, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
6. Section A: Management, Measure 9: Building Systems Commissioning, pp.29, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
7. Resource Allocation: Commission and Monitor Energy Systems, pp.94Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

MR1 Waste Diversion

1. Materials and Resources: Construction and Demolition Waste Management, pp.587, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Materials and Resources: Solid Waste Management – Facility Maintenance and Renovation, pp.385, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Materials and Resources: Construction and Demolition Waste Management, pp.291, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.5.4: Waste, pp.149, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 4.4: Waste, pp.68, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
6. Section A: Management, Measure 10: Construction Waste Management, pp.32, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
7. Resource Allocation, RA 1.5: Divert Waste from Landfills, pp.82, RA1.6: Reduce Excavated Materials Taken Off-Site, pp.84; Resource Allocation, RA1.7: Provide for Deconstruction and Recycling, pp.86, Envision Rating System for Sustainable Infrastructure – Institute for Sustainable Infrastructure, 2015

MR2 Sustainable Procurement Policies

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2. Materials and Resources: Ongoing Purchasing and Waste Policy, pp. 313; Materials and Resources: Facility Maintenance and Renovation Policy, pp.327; Materials and Resources: Purchasing – Ongoing, pp.337; Materials and Resources: Purchasing – Lamps, pp. 337; Materials and Resources: Facility Maintenance and Renovation, pp.355; Indoor Environmental Quality: Green Cleaning - Products and Materials, pp.501; Indoor Environmental Quality: Green Cleaning – Equipment, pp.511, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Materials and Resources: Building Life Cycle Impact Reduction, pp.4239; Materials and Resources: Building Product Disclosure and Optimization – Environmental Product Declaration, pp.251; Materials and Resources: Building Product Disclosure and Optimization – Sourcing of Raw Materials, pp.263; Materials and Resources: Building Product Disclosure and Optimization – Material Ingredients, pp.279, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.5 Materials and Resources, pp.138, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
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6. Section A: Management, Measure 5: Sustainable Purchasing Program, pp.15, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
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MR3 Regionally Sourced Materials

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HH1 Indoor VOC and CO2 Reduction

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2. Materials and Resources: Purchasing – Facility Maintenance and Renovation, pp.355, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Indoor Air Quality: Low-Emitting Materials, pp.341, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. 3.7.1: Source Control and Measurement of Indoor Air Pollutants, pp.191, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
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6. Section C: Technology and Structure Design, Measure 3: No/Low VOC Coatings, Paints, and Sealants, pp.103, Parksmart Certification Standard v1 – Green Business Certification Inc., 2016
7. Air: 04 – VOC Reduction, pp.30, Well Building Standard v1 – Delos Living LLC, 2016

HH2 Indoor Air Quality Testing

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2. Indoor Environmental Quality: Indoor Air Quality Management Program, pp.429; Indoor Environmental Quality: Enhanced Indoor Air Quality Strategies, pp.435, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
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4. 3.1.2.4: IAQ During Construction, pp.26; 3.7.1: Ventilation, pp.183; 3.7.1: Source Control and Measurement of Indoor Pollutants, pp.191, Green Globes for New Construction Technical Reference Manual v1.45 – Green Building Initiative Inc, 2017
5. 1.2.2: IAQ During Construction, pp.19; 6.1: Ventilation, pp.68; 6.2: Source Control of Indoor Pollutants, pp.80, Green Globes for Sustainable Interiors Technical Reference Manual v1.04 – Green Building Initiative Inc, 2017
6. All Preconditions and Optimizations of the Air Feature, pp.24, Well Building Standard v1 – Delos Living LLC, 2016

HH3 Quality Views

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2. Indoor Environmental Quality: Daylight and Quality Views, pp.475, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Indoor Environmental Quality: Quality Views, pp.419, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017
4. Light, 61: Right to Light, pp.103, Well Building Standard v1 – Delos Living LLC, 2016

HH4 Daylighting

1. Indoor Environmental Quality: Daylight, pp.723, LEED Reference Guide for Building Design and Construction v4 -US Green Building Council, 2013
2. Indoor Environmental Quality: Daylight and Quality Views, pp.475, LEED Reference Guide for Building Operations and Maintenance v4 –US Green Building Council, 2016
3. Indoor Environmental Quality: Daylight, pp.403, LEED Reference Guide for Commercial Interiors v4 -US Green Building Council, 2017

HH5 Drinking Water Filtration

1. Water, 31: Inorganic Contaminants, pp.65; Water, 32: Organic Contaminants, pp.66; 33: Agricultural Contaminants, pp.67, Water, 34: Public Water Additives, pp.68; Water, 35: Periodic Water Testing, pp.69; Water, 36: Water Treatment, pp.70, Well Building Standard v1 – Delos Living LLC, 2016

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Airport Facilities Landside/Airside New Construction/Modifications Design Standards– Revision Addendum Log

Design Standards – Revision Addendum Log
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Design Standards
Revision Addendum Log

1.0 Purpose

The purpose of this section is to reference the revisions to Section 1 through Section 9 of the Airport Facilities/Landside/Airside New Construction and Modifications Design Standards. Revisions are incorporated on a quarterly basis and design teams must adhere to the version of this document specified in Project Task Order unless otherwise directed by the City of Atlanta Department of Aviation Planning and Development Bureau . Previous versions of this document are available for reference upon request.

2.0 Revision Addendum Log

EDIT #	SECTION	LINE	EDIT TYPE	EDIT	REVISION DATE
1	1. Project Submittal and Review Standards	3.1.2	Change	Update "July 2019" to "November 2020"	Revision 1: 11/2020
2	1. Project Submittal and Review Standards	3.2.2	Change	Update "July 2019" to "November 2020"	Revision 1: 11/2020
3	1. Project Submittal and Review Standards	4.2.1	Change	Update "ten (10) business days" to "fifteen (15) business days"	Revision 1: 11/2020
4	1. Project Submittal and Review Standards	4.3.1	Change	Update "July 2019" to "November 2020"	Revision 1: 11/2020
5	2.1 Civil- Airfield	3.2.4	Change	Change "1.5"" to "1""	Revision 1: 11/2020
6	2.1 Civil- Airfield	4.2	Change	Change "Soil cement stabilized subgrade" to "crushed aggregate base course"	Revision 1: 11/2020
7	2.1 Civil- Airfield	5.1.1	Change	Change "FAA AC 150/5320-5B" to "FAA AC 150/5320-5D"	Revision 1: 11/2020
8	2.1 Civil- Airfield	5.7.2	Addition	Added "however, the 25 year hydraulic grade line should also be modeled on pipe profiles." after the word otherwise."	Revision 1: 11/2020
9	2.2 Civil - Details	All	Change	Revised Details	Revision 1: 11/2020
10	3. Structural	7.0	Change	Details No. 1-11 moved to Architectural Standards Appendix	Revision 1: 11/2020
10	3. Structural	7.0	Removal	Detail No. 12 Removed	Revision 1: 11/2020
11	3. Structural	2.4.1	Change	Update " ASCE/SEI 7-10" to "ASCE/SEI 7-16"	Revision 1: 11/2020
12	3. Structural	2.10.1.1	Change	Update "IBC 2006" to "IBC 2018"	Revision 1: 11/2020
13	4. Architectural	2.5.1	Change	Update "2.5.1 Demolition and removal of existing ceiling(s) and associated lighting systems shall include the removal of all unused hangers, supports, electrical feeds and/or other appurtenant items above the ceiling." to "2.5.1 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."	Revision 1: 11/2020
14	4. Architectural	2.7	Addition	New Section "2.7 Floor Mounted Appurtenances 2.7.1 Any appurtenances such as luggage carts, luggage cart dispensing equipment, wheel chairs, wheel chair 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."	Revision 1: 11/2020
15	5. Mechanical	2.1	Addition	Add "with amendments"	Revision 1: 11/2020
16	5. Mechanical	2.1	Removal	Remove "with Georgia Amendments"	Revision 1: 11/2020
17	5. Mechanical	3.0	Change	Change "General" to "General Drawings"	Revision 1: 11/2020
18	5. Mechanical	3.2	Addition	Add after Mechanical plans, "(HVAC, Plumbing, and Fire Protection)"	Revision 1: 11/2020

19	5. Mechanical	4.0	Change	Change "Trade Specific Requirements" to "Trade Specific Drawing Requirements"	Revision 1: 11/2020
20	5. Mechanical	4.1.9	Addition	Add "air flow balance"	Revision 1: 11/2020
21	5. Mechanical	4.2.1	Addition	Add "(as a minimum)"	Revision 1: 11/2020
22	5. Mechanical	4.2.2	Change	Change "Provide riser diagrams for all sanitary waste and vent, domestic waster system and gas systems." to "Provide riser diagrams for all sanitary waste and vent, grease waste, domestic water systems natural and gas systems."	Revision 1: 11/2020
23	5. Mechanical	5.2	Addition	Add "All out building BMS systems must connect into DOA front end BMS system."	Revision 1: 11/2020
24	5. Mechanical	6.1	Addition	Add "HVAC"	Revision 1: 11/2020
25	5. Mechanical	6.1.2	Change	Change "6.1.2 Large CPTC Public spaces are to be served by medium and low pressure VAV Rooftop AHUs 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. Separated ductwork and motorized damper for minimum and economized outside air shall be provided. Outside air and return air in mechanical rooms shall be ducted to AHUs. " to "Large CPTC Public spaces are to be served by medium and low pressure VAV Rooftop RTU or AHUs 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	Revision 1: 11/2020
26	5. Mechanical	6.2	Addition	Add "HVAC"	Revision 1: 11/2020
27	5. Mechanical	6.6.1	Addition	Add "AC to all rooms, GA Power separate" and Add "If plumbing routing through the room is unavoidable, provisions shall be made to protect equipment from water."	Revision 1: 11/2020
28	5. Mechanical	7.00	Removal	Remove "and Fire Protection"	Revision 1: 11/2020
29	5. Mechanical	7.2	Removal	Remove "7.2 Fire protection is supplied by a fire pump and jockey pump on each concourse and terminals. Dry pipe systems are provided where fire protection is subject to freezing."	Revision 1: 11/2020
30	5. Mechanical	7.2	Addition	New Section " 7.2 Restrooms 7.2.1 Public restrooms will be ADA accessible with touch free metering low flow fixtures (Per IPC). 7.2.2 All public restrooms will have floor drains in each fixture area. 7.2.3 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."	Revision 1: 11/2020
31	5. Mechanical	7.3	Addition	New Section "7.3 Back of House Restrooms 7.3.1 Restrooms will be ADA accessible with low flow fixtures (per IPC) 7.3.2 Restrooms will have floor drains"	Revision 1: 11/2020
32	5. Mechanical	7.4	Addition	New Section "7.4 Back of House Break Rooms 7.4.1 Break rooms with sinks can use storage heaters or instant electric water heaters. 7.4.2 If cooking is required or a dishwasher is required a grease trap or interceptor may be required. (See Concessions New Construction/Modifications Design Standards – Mechanical)"	Revision 1: 11/2020

33	5. Mechanical	7.5	Addition	New Section "7.5 Apron Level support areas 7.5.1 2 If cooking is required or a dishwasher is required a grease trap or interceptor may be required. (See Concessions New Construction/Modifications Design Standards – Mechanical)"	Revision 1: 11/2020
34	5. Mechanical	8.0	Addition	New Section "8.0 General System Descriptions (Fire Protection)"	Revision 1: 11/2020
35	5. Mechanical	9.0	Change	Previously Section 8.0	Revision 1: 11/2020
36	5. Mechanical	9.1.6	Addition	Add "required by codes and standards"	Revision 1: 11/2020
37	5. Mechanical	9.1.8.6	Addition	Add "(Or provide new system – coordinate with DOA Engineering)"	Revision 1: 11/2020
38	5. Mechanical	9.1.8.7	Addition	New Section "8.1.8.7 Remove any abandoned piping, hangers and ductwork."	Revision 1: 11/2020
39	5. Mechanical	9.1.8.9	Addition	New Section "8.1.8.9 Repair exterior cladding and new insulation to maintain the building envelope integrity."	Revision 1: 11/2020
40	5. Mechanical	9.1.10	Change	Change "Refer to "Design Standards - Concessions Facilities-Mechanical Engineering- Technical Standards" to "Concessions New Construction/Modifications Design Standards – Mechanical Engineering "	Revision 1: 11/2020
41	5. Mechanical	9.1.11	Addition	New Section "The Contractor is responsible for the demolition of all systems not required to serve the space in its final configuration with the exception of active systems serving other spaces passing thru the lease area."	Revision 1: 11/2020
42	5. Mechanical	9.1.12	Addition	New Section "The Contractor is responsible for the demolition of all systems not required to serve the space in its final configuration with the exception of active systems serving other spaces passing thru the lease area. 8.1.12 Removal shall include, but not be limited to: all existing piping, conduit, controls, hangers and equipment, etc. used to serve the space regardless of location within or outside the boundary of the lease space. Remove all abandoned rooftop equipment and appurtenances (capping roof openings) and all utilities (CHW/HW Primary/secondary Air, Duct, DW/ sanitary/FP/Storm/Water, etc.) located in the ceiling plenum or chases of adjacent floors. Piping abandoned will be removed back to active main and capped. Cap seal and insulate as required any active utilities. Demo electrical service back to the power panel. Coordinate the removal requirements for any buried piping and conduit with DOA engineering."	Revision 1: 11/2020
43	5. Mechanical	9.2.2	Change	Change "concessionaire" to "tenant"	Revision 1: 11/2020
44	5. Mechanical	9.3.4	Addition	Add "block walls"	Revision 1: 11/2020
45	5. Mechanical	9.4.1	Change	Change "D-CUP" to "T-CUP" , Change "I-CUP" to "E-CUP"	Revision 1: 11/2020
46	5. Mechanical	9.4.3.1	Change	Change "concession spaces" to "tenant spaces"	Revision 1: 11/2020
47	5. Mechanical	9.4.3.8	Addition	Add "All new controls shall be fully integrated with the base building BMS control system. "	Revision 1: 11/2020
48	5. Mechanical	9.4.5	Change	Change " ATL P&D Design Standards: Concessions New Construction and Major Renovations Section 6: Mechanical Standards" to "ATL P&D Design Standards: Concessions New Construction/Modifications Design Standards - Mechanical Engineering"	Revision 1: 11/2020
49	5. Mechanical	10.1.1	Addition	Add "Camfil MERV 13 high flow bag filters"	Revision 1: 11/2020
50	5. Mechanical	10.2.1	Addition	Add "Camfil MERV 13 high flow bag filters" and "in 100% outside"	Revision 1: 11/2020

51	5. Mechanical	10.2.2	Addition	Add "is achieved if"	Revision 1: 11/2020
52	5. Mechanical	10.4.1	Addition	Add "Provide turning vanes to help system balance and minimize affect."	Revision 1: 11/2020
53	5. Mechanical	10.5.1	Change	Change "Duct insulation for supply ducts" to "Duct insulation for supply air, return air, and outside air ducts"	Revision 1: 11/2020
54	5. Mechanical	10.5.2	Change	Change "Duct insulation for supply ducts" to "Duct insulation for supply air, return air, and outside air ducts"	Revision 1: 11/2020
55	5. Mechanical	10.6.1	Addition	Add "and in new facilities"	Revision 1: 11/2020
56	5. Mechanical	10.7.1	Change	Change "shall connect to and be compatible with" to "shall connect and be fully integrated with the"	Revision 1: 11/2020
57	5. Mechanical	10.7.2	Addition	New Section "10.7.2 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.)"	Revision 1: 11/2020
58	5. Mechanical	10.7.3	Addition	New Section "10.7.3 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.)"	Revision 1: 11/2020
59	5. Mechanical	10.7.4	Addition	New Section "10.7.4 Zone temperature thermostats shall be networked type sensors, communicating on either the SA or BACnet bus."	Revision 1: 11/2020
60	5. Mechanical	10.9.2	Addition	Add "where possible"	Revision 1: 11/2020
61	5. Mechanical	10.9.4	Addition	Add "closed cell"	Revision 1: 11/2020
62	5. Mechanical	10.9.6	Addition	Add "and MDF-IDF"	Revision 1: 11/2020
63	5. Mechanical	11.1.3	Addition	Add "exterior" grease inceptor, and "Provide joint restraints as recommended by the manufacturer"	Revision 1: 11/2020
64	5. Mechanical	11.2.2	Change	Change "2-1/2" to "4" and add "fittings with neoprene "O" ring"	Revision 1: 11/2020
65	5. Mechanical	11.2.3	Change	Change "2-1/2" to "4"	Revision 1: 11/2020
66	5. Mechanical	11.2.4	Change	Change "2-1/2" to "4"	Revision 1: 11/2020
67	5. Mechanical	11.4.4	Change	Change "the same as in kitchen except" to "a minimum of 1-1/2"	Revision 1: 11/2020
68	5. Mechanical	11.4.5	Change	Change "drains" to "drain body"	Revision 1: 11/2020
69	5. Mechanical	12.1.2	Addition	Add "and thrust blocks or tie-rods."	Revision 1: 11/2020
70	5. Mechanical	12.1.3	Change	Change "Mechanical grooved" to "Grooved	Revision 1: 11/2020
71	5. Mechanical	12.2.3	Addition	New Section "12.2.3 Sound dampening devices are required for all compressor installations (I. e. sound blankets, soundproof enclosures, etc.)"	Revision 1: 11/2020
72	5. Mechanical	13	Addition	New Section "Appendices"	Revision 1: 11/2020

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