



Hillsborough County Aviation Authority

Design Criteria Manual

October 1, 2022



Table of Contents

Introduction	7
Section 1 – Civil Engineering and Site Work	8
1.1 Abbreviations for Civil Engineering and Site Work Sections	8
1.2 Roadways	8
1.2.A Related Sections – Reserved	8
1.2.B Scope – Reserved	8
1.2.C Applicable Codes and Reference Standards	8
1.2.D Planning Objectives	8
1.2.E Authority Standards – Reserved	8
1.2.F Vehicular / Bus Design Consideration	8
1.3 Airfield Paving: Runways, Taxiways, and Aprons	8
1.3.A Related Sections – Reserved	9
1.3.B Scope – Reserved	9
1.3.C Applicable Codes and Reference Standards	9
1.3.D Planning and Functional Criteria	9
1.3.D.1 Line-of-Sight	9
1.3.D.2 Gradients and Slopes	10
1.3.D.3 Aprons	10
1.3.D.4 Geotechnical Investigation	10
1.3.D.5 Earthwork	11
1.3.D.6 Pavement Design	11
1.3.D.7 Pavement Type	11
1.3.D.8 Underdrains	12
1.3.D.9 Concrete Demolition	12
1.3.D.10 Subbase and Base Course	12
1.3.D.11 Portland Cement Concrete (PCC) Pavement	12
1.3.D.12 Asphalt Pavement	12
1.3.D.13 Pavement Marking	12
1.4 Surface Water Management	13
1.4.A Related Sections – Reserved	13
1.4.B Scope – Reserved	13
1.4.C Applicable Codes and Reference Standards	13
1.4.D Guidelines for Surface Water Management Design	13
1.4.E Storm Sewers	14
1.4.F NPDES Construction Generic Permit for Construction Activities	15
1.4.G Availability of SLOSH Model Evaluation for TPA	15
1.5 Site Utilities	15
1.5.A Related Sections	15
1.5.A.1 Section 1.4 - Surface Water Management	16
1.5.A.2 Section 2.2.A.6 Typical Facility Plumbing	16
1.5.A.3 Section 3.15	16
1.5.B Scope – Reserved	16
1.5.C Sanitary Sewers and Force Mains	16
1.5.D Water Mains and Appurtenances	16
1.5.E Sanitary Sewer – Pretreatment Devices and Other Appurtenances	17
1.5.E.1 Applicable Standards and Regulations	17

1.5.E.2	Wash Racks	17
1.5.E.3	Floor Drains	17
1.5.E.4	Utility Permits	18
1.5.E.5	Easements	18
1.6	Fueling Systems: Aircraft and Automotive	18
1.6.A	Related Sections – Reserved	18
1.6.B	Scope – Reserved	18
1.6.C	Applicable Codes and Reference Standards	18
1.6.C.1	USTs with capacities of > 110 gallons	18
1.6.C.2	ASTs with capacities of > 550 gallons that store pollutants or hazardous substances	18
1.6.D	Aircraft Hydrant Fueling System	19
1.6.D.1	New Installation	19
1.6.D.2	Removal & Abandonment of Existing Hydrant Piping	19
1.6.E	Automotive, Emergency Generator, and Other Tank Fueling Systems	19
1.6.F	Notification and Registration Protocol	20
1.6.G	Design and Installation Requirements – Reserved	20
1.6.H	Underground Storage Tank Removal/Abandonment Pre-Tank Removal Requirements	20
1.6.I	Tank and Soil Removal Operations	21
1.6.J	Tank Disposal Operations	21
1.6.K	Free Product Removal and Groundwater Testing	21
1.6.L	Storage Tank Forms	21
1.6.M	Closure Assessment	22
1.6.N	Post-Removal Activities	22
1.7	AGT Guideways - Reserved	22
1.8	Landscaping and Irrigation	22
1.8.A	Related Sections – Reserved	22
1.8.B	Scope – Reserved	22
1.8.C	Applicable Codes and Reference Standards	22
1.8.D	Planning Objectives	23
1.8.E	Authority Standards	23
1.8.E.1	Soil and Planting Beds	23
1.8.E.2	Acceptable Plant Materials	24
1.8.E.3	Irrigation	25
1.8.F	Erosion Control During Construction	26
1.8.G	Specified Turf Varieties	26
1.8.H	Anti-Perching Devices	26
1.9	Site Signage and Graphics – Reserved	26
1.10	Access Control	26
1.10.A	Equipment	26
1.11	Fencing and Gates	27
1.11.A	AOA Fence Requirements	27
1.11.B	Non-AOA Fence Requirements	27
1.11.C	Temporary AOA Fence	27
1.11.D	Razor Wire	27
1.11.E	Concrete Barricades	28
1.12	FAA Systems – Reserved	28
Section 2 - Architecture – Building Engineering		29

2.1	Applicable Codes and Reference Standards	29
2.2	Building Objectives - Planning Criteria	29
2.2.A	Typical Facility Objectives	29
2.2.A.1	Geotechnical	29
2.2.A.2	Structural	31
2.2.A.3	Architectural	32
2.2.A.4	Equipment/Furnishings	42
2.2.A.5	Conveying Systems	43
2.2.A.6	Miscellaneous Structural Considerations - Reserved	43
2.2.A.7	Miscellaneous Plumbing Requirements	43
2.2.A.8	Miscellaneous Fire Protection Requirements	44
2.2.A.9	Miscellaneous Mechanical Requirements	45
2.2.A.10	Miscellaneous Power Requirements	45
2.2.A.11	Miscellaneous Lighting Requirements	46
2.2.A.12	Miscellaneous Systems Requirements	47
2.2.B	Airside Terminals and Truck Courts	47
2.2.B.1	General Planning Criteria	47
2.2.B.2	Equipment/Furnishings	51
2.2.B.3	Conveying Systems	52
2.2.B.4	Miscellaneous Structural Considerations	52
2.2.B.5	Miscellaneous Plumbing Requirements	52
2.2.B.6	Miscellaneous Mechanical Requirements	53
2.2.B.7	Miscellaneous Power Requirements	53
2.2.B.8	Miscellaneous Lighting Requirements	54
2.2.B.9	Miscellaneous Systems Requirements	54
2.2.B.11	Truck Court Elements	55
2.3	Attic Stock / Spare Equipment / Spare Parts	58
Section 3 – Building Sections and Components		59
3.1	Division 1 – General Requirements - Reserved	59
3.2	Division 2 – Site work – Reserved	59
3.2.A	Section 02221 – Building Decommissioning and Demolition	59
3.3	Division 3 - Concrete	59
3.3.A	Section 03200 - Concrete Reinforcement	59
3.4	Division 4 - Masonry	60
3.4.A	Section 04200 - Unit Masonry	60
3.5	Division 5 – Metals	60
3.5.A	Section 05511 - Metal Stairs	60
3.6	Division 6 – Wood and Plastics	60
3.6.A	Section 06100 - Rough Carpentry	60
3.7	Division 7 – Thermal and Moisture Protection	60
3.7.A	Section 07190 - Water Repellants	60
3.7.B	Section 07411 – Metal Roof Panels	60
3.8	Division 8 – Doors and Windows	61
3.8.A	Section 08110 - Steel Doors and Frames	61
3.8.B	Section 08211 - Flush Wood Doors	62
3.8.C	Section 08411 – Aluminum-framed Entrances and Storefronts	62

3.8.D	Section 08461 – Sliding Automatic Entrance Doors	62
3.8.E	Section 08710 - Door Hardware	62
3.9	Division 9 - Finishes	63
3.9.A	Section 09220 - Portland Cement Plaster	63
3.9.B	Section 09310 - Ceramic Tile	63
3.9.C	Section 09770 – Wall Panel Systems: Art Glass	63
3.10	Division 10 - Specialties	64
3.10.A	Section 10155 - Toilet Compartments	64
3.10.B	Section 10265 – Impact-resistant Wall Protection	64
3.10.C	Section 10450 - Pedestrian Control Devices	64
3.10.D	Section 10801 - Toilet Accessories	64
3.11	Division 11 – Equipment - Reserved	65
3.12	Division 12 – Furnishings - Reserved	65
3.13	Division 13 – Special Construction	65
3.13.A	Section 13900 - Fire-Suppression System	66
3.14	Division 14 – Conveying Systems	66
3.14.B	Section 14215 – Electric Traction Elevators	67
3.14.C	Section 14240 - Hydraulic Elevators	67
3.14.D	Section 14310 - Escalators	67
3.14.E	Section 14410 - Dumbwaiters	67
3.14.F	Section 14600 - Outbound Baggage Conveyors	67
3.14.G	Section 14630 - Sloped-Plate Sorting Carousels - Reserved	67
3.14.H	Section 14650 - Inbound Baggage Conveyors (Flat-Plate)	67
3.14.I	Section 14800 - Apron-Drive Passenger Loading Bridges	68
3.15	Division 15 - Mechanical	68
3.15.A	Section 15030 - Electrical Requirements for Mechanical Equipment	68
3.15.A.1	Basic Motor Construction (15055)	68
3.15.A.2	Variable Frequency Drives (For Air Handling Units & Pumps)	69
3.15.B	Section 15050 - Basic Mechanical Materials and Methods	70
3.15.B.1	Housekeeping Pads and Equipment Supports	70
3.15.B.2	Identification of Piping and Equipment	70
3.15.C	Section 15060 - Pipes and Pipe Fittings	71
3.15.D	Section 15110 – Valves	72
3.15.E	Section 15185 - Pumps	72
3.15.E.1	Basic Pump Construction	72
3.15.E.2	Double Suction Pump	73
3.15.E.3	Domestic Water Booster Pump	73
3.15.F	Section 15410 - Plumbing Fixtures	73
3.15.G	Section 15485 - Plumbing Equipment	75
3.15.G.1	Electric Water Heaters	75
3.15.H	Section 15710 - Cooling Tower	76
3.15.I	Section 15800 - Air Handling Units	77
3.15.J	Section 15845 – Variable Air Volume Terminal Units	78
3.15.K	Section 15855 - Diffusers, Registers, and Grilles	78
3.15.L	Section 15890 – Ductwork	78
3.15.M	Section 15900 – HVAC Instrumentation and Controls Airside E	79
3.16	Division 16 - Electrical	79

3.16.A	Section 16050 - Basic Electrical Materials and Methods	79
3.16.B	Section 16060 - Grounding and Bonding	80
3.16.C	Section 16075 - Electrical Identification	80
3.16.D	Section 16110 – Raceways	80
3.16.E	Section 16120 - Conductors and Cables	82
3.16.F	Section 16130 – Raceways and Boxes	83
3.16.G	Section 16140 - Wiring Devices	83
3.16.H	Section 16190 - Supporting Devices	84
3.16.I	Section 16289 - Transient Voltage Suppression	84
3.16.J	Section 16415 - Automatic Transfer Switch (ATS)	84
3.16.K	Section 16425 - Distribution Switchboards	85
3.16.K.1	Products – General	85
3.16.K.2	Finish	85
3.16.K.3	Bussing and Terminations	85
3.16.K.4	Accessories	86
3.16.K.5	Control Wiring	86
3.16.K.6	Main Section	86
3.16.K.7	Distribution Sections	86
3.16.L	Section 16430 - Switchgear	87
3.16.M	Section 16440 - Disconnect Switches	87
3.16.N	Section 16442 - Panelboards	87
3.16.O	Section 16450 - Grounding	87
3.16.P	Section 16461 - Transformers	88
3.16.Q	Section 16442 - Panelboards	88
3.16.R	Section 16475 - Overcurrent Protective Devices	89
3.16.R.1	Description of System	89
3.16.R.2	Circuit Breakers	89
3.16.R.3	Fuses	89
3.16.R.4	Spare Fuse Cabinet	89
3.16.R.5	Identification Label	89
3.16.S	Section 16511 - Interior Lighting	90
3.16.T	Section 16670 - Lightning Protection	90
3.16 U	Airfield Lighting	90
3.17	Telecommunications Infrastructure Standards	91
3.17.A	General	91
3.17.A.1	Reference Standards	91
3.17.A.2	Submittals	92
3.17.A.3	Delivery, Storage, and Handling	93
3.17.B	Products	93
3.17.B.1	General – Materials Alternates and Substitutions	93
3.17.B.2	Fiber Optic Backbone Cable Subsystem	94
3.17.B.3	Fiber Distribution Panels	95
3.17.B.4	Fiber Cable LC Connectors	95
3.17.B.5	Fiber Optic Patch Cables	95
3.17.B.6	Interior Copper Cable Backbone Subsystem	95
3.17.B.7	Outside Plant Copper Cable Subsystem	96
3.17.B.8	Cable Voltage Protection	96
3.17.B.9	Horizontal Cable Subsystem	96
3.17.B.10	Station Cable Faceplates and Jacks	97
3.17.B.11	Category 6 Patch Panels	98
3.17.B.12	Fiber Optic Distribution Panels	98
3.17.B.13	Equipment Racks	98

3.17.B.14	Category Patch Cables and Fiber Optic Cross-Connect Cables _____	99
3.17.C	Execution _____	99
3.17.C.1	Installation _____	99
3.17.C.2	Testing _____	106
3.17.C.3	General Instructions _____	109
3.18	Aviation Authority Labeling Standards _____	109
Section 4 – Miscellaneous _____		114
4.1	Safety Risk Management _____	114
4.2	Environmental Matters _____	114
4.2.A	Radon Gas and Other Property Condition Notifications _____	114
4.2.B	Hazardous Substance Limitations on Construction Projects _____	115
4.2.B.1	Design Phase Considerations _____	115
4.2.B.2	Construction Phase Considerations _____	115
4.2.C	Management of Existing Site Conditions _____	116
4.2.C.1	Design Phase Considerations _____	116
4.2.C.2	Construction Phase Considerations _____	116
4.2.D	Definitions _____	117
4.2.D.1	Hazardous Substance Definition: _____	117
4.2.D.2	Solid Waste Including Universal Waste Definition _____	117
4.3	Airfield Lighting Control and Monitoring System _____	118
4.4	Design Quality Control / Assurance _____	118
4.5	Construction Cost Estimating _____	118
Appendix A - Main Terminal Public Restroom Criteria _____		120

Introduction

The criteria in this manual applies to all capital development projects administered by the Aviation Authority at Tampa International Airport (TPA), Peter O. Knight Airport (TPF), Tampa Executive Airport (VDF) and Plant City Airport (PCM) each referred to collectively herein as airport. The criteria in this manual is optional for any tenant development on airport property.

The objective of the Design Criteria Manual is to provide guidance to design professionals in areas where Hillsborough County Aviation Authority (Authority or owner) preferences may be provided in a manner that does not detract from the design intent. At all times it remains the responsibility of the design professional to ensure that all aspects of the design including plans, technical specifications and shop drawing reviews provide a finished product that complies with their Contract, project objectives, all applicable codes, standards and regulations. Coordination of the contract documents and information included in Division 0 and 1 of the Project Manual is the responsibility of the design professional.

It is incumbent on the design professional to identify and resolve any conflicts between criteria established in this and other criteria manuals published by the Authority with industry regulatory and advisory criteria and guidance. In some circumstances the term owner refers to a tenant or similar party that commissions design and construction on Authority property under a build-to-suit arrangement.

Other sources of design criteria which should be reviewed and incorporated, as applicable, by the design professional are as follows and can be obtained at tampairport.com:

- Main Terminal Interior Design Criteria Manual
- Sustainable Design Criteria Manual
- Concessions Design Criteria Manual
- Land Use Standards
- Wayfinding Standards Manual
- CADD Standards Manual

Section 1 – Civil Engineering and Site Work

1.1 Abbreviations for Civil Engineering and Site Work Sections

CFR	Code of Federal Regulations
COT	City of Tampa
DOT	Department of Transportation
EPC	Hillsborough County Environmental Protection Commission
ERP	Environmental Resource Permit
FAA	Federal Aviation Administration
FAC	Florida Administrative Code
FAR	Federal Aviation Regulations
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
NGVD	National Geodetic Vertical Datum (1929 or 1983 as applicable)
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination system
OSHA	Occupational Safety and Health Administration
PC	City of Plant City
SWFWMD	Southwest Florida Water Management District
SWPPP	Stormwater Pollution Prevention Plan
SPCC	Spill Prevention Control and Countermeasure Plan

1.2 Roadways

1.2.A Related Sections – Reserved

1.2.B Scope – Reserved

1.2.C Applicable Codes and Reference Standards

The design of all Authority roadways intended for automotive vehicular use, and not otherwise subject to any state or FAA standard, will be in accordance with the design criteria contained in the applicable edition of the State of Florida “Manual of Uniform Minimum Standards for Design, Construction, and Maintenance of Streets and Highways”. Should these standards not be able to be met for any reason, the design professional shall notify the Authority in writing and discuss during design meetings.

1.2.D Planning Objectives

The design professional shall coordinate with FDOT regarding any know planned FDOT improvements which impact the airport.

1.2.E Authority Standards – Reserved

1.2.F Vehicular / Bus Design Consideration

Vehicle types utilized and to be utilized will be taken into consideration for design of proper clearances. When roadways are under signage structures and covered drive lanes, design considerations will be taken to specify appropriate fire protection and material to prevent vehicular / bus exhaust heat damage to the building or actuation of the fire alarm or fire sprinkler system.

1.3 Airfield Paving: Runways, Taxiways, and Aprons

1.3.A Related Sections – Reserved

1.3.B Scope – Reserved

1.3.C Applicable Codes and Reference Standards

Minimum design standards will be in accordance with the appropriate Advisory Circulars and Federal Aviation Regulations.

All proposed construction standards will be in accordance with Advisory Circular 150/5370-10, Standards for Specifying Construction of Airports.”

Pavement designs and establishment of subgrade characteristics and properties will be in accordance with the latest edition of the FAA Advisory Circular, AC 150/5320-6, Airport Pavement Design and Evaluation.

Erosion and sediment control measures must conform to the specifications contained in the document, Roadway and Traffic Design Standards Erosion Control and Water Quality, published by the State of Florida Department of Transportation.

Geotechnical testing shall conform to applicable sections or ASTM Volume 04.08, Soil and Rock; Building Stones; Geotextiles.

Geotechnical testing and engineering will be conducted by corporations and experienced individuals licensed to practice this specialty by the State of Florida.

1.3.D Planning and Functional Criteria

Critical Design Aircraft: Critical Design Aircraft (CDA) will be identified for each project design pertaining to any of the following airfield elements:

- a. Width, Clearances, and Separations of Taxiways and Parking Aprons: The CDA, or its associated Airplane Design Group Number, per AC 150/5300-13, will be recommended by the design professional and approved by the Authority.
- b. Taxiway Design Group will be recommended by the design professional and approved by the Authority.

Geometrics: All airfield geometry will conform to the current Airport Layout Plan (ALP) where applicable, and will accommodate all Group V aircraft unless otherwise directed by the Authority. Detailed geometry not included or referenced on the ALP will conform to the requirements in AC 150/5300-13 and other relevant advisory circulars, except as directed by the Authority.

1.3.D.1 Line-of-Sight

- a. All public-use taxiways will conform to the line-of-sight criteria of AC 150/5300-13, Airport Design. Public use taxiways, under the control of the Air Traffic Control (ATC) tower, will be in full view of the tower cab, full length and width. An ATC Tower Line-of-Sight (Shadow) study will be performed by the design professional if in a potential ATC shadow zone. The responsibility for preparing this plan will be as directed by the Authority. Aprons and exclusive-use taxiways are not under the control of ATC and, therefore, normally do not require line-of-sight.
- b. Line-of-sight considerations may also be required when facilities are planned and designed near or in the vicinity of FAA NAVAIDS. Unless otherwise

directed by the Authority, all proponents of construction, except those funded under the Airport Improvement Program (AIP), will complete an FAA Form 7460-1, "Notice of Proposed Construction or Alteration," with appropriate information and exhibits required by the FAA on which the FAA can conduct an Aeronautical Study of the proposal.

1.3.D.2 Gradients and Slopes

All paved and turfed areas on the airfield AOA will conform to the requirements of AC 150/5300-13 and the following criteria:

- a. Side slopes on excavation (cut) and embankment (fill) areas outside of runway and taxiway safety areas will have 4:1 maximum slope.
- b. The standard crowns (transverse slope) on taxiways will be 1.5%, except where flatter grades are necessary due to intersection transition in which case they will be a minimum of 0.5% for concrete pavements and 0.7 % for asphaltic pavements.
- c. All taxiway shoulders will be graded 5% surface gradient for 10 feet, and then graded between 3% to 5% surface gradient to the edge of the taxiway safety area.
- d. Pavement gradients on aircraft parking aprons will be 0.5 to 1.0%. Where conforming or transitioning to existing facilities, and except for 50 feet from terminal buildings at the gate/parking positions, they will be 1.0% to conform to NFPA Standard 415 on airport terminal buildings, fueling ramp drainage, and loading walkways.
- e. Gradients and slopes for the following areas will conform to the requirements of AC 150/5300-13 for the respective aircraft approach category and airplane design group: Obstacle Free Zone, Runway and Taxiway Safety Areas, Clearway, and Stopway.
- f. Due to the critical nature of grades for all airfield pavements, safety areas, obstacle free zones, and other related areas, preparation of design plans will include a combination of both cross sections and grading plans to accurately portray the design intent.

1.3.D.3 Aprons

Aircraft parking aprons will be based on an Apron Utilization Plan, approved by the Authority. The responsibility for preparing this plan will be as directed by the Authority. Apron utilization criteria, including wingtip clearance, will be approved by the tenant and the Authority, and will be within the maneuvering limits of the Aircraft Characteristics Manual of the Critical Design Aircraft.

1.3.D.4 Geotechnical Investigation

Guidelines for a geotechnical investigation are contained in FAA AC 150/5320-6, Airport Pavement Design and Evaluation. Standard Penetration Test (STP) boring should be performed per 10,000 square feet of area. At a minimum, the following guidelines should be observed in the design investigation:

- a. In taxiway areas, STP borings should be performed at 200-foot intervals along centerlines.

- b. Borings should be SPT, and should extend to at least 10 feet in depth. At approximately 500-foot centers, borings should extend a minimum of 25 feet in depth.
- c. Any potential borrow material sources should be adequately investigated to evaluate acceptability.
- d. Borings and testing locations should carry airport grid coordinate locations, and ground surface NGVD elevations.
- e. Testing locations, procedures, and times of testing should be established well in advance of testing, and must be coordinated with representatives of the Authority. Test locations should be cleared for utilities by the Design Consultant, the Authority, and affected utility companies. All areas disturbed by testing should be restored satisfactorily.
- f. Sufficient field and laboratory testing should be performed to establish classifications and properties for the various strata encountered. This will include determination of Unified Soil Classifications, plasticity/consolidation properties, permeability, in-place density, typical bearing ratio-moduli values, and groundwater conditions.

1.3.D.5 Earthwork

Specific recommendations will be made for the project needs in the areas of clearing and grubbing, undercutting, proof rolling, embankment construction, suitable materials, compaction, stabilization, subgrade preparation, and any special procedures to be used. FAA Advisory Circulars and/or FDOT standards will be reviewed as applicable. For unit cost projects, the earthwork will be separated into the following pay items as appropriate:

- Unclassified excavation
- Unsuitable excavation
- Embankment
- Borrow

1.3.D.6 Pavement Design

The design professional will provide a pavement design utilizing FAARFIELD software in accordance with the methods prescribed in the latest edition of AC 150/5320-6. The determination of the recommended pavement sections shall consider all factors including initial cost, constructability, long-term maintenance, past experiences at Tampa International Airport or General Aviation Airports as appropriate and adaptability to future changes.

1.3.D.7 Pavement Type

Unless directed otherwise by the Authority, all air carrier airfield pavements will be rigid Portland Cement Concrete (PCC) pavement, General Aviation Taxiways or Ramps and blast protective pavement (shoulders) will be asphaltic concrete pavement. Blast protective pavement type will be recommended by the design professional, based on an occasional pass by the critical maintenance or Airfield Rescue and Fire Fighting (ARFF) equipment. General aviation pavement will be designed for the most demanding aircraft and approved by the Authority.

1.3.D.8 Underdrains

An underdrain/edge drain system should be reviewed for necessity on all pavement sections. If underdrains are not recommended, the design professional will present the basis on which they are not recommended and submit to Authority for approval. System layout, elements, and design will be designed based on soils investigation results, pavement function, and other relevant factors and parameters.

1.3.D.9 Concrete Demolition

All existing airfield concrete pavement to be removed will be crushed to meet the FAA P-209 grading specification for use in the project or stockpiled for future use as directed by the Authority. This material will be incorporated into the following items and approved by the Authority as applicable:

- a. Aggregate source for econcrete subbase (FAA P-306)
- b. Aggregate source for shoulder base course. (FAA P-209)

Existing econcrete subbase materials will not be incorporated into the crushing operations when creating the FAA P-209 crushed aggregate material.

1.3.D.10 Subbase and Base Course

All full-strength airfield pavements will include econcrete subbase (FAA P-306) as a minimum. A crushed aggregate base course (FAA P-209) will also be included if sufficient crushed concrete materials are available.

1.3.D.11 Portland Cement Concrete (PCC) Pavement

PCC will be designed based on 650 PSI flexural strength at twenty-eight (28) calendar days. Mix design proportions and criteria will meet FAA P-501 (AC 150/5370-10). Longitudinal and transverse construction and contraction joints will be doweled. Keyways are not allowed. Surface texture may be burlap drag or broom finish. Joints will be sealed with Dow Corning 888 or 890-SL silicone as applicable. Preformed joint sealers will be used on all sawed contraction joints.

1.3.D.12 Asphalt Pavement

Asphalt pavement will be used on shoulders and General Aviation Ramps and Taxiways/Taxilanes. Mix design proportions and criteria will be FAA P-401 (AC 150/5370-10, Standards for Specifying Construction of Airports). All concrete-to-asphalt conform joints will be sawed and sealed to retard moisture intrusion and vegetation growth.

1.3.D.13 Pavement Marking

Pavement marking of aprons, taxiways, taxilanes, and paved shoulders will conform to AC 150/5340-1, Standards for Airport Markings, and approved by the Authority. Taxiway centerline markings and apron taxilane marking will be yellow and a minimum of 12 inches wide. All taxiway/taxilane centerline markings (on concrete) will have a 6" black outline applied. Lead-in lines will be yellow, fire lanes will be red, and service roads will be white.

Designers are responsible for verifying the accuracy of existing airfield pavement markings within their area of work. It is not acceptable to include plan notes to re-paint existing markings in their current location. All marking plans must include detailed marking layout data to ensure the final markings are fully compliant with FAA criteria. If proposed

pavement marking will result in a paint dry film thickness greater than 40 mils, then full marking removal must be specified prior to painting.

Taxiway shoulder markings will not be installed.

Thermoplastic pavement markings will be installed on asphalt surfaces on all landside roadways. Temporary roadways and/or roadways that are expected to be modified in the near term may utilize other marking types with the approval of the Authority. Permanent tape pavement markings will be installed on concrete surfaces on all landside roadways.

For surfaces with coatings such as parking decks, traffic paint meeting Federal Specification TT-P-1952F will be used. The design professional will specify the appropriate type specific to project conditions.

1.4 Surface Water Management

1.4.A Related Sections – Reserved

1.4.B Scope – Reserved

1.4.C Applicable Codes and Reference Standards

The drainage requirements of the Authority and the FAA will be met.

The drainage connection permitting requirements of the FDOT, Chapter 14-86, F.A.C., will be met if applicable.

All proposed drainage structures and construction methods will be in accordance with FDOT Roadway and Traffic Design Standards (Latest Version - English Units), and Standard Specifications for Road and Bridge Construction most recent version (English Units). Special design considerations will be applied when drainage structures are located within airfield pavement or safety areas of the airfield.

All dredge and fill activities in wetlands and waters of Florida may require permits. All permits will be obtained for these activities from FDEP, SWFWMD, EPC, and the USCOE (United States Army Corps of Engineers).

The surface water management system design methods will be in accordance with approved SWFWMD, FDOT, City of Tampa, and FAA design methodologies.

All building, parking, and roadway areas will meet SWFWMD, City of Tampa, and other applicable federal, state, or local criteria regarding finish floor or low edge of pavement elevations.

1.4.D Guidelines for Surface Water Management Design

All features of any stormwater management system proposed for the Authority projects are to be conceptually visualized and depicted on preliminary drawings, coordinated with the Authority's existing Master Stormwater Management Plan and approved by the Authority. These documents are to be presented in preliminary meetings with applicable regulatory agencies for comments and conceptual approval prior to final design.

Coordination with regulatory agencies, such as SWFWMD, City of Tampa, FDEP, EPC and so forth, will be conducted prior to the design of the surface water management system to determine the exact regulatory permitting requirements.

Representatives of SWFWMD, FDEP, and EPC should be contacted and arrangements made for a field review. Existing permitting treatment systems should be identified and modifications / mitigation plans coordinated with regulatory agencies.

All permit application documents will be submitted to the Authority for review and comment prior to their submission to any agency.

The surface water management system must be designed to alleviate existing flooding problems to permanent structures within the project area. Any relocated drainage structures or stormwater systems must be able to convey the flows of their initial design. There should be no decrease in peak flow capacity to existing stormwater systems or increases in hydraulic gradients which would cause increased flooding on or off airport property as a result of the proposed surface water management system.

The modifications to the surface water management system will not degrade the existing water quality of the Spruce Street Canal Basin. The co-mingling of treated and untreated stormwater runoff should be prevented.

Off-site areas upstream and downstream will not be adversely affected by the time, stage, volume, or point or manner of discharge from the surface water management system.

Existing pump/irrigation systems will be considered in the surface water management system design. Existing stormwater control structures (i.e., weirs, orifices, and so forth) will be considered in the surface water management system design.

The velocities of flow over grassed areas should be kept low enough to prevent erosion.

Extended periods of ponding in depressed areas should be prevented to decrease the potential of bird activity.

Clearances of ground water levels to the pavement bases should be sufficient to prevent adverse impacts to the pavements and pavement bases.

The net differences in impervious areas (i.e., pavement added, versus pavement removed), will be considered in the surface water management system design and permitting. A zero net difference will be achieved if possible.

If stormwater pond facilities are necessary for quantity and for quality treatment, FAA AC 150/5200-33 Hazardous Wildlife Attractants on or near Airports will be reviewed. Ponds will be designed for dry detention rather than wet detention. Side slopes will be 4:1 (maximum slope) with a ten foot (minimum) maintenance berm. Whenever possible water quality standards will be met by utilizing detention with effluent filtration systems (underdrains). For airfield projects, quality standards will be met by utilizing Best Management Practices (BMPs) design such as vegetative control measures wherever possible. Water quantity standards may or may not be required depending on the drainage basin in which the project is located.

All existing contributing drainage areas including roadways, parking areas, off-site areas, and so forth, will be included in the surface water management system design.

1.4.E Storm Sewers

All Drainage Structures will conform to the FDOT's *Roadway and Traffic Design Standards*, latest version. Special design considerations will be applied when drainage structures are located within airfield pavements or safety areas of the airfield. Advisory Circular 150/5320-6G Airport Pavement Design and Evaluation Appendix B will be considered for these structures.

Except as may be specifically approved by the Authority, all storm drain pipe is to be reinforced concrete, of a minimum diameter of 15 inches, and conform to the FDOT Standard Specifications for Road and Bridge Construction, Concrete Pipe Section 941-1 and 941-2. Other pipe types that may be considered are polyvinyl chloride and corrugated polyethylene as appropriate for the project and approved by the Authority.

For all pipes 36" in diameter and greater to be installed on airfield projects, the contractor must provide the pipe supplier certified D-load test results for any lot of pipe delivered to the site.

Pipe bedding will consist of a bed of granular material having a thickness of at least six inches (6") below the bottom of the pipe and extending up around the pipe for a depth of not less than 30% of its vertical outside diameter. Filter fabric will be placed over the granular material and each pipe joint will be wrapped with a minimum one foot (1') overlap.

All pipes are to be kept clear of debris at all times during construction. After the completions of all earthwork and the placement of all sod and/or seeding and mulching and before final acceptance, all pipes will be cleaned of silt, debris, etc. to the satisfaction of the Engineer. This may require the de-watering of the pipes. Care must be taken during this operation so as not to damage the pipes or the surrounding areas.

The hydraulic gradient elevation in manholes and inlets will be a minimum of 1.0 foot below the throat of inlet or top of manhole unless minor energy losses are considered in the hydraulic calculations. The maximum velocity in open channels should be evaluated and comply with the FDOT Drainage Manual. Energy dissipation measures should be considered to minimize erosion in the drainage system.

The maximum length of pipe between access entry structures will be 300 feet for pipes less than 18 inches, 400 feet for pipes 24-36 inches, and 500 feet for pipes greater than 36 inches.

1.4.F NPDES Construction Generic Permit for Construction Activities

To obtain permit coverage, a NOI for Construction Generic Permit must be submitted by the contractor to FDEP online using FDEP's Interactive NOI, or by submitting a paper copy, on FDEP Form 62-621.300(4)(b), to FDEP's NPDES Stormwater Notices Center. A copy of the contractor's SWPPP must be kept onsite. If an Environmental Resource Permit (ERP) was issued by SWFWMD, the Erosion and Sediment Control Plan prepared as part of the permit requirements can be used in lieu of a SWPPP, provided that all requested information is included in the Erosion and Sediment Control Plan. At the completion of the work, FDEP form 62-621.300(6), Notice of Termination, must be submitted to FDEP.

1.4.G Availability of SLOSH Model Evaluation for TPA

The Authority will make available the Hurricane Surge Analysis Report that evaluated Tropical Storm and various Hurricane Category storm surge elevations using NOAA's SLOSH model for the TPA property.

1.5 Site Utilities

The Authority will make available the Utility Atlas Reference which provides information on site utilities at all facilities owned and operated by the Authority in CAD format. While the information is comprehensive, the Authority doesn't guarantee the accuracy of the information. The design professional is advised to verify any information during design deemed to be critical to the project.

1.5.A Related Sections

1.5.A.1 Section 1.4 - Surface Water Management

1.5.A.2 Section 2.2.A.6 Typical Facility Plumbing

1.5.A.3 Section 3.15

1.5.B Scope – Reserved

1.5.C Sanitary Sewers and Force Mains

Gravity sanitary sewers will be Polyvinyl Chloride for normal use and Ductile Iron for occasions requiring special strength or protection.

Polyvinyl Chloride pipe and fittings will conform to ASTM Specifications D-304 (SDR 35). The bell end of joints and fitting will have a rubber sealing ring to provide a tight, flexible seal in conformance with ASTM D-3212-76. The maximum laying length will be 12.5 feet.

Ductile Iron pipe and fittings for gravity sewers will conform to the specification for Ductile Water pipe (see Section 1.4.E), excepting that Ductile Iron pipe conveying sanitary sewer will have an interior “polylining” per manufacturer’s recommendations.

Sanitary sewer force mains will be either Polyvinyl Chloride or Ductile Iron and will conform to the Polyvinyl Chloride and Ductile Iron specifications for water mains (see Section 1.5.E following), except that Ductile Iron pipe will be provided with an interior polylining in accordance with manufacturer’s recommendation.

1.5.D Water Mains and Appurtenances

Ductile Iron pipe and fittings will be in accordance with ANSI / AWWA C 151 / A21.51-81. Pipe will have an asphalt coated exterior and a cement lined interior in accordance with ANSI / AWWA C104 / A21.4-80.

Pipes larger than 8 inches will be Ductile Iron.

Polyvinyl Chloride pipe (up to and including 8 inch size) will be in accordance with ANSI / AWWA C900-81 and with ASTM-D2241 and D-1784.

PVC pipe must be compatible with Cast and Ductile Iron pipe without the need for special adapters.

The bell of PVC pipe will consist of an integral wall section with an elastomeric ring which meets the requirements of ASTM D-1869.

Gate valve discs will be suitable for operation in any position with respect to the vertical. Valves for interior piping or exposed above grade will be handwheel operated.

Valves three inches and larger buried below grade will be equipped with a two inch square operating nut, valve box, and cover. The direction of opening for all valves will be to the left (counter-clockwise). Unless otherwise specified, valves for pressure service will be rated at not less than 150 psi, cold water, and nonshock.

Fire hydrants will be in accordance with AWWA Specification C-502 with breakable, dry-barrel, in two sections with the breaking flange located approximately 2 inches above the ground line. The main valve opening will not be less than 5 ¼ inches, and the hydrant nozzles will consist of two 2 ½ inch hose nozzles and one 4 ½ inch pump nozzle. The hydrant will be equal to a Mueller Centurion, Catalog Number A-423.

Backflow preventers will be above ground and will be of the double check valve assembly type or the reduced pressure type depending on the degree of hazard associated with the event to be prevented.

1.5.E Sanitary Sewer – Pretreatment Devices and Other Appurtenances

1.5.E.1 Applicable Standards and Regulations

Wastewater discharges are regulated by the City of Tampa for the majority of the areas located within the boundaries of TPA, TPF and VDF. Wastewater discharges from PCM are regulated by Hillsborough County and the City of Plant City.

City Section 26 (Utilities) Article III Sanitary Sewers

Sec. 26-120. Excluded wastes prohibits...”any person to discharge or deposit any waste, waste material, gases, toxic materials or wastewater which contains any pollutants of a type, nature, temperature or concentration not found in normal domestic wastewater to the treatment works.”

In addition “The department’s Technical Manual of Standards for Industrial and Special Users sets forth the limitations and types of excluded wastes which may be discharged following pretreatment.” (Ord. No. 89-253, § 2(58-126), 9-28-89)

All operations that generate wastewater other than sanitary wastewater will be equipped with pretreatment devices or appurtenances that will pretreat the generated wastewater to effluent levels compliant with the City of Tampa Code referenced above. The City of Tampa (or the regulating entity) will be contacted to confirm that the discharge is allowed.

1.5.E.2 Wash Racks

All wash racks built at Tampa International Airport for aircraft washing must meet the requirements of the Aircraft Washing Operating Directive. All other wash racks must meet the following requirements. Regardless of the type of pretreatment provided, all wash rack outlets will be connected to the sanitary sewer system, which is separate from the stormwater drainage (sewer) system. The system can be designed with a bypass that allows the discharge of wastewater to the sanitary system, while diverting stormwater runoff to the stormwater drainage system.

An oil/waster separator will be installed as a pretreatment system before the wastewater is discharged into the sanitary sewer system. A sand trap is also recommended.

1.5.E.3 Floor Drains

All building floor drains will be connected to the sanitary sewer system. Depending on the types of activities conducted inside a building, the following appurtenances may be required in order to comply with the City of Tampa wastewater effluent disposal requirements:

Oil/Water Separator – They are required for all vehicles and equipment washing activities. A sand trap may also be required.

Acid Tank – If there is a potential for acidic wastewater or other similar liquids to be generated inside a building during equipment washing, floor washing, or other operations, an acid tank will be installed.

Grease Traps – Grease traps must be installed for all restaurant generated grease waste as required by local codes.

Dumpsters, waste compactors, and other waste handling equipment will be installed such than any wastewater or leachate generated through contact of water or stormwater with the waste is discharged to the sanitary sewer system. Pretreatment may be required depending on the characteristics of the leachate.

1.5.E.4 Utility Permits

Coordination with regulatory agencies, such as City of Tampa Water Department (water service commitment), City of Tampa Department of Sanitary Server (sanitary sewer service commitment), Hillsborough County Health Department (water distribution system approval), EPC, (sanitary sewer collection system approval), Hillsborough County Water Department (water service commitment), Hillsborough County Sanitary Sewer Department (sanitary sewer service commitment) will be conducted during the design phase to determine the exact regulatory permitting requirements.

All permit application documents will be submitted to the Authority for review and approval prior to their submission to any agency.

1.5.E.5 Easements

If a project requires the abandonment, relocation, extension or installation of utilities, the design professional will include in their scope of services easement coordination services. At a minimum, this will include preparation of developer agreements, legal descriptions and sketches of new or revised utility limits.

1.6 Fueling Systems: Aircraft and Automotive

1.6.A Related Sections – Reserved

1.6.B Scope – Reserved

1.6.C Applicable Codes and Reference Standards

Storage tanks which are regulated by federal, state and local agencies must be registered with the FDEP. As defined by FDEP, a storage tank system includes all tanks, integral piping, dispenser, and release detection equipment. See Chapters 62-761 Florida Administrative Code (FAC) and 62-762, FAC, for complete definitions and rules pertaining to underground storage tanks (UST's) and aboveground storage tanks (AST's), respectively. Regulated systems generally consist of:

1.6.C.1 USTs with capacities of > 110 gallons

1.6.C.2 ASTs with capacities of > 550 gallons that store pollutants or hazardous substances

In addition, if a facility has a single AST with a capacity greater than 1,320 gallons, the facility must also comply with the federal Oil Pollution Prevention regulation (40 CFR 112). Once a container exceeds the 1,320-gallon threshold, all containers with a capacity of 55 gallons or more are regulated under this rule. In compliance with this regulation, A Spill Pollution Control and Countermeasure (SPCC) plan must be prepared and submitted to the owner's representative for implementation.

All tanks, piping, and related equipment must be on the most recent edition of the FDEP Approved Equipment List.

If warranted, all site sample collection, site assessment activities, and all laboratory analyses will be conducted in compliance with the most current FDEP Standard Operating Procedures.

1.6.D Aircraft Hydrant Fueling System

1.6.D.1 New Installation

At Tampa International Airport, jet fuel is delivered via the hydrant fueling system from the Bulk Fuel Farm to all the airside.

All new piping for the hydrant fuel will be double walled piping in compliance with current FDEP regulations Chapters 62-761 and 62-762, FAC.

All hydrant pits will be listed on the most recent edition of the FDEP Approved Equipment List. If a proposed hydrant pit is not on the list, the design professional or contractor will contact the FDEP and notify Authority staff as early as possible. The process of obtaining approval of a non-listed hydrant pit, or any other equipment, may involve supplemental coordination and approval by the fuel system operator, Tampa Fuel Committee.

Interstitial space will be filled with nitrogen with a pressure of 10 psi (pound per square inch) or more, or will have a vacuum with a pressure of -10 psi or less.

Pressure gauges will be installed to accurately monitor the interstitial space. Valves will be installed to allow visual monitoring for leaks and will be designed such that the proper pressure can be restored after visual testing.

1.6.D.2 Removal & Abandonment of Existing Hydrant Piping

Before the removal and abandonment of any existing hydrant fuel piping or components, the operator of the system Tampa Fuel Committee, will be contacted by the Authority in order to have the fuel removed and valves secured as needed. Once the necessary work has been completed, the Authority will notify the design professional and contractor.

Residual fuel will likely remain on the line and must be appropriately handled by the contractor in charge of the removal or abandonment of the line.

For piping that will be removed, pigging is allowed, provided that the residual fuel and the waste generated are prevented from reaching the surrounding soil and is disposed of in accordance with applicable regulations.

Piping that will permanently be left in place will be grouted once the residual fuel has been removed. In some cases, the Authority will allow some piping be left in place without grouting. However, all residual fuel must be removed and the line must be certified gas free or filled with nitrogen to prevent corrosion.

1.6.E Automotive, Emergency Generator, and Other Tank Fueling Systems

The Authority recommends that fuel tanks used for automotive and emergency generators be stored in aboveground storage tanks instead of underground storage tanks. Emergency Generator tanks will be less than 550 gallons to the extent possible. As indicated above, such tanks are exempt from FDEP regulations.

- All regulated tanks will be double walled tanks or have secondary containment in compliance with Chapters 62-761 and 62-762, FAC.

- Tanks and fuel dispensing equipment will be located as far as practical from stormwater inlets.
- For all systems that fall under the SPCC regulations, the operator of the system must have an SPCC plan prepared in compliance with the Federal regulations and submitted to EPC and the Authority before the system is put in service.

1.6.F Notification and Registration Protocol

Notify and coordinate all activities with the Authority's Maintenance and Planning & Development Departments.

Determine whether the storage tank system is a regulated system. If the system is not regulated, no tank registration is required. However, copies of the design plans will be sent to the EPC for their records and submitted to Authority staff for review.

Submit storage tank system designs and a copy of the completed Storage Tank Registration Form to the EPC for review. If a tank system is being removed, an application for Closure of Pollutant Storage Tank System Form will be submitted to EPC. EPC will review the plans and approve them or return the submittal with comments for revisions. After revisions have been made, re-submit the documents to EPC for approval. A copy of the approved plans will be submitted to the Authority.

As applicable, obtain the appropriate construction permits from the city or county and submit copies to the Authority.

Provide the Authority and EPC with advance written or verbal notices as follows:

- Ten calendar days advance notice for tank installation, replacements, or upgrades.
- 30 calendar days advance notice for tank closures.
- Send the completed Storage Tank Registration Form to FDEP in Tallahassee with copies to EPC.
- Provide the Authority and EPC a 48-hour advance notification prior to commencement of on-site work for all tank removals, installations, replacements or upgrades. If work is to be completed in stages, this 48-hour notice is required prior to each stage of work.
- After completing steps above and approval by the Authority, work may begin. (Note: If an UST system is being installed or removed, an Underground Storage Tank Installation and Removal Form for certified contractors must be completed and submitted to EPC and the Authority after work is complete on the tank system).
- Copies of all applicable forms, plans, reports, and record drawings will be submitted to the Authority's Planning and Development Department.

1.6.G Design and Installation Requirements – Reserved

1.6.H Underground Storage Tank Removal/Abandonment Pre-Tank Removal Requirements

Notification of tank closure (removal) is to be submitted to the appropriate agencies as per the protocol, including the Fire Department, or local Fire Department, as applicable.

Only a State Certified Pollutant Storage Systems Contractor will perform tank removals. A copy of the contractor's certification must be submitted prior to commencement of the Work.

A Work Plan will be prepared and submitted prior to commencement of work.

A Health and Safety Plan will be prepared and submitted prior to commencement of work.

When groundwater monitor wells are present, samples must be obtained prior to tank removal.

Tank removals will be performed in accordance with FDEP's underground storage tank or aboveground storage tank closure guidance documents (latest edition). A copy of these guidance documents can be obtained for the FDEP website at: <https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-systems-guidance-and-information>

1.6.I Tank and Soil Removal Operations

All interior liquid from the tank and integral piping must be properly removed and disposed of prior to tank removal.

During excavation, soil samples will be continuously screened for organic vapors following the FDEP "headspace" method using an organic vapor analyzer (OVA) equipped with a flame ionization detector (FID) or equivalent.

All contaminated soils excavated during tank removal will be placed on, and covered with, plastic sheeting and secured.

Waste Characterization soil samples will be collected and analyzed for the FDEP "Pre-Burn" constituents prior to removal of contaminated soil from site for disposal.

All contaminated soil disposal manifests will be supplied to the Authority as part of the Closure Assessment Report.

1.6.J Tank Disposal Operations

Tank will be purged for all volatile and explosive vapors prior to entry and/or removal of interior sludge.

Tank will be rendered unsuitable for future use as a storage tank by drilling or cutting holes in the tank before removal of it from the site.

Tank disposal manifests will be included as part of the Closure Assessment Report.

1.6.K Free Product Removal and Groundwater Testing

Should any free product be encountered in tank system excavation, it should be removed by appropriate methods, (i.e., absorbent mats or vacuum suction).

Should groundwater be encountered less than 20 feet below land surface, samples will be obtained from each monitor well before tank removal. If there are no monitor wells present, a temporary well point should be installed in the area of highest OVA reading or in the area of the tank fill port before excavation is backfilled.

If groundwater is more than 20 feet below grade, coordinate with appropriate governmental agency to determine if sample is required.

1.6.L Storage Tank Forms

The following forms, where applicable, should be included in the Closure Assessment Report and also submitted to the appropriate agencies:

- Application for Closure of Pollutant Storage Tank Systems which can be found at the following website:

<https://www.epchc.org/divisions/waste/storage-tank-compliance>

- Underground Storage Tank Installation and Removal Form for Certified Contractors, which can be found at the website below.
- Discharge Reporting Form and Incident Reporting Form which can be found at the website below.
- Storage Tank Registration Form and instruction which can be found at the website below.
- Limited Closure Summary Report Form which can be found at the website below.

<https://floridadep.gov/waste/permitting-compliance-assistance/content/storage-tank-system-rules-forms-and-reference>

1.6.M Closure Assessment

For sites with documented soil or groundwater contamination that has already been reported to the regulatory agencies, a closure assessment is not required prior to the removal or abandonment of USTs, ASTs, and appurtenances. However, a Limited Closure Summary Report Form must be filled out and submitted to the EPC.

For all other site, a “full” Closure Assessment is required and a Closure Assessment Report must be prepared as described below.

Closure Assessment Report will include all items from the attached checklist.

1.6.N Post-Removal Activities

Return the site to original condition or as otherwise specified.

Remove all debris.

Address contaminated soils and/or groundwater in accordance with pertinent regulatory requirements.

Provide the Authority with a copy of the complete Closure Assessment Report including all pertinent drawings and specifications.

1.7 AGT Guideways - Reserved

1.8 Landscaping and Irrigation

1.8.A Related Sections – Reserved

1.8.B Scope – Reserved

1.8.C Applicable Codes and Reference Standards

Landscape treatment will be provided in accordance with the City of Tampa Municipal Code Chapter 13 (Latest Version), Landscaping, Tree Removal, and Site Clearing, and any other applicable City of Tampa Rules and Regulations.

Plans, specifications, and inspection for landscaping will be accomplished by a professional landscape architect registered in the State of Florida.

All plant materials will be in accordance with Grades and Standards for Nursery Plants, Parts I and II, latest edition, as published by the Florida Department of Agriculture and Consumer Services. All plants not otherwise specified as being "Specimen" will be Florida Grade Number One or better, as determined by the Florida Division of Plant Industry. "Specimen" refers to an exceptionally dense, symmetrical plant, so trained or favored in its development that its appearance is unquestionable and outstandingly superior in form, number of branches, compactness, and symmetry.

Special attention should be paid in landscaping design and coordination to reduce the site's potential wildlife hazard attractants. All landscaping plans, details, and specifications should be independently reviewed by the Authority's Wildlife Biologist general consultant.

1.8.D Planning Objectives

Primary design objectives for the proposed project area will focus on the following areas of concern described below.

Maintaining and Reinforcing the Central Theme of Existing Planting Areas: By using certain varieties of landscape materials that currently exist within the terminal complex, a unity in design will result to enhance and reinforce the existing overall design concept.

Protecting Existing Plant Materials: Existing trees and shrubs will be protected.

Relocating Existing Trees: Existing trees that must be removed due to proposed construction will be relocated to a suitable location within the terminal complex whenever possible, at the direction of Authority. Tree relocation will be accomplished by a qualified and licensed mechanical tree mover and will be coordinated with Authority.

Visual Screening and Aesthetic Effects: Visual screening will be used where service-oriented and mechanical facilities, if any, are visually adjacent to public areas. Screening materials will consist of large trees and shrubs, berm/hedge combinations, or walls. Service facility walls should be softened with ground cover. The transition from parking area to public right-of-way can be made more visually pleasing with partial or intermittent screens of plant materials, which also function as a defining edge for the parking area.

Heat and Glare Reduction: Plant materials will be used wherever possible to reduce the glare and solar radiation in the airport environment created by pavement surfaces and structures. Plant materials effectively prevent the glaring light from reaching a reflective surface, block the glaring light from a reflective surface, and decrease the reflective qualities of a surface.

1.8.E Authority Standards

1.8.E.1 Soil and Planting Beds

Soils: The project site has been subject to considerable soil disturbance in the past. Soils analysis studies should be completed so that all variables are known. Soil testing locations will be designated on the Plans. Tests for soil pH, soluble salts, and organic content, as a minimum, will be conducted for each testing location. Soil testing will be conducted by an approved soil testing laboratory. Results of the analysis and recommendations for any amendments will be provided to the owner and design professional prior to any installations

throughout the project. If soil conditions are insufficient for proper plant growth, compensation for deficiencies can be made as detailed landscape plans are developed.

For the subject site, the following soil preparation will be completed prior to plant material installation. Inspections for soil medium verification will be strict, and must be in adherence with the following specification.

Preparation for tree planting areas will be as follows: Trees will grow in the existing soil, but to promote quick recovery from the transplanting process, backfill will be required that contains 60% high quality, pulverized, local brown peat; 1 cubic foot of manure per 1 cubic yard of peat; and, 40% sand loam. Backfill will be placed around the balls of all new trees. Large shade trees should have pits 2 feet greater in diameter than the size of the ball. Sides and bottoms of the pits should be scarified to increase porosity and to help root penetration into the existing soil. Care should be taken to ensure trees are planted at the proper depth, and to prevent settling of the soil. All trees should be set so that the top of the ball is 1 inch above the finished grade. For trees on sloping areas, the top of the ball should be even with the downhill side.

Shrubs require similar bed preparation. Bed areas require a minimum excavation depth of 6 inches. The excavated soil should be removed from the site and the beds backfilled with a thoroughly mixed and prepared soil containing 1 part sandy loam, 1 part peat moss, and 1 part sharp sand. Shrub areas which occur on compacted fill should have 12 inches of prepared soil. These areas require cultivation to a depth of approximately 6 inches before tilling in a topsoil mixture. Once the bed is prepared, it should be sterilized using an appropriate method to prevent weeds and unwanted growth. Bed areas which occur on slopes greater than 3:1 should be stabilized to prevent erosion until plants are established.

After bed preparation has been accomplished, plants should be spaced according to specifications and set with top of balls even with top of bed. Soil should be compacted carefully around each plant and watered sufficiently to eliminate air pockets around roots. A minimum 3-inch layer of red hardwood mulch, certified by the Florida Mulch Council, will be added after plants have been installed.

Grassed and ground cover areas should have a minimum 4 inches of topsoil over regraded subsoil. Drainage is essential, so it is expedient to cultivate sand or sandy loam into the upper 4 inches of soil to permit fine grading. All areas to be grassed should be fine graded to establish a smooth, even grade, suitable for grass placement. Any undulations that cannot be raked out should be top dressed with sandy loam. Stones 1 inch or larger, sticks, roots, or other debris exposed during this operation should be removed from the site. Areas showing weed growth will be sprayed with Authority-approved herbicides, mowed, and clippings removed from grassed areas prior to final grading.

Grassed areas which receive sod application should have sod placed so edges are touching, top dressed to fill voids with sharp sand, and rolled to eliminate undulations. The ground should be scarified as necessary immediately before sodding to provide a smooth bed. Drainage swales or channels should be protected with solid sod and/or matting as required. During construction, temporary measures should be taken to prevent erosion and sediment build-up of all drainage systems.

Protection and Relocation of Existing Plant Materials: Protection and/or relocation of existing trees will be in accordance with City of Tampa Municipal Code Chapter 13, (10/12/89).

1.8.E.2 Acceptable Plant Materials

For the purpose of unity in design, the plant list provided will form the basis of landscape design. Plant materials permitted have been selected for adaptability to existing conditions, harmony, interest in structure, texture, and ultimate growth habits. Acceptable plant materials for specific uses are shown in Table 1. Shade Trees and Other Trees as listed are acceptable for use in open areas, surrounding buildings, buffer areas, and parking areas except as noted. Shrubs as listed are acceptable for use in all landscape areas. Ground Covers as listed are acceptable for mass plantings. Vines as listed are acceptable for upright growth against buildings or other structures. Any deviation from this list will require the approval of Authority's Director of Maintenance.

Table 1 – Acceptable Plan Material

<p style="text-align: center;"><u>Shade Trees</u></p> <p style="text-align: center;">Live Oak Jacaranda Oriental Sweet Gum Red Maple</p> <p style="text-align: center;"><u>Shrubs</u></p> <p style="text-align: center;">Cast –Iron Plan Rigid Bottlebrush Dwarf Yaupon Holly Giant Liriope African Iris Indian Hawthorn Crinum Lily Florida Anise Dwarf Bufford Holly Nandina Oleander Calypso Split-leaf Philodendron Coontie Dwarf Wax Myrtle</p> <p style="text-align: center;"><u>Vines</u></p> <p style="text-align: center;">Confederate Jasmine Coral Honeysuckle</p>	<p style="text-align: center;"><u>Other Trees</u></p> <p style="text-align: center;">Dahoon Holly Crape Myrtle Southern Magnolia Paurotis Palm Senegal Date Palm Canary Island Date Palm Ligustrum Tree Cabbage Palm Drake Elm Chickasaw Plum (open areas only)</p> <p style="text-align: center;"><u>Grassed Areas</u></p> <p style="text-align: center;">St. Augustine – Bitter Blue or Floratam Argentina Bahia</p> <p style="text-align: center;"><u>Ground Cover</u></p> <p style="text-align: center;">Day Lily Lily-turf Mondo grass Confederate Jasmine Dwarf Confederate Jasmine Society garlic English Ivy Holly Fern Boston Fern</p>
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1.8.E.3 Irrigation

Depending on location, different sources of irrigation water are utilized including reclaimed, well and municipal potable. The irrigation water supply must be site specifically verified prior to plant selection to ensure proper plant selection compatible to water type.

Sleeving: All irrigation-related sleeving will be PVC Schedule 40 and installed for the proposed project area so that sprinkler systems can be installed without the disruption of transportation systems. All piping used in planting areas will be PVC Schedule 40.

Control Valves: The control valves will be electric automatic remote control valves. All electric valves will be enclosed in plastic valve boxes. Backflow preventers will only be

used when tied to a potable system. Reclaimed water valve boxes should consist of purple polyolefin material and clearly marked “Reclaimed water – do not drink”.

- a. Small grassed areas which occur adjacent to roadway paving will be watered with small diameter pop-up heads so that close control can be maintained on wind spray.
- b. Flush lawn quick coupler valves will be provided in all landscape planted areas. They should be located so that all trees and planting areas can be reached by a 100-foot hose.
- c. Irrigation piping will not be installed on top of roadway slopes or along retaining wall toes unless cut-off valves are positioned at lower levels and away from structure.

1.8.F Erosion Control During Construction

Where slopes are equal to or greater than 3:1, jute matting or fiberglass matting should be considered to protect against erosion of the topsoil or prepared soil. Drainage systems should be protected with solid sod and/or matting, as required. During construction, temporary measures should be taken to prevent erosion and sediment build-up of all drainage systems.

1.8.G Specified Turf Varieties

Turf and grass types specified should be desirable for wildlife hazard management and, along with all Landscaping plans, should be independently reviewed by the Authority’s Wildlife Biologist general consultant.

Select grass species will not be included due to the potential to create a wildlife hazard attractant: Millet or Large-seed producing grasses.

The following turf varieties are preferred at the specified locations:

- a. Airfield – Argentine Bahia; 6-12” tall
- b. Parkway – St. Augustine*; with irrigation
- c. Terminal Facilities – St. Augustine*; with irrigation
- d. SkyCenter and Rental Car Center Facilities
 [in public view] St. Augustine*; with irrigation
 [back-of-house, service center areas] Bahia

* Heavily shaded areas with St. Augustine grass should be cultivar type Seville/Bitter Blue

1.8.H Anti-Perching Devices

Anti-perching devices should be utilized as needed on tall structures (light poles, signage, etc.) to deter Osprey and other large birds from perching on the facility.

1.9 Site Signage and Graphics – Reserved

1.10 Access Control

All access control equipment must comply with the following standards and must be compliant with the current version of the Software House C-Cure Access Control Headend system.

1.10.A Equipment

Card Reader: Software House TST-100-V
Door/Gate Controller: iStar Ultra SE
I/O Module: IP-ACM v2 Ethernet Door Module

1/10/B Configuration Requirements

No power over ethernet is permitted, all power shall be furnished via power supply with a maximum of one gate or two doors served by the same power supply. A battery backup system shall be specified to provide power for up to 4 hours in the event of power interruption.

No more than 16 card readers may be connected to any one iStar Ultra SE controller.

1.11 Fencing and Gates

1.11.A AOA Fence Requirements

All fence and gates that secure the AOA must conform to the following requirements and the requirements of FAA Advisory Circular 150-5370-10G, Standards for Specifying Construction of Airports.

- Fence Height: 8' chain link fence fabric with 3 strands barb wire (barb) wire not included in 8' dimension.
- Wildlife Exclusion Barrier: A subterranean wildlife barrier is required at all locations the fence is located over non-paved areas. The wildlife barrier will be constructed of 4' chain link fence fabric buried horizontally 6" underground and attached to the vertical fence fabric every 12". The fence fabric may also be installed at a downward angle such that the deepest portion of the 4' barrier is 1' 6" underground. Where necessary to avoid existing underground objects, the wildlife barrier may also be installed vertically.
- Any gate not located over pavement will have a concrete apron constructed under the gate to serve as a wildlife barrier.
- Gate Height: Gates will be constructed with a frame height 8' tall with straight coil razor wire installed on top of the gate.

1.11.B Non-AOA Fence Requirements

All fence and gates that do not secure the AOA will comply with all requirements of 1.11.A with the exception that a wildlife exclusion barrier will not be required.

1.11.C Temporary AOA Fence

Temporary AOA fences are fences securing the AOA that will not be in place 60 days or longer. Temporary fencing material is not required to be new material but shall provide a like-new appearance and condition. Temporary AOA fence must meet all requirements of Section 1.11.A with the exception that a wildlife exclusion barrier will not be required and fence posts may be driven into the ground without concrete foundations.

Temporary fence lines must resist wind loads and remain plumb and in a straight alignment. Any temporary fence that is expected to be required longer than 60 days must be removed and reconstructed to meet all requirements of Section 1.11.A

1.11.D Razor Wire

Razor wire is required over all gates and over any fence deemed by Authority Operations or TPA

PD as a high-risk area. Short and medium razor wire types are acceptable. Razor wire will be installed in a double coil configuration over high-risk fences and in a straight coil configuration over gates so as not to interfere with gate movements.

1.11.E Concrete Barricades

In areas identified by Authority Operations or TPA PD as a high risk for vehicle collisions all fence will be installed on top of or behind FDOT compliant concrete barrier walls.

1.12 FAA Systems – Reserved

Section 2 - Architecture – Building Engineering

2.1 Applicable Codes and Reference Standards

The design professional is responsible for identifying and complying with all applicable local, state and federal codes, regulations and standards.

2.2 Building Objectives - Planning Criteria

2.2.A Typical Facility Objectives

2.2.A.1 Geotechnical

2.2.A.1.1 Building Area

Previous Foundation History: A variety of structural foundation types have been used at TPA, including the following:

- a. Landside Terminal Building (1971): This building is supported on both steel pipe piles and spread footings, bearing on rock at willow rock locations. A boring was drilled at each column location. At one column location, excessive settlement was experienced, resulting from solution activity in the limestone bedrock under a spread footing at that location. The settlement initiated when three levels of the garage were added in 1982. About two inches of settlement occurred and large quantities of grout had to be pumped into the solution void to stabilize the foundation. Grouting quantity could not be predicted in advance.
- b. The foundation systems utilized for the original four airside (1971) vary. Airsides B and C were built on pile foundations; Airsides D and E were constructed on willow spread footings. The foundations of the shuttle (AGT) system hammerhead pier and maintenance area/platforms for all four original airside were constructed with pile foundations.
- c. Taxiway "J" Overpass (1971): Spread footings on limestone were used.
- d. Airside F (1987): Spread footings, in combination with a grouting program, were used. A boring was drilled at each column location. Grouting quantities were substantial and could not be accurately predicted in advance.
- e. Airside F AGT System Guideway Piers (1987): Drilled shafts were used. Final lengths were determined by a boring taken at each drilled shaft, plus observations during the shaft drilling operations.
- f. Quad Deck Expansion on East and West Sides of Terminal Building (1987): Drilled shafts were used. Final lengths were determined by a boring taken at each drilled shaft, plus observations during the shaft drilling operations.
- g. Long Term Parking Garage (1991): Drilled shafts were used. Final lengths were determined by a boring taken at each drilled shaft, plus observations during the shaft drilling operations.
- h. Airside A (1993) was constructed utilizing 30", 36", 42" and 48" diameter drilled piers as the foundation system. The AGT maintenance platforms and the passenger loading bridge pedestals were constructed on 48" diameter drilled shafts.

- i. Airside E (2002) was constructed utilizing spread footings. The AGT maintenance platforms and the passenger loading bridge pedestals were constructed on 48" diameter drilled shafts.
- j. Airside A Outbound Baggage Sortation Facility (2003) was constructed utilizing 48" diamante caissons under all columns and strip footings under the exterior masonry walls.
- k. Airside C (2005) was constructed utilizing spread footings. The AGT maintenance platforms and the passenger loading bridge pedestals were constructed on 48" diameter drilled shafts.
- l. Remote Parking Garage (2005) was constructed utilizing 30", 48" and 60" diameter drilled piers (caissons). The administration building was built on spread footings.

2.2.A.1.2 New Foundations

Because of the uncertainty of the limestone bedrock consistency, drilled shafts or piers have been the most prevalent foundation system in recent years. Airside E was, however, a notable exception; it was constructed on willow spread footings.

The foundation system options must be considered on a site by site basis after an extensive geotechnical investigation.

If a deep system is required, the choices include drilled shafts, piers, or caissons and auger cast piles. Mechanically driven pile systems are not allowed with close proximity of the Landside Terminal Complex.

2.2.A.1.3 Geotechnical Investigation

As a minimum, the following guidelines will be observed in the design investigation.

- a. Minimum boring grid will be 200 feet on center.
- b. Borings and testing locations will carry airport grid coordinate locations and ground surface NGVD elevations.
- c. Minimum boring depth will be 50 feet, including 20 total feet into refusal (N=50+ blows/ft) limestone material.
- d. Testing locations, procedures, and times of testing will be established well in advance of testing, and must be coordinated with the Authority. Test locations will be cleared for utilities by the Design Consultant, the Authority, and affected utility companies. All areas disturbed by testing must be restored to the satisfaction of the Authority.
- e. Sufficient field and laboratory testing will be performed to establish classifications and properties for the various strata encountered. This will include determination of Unified Soil Classifications, plasticity/consolidation properties of compressible materials, bearing values, strength properties, and groundwater conditions.

- f. Design phase load test programs will only be considered after completion of a preliminary geotechnical program, a preliminary foundation analysis, and a cost study justifying the load test program.
- g. Foundation selection will address vibration and disturbance to adjacent structures, noise, and annoyance levels, cost, risk, and constructability.

2.2.A.1.4 Earthwork

Specific recommendations will be made for the project needs in the areas of clearing and grubbing, undercutting, proof rolling, embankment construction, suitable materials, compaction, stabilization, subgrade preparation, and any special procedures that may be proposed.

2.2.A.1.5 Code Requirements

- a. Geotechnical testing will conform to applicable sections or ASTM Volume 04.08, "Soil and Rock; Building Stones; Geotextiles."
- b. Geotechnical testing and engineering will be conducted by corporations and experienced individuals licensed to practice this specialty by the State of Florida.

2.2.A.2 Structural

2.2.A.2.1 Coring, Drilling, and Anchoring into Existing Structure

Non-Destructive Testing (NDT), scanning, should be performed by a qualified professional prior to any coring, drilling, or anchoring into existing structure (slabs, beams, columns, etc.) to minimize clashes with reinforcing steel, conduits, and other subsurface conflicts. The contractor and design professional should determine the best testing method for each application, but the preferred methods are as follows:

- o Elevated Slabs and other applications where plastic conduits may be present - X-Ray
- o Slab-On-Grade – Ground Penetrating Radar (GPR)

2.2.A.2.2 2014 Main Terminal Building Structural Evaluation Report

Walker Consultants performed an investigation of Tampa International Airport's Main Terminal Structure: Main Terminal Structural Investigation, dated July 16, 2014. Any structural modification proposed for the Main Terminal Building or Short Term Parking Garage requires the design professional review the report noted above. Following the review, the design professional must provide a memorandum to the Authority stating what impact the report's conclusions have on the proposed modifications.

2.2.A.2.3 Designated / Delegated Design

Delegated design is the act of the design professionals leaving design responsibility to the constructor for one or more specialty scopes of the work for the construction of a project. The design professional is responsible for all design work and may not delegate design of any system without the approval of the **owner** of each systems design desired to potentially be delegated.

2.2.A.3 Architectural

2.2.A.3.1 Glare Control or Prevention

- Use roof overhangs, tinted glass, coated glass, fritted glass or applied films to control glare and reduce heat gain from the sun.
- Exterior sunscreens are generally not allowed because they provide a roosting area for birds. Reflective-type glasses are generally not considered because of the possibility of creating high intensity reflections that might temporarily cause blindness to pilots during aircraft operations.
- Consider glare patterns in the placement of light fixtures. High contrast “scallop” can be created on walls or sign faces as a result of poor fixture placement. When preparing reflected ceiling plans, show all ceiling-hung signage elements so that lighting patterns and glare potential may be reviewed. Avoid placing lighting adjacent to ceramic tile walls; the “wash” of light accentuates irregularities that are common with such a finish.
- Avoid products or conditions that can create navigation hazards. Finishes such as metallic paints can cause visual reflections and even radar interference. Sloped glass areas can cause reflection problems.
- High intensity exterior lighting fixtures will be selected that include appropriate shielding or cut off provisions to eliminate glare to roadway and walkway areas.

2.2.A.3.2 Noise and Vibration Control

- Provide for isolation joints between slab areas and between slabs and columns. This isolation will be designed to prevent the transmission of low frequency vibrations from main mechanical rooms that contain chillers, compressors, and pumps.
- Provide localized isolation for pumps, air handlers, and so forth. Consider inertia pads.
- Install sound attenuation devices on ductwork and provide acoustic treatment in air plenum areas.
- At baggage sortation areas, provide vibration isolators at all conveyor system suspension elements. Consider a sprayed-on insulation product on the bottom side of all elevated slabs for thermal and sound absorption purposes.

2.2.A.3.3 Passenger Circulation and Travel Distance

- Endeavor to maintain a maximum 700-foot walking distance from the passenger's parked car to the door of the aircraft.
- Understand the influences of the types of passenger flow as follows:

Enplaning passengers: “Trickle flow” describes the arrival rate for departing passengers. The earliest passengers arrive an hour or more before departure, and the arrivals continue a few at a time every few minutes until departure.

Deplaning passengers: “Slug flow” describes the 200-300 passengers arriving through a single doorway within a five- to ten-minute time period.

- Maintain a 30-foot minimum clear width for a double loaded concourse walkway.
- Position passenger check-in counters so they are set back a minimum of 16 feet from the edge of the concourse walkway to accommodate the passenger queue. By setting the check-in counter at a ± 60 degree angle relative to the concourse walkway, the available queuing area can be increased. The angular placement of the counter also provides improved sight lines for the gate number signage on the check-in counter back wall. (See 2.2.B.1.6, 2.2.B.2.2, and 2.2.B.2.3 for notes regarding ticket counter and back wall design.)
- Arrange seating and check-in counters to create separate enplaning and deplaning aisles within each holding area. Provide a direct gate to walkway alignment for deplaning aisle. Locate the enplaning aisle parallel and adjacent to the outside wall.
- Provide stairs adjacent to up and down escalators as a backup system when the escalator(s) may be out of service. Minimum escalator tread width will be a nominal 40 inches to accommodate a single passenger with carry-on baggage.

2.2.A.3.4 Building Occupant Load and Miscellaneous Code Issues

With the 1991 edition, the Life Safety Code, NFPA 101, began to recognize the unique occupancy conditions associated with airport terminal buildings. Table A.7.3.1.2 provides airport terminal load factors to assist in calculating the occupant load.

Table A.7.3.1.2 (NFPA 101-2000) Airport Terminal Occupant Load Factors	
Airport Terminal Area	Area/Person
Concourse (circulation area)	100 sf / person
Waiting areas (seating areas)	15 sf / person
Baggage Claim	20 sf / person
Baggage Handling	300 sf / person

Other terminal space occupant loads that have been generally agreed to by the City of Tampa Building Department and Fire Marshal includes:

Gift shop (mercantile)	60 sf / person
Lounge / restaurant (small assembly)	15 sf / person
Airline operations (business)	100 sf / person
Storage	300 sf / person
Mechanical / Electrical (storage)	300 sf / person
AGT Maintenance (storage)	No occupant load
Toilet Rooms	No occupant load

Elevators, escalators, and stairs	No occupant load
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Section 12.2.3.3 includes Exception No. 2 which allows exits to be distributed around the perimeter of the building. Exiting distances become more workable, but most of the exit doors must now be equipped with special delayed release locking hardware to maintain aircraft operations area (AOA) security. In Airsides F, A, E, and C, exterior exit stairs are provided at frequent intervals around the building perimeter. These stairs are served by exit doors with delayed release exit hardware that is interfaced with an access control system based on a computer/identification badge program. Section 7-2.1.6, provides the guidelines for this operation (refer to subsections 2.2.A.3.5 and 2.2.A.3.6 for the functional features of the access control system and the delayed action fire alarm system).

In addition to the interior and exterior exit stairs, the elevated emergency walkway between the AGT guideways has been recognized as an acceptable exit, or area of refuge. Other potentially applicable NFPA fire codes include (but are not limited to) the following: NFPA 1, Uniform Fire Code, NFPA 10, Standard for Portable Fire Extinguishers; NFPA 13, Standard for the Installation of Sprinkler Systems; NFPA 20, Standard for the Installation of Stationary Pumps; NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages; NFPA 70, National Electric Code; NFPA 72, National Fire Alarm Code; NFPA 80, Standard for Fire Doors and Fire Windows; NFPA 88A, Standard for Parking Structures; NFPA 92B, Standard for Smoke Management Systems in Malls, Atria, Large Areas; NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations; NFPA 105, Standard for the Installation of Smoke Door Assemblies; NFPA 110, Standard for Emergency and Standby Power Systems; NFPA 111, Standard for Stored Electrical Energy Emergency and Standby Power Systems; NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems; NFPA 221, Standard for Fire Walls and Fire Barrier Walls; NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations; NFPA 407, Standard for Aircraft Fuel Servicing; NFPA 409, Standard for Aircraft Hangars; NFPA 415, Standard for Airport Terminal Buildings, Fueling Ramp Drainage, Loading Walkways; and NFPA 780, Standard for the Installation of Lightning Protection Systems.

NFPA 415, Section 2-1.5, addresses architectural features that may be required if potential fuel spill points (such as fuel hydrant boxes) are located less than 100 feet horizontally from glazed building walls. Section 3-1.1 addresses minimum ramp slopes away from terminal buildings.

Relatively obscure code provisions can create difficulties for design professionals if they are not considered in the early schematic phase of a project. NFPA 415, Section 2-2.2, restricts the placement of exhaust outlets, or air intakes, on the aircraft ramp side of the building. Openings will not be less than ten feet above grade level of the ramp.” This provision has required several creative solutions to accommodate kitchen makeup air and exhaust, and tenant area toilet exhausts.

2.2.A.3.5 Access Control System (ACS)

In compliance with Transportation Security Administration (TSA) Part 1542, the Authority has an Airport Security Program incorporating the use of a computerized Access Control System (ACS). The ACS software (CCure800) and processing panels are manufactured by Software House. This ACS controls select doors and gates throughout the airport terminal complex and airfield.

The system has the capability to:

- Ensure that only those persons authorized to have access to secured areas are able to obtain that access.
- Deny access immediately at the access point(s) to individuals whose authority to have access changes.
- Differentiate between persons authorized to have access only to a particular portion of the secured area or to the entire secured area(s).
- Restrict an individual's access by time and date.

Upon authorization, security training, and an FBI background check, employees of the airport, tenants, or contractors may be issued an Airport Identification Badge that incorporates a uniquely identifiable electronic code. When the proximity badge is presented to the badge reader at either side of the door or gate, the system confirms access authorization according to the particulars previously entered into the individual's computer record.

In addition, select components of the Access Control System have been installed in other non-secure access points (i.e., Authority Offices). For these doors, exit activation of the door release mechanism is usually controlled by a motion sensor and/or panic hardware.

The ACS host computer is located in the Communications (Comm.) Center. The access status of each employee is programmed into the system by way of a terminal located in the Operations Department. Comm. Center personnel monitor the system's operation and report alarm conditions to the Airport Police Department. At many portals, an alarm condition initiates a video scan of the location that can be recorded and reviewed.

The ACS host computer is networked with processors which are located at each airside building through a fiber optic conductor network. From these processors, the network is distributed to local processors, which generally are located in nearby mechanical or electrical spaces that can support four door openings. At doors, power supplies and timer modules interface with either electromagnetic locks or electronic panic devices to provide controllable access through the portal. At gates and turnstiles, the card reader interfaces with contacts to start a gate operator or release a turnstile.

Access-controlled building doors are also interfaced with the fire alarm system to allow a complete release of all doors in the event of general building alarm activation.

2.2.A.3.6 Closed Circuit Television (CCTV) System

The Airport utilizes CCTV for various security and operational purposes. The system transmits video via coaxial and fiber optic cable. The CCTV cameras consist of pan/tilt/zoom and fixed mount lens type that redesigned for both interior and exterior environments. Video is transmitted back to the Airport Communications Center where by the cameras can be controlled through video switchers located in Airport Operations, the Airport Police Department, and the Communications Center. Many cameras and associated video signals are linked to the access Control System that displays video upon a generated alarm. All CCTV cameras are digitally recorded on a 24-hour basis.

Typical areas with CCTV monitoring include:

- Passenger screening areas at the airside
- Airside concourses and exit doors.
- AOA turnstiles from the truck court (at the airside)
- AOA vehicle gates (at the truck courts and around the airfield)
- At the monorail and shuttle stations (at the airside, at landside, and in the Long Term Garage)
- At entry/exit doors at baggage makeup areas (AOA)
- And at many other selected areas
- The CCTV system continues to expand. A design professional must meet with the Operations and Police Departments to establish and confirm the definitive needs for a particular project

2.2.A.3.7 Federal Inspection Services (FIS) Security

In Airside F, a second door security system is installed to maintain a sterile accessway for arriving international passengers. At each of the international arrival ramps, a door interlock has been created with a pair of doors above and a pair of doors below the loading bridge entry/exit door. An electromagnetic lock system allows for only one pair of doors to be open at one time. The locking arrangement is controlled by key switches operated by an airline gate agent. In the most frequently used condition, the domestic mode, doors above the loading bridge door (located between the holdroom and the loading bridge door) are held open by energized electromagnetic door holders (their electromagnetic locks are de-energized). The second pair of doors below the loading bridge door is locked with electromagnetic locks preventing access to the lower level FIS processing area.

When an international flight is due to arrive, the gate agent resets the key switch reversing the locking arrangement. The electromagnetic holders on the upper doors are de-energized which allows the doors to close against an energized electromagnetic lock. The upper doors are then secure. As a result of the same key switch operation, the magnetic locks on the lower doors are de-energized which allows them to open. As the passengers move down the ramp, the doors can be opened and then held open by the electromagnetic holders which are now energized. When the last passenger passes through the lower door opening into the FIS screening area, the gate agent activates another key switch which resets the interlock to the domestic operation mode

2.2.A.3.8 Fire Alarm Pre-Signal System

With the activation of a pull station, smoke detector, heat detector, or sprinkler flow switch, an audible signal and visual display are indicated at the local building annunciator and at the Comm. Center. An alphanumeric display is illuminated on the fire alarm control panel, a graphic representation appears at the "satellite" annunciator at the airside, security office, and the fire control rooms, and a user-defined English language description is transmitted to the Comm. Center CRT displays and line printers. Activation of a duct detector on an air handling unit will

immediately shut that unit down. Additional HVAC control sequences may occur as a result of building control system programming. A local indicating lamp will light at locations of the area detector or duct detector initiating the alarm.

Upon activation of any elevator lobby, elevator machine room, or elevator hoistway smoke detector, Phase I recall will be initiated at that elevator (or bank of elevators), and the elevator car will return nonstop to its designated service level where the doors will open and remain open. The “Do Not Use Elevator” lamp will illuminate at the designated level.

Upon activation of an elevator machine room or elevator hoistway heat detector, the system will shunt trip the elevator controller operating power after the above recall event has successfully landed the elevator at the appropriate level and opened the doors.

Once the alarm is displayed, the Comm. Center notifies the airport police dispatcher of the alarm and an officer is dispatched to assess the alarm condition. If within a five-minute time period, the alarm is determined to be false, the system will reset and all functions will return to normal. If the alarm is verified as valid, the officer immediately advises the Comm. Center of the details and a general alarm is initiated.

At a general alarm, the City of Tampa Fire Department is notified (apparatus will be dispatched), a contact closure is made with the access control system, and all delayed-action door operators are immediately released. One of several prerecorded messages is broadcast over the annunciator speaker system, and the strobes begin to flash.

In the event the police officer is unable to complete alarm verification within the five-minute pre-signal period, a general alarm is initiated and all operations previously mentioned will occur.

2.2.A.3.9 Shunt-Trip Operation, Building Power, and AGT Power

Power feeds for both the airside building and its AGT system generally occur on the airside end of the AGT route. Typically, each system has its own switchgear room with dedicated transformers and switchgear. The buildings use 277V/480V, and 120V/208V systems, and the AGT system is typically 600V.

As a life safety precaution, the Fire Marshal has required the capability of de-energizing both power systems from either switchgear room. Typically, the local switchgear can be de-energized with a few disconnect pulls. In order to de-energize the entire building and the guideway, shunt trips for the other system will be located on the switchgear room wall, within steps of the main gear disconnects.

2.2.A.3.10 Tempered Glass

Shortly after opening in November 1987, Airside F experienced a large amount of spontaneous tempered glass breakage that was essentially due to nickel sulfide intrusion. The problem became so severe that the facility was ultimately completely re-glazed with laminated glass. Apparently, the quality level of tempered glass in the mid-1980s deteriorated to such a degree that the industry as a whole began to discourage its use.

As a result of the Airside F difficulties, the Authority now specifies that all areas requiring safety glass (per Florida Building Code, Chapter 24) will be finished with

laminated glass. The only exception might be the use of 1/4-inch clear tempered glass for infill in “normally-sized” storefront entrance doors.

For exterior purposes, Airside A used a 1-foot, 8-inch-high curb to eliminate the safety glass requirement, and 9/16” thick laminated heat-strengthened glass to achieve the strength necessary to achieve the opening sizes desired.

Airside E: (All Viracon Products)

Type 1: 9/16” laminated VH 13075, HS/HS
1/4” clr with VE-1-85 coating, #2
.060” PVB interlayer
1/4” gry

Type 2: 9/16” laminated VH 13-75 HS/HS spandrel
1/4” clr with VE-1-85 coating, #2
.060” PVB interlayer
1/4” gry with V907LF blk, #4

Type 3: 9/16” laminated VH 13-75 HS/HS
1/4” clr with VE-1-85 coating, #2
.60” PVB interlayer
1/4” gry with V907LF blk, pattern 5006, #4

Type 4: 1” insulated glass, Low E, HS/HS
1/4” gry with VE-3-2M coating, #2
1/2” air space
1/4” clr

Type 6: 1” insulated glass, Low E, HS/HS
1/4” gry with VE-3-2M coating, #2
1/2” air space
1/4” clr with V907LF blk, pattern 5006, #4

Curtain wall and storefront systems:

Kawneer 1600, nominal 2 1/2” x 7”
Kawneer Tri-fab 450, nominal 1 3/4” x 4 1/2”

Specialty long span truss curtain wall system:
Advanced Structures, Inc. Marina del Rey, CA.

Airside C: (All Viracon Products)

Main glass: 1” insulated glass, Low E, HS/HS
1/4” Evergreen with VE-8-2M coating, #2
1/2” air space
1/4” clr

“A” glass: 1” insulated glass, Low E, HS/HS (appears “frosted”)
1/4” Evergreen with VE-8-2M coating, #2
1/2” air space
1/4” clr SK/P V1086 S1M SANDBLAST #3
SCRN/P1 3058 #3

“B” glass: 1” insulated glass, Low #, HS/HS (appears “frosted”)

- 1/4" Evergreen with VE-8-2M coating, #2
 1/2" air space
 1/4" clr SLK/P1 V185 S11M ACID ETCN #3
 SCR/P1 3058 #3
 "C" glass: 1" insulated glass, Low E, HS/HS (fritted)
 1/4" Evergreen with VE-8-2M coating, #2
 1/2" airspace
 1/4" clr SLK/P1 v175 lf opaque white #3
 SCR/P1 5006 #3
- "D" glass: 1" insulated glass, Low E, HS/HS
 1/4" gry with VE-3-52 coating, #2
 1/2" air space
 1/4" clr
- "5D" glass: 1" insulated glass, Low E, HS/HS (spandrel)
 1/4" gry with VE-3-52 coating, #2
 1/2" air space
 1/4" clr APD/P1 V175 LF (opaque wht) #4
- "E" glass: 1" insulated glass, Low E, HS/HS (spandrel)
 1/4" Evergreen with VE-8-2M coating, #2
 1/2" air space
 1/4" clr
- "G" glass: 1" insulated glass, Low E, HS/HS
 1/4" clr with VE-1-2M coating, #2
 1/2" air space
 1/4" clr

Curtain wall System:

- Vistawall: Several frame configurations, 2 1/2" wide X 6 1/2", 7 1/4", 8 1/2", and
 12 1/4" deep
 Interior Tempered Glass System:
 RDM Glass Systems (Inkan Limited), Ontario,
 Canada:
 1/2" and 3/4" glass panel system with 14" fins.

2.2.A.3.11 Maintenance Contracts

For nearly 30 years, the Authority Maintenance Department has maintained exclusive service contracts with various equipment and system manufacturers. Over the years, these contracts have resulted in competent regularly scheduled preventative maintenance, and in several cases, full-time, on-site representation for emergency maintenance. Current service contracts include:

Bombardier	for airside to landside AGT systems for monorail system at the Long Term Garage
ASIG	for hydrant fuel system
Bombardier	for monorail system at the Long Term Garage
Carrier	for chillers (building/preconditioned air) and chilled water systems
Com-Net	for EVIDS System
Johnson Controls	for building control system (Metasys - EMCS)
Schindler	for elevators, escalators, and dumbwaiters

Simplex	for fire alarm system
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2.2.A.3.12 Toilet Room Design

Restroom design in public areas of the main terminal will comply with the requirements of the Main Terminal Interior Design Criterial Manual.

Fixture Counts: With the construction of Airsides F, A, E, and C, the CAA has exceeded the minimum standards for fixture counts as listed in the Florida Building Code-Plumbing (FBC-P). The increased fixture quantities have been developed in response to estimated slug load passenger counts at the terminal's peak load condition. The design professional will review any updates to the passenger loading forecasts before finalizing any toilet facility modifications. The design professional will also refer to the FBC-P, Paragraph 403.1.1, for special male/female fixture ratios associated with assembly occupancies. (potty parity)

Entry Detailing: Typically, a semi-circular maze arrangement is used, with carpeted wall for acoustical control (without doors). The minimum clear width will be 5 feet. The maze floor is typically carpeted, and a marble threshold transitions to ceramic tile upon entering the toilet room.

Finishes: Walls, within the toilet room, are typically clad full height with ceramic tile (minimum size is 4 inches by 4 inches), with 1/8 inch maximum joints, and gray grout. Floors are also ceramic tile (minimum size is 8 inches by 8 inches), with 1/4 inch or smaller joints, and gray grout. Ceilings will be painted gypsum wallboard. Refer to section 3.9B.

Minimum Circulation Clearances: Toilet stall to front face of lavatory will be 5 feet, 6 inches; toilet stall door to toilet stall door will be 6 feet; front face of lavatory to front edge of urinal will be 6 feet, and a minimum walkway clearance will measure 5 feet.

Toilet Partitions, Toilet Accessories, and Toilet Fixtures/Fittings: The Authority maintains strict and well-defined standards for these components. Refer to Sections 3.10.A, 3.10.E, and 3.15.F, for a detailed listing of the respective Authority standards.

Trash Receptacles (in toilet rooms): A trash receptacle (R) must be placed adjacent to one edge of each lavatory (L). A typical configuration at a lavatory wall would be: L-R-L-L-R-L. In addition, a receptacle is to be placed on each side of the entrance/exit doorway.

Diaper Changing Facilities: Each toilet room (both men and women) will be equipped with a diaper changing area. A counter with an integral sink will be fabricated of Corian (or equal) and will have a raised front edge. The counter will have a minimum length of 6 feet, and the sink will be placed at one end, leaving a 4-foot clear shelf width. The counter depth will be 2 feet. Counter detailing will make ADA compliant accommodations for individuals with disabilities. Adjacent toilet accessories will include a towel dispenser, a soap dispenser and a waste receptacle.

Women's Vanities: Each woman's toilet room will be provided with a "makeup" vanity counter, fabricated from Corian (or equal). Length can vary from 8 feet to 16 feet, depending on toilet room capacity. Counter depth will be 1 foot. A full width stainless steel-framed mirror will be installed above the counter to a height

of 6 feet, 6 inches, approximately. A duplex outlet will be provided for every 6 feet of counter length.

Mirrors: All mirrors will be framed in stainless steel. Each women's toilet must be equipped with a 24-inch by 60-inch-high, full length mirror, mounted 1 foot above the floor.

Companion/Family Toilets: At each large toilet room grouping, provide a separate private toilet room that is accessible by an individual with disabilities (of either sex), who requires assistance from a spouse, nurse, or companion. The room should be at least 80 square feet in area. Corian (or equal) shelves will be provided for baggage and diaper changing. All plumbing fixtures installations will be ADA compliant. A junction box for an emergency call system will be roughed in, between the toilet and lavatory, at a height of 1 foot, 4 inches above the floor. All finishes and accessories will be consistent with standard toilet room construction.

Plumbing Chase Design: All plumbing chases will be designed to provide a minimum clear access walkway, 2 feet, 6 inches wide by 6 feet, 6 inches high, between the fixture carriers. Such a space is necessary to access and service the electronic flush valves, the electronic faucets, all fixture traps, waste line cleanouts, and water service branch isolation valves. Chases will be accessible from outside the toilet room such that a female plumber can service a men's room fixture, or vice versa. A 3'-0" wide door will be provided for access. Floor drains must be provided at each lateral cleanout location. A waterproofing membrane will be installed on all chase floors. The membrane will be turned up the perimeter wall a minimum of 2" to create a "mini-sump". Appropriate linear fluorescent fixtures will be provided to effectively illuminate any serviceable area. The light will be switchable at the chase door. Duplex outlets must be provided at 20 feet on center. All piping penetrations through elevated floors will be waterproofed. All valves within the chase will be located at or beneath 7 feet above the floor.

Floor Drains: Floor drains will be located frequently within the toilet room; allow one drain for each 500 square feet of floor area. Drains will be located near the wall and between fixtures, or under toilet partition sidewalls. The drain placement will be away from any traffic areas (refer to chase requirements listed previously)

Cleanouts: Waste cleanouts will be placed at the end of each fixture bank lateral.

Janitors Closet: All closets will include a floor sink and a mop holder. Walls abutting the sink will be clad with ceramic tile (4" x 4" minimum size) to a height of 6' - 0" and a width of 1' - 4" beyond the sink edge. The mop holder will be installed in a position that will allow the mop to drip into the floor sink.

Walls beyond the tile areas will be painted gypsum wallboard to a height of 8' - 0". All plumbing lines and electrical conduit and junction boxes must be concealed behind the wallboard. The remainder of the space, above 8' - 0" can remain unfinished with exposed studs, conduit, piping, valves, etc.

Art Glass: All new and/or remodeled multi-person restrooms at TPA will include an "art glass" wall panel system, utilizing images from the Authority's existing catalog of approved photographs. Designer will evaluate similar installations in existing campus restrooms for reference on preferred locations, size, design intent, etc. Refer to section 3.9C.

2.2.A.3.13 Housekeeping Facilities

Vacuum cleaner outlets, 20 amp/120v, hospital-grade, will be located in carpeted areas within 100' of any point within that area. Breakroom facilities will be provided for the housekeeping staff that includes a counter with a sink, a microwave oven, a refrigerator; other furnishings within the space may include a rectangular table (seating 6) and a desk and chair. Thirty-to-forty half lockers, 12" wide x 36" high x 16" deep, will be provided for storage of personal items. Lockers will have a padlock hasp.

2.2.A.3.14 Bird Control

Building designs will discourage the roosting of pigeons and other nesting birds by minimizing the amount of ledges and protected surfaces where nesting might occur. The building envelope will be sealed as necessary with grilles, screens, etc., to prevent bird entry. In areas where the design may create a roosting area, a proven means of discouraging birds will be used; such as low-voltage wiring strips along parapet walls, low-visibility nylon lines crossing the areas, nylon netting around cooling towers, etc.

2.2.A.4 Equipment/Furnishings

2.2.A.4.1 Ash/Trash Receptacles

The construction of Airside A prompted the development of new receptacle that has been repeated on many subsequent renovations. The stainless steel unit can be fabricated with a sloped top or a sand tray (smoking areas). Typically, it is fabricated with a wall-mounting bracket. The piano-hinged access door has a concealed latch and an integral raised lip receptacle shelf. A removable cylindrical galvanized receptacle sits on the shelf.

2.2.A.4.2 Landside Ticket Counters

During 1999-2000, a project was initiated to replace the airline ticket counters on the Ticket Level. The resulting shell configuration consists of stainless steel clad end pylons bridged by a solid surface cowling to conceal the computer monitors. Two solid surfaces are overlaid on stainless steel clad front panel. This has an overall width of 6' - 0".

Stainless steel clad bag wells are placed on each side of a ticket counter module. The "floating" top design for the bag well allows for the installation of electronic scales on an as-needed basis. Digital readouts are provided on the cowling ends on each side of the bag well. The typical width of a bag well is 3' - 0". On the agent side of the counter line, the shell is filled with an insert cabinet that is generally designed and built to the particular airlines specifications. Typically, the insert design and detailing reflect the functional needs of the airline including the after hour security of ticket and bag tag stock. The design has generally evolved from work flow and ergonomic studies.

Shortly after the ticket counter replacement project was completed, the airlines began replacing many of the manned ticket counters with customized self-service E-ticket units. Many airlines installed a "corporate-standard" full height pedestal units, while others have chosen to install a small drop-in CRT module into a modified Authority counter shell. To date, the airlines have been generally receptive to making minor material adjustments to ensure visual compatibility with the Authority standard counter design. Most units are utilizing stainless steel and solid surface cabinetry.

2.2.A.5 Conveying Systems

Elevator entrance design has become a somewhat complex problem. The arrangement of up to ten distinct elements that may be necessary at an elevator entrance requires research and coordination with the elevator vendor, and numerous other contractors. The six items typically installed by the elevator installer include the call button unit (with or without the key switch), the hall lantern (indicating direction of travel), the current floor indicator (above the door), the fireman's phone outlet, the emergency sign explaining firefighter's operation, and the "Do not use elevator when flashing" signal light. In addition, other signage elements are required: a directory sign (that indicates the spaces accessed on the other floors via this elevator), an "In case of fire" sign, possibly a wall bumper (in a service corridor) and possibly a tenant requested sign (intended to provide instructions to flight crew members).

At airside buildings, it is frequently necessary to equip an elevator with special access-control components to prevent the unauthorized access to a secure level of the building by the general public. The most frequently used controls are proximity cards (which require an interface with the airport's access control computer) or a digital keypad. A reprogrammable digital keypad can be programmed to a "corporate" code that will allow out-of-town flight crew members to access the airline's operations areas.

2.2.A.6 Miscellaneous Structural Considerations - Reserved

2.2.A.7 Miscellaneous Plumbing Requirements

Provide ½-inch water stub up and 2-inch sewer stub up for electric water coolers (typically a tenant provided item). The design professional should consult with each tenant regarding the desire and need for water coolers.

Prepare waterproofing details for all piping penetrations through elevated floor slabs. Coordinate with fire safety system.

All public toilet rooms will have 24 volt electronic flush valves on water closets and urinals and electronic faucets with blended water at lavatories.

Provide access panels when it is necessary to conceal a valve or other device that may require service or adjustment. Generally, it is preferred to locate such devices within service spaces, such as janitor closets, or plumbing chase, where they can be directly accessible. The components should be located within 7 feet of the floor (accessible without a stepladder). If an access panel is required in a tiled wall, it will be fabricated in stainless steel.

Provide frequent placement of cleanouts (particularly at changes of direction) in all underground storm, sanitary, grease, and specialty waste lines.

Provide tenant sub-meters on each tenant water service line. Meters must be accessible for monthly readings (accessible without a stepladder).

Provide a separate city water meter for cooling tower makeup water and cooling tower blow down. Meters must be purchased from the City of Tampa.

All "P" traps, shutoff valves, and faucet electronics will be located inside the plumbing chase.

All watercloset and urinal flush valves will be located in the plumbing chases.

Electric water heaters (EWH) will be roughed-in (plumbing and electrical) so that they can be easily removed and replaced without unsoldering or cutting piping. Locate adjacent to a floor drain.

Install gate valves immediately adjacent on either side of any pressure-reducing valve. Install pressure reducing valves in an accessible area below 7' - 0" above finished floor.

Install domestic water isolation valves on branch lines 2" and larger.

Coordinate floor drain locations with structural framing.

Do not install storm, sanitary piping, drainage piping, or HVAC pans or piping directly over electrical equipment, including panels. Do not run pressurized liquid (domestic water, chilled water, etc.) piping through electrical rooms.

Design water supply system for toilet rooms with valve zones so that only a small portion of the room must be shut down to service a particular component.

Install floor drains with trap primers and hose bibbs in all mechanical rooms.

All piping and conduit will be concealed in all finished interior spaces and on the exterior of the building.

Design domestic water pumps, so that one pump can be mechanically and electrically isolated to enable the other pump to remain operational (100% redundant and alternating function). Provide a full size bypass line on the domestic water system downstream of the booster pump package.

Provide a duplex in-line filter/strainer on the inlet to the domestic water pump.

Provide conductivity monitoring sensor on incoming city water and interface with BCS (METASYS).

Install gate valves immediately adjacent on either side of an air separator or a pressure reducing valve.

Provide cleanouts at the top of all sanitary risers. Provide cleanouts at the ends of all laterals and at all sanitary drops. Provide cleanouts at the end of all branch lines. Install floor drains beneath all cleanouts.

Coordinate the location of all storm and sanitary cleanouts with Authority maintenance prior to installing any piping.

2.2.A.8 Miscellaneous Fire Protection Requirements

A standpipe system will be an automatic wet system, class 1, 100 psi residual pressure at the most remote hose connection.

All fire sprinkler valves will be located in accessible areas. Access must be possible without a stepladder. If the valves must be concealed, appropriately sized access panels must be provided to allow inspection and/or servicing.

Fire sprinkler zone drain lines will be located at non-traffic locations and will terminate at a floor drain.

Utilize only UL-Listed hot-dipped galvanized hangers and threaded rods to support sprinkler system components in non-conditioned spaces such as: tug tunnels, bag make up areas, shuttle maintenance areas, and sheltered areas (exterior, but under cover.)

Utilize only UL Listed pipes and fittings for wet pipe and dry pipe systems. Pipe and fittings in non-conditioned spaces such as: tug tunnels, bag make up areas, shuttle maintenance area, sheltered areas (exterior, but under cover.) will be factory hot dipped galvanized.

All fire protection equipment and devices will be UL Listed and FM approved.

The design professional will carefully consider the potential impact of an accidental discharge or leak from a wet pipe system in rooms housing significant electrical equipment or electronic systems. Increased fire separation provisions may eliminate the sprinkler requirement or negate the need for a dry pipe or pre-action system.

2.2.A.9 Miscellaneous Mechanical Requirements

Provide air conditioning for all mechanical equipment rooms, electrical distribution rooms, systems rooms, the sound rooms.

Install large mechanical system components (chillers, pumps, etc.) on isolated sections of floor slab to reduce vibration transmission throughout the structure.

Provide access panels when it is necessary to conceal a valve, damper, or other device that may require service or adjustment. Generally, it is preferred to locate such devices in mechanical equipment rooms, janitor closets, or plumbing chases. If an access panel cannot be avoided, coordinate location with the Architect.

Air handling unit condensate will drain to the storm sewer system. Chillers will be painted.

Specify a three-to-five year full service extended warranty on any new chillers in addition to a renewable maintenance contract. The warranty documents will list the monthly cost to the owner for term of the warranty.

Provide sensors to monitor condenser water conductivity and pH, and interface with BCS (METASYS).

Provide vibration isolators on pipe hangers for the preconditioned air system (glycol) piping.

Cooling tower water piping and flange connections exposed to water spray should be constructed of PVC or coated steel.

Provide isolation valves in main glycol piping loop and branch line connections to main header.

All air handling unit equipment condensate drains will be piped to the nearest storm drain line. All air handling unit equipment on large scale "green field" projects, install a condensate collection system to recycle condensate "waste" as make up to replace evaporated condenser water. See system installed at Airside C.

2.2.A.10 Miscellaneous Power Requirements

No exposed conduit will be allowed in janitor closets beneath 8 feet above the floor.

All electrical distribution rooms will be air-conditioned.

Provide GFI (ground fault interruption) at vanities and between lavatories; an outlet must be adjacent to each lavatory.

Install gray 20 amp/120 volt hospital-grade outlets in carpeted areas (100 feet maximum spacing) for carpet cleaning equipment.

Provide power to irrigation system components such as pumps, controllers, and solenoid valves.

Provide power to all parking gates and electrical sliding gates.

Provide power stub-ups for FIDS system.

Extend normal and emergency power to subpanels in each tenant area.

Provide power source for low voltage 24VDC valves or lavatories, urinals, and water closets. Connect no more than three sensors to each transformer.

Rough-in empty conduit for an intercom system at each tenant's access-controlled security door. Rough-in power to master station location and rough-in system conduit between master station and substation. Typically, the substation will be located on the non-secured side of the access-controlled door hardware for the system will be provided by the tenant).

Rough-in empty systems conduit (for an emergency call system) to a location 1 foot, 4 inches off the floor, between the watercloset and the lavatory in all companion toilets. Extend conduit to near systems room to allow interface with a future master station that may be installed in the security office or the Communications Center.

Provide separate electrical meters, located in satellite electrical rooms, for each tenant space.

Provide emergency power to the waterproof duplex outlets in the elevator and escalator pits.

Provide GFI receptacles in the elevator machine rooms and central plant spaces.

Construction documents will outline all work to be performed. Drawings will show new branch or feeder circuits and identify panel and breaker numbers where originating, size of conduit, size of wire, number of conductors and full load current.

Provide a complete riser diagram if any electrical panels are added. (Having an accurate and complete riser diagram is a necessary tool to support the ongoing maintenance operation as well as provide for future development of the power network.)

Office Design: Provide a clean power receptacle in addition to a normal power outlet at each computer network data outlet. Provide separate transformer, dedicated panel and surge suppression when practical.

2.2.A.11 Miscellaneous Lighting Requirements

All HID downlights will be specified to have a protective glass lens to prevent hot glass from falling in the event of a lamp explosion.

Lighting at all exit stairs will be on emergency power.

Avoid using "shear" light along the walls; it accentuates all imperfections.

Do not install light fixtures (or speakers) above areas inaccessible to a lift device. Lower height construction such as bar/food service and preparation areas, planters, and escalators and stairs can make lamp maintenance impossible.

Provide appropriate lighting to enable nighttime servicing of the cooling tower.

Do not provide switches for toilet room lighting. They are always turned on. The only control is the breaker at the panel.

Provide emergency power to the light fixture in the elevator and escalator pits.

Minimize the use of fluorescent light fixtures. Lamp cost is high and replacement frequency is often.

2.2.A.12 Miscellaneous Systems Requirements

Provide raceways and conductors to monitor and control all elevators from the Communications Center.

The fire alarm system will be the pre-signal system operated through the Communications Center.

Provide data stub-ups for FIDS system.

Provide data raceway system and stub-ups for FIDS system.

Route systems cable tray (data, phone, fire alarm, CCTV, and so forth) to each tenant space.

Provide Gaitronic 280 series telephone in all elevator cabs.

Provide heat detectors in elevator pits.

Provide fire alarm speaker "strobe" devices in all enclosed rooms.

System vendors will provide source codes to allow local software adjustments. Systems include access control, fire alarm, and building management.

Provide fire alarm system annunciator in the fire control room (off the truck court) and in the security office. The system will also provide alarm notification to the Comm. Center in the Service Building.

When possible, expand existing fire alarm and building control systems instead of introducing new systems. Simplex and Johnson Controls are the manufacturers of the existing systems.

2.2.B Airside Terminals and Truck Courts

2.2.B.1 General Planning Criteria

2.2.B.1.1 Building Envelope Limitations

Provide raceways and conductors to monitor and control all elevators from the Communications Center.

The fire alarm system will be the pre-signal system operated through the Communications Center.

Provide data stub-ups for FIDS system.

Provide data raceway system and stub-ups for FIDS system.

Route systems cable tray (data, phone, fire alarm, CCTV, and so forth) to each tenant space.

Provide Gaitronic 280 series telephone in all elevator cabs.

Provide heat detectors in elevator pits.

Provide fire alarm speaker "strobe" devices in all enclosed rooms.

System vendors will provide source codes to allow local software adjustments. Systems include access control, fire alarm, and building management.

Provide fire alarm system annunciator in the fire control room (off the truck court) and in the security office. The system will also provide alarm notification to the Comm. Center in the Service Building.

When possible, expand existing fire alarm and building control systems instead of introducing new systems. Simplex and Johnson Controls are the manufacturers of the existing systems.

2.2.B.1.2 Shuttle System Design Issues

Provide a 2° angular splay from station centerline for the shuttle station tunnels. The widened exit lobby "throat" allows for better queuing distribution at all entry doors along the boarding area. The minimum lobby width dimension should be 27' - 0".

When designing the tunnel envelope, provide emergency egress doors for any possible vehicle stop location. Misalignment of doors is extremely rare, but all scenarios of misalignment must be planned for, including the worst case of striking and collapsing the buffer. Typically, the emergency egress doors have been concealed by the panel systems between the doors. The existing airside buildings present various approaches to the detailing of these doors.

The maintenance area for the shuttle system is typically constructed at the airside end of the system. The area required for a typical maintenance area is approximately 9,000 square feet. This space includes:

AGT Switchgear	850 SF
UPS Room	160 SF
ATC (automatic train control)	60 SF
Parts storage	1,100 SF
Toilet/lockers	64 SF
Maintenance area	6,666 SF
(Includes two elevated work platforms 20' x 95')	

These areas are for reference only. Consult with the system manufacturer / maintenance contractor for confirmation or current needs.

With the current Bombardier C-100 car system, the running surface (where the vehicle tires roll) is 3' - 6" below the lobby floor and vehicle floor level. The maintenance platform is 5' - 0" below the running surface and in Airside A the maintenance area is 8' - 4" below the work platform. The elevation difference between the maintenance platform and the maintenance area floor varies from airside to airside. With only 8' - 6" from the lobby floor to the maintenance platform, headroom for the mechanic becomes an issue. As a result, the lobby floor structure cantilevers approximately 5' - 0" on each side thus eliminating deep edge beams. (At Airside A the slab thickness is 10", which allows approximately 7' - 8" of headroom.)

The airside end of the system has also been constructed with wash platforms to allow regular cleaning of the vehicles. At Airsides A, C, E, and F, the 50' platform cantilevers from the outside face the guideway structure. The platform is approximately 5' - 0" wide and is constructed with a metal grating walking surface and enclosed by a perimeter guardrail. Each platform is equipped with a hose bibb and a power outlet to allow the use of a pressure washer. The platform is connected by ships ladder to the interior maintenance platform.

2.2.B.1.3 Special Access Provisions

At Airside A, C, and E three distinct features were included to accommodate the movement of large items in or out of the building.

Near the loading dock, a 10,000 lb. capacity elevator was provided with an 8' x 10'(±) platform and a 6' wide door.

In addition, double wide exit doors have been provided at each airside onto the emergency walkway of the shuttle system to allow the movement of hydraulic boom or scissors lifts to and from the airside and the landside terminal.

On the apron side of the Airside A, a pair of exit doors and an exit stair was detailed to facilitate the movement of large furniture, equipment, or landscape features. The exit doors are equipped with a removable center mullion and the stair landing is detailed to allow the removal of a portion of the guardrail.

At Airside E, a removable section of curtain wall was detailed, without a concrete curb, into the east wall near Gate 75, just south of the outdoor patio.

2.2.B.1.4 Passenger Loading Bridges

The standard passenger loading bridge configuration utilized at this airport is an apron drive unit. Airside A has Stearns units throughout, with the exception of Gate 16 which is a Jetway unit. Jetway units are in place at Airsides C and E. Thyssen-Krup units are in place at Airside F. Bridges are manufactured in two tunnel and three tunnel configuration depending on the operational needs of the particular gate.

With the closure of Airside D, all airside are now "second generation" airside which have 400Hz power systems and pre-conditioned air systems on all loading bridges. The 400Hz power system consists of a power converter (that hangs beneath the loading bridge tunnel) that converts the standard 48 or 3-phase 60Hz AC power to 90KVA, 200/115V, 400Hz, 3-phase AC power. The pre-conditioned air system consists of a series of air handling units (hung beneath the cab of the loading bridge) with flexible duct connecting to the aircraft utilizing a glycol-based

refrigerant system that is processed within the building through a system of chillers, pumps, and ice storage tanks.

In selecting a bridge configuration, the design professional must analyze the relationship of aircraft threshold heights, ramp slope, rotunda height, and bridge length to meet the loading door. Bridge floor slope maximums will not exceed 8.33% or 12 to 1.

In analyzing bridge slope, avoid operations within five feet of full extension or five feet of full retraction. Within these limits, the bridges typically operate at half speed.

With many airlines downsizing their fleets to regional jets, they may very soon be a need to reconfigure a number of our current loading bridges to allow them to “stoop” to a lower to a 7’-2” threshold height (M0-80). Several regional jets require the bridge to lower to a 5’-0” threshold height. Rework kits are currently available from several sources.

In developing the apron layout, avoid placing manholes or fuel hydrant pits within expected operating zones for the loading bridge.

Maintain adequate clearance between bridge tunnels and fixed items such as columns and apron lighting poles.

Locate hurricane tie down positions with the bridge in a fully retracted condition as tight to the face of the building as possible. The tie down receptacles will not project above the apron surface and they will not present a tripping hazard.

An appropriate raceway system will be installed in the loading bridge to allow the installation of a telephone at the operator's console.

An appropriate raceway system will be installed in the loading bridge to allow the installation of an illuminated gate identification sign on the aircraft approach side of the cab. (See Airside A and E bridges.)

Boarding bridge interior air conditioning will be specified for all new boarding bridges.

2.2.B.1.5 Specialized Storage Areas

Provide a storage space for the Maintenance Department to high lift unit. Provide appropriate doors and power outlet to recharge batteries. Doors throughout the facility should be sized to allow necessary movement. Doors to the AGT system emergency walkway will be sized to accommodate the lift.

Provide a storage space for the interior plant maintenance cart.
Provide appropriate doors and power outlet to recharge batteries.

Wheelchair storage spaces will be provided near all holdroom areas.

2.2.B.1.6 Holdroom Layout

In recent years, security concerns have prompted many airlines to relocate their check-in counter/backwall” packages” to a location very near the exterior concourse wall directly adjacent to the loading bridge door. With the closure of the gap behind the backwall, the possibility of an unticketed passenger sneaking onto a flight is significantly reduced.

The close proximity of the check-in counter to the loading bridge has allowed many airlines to reduce the number of personnel required to service a boarding operation. An agent at the counter can now oversee the door in the event that the podium or pass reader agent is required to assist a special needs passenger down the loading bridge.

Orient the check-in counter and backwall at angle ($60 \pm$) facing toward the passengers as they approach the area from the shuttle lobby. The angled orientation increases the visibility of the gate numeral on the top of the backwall.

“Quick-turnaround” airlines such as Southwest require the creation of distinct deplaning and enplaning aisles. The deplaning aisle is usually a well-defined straight “chute” that directs the passenger out into the wider concourse walkway. With Southwest, the boarding queues are separated into four groups; preboards, and the A, B, and C groups. These groups must be separated from the deplaning aisles.

2.2.B.2 Equipment/Furnishings

2.2.B.2.1 Holdroom Seating

Holdrooms at Airside A, E, F, and C are all furnished with Herman Miller Eames Tandem Sling seating units. These seating units are also used throughout the Landside Terminal.

The tandem seating groupings are assembled in either single gang or back to back configurations with three to ten seat long groupings. Groupings that are too long prove to be difficult to move to allow carpet cleaning or overhead maintenance or housekeeping work.

2.2.B.2.2 Airside Check-in Counters (Airsides A and D)

With the development of Airside A, a prototype check-in counter shell was developed. The shell consists of two stainless steel clad end pylons which support a front-projecting transaction surface/cowling fabricated from solid surface material. The front panel consists of two solid surface panels set on a stainless steel-clad backpanel.

The top of the cowling is routed to accept a recessed signage panel containing required FAA notices.

As with ticket counters, an airline specific insert cabinet has been fabricated to accommodate the specific functional needs of their check-in operation. Utility interfaces include: emergency power, telephone, PA system, and data lines (connected to airline's network). Airline standard check-in counters were utilized by Delta and United at Airside E and by Southwest at Airside C.

2.2.B.2.3 Airside Back Wall Units (Airside A)

The back wall unit somewhat mimics the detailing of the check-in counter. Stainless steel clad rounded ends and corners surround a plastic laminate wall and storage cabinet.

Storage modules are provided in the lower portion of the front area and full height in two compartments on the back.

The upper portion of the front is allocated for airline signage and flight information displays (gate number, flight number, destination, and departure time).

A fire extinguisher cabinet and a waste receptacle are located on the backsides of the unit.

A sign box is mounted on the top of the storage unit and includes an illuminated gate number sign and a clock on the front and gate number signs on each side. Utility interfaces include: emergency power and data lines (connected to airline's network).

Airline standard back walls were utilized by Delta at Airside E and by Southwest at Airside C.

2.2.B.2.4 Airside Gate Podiums (Airsides A and D)

Typically, the airlines have established a final boarding pass checkpoint at the doorway to the lading bridge. These checkpoints vary in configuration with each airline. Some have a podium component with both a computer terminal and an electronic boarding pass scanner; another scanning console; a third may utilize an airport standard podium with an attached proprietary electronic scanning module; and smaller airline may simply have a podium from which the gate agent checks off a paper boarding pass.

2.2.B.3 Conveying Systems

2.2.B.4 Miscellaneous Structural Considerations

At security screening areas, provide adequate loading bearing capacity to support the latest generation of X-ray machines.

During the design of floor systems, consider weights and load distribution of the high lift equipment that will be utilized during construction as well as during the ongoing maintenance operations throughout the life of the structure.

Consult early with the Authority staff and tenant design professionals to establish special loading requirements for planters, aquariums, and any other concentrated load elements that may be associated with a concession buildout (i.e., signage pylons or "umbrella" canopies).

Consult early with signage and FIDS system design professionals to establish locations of ceiling/roof structure supported elements. The design professional will survey other similar terminal areas to develop a sense of the typical signage locations.

Provide 2" floor depression for tile placement at all toilet room areas.

With the construction of baggage sortation facilities at the airside, elevated floor slab design should address the extensive vibration introduced into the structure by the conveyors and pushers suspended beneath.

2.2.B.5 Miscellaneous Plumbing Requirements

At Airside buildings, provide 1½-inch water stub-outs at the building wall for potable water cabinets (a tenant provided item). Potable water cabinets are generally located on the pilot's right side of the aircraft parking position.

2.2.B.6 Miscellaneous Mechanical Requirements

Provide an aboveground fuel tank for the emergency generator. Locate in close proximity of truck court. Verify tank truck accessibility and path for filler hose. The fuel tank construction and installation will comply with all NFPA, EPA, and DEP regulations.

Consult NFPA 415 for height restrictions for exhaust outlets or air intakes located in walls adjacent to the apron/aircraft parking areas.

2.2.B.7 Miscellaneous Power Requirements

Provide disconnects/breakers for the pre-conditioned air system (PCA), the 400 Hz system, and the loading bridge at the building wall beneath the bridge's rotunda.

Provide electric meters on the service to the loading bridges, including the PCA air handler and the 400 Hz equipment. Locate meters in the satellite electrical rooms.

Provide emergency power to all check-in counters, backwalls, and gate podium scanners.

Provide emergency power for the AGT system control system.

Provide appropriate conduit and junction box rough-in to accommodate the power/phone/PA/data systems that serve subsequent bid packages, such as millwork (check-in counters, back wall cabinets, podiums, phone kiosks), and loading bridges.

Provide shunt trips for building and AGT power systems. Provide signage in each switchgear room with instructions indicating how to de-energize both power systems.

Provide electrical rough-in at the transom of the loading bridge door to accommodate the gate identification sign and a future digital flight information signage system.

Provide power rough-in for a future aircraft guide/approach system at each gate position. Locate junction box at 14 (fourteen) to 16 (sixteen) feet above apron elevation at the intersection point of the apron lead-in line and the building wall. Confirm exact placement of rough-in with manufacturer of equipment.

Provide power rough-in for security screening equipment (X-ray machines, magnetometers, etc.) Confirm detailed electrical characteristics for all equipment. At Airside E, it was discovered that all magnetometers must be connected to the same electrical phase in order to operate without electrical interference problems.

Extend power distribution panels to mezzanine levels to accommodate the future development of offices or airline lounge space.

Emergency power requirements: Typically, the following components require emergency power to maintain the basic operational capabilities during a power outage.

- operational lighting for all public spaces
- toilet room lighting
- soffit lighting above exterior stairs
- lighting for interior stairs
- signage lighting
- apron lighting
- truck court lighting

- gate operators
- elevators (provide capacity for only a percentage of the unit, which is switchable to any selected unit)
- passenger loading bridges (provide capacity for only a percentage of the unit, this is switchable to any selected unit)
- sewage lift stations
- jockey pump
- security equipment - magnetometers and X-ray machines
- automatic doors
- turnstiles
- blast fence lights
- generator fuel pump and battery charger
- coolers and freezers (tenant facilities)
- irrigation controllers
- U.P.S. systems for various computer controlled systems
- toilet room devices - electronic flush valves and lavatory faucets
- check-in counters and gate podiums
- telephone kiosks
- sound and fire control room receptacles
- systems equipment - access control and CCTV
- FIDS monitors and EVIDS information boards

Provide power rough-in for potable water cabinets (the unit is generally equipped with a motorized hose reel and a duplex outlet.)

2.2.B.8 Miscellaneous Lighting Requirements

Design apron lighting with light sources aimed at the cargo loading side of the aircraft (pilot's right side).

Apron lighting will be high pressure sodium, with double arc tubes, quartz restrrike and remote ballasts. Do not provide any dimming capability; it should either be "fully on" or "completely off."

Consider supplemental task-oriented lighting at ticket check-in counters and podiums. Carefully consider the impact of glare on computer screens.

Prepare a point-by-point photometric analysis of apron lighting prior to finalizing design.

2.2.B.9 Miscellaneous Systems Requirements

Provide rough-ins for public address (microphone station), data and phone at all check-in counters and gate podiums.

Design PA system with zones at each gate area. Do not provide local amplifiers that can be adjusted by gate agents. Locate all amplifiers in a common air-conditioned sound room. Provide conduit/junction box for telephone installation on a loading bridge.

Provide separate cable trays or conduit for power and systems under and between each check-in counter.

Provide interface with terminal master clock system. Extend to all check-in counters and other clock locations.

Provide data conduit from the check-in counter to the transom of the loading bridge door to accommodate a future digital flight information signage system.

Provide raceways, conductors, and push, buttons for the passenger screening area phone and "trouble" alarm systems. The alarm will be interfaced with police department dispatch computer system.

Develop decentralized "satellite" system rooms to provide localized connection/distribution points for phone, access control, fire alarm, data, and so forth. Locate systems room within the 100 meter maximum copper cable length.

Locate fire annunciator panels in the fire control room (accessible directly from the truck court) and the security office.

Extend the conduit or cable trays for phone, data, and other systems to the mezzanine level to accommodate the future development of offices or airline lounge space.

Provide appropriate raceways, conductors, and the necessary support equipment to provide monitoring at the Comm. Center of the following equipment and/or systems: fire alarm (typically Simplex); building management system (typically Johnson Control Metasys), elevator/escalator (typically Schindler), and access control. A trouble alarm will also be installed at each security screening area that is connected to the police department dispatch computer.

Require a five-year warranty on the public address system.

2.2.B.10 Building System Rough-in Provisions for Tenant Provided Equipment

Provide electrical junction boxes for aircraft parking "guide/approach system." Locate at approximate boarding level beam line at the projected intersection of parking lead-in lines.

Provide concealed empty conduits from the base of apron lighting poles to the apron level ceiling space to accommodate ground radio antennas that may be required by tenant airlines. Detail lighting poles to allow attachment points for these antennas. Confirm conductor size for antenna. Many airlines specify cabling that requires a 2" diameter conduit system.

Provide electrical junction boxes for hose reel power at locations appropriate for potable water cabinets. Typically, cabinets are placed to the pilot's right side of the projection of the lead-in line extended to the building wall. Water source will be a valved 1 ½" line.

Provide electrical junction boxes for electric water coolers. Coordinate placement with a valved water line and sanitary drain.

Provide separate signal and power conduits to the locations planned for communication antennas and satellite dishes.

2.2.B.11 Truck Court Elements

An airside terminal truck court typically includes the following components:

2.2.B.11.1 Guardhouse between Gate-Controlled Entry & Exit Roadways

Truck court entry and exit gates are controlled from the guardhouse. All vehicles entering the truck court must display proper identification. A guardhouse will be located adjacent to the service road and between the entry and exit gates. The guardhouse will have a clear view of AOA entry gates that are nearby. The guardhouse will be equipped with 120 volt power, an air conditioning/heating unit,

telephone service, and be interfaced with the access control system to allow gate control.

2.2.B.11.2 AOA Entrance Gate(s)

The AOA gates will be electrically operated horizontal sliding cantilevered gates with sensitive edges that reverse the operation in the event of contact with a vehicle. The gate operator is to be interfaced with the access control system. Valid security identification must be presented to a card reader when passing through in either direction. Typically, an entry and an exit gate are provided at each AOA entry point. The drive lanes are separated by a raised curb. On the curb are two card readers and numerous pipe bollards to protect the equipment.

Inductive loop detectors are placed in both drive lanes to ensure the vehicles pass through the gates in a prescribed sequence. The loops on the existing side, of either approach direction, serve to monitor the position of the vehicle during the closing cycle of the gate operation.

By requiring the vehicle to maintain a nearby parking position until the gate closes, the vehicle operator becomes responsible for supervising the gate operation during both the opening and closing cycles. This operation also prevents two vehicles from passing through on a single access card swipe (piggybacking).

2.2.B.11.3 Transformer Enclosure (Building & Shuttle System Equip)

At Airside A, a transformer enclosure was constructed adjacent to compactor enclosure. The concrete and masonry structure has a removable metal grating top that screens the electrical gear from view from above. The yard area enclosed is topped with course stone except at the concrete equipment pads. An underground drainage system is required to relieve any significant water accumulation. At Airside C, the generator building and transformer yard were combined into single enclosure. At Airside E, the generator building, the transformer yard the cooling tower and the compactor/dumpster enclosure were combined into a single concrete and masonry structure.

2.2.B.11.4 Trash Compactor Enclosure

A trash compactor is generally placed in a concrete/masonry enclosure. The compactor is generally integral with a 30 cubic yard trash container. When the compactor/container is removed for dumping, the compactor must be disconnected from a stationary hydraulic pump unit. The combined compactor/container assembly reduces the spillage that may result from a two component installation.

Electrical service will be in accordance with the container/compactor manufacturer's specifications.

The concrete slab should slope outward toward a trench drain and should be poured with steel guide channels to serve as the bearing surface for the container rollers as it is being removed or reset in place. The interior of the concrete enclosure should be constructed of poured-in-place concrete.

A pressure wash unit should be installed to allow periodic clean ups.

2.2.B.11.5 Loading Dock

At an airside, a loading dock will be constructed with minimum two berth width, 30'-0"±. The dock should be constructed with a minimum 10'-0" clear overhang to allow unloading during rain. The dock height is typically 4'-0".

2.2.B.11.6 Access Doors to Shuttle Maintenance Spaces

At the airside, exterior access doors are required for the following maintenance area spaces:

AGT Maintenance Space	- man door and overhead door
AGT Switchgear Room	- man door and overhead door
UPS Room	- overhead door
ATC Room	- man door

(See the Airside E and C construction documents for most recent configurations of shuttle maintenance areas)

2.2.B.11.7 Access Doors to Maintenance Areas and Central Plant

At the airside, exterior access doors are required for the following spaces:

Mechanical Equipment Room	double man door
Electrical Room	double man door
Fire Pump Room	double man door
Central Plant	man door and overhead door
Communications Room	man door

2.2.B.11.8 Access to Fire Control Room

At Airsides A, E and C, the fire control room is located at or adjacent to the loading dock.

2.2.B.11.9 Emergency Generator Enclosure and Cooling Tower

At Airside A and E, the cooling tower and the emergency generators are housed in adjacent concrete and masonry structures. The emergency generator area includes the generator unit, with control console, and an above ground fuel tank. The design professional will consider the normal length of fueling hose and available tanker truck parking positions when siting this enclosure. All exhaust pipe exposed to view will be fabricated from stainless steel. Consult with DEP for special fuel facility regulations.

2.B.11.10 Flight Crew Loading/Unloading Area (Hotel Courtesy Vans)

At Airsides A, E, and C, flight crew entrances routes have been created to allow for non-Tampa badged airline personnel to enter the building and gain access to the Boarding Level passenger screening area. (Consult construction documents for Airsides A, E, or C.)

2.2.B.11.11 Ramp to Loading Dock

At Airsides A, E, and C, a ramp has been constructed to connect the loading dock to the truck court driveway to facilitate trash removal, handicapped access, and maintenance access.

2.2.B.11.12 Truck Court Lighting

2.2.B.11.13 Staff Parking Area

Every attempt should be made to maximize the amount of staff parking spaces in the truck court area. At least two spaces will be provided for Authority maintenance vehicles adjacent to the Central Plant overhead door.

2.2.B.11.14 Access-Controlled Pedestrian Turnstile

Pedestrian access to the AOA area is provided from the truck court via an electronic turnstile within the fence line. The turnstile operator is actuated by an airport employee ID/proximity card badge.

2.2.B.11.15 Maneuvering and Turn Around Area in Truck Court

Typical vehicles accessing the truck court can include large semi-trailer units, large roll-off container trucks (to haul the 30 cubic yard trash container/compactor unit), fuel trucks, and various fire department apparatus. Adequate maneuvering space must be provided for all vehicles.

2.2.B.11.16 Miscellaneous Site Utility Elements

Double detector check valve for fire and domestic water service (with landscape screening); lift station for sanitary sewer (if required); irrigation system valves and controllers; manholes; fire department valves/standpipe connections

Provide water and power sources for irrigation system. Locate controllers and all solenoid valves in boxes below grade. (Investigate the possibility of utilizing nearby retention pond water for irrigation.)

Locate fire department connection (FDC) with 1000 GPM flow rate, maximum 6' from curb in an appropriate and accessible location. Verify position with the Fire Department.

Utilize landscaping elements to screen truck court from the service road and/or the shuttle system vehicles.

2.3 Attic Stock / Spare Equipment / Spare Parts

The design professional will coordinate with the Authority and establish and specify, as part of the project requirements, a list of all systems that require attic stock, spare equipment and or spare parts. Some specific items are listed in Section 3 however, other items are often required and not listed. The design profession will coordinate and specify a project specific list meeting the needs of the Authority.

Section 3 – Building Sections and Components

3.1 Division 1 – General Requirements - Reserved

3.2 Division 2 – Site work – Reserved

3.2.A Section 02221 – Building Decommissioning and Demolition

Prior to the demolition of a building or structure, all hazardous waste and materials must be disposed of in accordance with all applicable federal, state, and local regulations including but not limited to OSHA, EPA, DOT, FDEP, and EPC regulations. Waste disposal transporters must maintain continuous compliance with FDEP Rule 62-730.170, FAC, Standards Applicable to Transporters of Hazardous Waste . Copies of all waste disposal manifests must be provided to the Authority at the completion of the waste disposal task.

Asbestos survey, abatement, and disposal activities must be conducted in compliance with all applicable federal, state, and local regulations including but not limited to OSHA, EPA, FDEP HRS, and EPC regulations. Air quality monitoring (personal or ambient) during the asbestos abatement activities must be conducted by the contractor independently of other entities providing oversight.

Applicable Codes and Reference Standards

Applicable regulations include but are not limited to:

29 CFR 1910 Sections 2, 134, 145
29 CRR171 and 172
Chapter 99-469.001 99-469.015 of the Florida Statutes
40 CFR 61, Subpart M, and Section 61.145

3.3 Division 3 - Concrete

3.3.A Section 03200 - Concrete Reinforcement

In architectural concrete, only stainless steel tie wire will be used.

3.3.B Section 03300 - Cast-in-Place Concrete

The typical concrete for airport construction will have standard gray cement and normal weight limestone aggregate in accordance with ANSI/ASTM C 33.

All architectural concrete surfaces will be finished with a water-repellant.

The typical concrete floor slab finish, for a floor to receive VCT or carpet, will be steel-troweled with a liquid membrane forming, curing, and sealing compound.

The typical finish for a floor slab that is to be left exposed will be a “lightly broomed” finish with a liquid membrane forming, curing, and sealing compound.

Typically, slab hardener products are not used.

Typically, all slabs will be installed over compacted fill and a vapor retarder membrane (normally asphalt impregnated felts). At Airsides C and E, a heavy Stego-Wrap barrier (Stego Industries, (877/464-7834) was installed beneath the ground floor slab to prevent the upward flow of fuel vapors that exist in the building subgrade. This barrier has taped seams and is detailed to fit tightly around all vertical slab penetrations.

3.4 Division 4 - Masonry

3.4.A Section 04200 - Unit Masonry

Glazed brick for Landside Terminal renovations will be as follows:

Red face brick: "TIA - Red Glazed" by Belden Brick Co.

Blue face brick: "WG-90-3368" by Glen-Gery Corp.

White face brick: custom beige" to match existing by Endicott Clay Products, Co.

Sources: Clay paving bricks for Bag Claim and Ticketing Level paving bands:

Precast concrete pavers: 2'-0" x 2'-0" x 1-1/4" for Bag Claim, Ticketing and Plaza Level areas.

3.5 Division 5 – Metals

3.5.A Section 05511 - Metal Stairs

Exterior stairs and ladders will be left unpainted with a galvanized finish. Large assemblies will be detailed using "bolt-together" components or sub-assemblies. The weakest point in the integrity of a galvanized coating is in the area of a field weld that has only a thin, sprayed-on cold-galvanizing coating. Extensive preassembly by welding, before galvanizing, can be counter-productive because the high heat associated with the galvanizing process will warp a competently prepared assembly to the point that it may not be usable. The design professional will verify the limits on component or subassembly size dictated by capabilities of local processors

When field-welding is necessary, cold-galvanizing must be used to complete the corrosion protection. Careful research and sample procurement are necessary to find a matching cold-applied product.

Avoid products that tend to be a flat gray (either too light or too dark) without the "metallic" look.

3.6 Division 6 – Wood and Plastics

3.6.A Section 06100 - Rough Carpentry

In recent years, it has been discovered that the structural integrity of fire-treated wood framing and plywood can deteriorate significantly when exposed to the radiant heat of light fixtures (including fluorescents). Research the products carefully before specifying or using fire-treated wood. Do not use in a loadbearing condition. Backing boards for telephone terminal boards are acceptable. The painting of backing boards will be performed outdoors away from conditioned spaces.

3.7 Division 7 – Thermal and Moisture Protection

3.7.A Section 07190 - Water Repellants

Exterior exposed concrete surfaces will be coated with water repellent.

3.7.B Section 07411 – Metal Roof Panels

Six aluminum standing roofing systems have been installed at the airport. The north Pemco Hangar and Airside F are built with the Merchant and Evans, "Zip-Rib" system; the U.S. Airways Hangar (steel) and Airside A are built with a Centria (formerly H.H. Robertson/Smith Steelite) SRS-3 system; and Airside E and C and the Airside A baggage sortation building are built with a BemoUSA Corp. 305 system. All systems are field-formed from Kynar-coated aluminum coil stock, 0.40-inch thick. Panel lengths on the hangars approach 125 feet; Airside E has panels in excess of 250 feet long; and Airside C has panels exceeding 370 feet in length. Special detailing considerations are required to accommodate the thermal expansion of the very long roof panels. All systems have

nominal 3-inch-high standing seams that are sealed with sealant and an electric sealing tool. All systems use a stainless steel clip system which attaches to a heavy gauge metal purlin system.

The curved panels on Airside A and F were formed in the field by running the panels through a second roll-forming machine to create the desired radius. Gutters for the standing seam roofs are formed from 18 or 16 gauge stainless steel that is fully welded and water tested.

Gutter expansion joints are typically spaced 30 to 40 feet on center. Downspout drops are formed from the same gauge stainless steel (18 or 16), and are welded to the gutter box. Transitions are then made to connect to the building's downspout system (steel or PVC, depending on conditions).

Warranty requirements for Metal Roof Panels will be as follows:

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of metal panel systems that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including rupturing, cracking, or puncturing.
 - b. Deterioration of metals and other materials beyond normal weathering.
 2. Warranty Period: Ten years from date of Substantial Completion.
- B. Special Warranty on Panel Finishes: Manufacturer's standard form in which manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
 1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.
- C. Special Weathertightness Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace standing-seam metal roof panels, roof specialties, roof accessories and built-in gutter assemblies that fail to remain weathertight, including leaks, within specified warranty period.
 1. Warranty Period: 20 years from date of Substantial Completion.

Exposed fasteners are prohibited where visible. If fasteners penetrate the roof decking where the fasteners are visible, provide an acceptable exterior soffit system to visually conceal all areas.

3.8 Division 8 – Doors and Windows

3.8.A Section 08110 - Steel Doors and Frames

Do not specify of doors fabricated with vertical galvanized sheet steel channel-shaped sections or interlocking Z-shaped sections. The doors on Airside A exhibit significant spot weld dimples on the face panel at each of these reinforcement members. Care should be taken in considering acceptable manufacturers. Consider requiring a door and frame sample to assess quality of hardware preparations and finish. Galvanize all exterior doors and frames.

On frames with access control hardware, require the inclusion of a tightly sealed mud box with a flexible conduit connection at each attachment point for electronic hardware. A continuous raceway must be provided from the face of the door from e to a system junction box located near the door. With a definitive conduit route, a new conductor can be re-pulled into the hardware location whenever necessary.

Airside F had significant wiring difficulties because of improperly constructed wiring raceways.

Each exterior door will be equipped with a small permanently affixed sign numbering the door in accordance with the Authority door numbering system. The sign will be placed in the upper hinge side corner of the door.

3.8.B Section 08211 - Flush Wood Doors

Typically, interior wood doors in airport buildings are solid core assemblies with plastic laminate faces.

3.8.C Section 08411 – Aluminum-framed Entrances and Storefronts

Use only “wide-style” sections for aluminum and glass entrance doors. The construction is more durable and the wide face dimension provides enough surface to accommodate all hardware components.

3.8.D Section 08461 – Sliding Automatic Entrance Doors

Fabricate entrance doors and side lights with “wide-style” sections to match manual doors.

Provide a minimum opening width of 5 feet, 0 inches, clear.

Detail assemblies with both inside and outside side light elements. The outside piece will require breakaway hardware to maximize egress width.

The inside fixed panel must be installed so as to protect any unsuspecting individual from the suddenly moving edge of the operable door.

3.8.E Section 08710 - Door Hardware

Locks will be Corbin/Ruswin ML 2000 Series (no substitution) with removable core cylinders.

All permanent cores are to be great grand master keyed into existing or Authority approved Ruswin removable cores, H Keyway 6-pin system, in accordance with Authority’s key control requirements and instructions. Owner is the Authority. Individual door keying requirements are to be established in a meeting with the contractor, user, design professional, Authority, key control staff, Operations and others as deemed appropriate by the Authority. Key bittings will be per Authority requirements and provide upon project completion to the Authority.

Unless otherwise agreed, permanent keys are to be delivered to the Authority key Authority will direct installation and establish key control over the permanent key set. The Authority reserves the right to order and install the cores for any project. If this occurs, the contractor will install a construction set as directed by the Authority and they will be returned to the contractor when the final set is installed.

For factory ordered cores, the order must be received by the factory a minimum of 90 calendar days prior to occupation. If delivery is not by space use date, the contractor must provide a construction set with all keys that mimics how the final key set will operate and that set must be

available for installation a minimum of 10 calendar days prior to space use or sooner if so directed by the Authority.

Panic devices will be Von Duprin 99 - Series touchbar devices. No exposed vertical rod devices are allowed.

Hinges will be Hager, McKinney, or Stanley. Units installed on exterior doors will be stainless steel. Units installed with door closers will have ball bearings.

Door closers will be Corbin/Ruswin 2200 series. Valve body will be located on the non-public face of the door whenever possible.

Stainless steel kickplates will be provided at all high-traffic doors (push side). Armor plates will be installed at all doors where carts or equipment will be pushed against the door while it is being opened.

Access control: Designers will coordinate door hardware and access control electronic device installation to verify that all operational objectives are met. Refer to Section 16730 for narrative on access control operations.

3.9 Division 9 - Finishes

3.9.A Section 09220 - Portland Cement Plaster

Exterior stucco areas will use only zinc alloy or PVC accessories: corner beads, casing beads, control joints, and so forth.

Framing for exterior soffit areas will use "stiff-leg" framing that is engineered for both positive and negative uplift loading.

3.9.B Section 09310 - Ceramic Tile

Floor and wall tile will be 4 inches by 4 inches minimum size (larger sizes are preferred).

Wall tile in restrooms will have a gloss or semi-gloss finish; no matte finish.

Grout for floor applications will complement the tile color selection and will be darker in color as to minimize staining and an overall uncleanly appearance from normal wear and tear. Grout for wall applications will complement the tile color selection but is not required to be a darker hue. Grout will have a maximum joint width of 1/8 inch.

Backing for tile on fixture or "wet" walls will be a glass fiber-reinforced cement board, such as "Durock" or "Wonderboard."

Transitions from ceramic tile to another floor finish (carpet, vinyl composition tiles, and so forth) will use a tapered marble strip that provides an ADA-compliant transition between the varied finish thicknesses.

3.9.C Section 09770 – Wall Panel Systems: Art Glass

Basis-of-Design Product: Forms+Surfaces; LEVELe Wall System.

Image to be back-printed on minimum 1/2" thick, impact rated glazing.

3.10 Division 10 - Specialties

3.10.A Section 10155 - Toilet Compartments

The partition system will be manufactured by the American Sanitary Partition Corporation (no substitution).

The installation will be a ceiling-hung configuration, except at large handicapped stalls, where a full height pilaster may be necessary to achieve proper lateral stability for the compartment front. In Airside A, a removable floor connection was designed to allow periodic disassembly to facilitate a thorough cleaning of the floor in the area of the pilaster footprint.

Doors will be reinforced to prevent racking and twisting.

The panels will be furnished with the manufacturer's standard powder-coated finish.

All hardware will be consistent with the parts inventory maintained by the Authority Maintenance Department.

Accessory and partition installers will coordinate placement of accessories to prevent damaging contact between components.

Coat hooks will not be placed on the inside face of an outward swinging door. At the normal placement height, the hook can become a dangerous projection. Locate on a side wall near the back of the compartment, safely out of the way. In the larger handicapped stall, the hook can be located on the front panel opposite the water closet.

Coordinate wall framing to provide solid wall reinforcement or backing between studs to provide a competent anchoring substrate.

3.10.B Section 10265 – Impact-resistant Wall Protection

In public area service corridors and at high traffic corners within the Authority offices, install corner guards to protect the wall. Typical corner guards are SM-20 units (surface-mounted) and FS-20 or 20R units (flush-mounted in gypsum board partitions), by Construction Specialties, Inc. or approved equal. At non-gypsum board partitions (masonry or concrete use 6 gauge stainless steel corner guards, with ½" hemmed edge on 3 ½" wide flanges).

In service areas, where carts or rolling equipment circulate frequently, it is appropriate to install both crash rails and corner guards. At Airsides E and C, dual crash rails were used to protect the walls, one just above the base and another at about 4'-0" above the floor. The crash rails are SCR-64 units by Construction Specialties, Inc., or approved equal. Corner guards are SM-20 units for surface mounted conditions and FS-20 units for flush-mounted conditions, by Construction Specialties, Inc. or approved equal.

3.10.C Section 10450 - Pedestrian Control Devices

At AOA pedestrian access points, a full-height turnstile (Model MSTX by Alvarado Manufacturing Company, Inc.) will be used. Controlled access is required in both directions. Allow a maximum 120-degree rotation with each card activation.

Refer to Section 16730 for narrative on access control operations.

3.10.D Section 10801 - Toilet Accessories

Toilet accessories will be by Bobrick Washroom Equipment, Inc. (no substitution) typical units are as follows:

B-224: Surface-mounted utility shelf, with mop/broom holders and rag hooks.

B-2621: Surface-mounted paper towel dispenser (typically used only in non-public service areas).

B-274: Toilet tissue dispenser, double roll (typically used only in non-public service areas).

B-290: Mirror with stainless steel angle frame (used above makeup vanities, and in full-height dressing configurations).

B-347: Partition-mounted toilet seat cover and toilet tissue dispenser (for installation between two toilet compartments, without grabbars in a men's restroom).

B-3471: Partition-mounted toilet seat cover and toilet tissue dispenser (for installation between two toilet compartments, one with grabbars, in a men's restroom).

B-3474: Recessed toilet seat cover and toilet tissue dispenser (for installation in a handicapped stall, with grabbars, in a men's restroom).

B-3500: Recessed napkin/tampon vendor, single coin mechanism, 25-cent operation.

B-357: Partition-mounted toilet seat cover dispenser, sanitary napkin disposal, and toilet tissue dispenser (for installation between two toilet compartments without grab bars in a women's restroom).

B-3571: Partition-mounted toilet seat cover dispenser, sanitary napkin disposal, and toilet tissue dispenser (for installation between two toilet compartments, one with grab bars, in a women's restroom).

B-3574: Recessed toilet seat cover dispenser, sanitary napkin disposal and toilet tissue dispenser (for installation in a handicapped stall, with grab bars, in a women's restroom).

B-3644: Recessed waste receptacle for 4-inch wall.

B-3900: Recessed paper towel dispenser and waste receptacle (for 8-inch wall or chase).

B-3944: Recessed paper towel dispenser and waste receptacle (for 4-inch wall).

B-6717: Surface-mounted robe hooks.

B-6806: 1½-inch (38mm) diameter stainless steel grab bars, with snap-flange cover.

In 2004, Bobrick discontinued the production of two multi-purpose soap dispenser/towel dispenser units (Items B-317 and B-330) that had been specific extensively for the larger terminal toilet rooms. As result, a Bradley Corporation product has been selected as a replacement unit: Model 130, a recessed multi-purpose towel dispenser/soap dispenser/mirror/shelf unit. As with the Bobrick unit, the soap dispenser valve must be specified offset to the right to prevent soap from dripping on the faucet spout.

3.11 Division 11 – Equipment - Reserved

3.12 Division 12 – Furnishings - Reserved

3.13 Division 13 – Special Construction

3.13.A Section 13900 - Fire-Suppression System

All exposed sprinkler and standpipe piping will be painted red.

3.14 Division 14 – Conveying Systems

3.14.A Section 14200 - Elevator General Requirements

The controller must provide for future tie-ins to a vertical transportation monitoring system.

Initial maintenance service will include: fully paid, full service maintenance warranty service by skilled, competent employees of the elevator installer for a period of 12 months following the Date of Final Acceptance by the owner on a daily-surveillance basis. Include repair or replacement of worn or defective parts or components and lubrication, cleaning and adjusting as required for proper elevator operation in conformance with specified requirements. Include 24 hours-per-calendar day, 7 calendar days-per-week emergency callback service. Exclude only repair or replacement due to misuse, abuse, accidents, or neglect caused by persons other than installer's personnel. Installer will have maintenance personnel at Airport property 24 hours-per-calendar day, Monday through Friday, 0600 hours until 1830 hours Saturday, and 0700 hours until 2130 hours Sunday and holidays. This work will not be subcontracted. Only parts and supplies as used in manufacture and installation of the original installation will be provided.

System maintenance service will include: contractor, at contractor's own cost, agrees to furnish to owner an executed Amendment with the current contractor specified in this Design Criteria under Section 2.2.A.3.9 Maintenance Contracts. This amendment to the existing "Maintenance Contract Elevators, Escalators, and Dumbwaiters, Tampa International Airport" will expand the Scope of Work of the existing contract to include the Work of this Section, "Section 14240 - Hydraulic Passenger Elevator," of the Contract between owner and contractor. All Work under this Section will be added, by said Amendment and at no direct cost to the owner, to the existing "Maintenance Contract Elevators, Escalators, and Dumbwaiters, Tampa International Airport." Said Amendment will be automatically effective on the date of Substantial Completion of the whole Work. All other terms and conditions of the existing "Maintenance Contract Elevators, Escalators, and Dumbwaiters, Tampa International Airport" will remain unchanged.

The design will include TriTronics safety edges.

Doors will be finished in #4 stainless steel.

ADA compliant elevator telephones, such as the Micro Tech Emergency telephones, will be integral with the car station.

No elevator hoistways will have sump pumps or drains.

The key lock cylinder in the restricted-access keyed switch in the elevator car operation panel will match the owner's standard.

Cars will have a 1.5" x 4" cutout adjacent to each floor level pushbutton for installation of graphics by the owner.

Work on existing elevators will include modifications as necessary to meet applicable fire safety code requirements.

All work in existing elevator machine rooms and hoistways will be accomplished with the Elevator Maintenance Contractor mechanic present.

Elevators will not be used for construction purposes even on a temporary basis.

For additional notes, see the general hydraulic elevator specifications on file at the Authority.

3.14.B Section 14215 – Electric Traction Elevators

No traction-type elevators will have sprinkling systems installed in the elevator machinery rooms or hoistways.

For additional notes, see the traction elevator specifications on file at the Authority.

3.14.C Section 14240 - Hydraulic Elevators

The design will include Lifejacket hydraulic elevator safety brakes. For additional notes, see the hydraulic elevator specifications on file at the Authority.

3.14.D Section 14310 - Escalators

No Low-E (energy) Glass Permitted. Black Treads only. For addition requirements, See the escalator specifications on file at the Authority.

3.14.E Section 14410 - Dumbwaiters

See the dumbwaiter specifications on file at the Authority.

3.14.F Section 14600 - Outbound Baggage Conveyors

The design professional will use the Authority's latest standard technical specification for outbound baggage conveyors and related systems. The technical specification will be provided by the Authority's Maintenance Department upon request and justification of project related need.

3.14.G Section 14630 - Sloped-Plate Sorting Carousels - Reserved

3.14.H Section 14650 - Inbound Baggage Conveyors (Flat-Plate)

Transitreads will be normally started from the Bag Make-up side of the belt by depressing a green "Start" button. They may additionally be started by turning a keyed start switch on the Bag Claim side.

All components of security doors will be removable for maintenance.

Transitreads will have emergency-stop buttons located on each side of the transitread on the Bag Claim side and at the Bag Make-up Control Panel, which illuminate when depressed and stop all power to the system, including a security doors. Upon pulling out the E-stop, the security doors will close. Keyed start switches will be located adjacent to each E-stop on the Bag Claim side to restart the system.

Each transitread will have the capability of accepting a remote control cable operating station for use by maintenance personnel.

Each transitread will have an adjustable section to allow for expansion and contraction of the system linkage.

All grease fittings will be connected to a remote manifold allowing greasing of the linkage without the need for disassembly.

3.14.I Section 14800 - Apron-Drive Passenger Loading Bridges

Mirrors will be installed allowing the bridge operator to view the drive wheels from the operator station.

An audible alarm and visual beacon will warn ground personnel that a bridge is energized and about to move.

The auto-leveler will have an audible and visual alarm at the console and under the bridge to alert personnel of a malfunction.

Floodlights will be installed at locations to illuminate the drive wheels and nose wheel of the aircraft.

A cab-floor light will be installed to illuminate the vestibule area between the aircraft and the bridge cab.

Each ramp area between tunnel sections will be equipped with ADA safety handrails.

Bridges will be constructed in accordance with NFPA guidelines for fire-retardant materials.

Side-mounted vertical maintenance ladders accessing the top of the bridge will have a safety cage surrounding the ladder.

If installed, bridge-mounted baggage slides will be of stainless steel construction with bracing mounted to the structural portion of the bridge and not cantilevered solely from the bridge stairs.

3.15 Division 15 - Mechanical

3.15.A Section 15030 - Electrical Requirements for Mechanical Equipment

3.15.A.1 Basic Motor Construction (15055)

General: Provide motors for continuous duty conditions in which they will be required to perform (i.e., general purpose, splash proof, explosion proof, standard load, high torque, or any other special type) as required by the equipment motor manufacturer's recommendations. Unless otherwise indicated or required, motors will be open drip-proof.

Motors installed outdoors will be totally enclosed and fan-cooled (TEFC).

Motor enclosures will be as recommended by the equipment manufacturer for the specific application.

All motors will be furnished for starting in accordance with the electric utility company's requirements, and will be compatible with the motor starter and driven load. Motors will not exceed full-rated nameplate load when operated at any point along the driven equipment's characteristic performance curve. The motor service factor will not be used to justify exceeding nameplate amperage.

Unless otherwise indicated, motors of 1/2 horsepower or less, will be single-phase. Motors of 3/4 horsepower and larger, will be three-phase, squirrel-cage induction.

Sound power levels for motors will be no greater than the guidelines as recommended by NEMA, MG 1-12.49. A motor which, in the opinion of the Architect, generates excessive noise within the occupied area of the building, will be replaced with a quieter operating motor at no additional cost to the owner.

Motors designed to operate with a variable frequency drive will be approved by the manufacturer of the variable frequency drive equipment, and the manufacturer of the motor for inverter duty to insure quiet and stable continuous operation over the entire speed range.

Verify the circuit voltage and phase being furnished to the motor. All motors will be 1750 rpm, unless noted otherwise. Motors will operate with electrical input voltage variations of plus or minus 1 % of nameplate rating, or frequency variations of plus or minus 5 % of nameplate rating.

Design: Provide NEMA Design B for normal starting torque, with Standard MG1 12.42 Class F insulation, unless noted otherwise, or required by the equipment on which the motor is being used. Motors will be designed for operation in 104 degrees Fahrenheit (40 degrees Celsius), ambient temperature at 1.15 service factor on sine wave power at the base voltage and frequency, and will have all copper windings. Motors will meet or exceed the locked-rotor (starting) and breakdown (maximum) torques for the NEMA rating. Locked rotor current will not exceed six times full-load current. Motor current density and heating characteristics will be such that the motor insulation will not fail if subjected to locked-rotor current for 20 seconds.

Acceptable manufacturers for motors are General Electric, Westinghouse, Baldor Electric Company, Emerson, and Lincoln.

Efficiency: Motors 1 horsepower and larger will be high efficiency design.

3.15.A.2 Variable Frequency Drives (For Air Handling Units & Pumps)

Variable Frequency Drive: Specify variable torque Variable Frequency Drives (VFD) variable speed operation where suitable for controlling NEMA Design B motors on continuous duty in variable speed applications. The VFD will be listed by Underwriter's Laboratories and will comply with the latest standards of ANSI, IEEE, and the NEC.

Manufacturer: Refer to paragraph entitled "Manufacturers" in Section 15010. Acceptable manufacturers are as follows:

- a. Asea Brown Boveri (ABB)
- b. Cutler-Hammer, Eaton Corporation
- c. Allen-Bradley

Control Requirements: The following control interfaces will be provided at a terminal strip in the VFD as a minimum to assure control system integrity:

- a. Speed Control Input: A 4-20mA, or 0-5 vdc signal proportional to speed will be input for directly controlling the speed of the VFD when in automatic mode.
- b. Start/Stop Control: The VFD will be capable of being started and stopped remotely by a maintained-contact start/stop relay.
- c. Control Interlock: The VFD will provide an auxiliary control interlock output of 115 VAC whenever the VFD is enabled, to provide inter-locking with the control system. The VFD will be provided with a 115 VAC control transformer so that no external 115 VAC power source is required.

- d. Speed Signal Reference: The VFD will furnish a 0-5 VDC, or 4-20mA signal directly proportional to the output frequency of the VFD for remote monitoring of the VFD speed.
- e. Hand-Off-Auto Switch: The VFD will be furnished with a door-mounted Hand-Off-Auto switch to allow switching of the speed control signal from the "Automatic" signal to a manually adjustable digital speed control on the VFD when in the "Hand" position. The VFD will be disabled when in the "Off" position.
- f. VFD Trip Contacts: The VFD will be furnished with a set of Form C (NO/NC) contacts for remote annunciation to the building automation system under Section 15950.
- g. Speed Control: A digital manual speed control will be door-mounted to select the speed when the H-O-A switch is in the "Hand" position.
- h. Speed Meter: The VFD will be furnished with a digital door-mounted speed meter (0-100 %) to indicate the rpm of the motor or the percent of full-load frequency of the VFD.
- i. The VFD manufacturer will provide "N2 bus interface card" for direct interface with Johnson Controls METASYS System.
- j. The VFD will be furnished with bypass contractors that will allow manual operation of the unit.

3.15.B Section 15050 - Basic Mechanical Materials and Methods

3.15.B.1 Housekeeping Pads and Equipment Supports

General: Pads and supports will extend a minimum of 4 inches and a maximum of 8 inches beyond the base or supporting member in all directions. It is the intent to have the pad not extend under the entire piece of equipment unless that equipment is located on the exterior of the building on the ground, or the weight of the pad is required for vibration control. Pads will have 1/2 inch chamfered on all exposed edges and will be poured and finished smooth and level to insure proper and continuous support for the bearing surfaces of the equipment. There will be no deviation in excess of 1/8 inch when tested with a 10-foot straightedge.

Size: Coordinate length and width of pads and penetrations necessary for piping or conduit with the actual equipment approved for use on the project.

Height: Pads will be a minimum of four inches high, or as required to maintain proper condensate drainage characteristics for the air handling unit.

3.15.B.2 Identification of Piping and Equipment

General: Comply with ANSI A13.1-1981, Scheme for Identification of Piping Systems, and OSHA requirements, or as otherwise indicated.

Markers and Bands: Use to identify contents of pipe and direction of flow. Required for all visible or accessible piping systems.

Valve Tags: Each tag will designate appropriate service and valve number. Used in association with the valve tag list to confirm operational data and other pertinent information.

Labels: Establishes identity for mechanical system components. Labels on access panels advise of item that is accessible through the panel.

Equipment Access: Provide access doors and panels at all locations where concealed equipment, fixtures, devices, and similar items require accessibility for service, inspection, maintenance, repair, or replacement.

3.15.C Section 15060 - Pipes and Pipe Fittings

Domestic Water Piping (Above Ground): Copper piping will be annealed seamless hard temper type "K" and will comply with ASTM B-88. Copper is allowed for pipe sizes up to an including 4 inch diameter. The name or trademark of the manufacturer and the type of pipe will be permanently marked on each section of pipe at intervals not exceeding 4-1/2 feet. Fittings used in copper alloy piping will be streamlined pattern, wrought or cast brass conforming to ANSI B16.22 or wrought bronze conforming to ANSI B16.15.

2-1/2 inches and smaller will be solder-type. Fittings for piping 3 inches and larger will be brazed fittings and will be braced or silver-soldered. Exposed piping in finished areas will be brass pipe or tube, chrome-plated.

Domestic Water Piping (Below Ground): Copper piping will be annealed seamless soft drawn type "K" copper tubing. Copper is allowed for pipe sizes up to an including 4 inch diameter. The name or trademark of the manufacturer and the type of pipe will be permanently marked on each section of pipe at intervals not exceeding 4-1/2 feet. Fittings used in copper alloy piping will be streamlined pattern, wrought or cast brass conforming to ANSI B16.22 or wrought bronze conforming to ANSI B16.15. Class 52 cement lined ductile iron for pipe 6 inches and larger with Rigid mechanical joint piping connections.

Sanitary Waste and Vent Piping (Above Ground): Cast-iron soil pipe, service weight, no-hub piping. Piping will comply with the requirements of CISPI 30 and ASTM A-888. Hubless joints will be "No-hub" type coupling consisting of a 24 gauge 304 stainless steel compression clamp with gasket guides, 304 stainless steel screw clamp and matching full neoprene gasket that interlocks with the housing. Coupling will comply with the requirements of CISPI 310 and ASTM C-564. Maximum size allowed for no-hub piping is 8 inches. Alternative materials will be considered on a case by case basis and will be approved prior to procurement or installation.

Sanitary Waste (Below Ground): Cast-iron soil pipe, service weight, hub and spigot piping. Piping will comply with the requirements of CISPI 301 and ASTM A-74. Joints for hub and spigot pipe will be installed with compression gaskets conforming to the requirements of ASTM C-564. Alternative materials will be considered on a case by case basis and will be approved prior to procurement or installation.

Stormwater Piping: Same as Sanitary Waste. Piping for encasement in concrete walls or columns will be Schedule 40 PVC. Alternative materials will be considered on a case by case basis and will be approved prior to procurement or installation.

Cooling Tower Make-up Water Piping (Above Ground): Copper pipe, Type L or K.

Cooling Tower Make-up Water Piping (Below Ground): Galvanized steel pipe, Schedule 40, with galvanized threaded fittings.

Subsoil Drainage: Perforated PVC.

Steam Piping: Steel.

Condensate Piping (Steam): Copper Type DWV with soldered joints or Schedule 80 steel.

Chilled Water Piping (Inside): Type K copper or steel.

Heating Water Piping (Inside): Type K copper or steel.

Chilled Water Piping (Underground): Pre-insulated steel.

Hot Water Piping (Underground): Pre-insulated steel.

Thermal Insulation (Hydronic Piping):

Chillers and chilled water piping will be insulated with cellular glass insulation: Owens Corning Foamglas, 1 ½" minimum thickness with bore coating, joint sealant, finish fabric, and finish mastic.

Condensate drain piping will be insulated with elastomeric insulation: Rubatex or Armstrong AP Armaflex.

Sprinkler Piping (Above Ground): Pipes 2 inch and smaller will be schedule 40 black steel, ASTM A-53 and UL Listed, Fittings will be malleable iron, 150 psi banded, threaded, black, ANSI B-16.3; Pipes 2 ½ inches and larger roll and grooved schedule 10 black steel pipe, ASTM A-135 and UL Listed. Fittings will be mechanical grooved coupling system, UL Listed.

Sprinkler Piping (Below Ground): Ductile cast iron class 52, UL Listed and FM Approve. Fittings will be mechanical joint cast iron, class 250.

3.15.D Section 15110 – Valves

Domestic Water System: All valves in the domestic water system will be gate valves as manufactured by Crane, Milwaukee, Stockham, Nibco, and Powell. Valves 2 inch and smaller will be gate valves with bronze body and bronze trim, threaded or soldered connections. Valves 2 ½ inch and larger above ground will be butterfly valves with flanged, welded or mechanical joint connections, cast iron body with bronze trim. Valves underground will be butterfly (or ball – 2 inch or smaller) type with cast iron body and bronze trim, flanged or welded connections, and non-rising stem with square wrench nut head.

Hydronic Piping System: Gate, gate and angle gate valves can be appropriate for hydronic piping. Acceptable manufacturers are Crane, Milwaukee, Stockham, Nibco, and Powell. Other valve options include butterfly valves by Milwaukee (2 inches and smaller), and Crane, Centerline, DeZurik, and Nibco (2-1/2 inches and larger), and ball valves (2 inches and smaller) by Crane, Milwaukee, Nibco, Jamesbury and Stockham.

Double Detector Check Valves: Reduced Pressure Detector Assembly Backflow Preventor of, ASSE, FM Approved, UL Listed, with OS&Y gate valves on inlet and outlet, and strainer on inlet. Include 2 positive-seating check valves and test cocks, bypass with displacement-type water meter, valves and double-check backflow preventor for continuous pressure application.

Pressure Reducing Valves: Pressure reducing valves will have a means of externally adjusting the outlet pressure. All internal parts subject to wear will be replaceable without removing the valve from the piping. Valves will have an integral low inlet pressure check valve, and will maintain. Acceptable manufacturer: Golden Anderson (no substitutions).

3.15.E Section 15185 - Pumps

3.15.E.1 Basic Pump Construction

General: All pumps will comply with the following requirements unless otherwise indicated.

Casing: The casing will be designed for 175 psi working pressure and will be hydrostatically tested at 150% of the maximum working pressure. Suction and discharge flanges will be provided and drilled to ANSI Standards. Provide cast lifting lugs in pump casing. Casing will be horizontally split unless otherwise noted.

Pump Volute: Plugged drain, vent, and gauge tappings will be cast into the pump volute. The volute will be designed such that the motor and pump can be disconnected and removed, leaving the volute and piping in place.

Casing Rings: The pump case will have two replaceable bronze case wear rings (impeller wear rings), located at each impeller skirt. Each ring will be pinned or press-fit into grooved shoulders to lock the ring in place.

Mechanical Seals: Mechanical seals will be designed for operation in 225 Degrees Fahrenheit liquid. Seals will have a carbon seal ring and ceramic seat, or Ni resist seal, installed on both sides of the shaft, and will have provisions for venting and lubrication. The shaft will be steel, with a replaceable bronze shaft sleeve or collar. All pumps will be provided with mechanical seals unless specifically indicated otherwise.

Bearings: Radial and thrust bearings will be single row ball, re-grease lubricated, self-aligning type mounted in cast-iron cartridges, with 100,000 hours average life. Bearings will be removable without disconnecting the pump volute. Provide grease seals and neoprene water slingers to protect the bearings.

Base: Provide a cast-iron or steel drip rim base for each pump unit. Pump and drive unit will be aligned and bolted or welded in place on a common base plate prior to factory shipment.

Gasket: Provide cellulose fiber gaskets for the suction and discharge flanges.

3.15.E.2 Double Suction Pump

Certified Pump Curve: A certified pump curve for each double suction pump is required.

General: Pump will be single-stage centrifugal type with horizontal axially-split cast-iron casing.

Impeller: the impeller will be double suction type, made of cast bronze, balanced hydraulically and dynamically, keyed to the shaft and securely retained in an axial position by positive mechanical means.

Piping Connections: Suction and discharge connections will be located on opposite sides of the lower half casing, allowing removal of the rotating element without disturbing the system piping connections.

Manufacturer: Acceptable manufacturers are: Aurora, Bell & Gossett/ITT, or approved equal.

3.15.E.3 Domestic Water Booster Pump

The domestic water booster pump will be a UL Listed Variable Speed packaged system with 100% redundancy and alternating sequence of operation.

3.15.F Section 15410 - Plumbing Fixtures

Plumbing fixtures within public areas of the Main Terminal will comply with the requirements of the Main Terminal Interior Design Criteria Manual.

Water closet, Wall Hung: American Standard No. 2258.125 (1.6 GPF) (or approved equal by Kohler Co.) white vitreous china, wall-mounted, elongated bowl, siphon jet, 1-1/2 inch back spud. Provide Sloan "Royal" Model No. 152-1.6 ES-S (1.6 GPF) water saver, automatic flush, valve system, with 24V. sensor and solenoid operator, with vandal resistant screws for the sensor cover plate, vacuum breaker, 1-1/2 inch flush connection for concealed back spud, angle stop valve and override push button. Provide each valve with a factory supplied transformer model EL-154 (no substitutions on flush valve assembly).

Provide a Zurn Series Z-1203, or approved equal, hub and spigot adjustable horizontal carrier system for siphon jet water closet. Provide a Sperzel No. 150-EEWSSCH, or approved equal, white heavy duty, open front, and extended back, toilet seat, with four bumpers.

Water closet, Handicapped, Wall-hung: Use all of the components as described in the previous paragraph, entitled, "Water closet, wall-hung." Set at raised handicapped height.

Urinal, Wall-hung: American Standard No. 6605.027 (or approved equal by Kohler Co.) white vitreous china, blowout flush action, 1-1/4 inch back inlet spud. Provide Sloan "Royal" Model No. 195-1.0 ES-S (1.0 GPF) water saver flush valve system, with 24V sensor and solenoid operator, with tamper-proof screws for the sensor cover plate, vacuum breaker, 1-1/4 inch flush connection for concealed back spud and angle valve. Provide each valve with a factory supplied transformer model EL-154 (no substitutions on flush valve assembly). Provide a Zurn Series Z-1222 or approved equal plate type carrier system.

Urinal, Handicapped Wall-hung: Use all of the components as described in the previous paragraph, entitled, "Urinal, wall-hung." Set at lowered handicapped height.

Lavatory, Wall-hung: American Standard No. 0355.012 (or approved equal by Kohler Co.), white vitreous china, front overflow, and 4-inch centered faucet holes. Provide a Speakman Sensor-Flo, Model S-8810-BO-HTS-VRS, electronic faucet with 4-inch deck plate (with double studs), complete with transformer, 12 VDC solenoid valve, waterproof connectors, filters, braided steel flex hose, 0.5 GPM reduced flow device and spout locking device (no substitutions on faucet assembly). Provide a Zurn Series Z1231 or acceptable equal, concealed arm carrier system. Provide one piece escutcheon with rubber grommet at wall for control wire and braided tube. Provide 17 GA.C.P.-trap, supplies and stops (no substitutions for fittings).

Lavatory, Handicapped, Wall-hung: Use all of the components as described in the previous paragraph, entitled, "Lavatory, wall-hung." Set at handicapped accessible height.

Mop Sink: Fiat Model No. TSB 100, or approved equivalent, precast terrazzo, 24-inch by 124-inch by 2-inch high, with 2-inch wide shoulders and 1/2-inch pitch towards inside, and stainless steel integral drain. Provide Fiat Model 889-CC, 24 inches long by 3 feet wide stainless steel mop hanger with three rubber grips. Provide Speakman Model No. SC-5811-RCP chrome-plated cast brass, complete with 3/4-inch hose coupling discharge, pail hook, and top brace (no substitutions for fittings).

Lavatory, Fittings for solid-surface countertop with integral bowl (Corian or similar): Provide a Speakman Sensor-Flo, Model S-8810-BO-HTS-VRS, electronic faucet, with 4-inch deck plate, complete with transformer, 12 VDC solenoid valve, waterproof connectors, filters, braided steel flex hose, auto-flo 0.5 GPM reduced flow device, and spout locking device. Provide 17 GA. C.P. P-trap supplies and stops (no substitutions for fittings). This sink configuration would be typical at a diaper changing station.

Hydrants, Wall- or Floor-Mounted:

Interior: Recessed, wall-mounted, with hinged cover, 3/4-inch male hose thread nozzle, vacuum breaker-backflow preventer, chrome finish brass casting, with loose key-operated stem and door. Woodford Model B74, or approved equal.

Exterior: Recessed, wall-mounted, with hinged cover, 3/4-inch male hose thread nozzle, non-freeze, automatic draining, chrome finish all bronze construction, vacuum breaker-backflow preventer, with loose key-operated stem and door, Woodford Model B65, or approved equal.

3.15.G Section 15485 - Plumbing Equipment

3.15.G.1 Electric Water Heaters

Tank: Heater will be constructed with steel tank constructed to 125 psi working pressure, 300 psi test pressure and lined with borosilicate glass bonded to tank. Glass lining to be baked at 1600 Degrees F., to assure a molecular-interchange between tank and lining. Tank to be protected against electrolytic activity with replaceable factory installed anode rod and factory installed dielectric nipples.

Temperature Control: Water heater to be provided with fully adjustable temperature controls and automatic high limit control. Unit will have ASME-approved temperature and pressure relief valve properly sized for BTU capacity of the unit installed.

Insulation: Water heater will be insulated to ASHRAE 90.1-1989 standards and jacketed with manufacturer's standard heavy steel jacket.

Heating Element: Water heater will also feature 90% efficient immersion type heating elements. Incoloy sheathed elements will be provided. All units will be constructed with factory-installed heat traps to increase efficiency and reduce standby loss by a minimum of 10%.

Relief Valve: Provide ASME-rated and UL-listed temperature and pressure relief valve. Temperature setting will be 210 Degrees F., and the pressure setting will be 125 psig, unless otherwise indicated.

Drain: Provide storage tank drain and drain pan fabricated of minimum 18-gauge galvanized steel, with a minimum lip of 1-1/2 inches, and provided with a drain connection piped to the nearest floor drain unless otherwise indicated.

Testing: Each unit is to be UL-tested, and UL-listed, for service as a domestic water heater for voltage inputs as indicated on the drawings.

Warranty: Water heater will carry a limited factory warranty of 5 years. Acceptable manufacturers are as follows:

- a. Rheem
- b. Lochinvar
- c. A. O. Smith

Thermostatic Mixing Valve: Provide a thermostatic mixing valve with bronze body construction and corrosion-resistant components for each water heater serving the public toilets. Valve will be equipped with a removable union and stop and check valve, and stainless steel strainer. Unit will be a Lawler No. 66-50, with dialed thermometer and solenoid valve. The mixing valve will be enclosed within a lockable metal box.

3.15.H Section 15710 - Cooling Tower

Enclosure: The Landside Terminal, Airside F and Airside A have custom-designed concrete and masonry structures that form the basin, the tower walls, the fan deck, and the fan stacks.

Product: The cooling tower design is to be based on a regularly catalogued product assembly of the manufacturers.

Lintels: The tile fill will be supported by pultruded fiberglass reinforced vinyl ester resin tee section lintels capable of withstanding imposed loadings with a safety factor of 3.

Tile Fill: The tile fill will be of multi-cell design, set without mortar, in a pattern, and of sufficient height to meet the necessary design performance level. The tile fill will be of hard burned clay, with a low absorption such that it will pass a freeze-thaw test conducted in accordance with ASTM C 67. The tile fill will have a minimum crushing strength of 2000 psi over the gross area with the load is applied parallel to the cells as tested in accordance with ASTM F 67.

Mist Eliminators: The eliminators will be of the 3 pass cellular type, assembled in sections. Free water carryover will not exceed 0.05 % of the total water flow. The eliminator will be constructed of PVC conforming to ASTM D 1784, Type I, Grade 2. The mist eliminators will have a flame spread rating of 25 or less when tested in accordance with ASTM Procedures E-84.

Speed Reducer: The speed reducer gears will be rated with a service factor of 2 and designed for cooling tower service. The alarms for both the vibration switch and the oil level switch will be transmitted to the BCS.

Fan Assembly: The complete fan assembly will provide maximum efficiency and long life while handling saturated air at high velocities. The fan will be a multi-blade design and constructed of fiberglass reinforced resin.

Drive Connection: The motor will be located outside the airstream. The stainless steel drive shaft will be full floating type with flexible couplings at both ends. Each coupling will be provided with a galvanized steel guard.

Distribution System: The distribution system for each cell will consist of two central headers, side laterals and nozzles. The header capacities will be as indicated in the cooling tower schedule on the drawings. All piping will be fiberglass or PVC. Fittings and nozzles will be PVC or ABS. The distribution system will terminate in a flange face located 6 inches below the top of the fill support beams.

Ladders: Provide stainless steel ladders that comply with OSHA requirements. Two ladders, located at opposite faces, will be provided for tower installations with more than two cells. Ladders will extend from the ground or walking surface to the top of the cooling tower working surface, unless otherwise indicated. Provide a stainless steel OSHA cage if the height of the top of the tower is more than 20 feet above the ground.

Water Level Control: Provide plastic or bronze mechanical float with adjustable linkage, unless otherwise indicated. The water level control will be provided with a still well and will be accessible without entering the tower basin.

Fan Motor: Provide totally enclosed, air over type motor located outside the air stream. Motor will be two-speed motor rated at 1800/900 rpm. Fan motor will have 1.5 service factor.

Vibration Cutout Switch: Provide switch to de-energize fan motors if excessive vibration occurs due to fan imbalance.

Maximum Permissible Sound Pressure Level: Use 0.0002 microbar as reference. Measure at 50 feet in several directions, uniformly covering 360 degrees. Do not exceed maximum permissible dB level in each of the following octave bands:

63 HZ - 73 dB 1000 HZ - 63 dB
125 HZ - 71 dB 2000 HZ - 60 dB
250 HZ - 69 dB 4000 HZ - 55 dB
500 HZ - 69 dB 8000 HZ - 50 dB

3.15.1 Section 15800 - Air Handling Units

Solid Double Wall Construction: Units will be double wall construction with 2 inch thickness, 1-1/2 pound density fiberglass insulation. The insulation will be sandwiched between a minimum 18 gauge galvanized steel solid interior wall and the exterior wall. Removable or hinged access panels will provide access to both sides of cooling coil, drain pan, internal fan drive, electric heating coil, and filter section.

Condensate Drain Pan: Each unit will have an insulated, 20 gauge stainless steel double wall drain pan for condensate drainage. The insulation will be a minimum of 1 inch thick fiberglass and the inner pan will be coated with corrosion-resistant elastomeric-based material. Threaded pipe drain connections will be provided on one side only and the pan will slope toward the connection, allowing no standing water. The drain connection will be on the side of the unit that has the condensate drain plumbing connection. If the selected air handling units have more than one drain connection, each connection will be provided with a trap and an individual drain line piped to discharge at the nearest condensate floor drain. The discharge of the individual condensate traps will not be connected together.

Fans: Fans will be double width, double inlet, multiblade type constructed in accordance with the American Fan Manufacturers Association Standards. Fan wheels will be forward curve or backward inclined air foil type. Fan blades will be bonderized or galvanized steel and will be finished with baked enamel for corrosion protection. Fan shafts will not pass through their first critical speed at any cataloged rpm.

Bearings: Fans will be equipped with self-aligning, anti-friction pillow block ball type bearings with a minimum life of 100,000 hours.

Fan motors will be an open drip-proof when located outside the discharge air stream from the cooling coil and totally enclosed air-over type when located in the cooling coil discharge.

Water Coils: Coils will be leak tested to 200 psig air pressure underwater and designed for 300 psig working pressure. The coils will be continuous seamless copper tube with aluminum plate fins bonded by mechanical expansion of the tubes, unless otherwise indicated. Fin spacing will not exceed 12 per inch. Frames will be constructed of 16 gauge galvanized steel casing with copper headers brazed to tubes and threaded connections. Both supply and return headers will be provided with 1/8 inch NPT vent connection at top and bottom for venting and draining coil. The coils will be arranged for the water to counterflow in the direction of the air flow. Tube sheets will be 16 gauge stainless steel, located on each end and at a maximum of 80 inch intermediate spans with drain collars to support tubes. Return bends will be die-formed, brazed to tubes and header and will be seamless hard-drawn copper tubing. Casing channels will be free-draining, without depressions to collect moisture and contaminants or to block fin area, and with an air bypass/water carryover arrester between the casing bottom channel and the fins.

Electric Coils: Electric heating coils will be UL, ETL, or ARL listing for installation in a section of the air handling unit. Coils less than 5 kW will be single stage; above 5 kW will have a minimum of two stages. Electric heater element will be constructed of heavy-duty nickel chromium. 480 volt, three phase elements will be internally wye connected with automatic line break high limit control.

Each heater will be provided with single point electric power connection and terminal strip connection for control wiring.

Whenever possible, fan coil units, necessary for the odd situation, will be installed in a vertical configuration and within a nearby mechanical room.

3.15.J Section 15845 – Variable Air Volume Terminal Units

VAV units will be double wall construction with no insulation exposed to the air stream.

VAV unit controls will be Johnson Controls “Metasys” type and be factory installed.

VAV units will be located as close to the finished ceiling as possible. Units will be accessible by using a ladder no taller than eight feet.

3.15.K Section 15855 - Diffusers, Registers, and Grilles

Supply diffusers, return air grilles, and exhaust grilles mounted in ceilings will have a painted perforated metal face. Round, square, or rectangular devices with exposed directional blades are not allowable. Linear devices are allowable and generally preferred by design professionals.

3.15.L Section 15890 – Ductwork

Sheet Metal Ductwork:

Material: Prime quality 48 inch wide resquare tight coat cold-rolled hot-dipped galvanized steel capable of double seaming without fracture. Conform to the requirements of ASTM A-525 and ASTM-G90 for a minimum galvanizing coat of 1.25 ounces per square foot total for both sides.

Construction: Provide corner closures. Longitudinal seams and transverse joints will be flat and smooth inside. Make slip joints in direction of air flow. Transverse joints will be Pittsburgh lock or double corner seam. Button punch snaplock construction is not acceptable. All welds will be continuous and corrosion-resistant.

Fittings: Fabricate offsets, turns, and elbows with centerline radius equal to 1-1/2 times diameter when possible. No mitered offsets will be allowed.

Insulation: All supply return, and outside air ducts will be externally insulated. Unless detailed system design dictates otherwise, external insulation will be minimum 2" thick fiberglass duct wrap where concealed and 1 ½" thick duct board where exposed. Continuity of the vapor barrier on the exterior insulation will be maintained in accordance with the manufacturer's instructions. Duct insulation within equipment rooms will be fully coated with mastic or painted in its entirety.

Double Wall Manufactured Ductwork:

Material: Duct will be double wall, machine formed round or flat oval spiral lock seam duct constructed of galvanized steel sheets. The inner wall will be perforated and the annular space will be filled with minimum 1" glass fiber insulation with a maximum "k" value of 0.27 BTU per square foot per hour. Insulation will be covered with a minimum 1.5 mil film so that no fibrous material is exposed to the airstream.

Flexible Ducts:

Insulated Flexible Ducts, Fiberglass: Flexible duct will be factory-fabricated pre-insulated type with seamless vapor barrier. Fiberglass insulation will be nominal 1 inch thickness with maximum thermal conductance of 0.23 BTU/hr-sq. ft.-degrees at 75 degree F mean temperature. Flexible duct will have an operating pressure range of minus 0.5 inch w.g. to plus 2 inch w.g., maximum

working velocity to 4000 fpm and temperature range to 250 degree F. Core will be continuous and consist of aluminized mylar laminated to a corrosion resistant steel wire helix.

Vapor retardant rating will be 0.17 perm maximum per ASTM E96-A.

Flexible duct will be a maximum of 8 feet in length unless otherwise indicated and will be fully extended to smooth out internal corrugations, and will be installed without kinks, compression, or obstructions so that pressure drop is minimized. Install with a maximum equivalent of two 90-degree bends. No bend will be made with centerline radius of less than one duct diameter for fiberglass ductwork, or four and one-half diameters for metal ductwork. No additional flexible duct will be provided for future relocation unless otherwise indicated; cut and remove excess length.

Flexible duct will be supported at ends and at each 90-degree bend. Maximum permissible sag is ½ inch per foot of spacing between supports.

Hanger and saddle material in contact with the flexible duct will be of sufficient width to prevent any restriction of the internal diameter of the duct when the weight of the supported section rests on the hanger or saddle material. In no case will the material contacting the flexible duct be less than 1 inch wide. Hanger will be used in conjunction with a sheet metal saddle formed to cover one-half the circumference of the outside diameter of the flexible duct and will be rolled to fit neatly around the lower half of the duct's outer circumference.

Coordinate ductwork and piping to allow clear access to and around equipment.

3.15.M Section 15900 – HVAC Instrumentation and Controls Airside E

For the Landside Terminal complex, Airside F, Airside A, Airside E, and the new Airside C, the Building Control System is, and will be the Johnson Controls "Metasys" system installed by the manufacturer.

With a Johnson Controls system, all AHU and chiller plant control valves and dampers will be pneumatically actuated. In addition, all VAV control dampers will be electronically actuated.

All new and revised control drawings will be laminated and inserted in the master set in the HVAC Control Room (Service Building at the Central Plant).

3.16 Division 16 - Electrical

3.16.A Section 16050 - Basic Electrical Materials and Methods

A City of Tampa Electrical Permit must be obtained and displayed at the work location.

All work must conform to the National Electrical Code, the City of Tampa Code, the Authority Tenant Work Permit General Construction Standards (Special Provision No. 4) and the applicable Authority Design Criteria Manual.

All relays, contactors, starters, motor control centers, switchboards, panelboards, dry-type transformers and so forth, will be supplied and manufactured by the same manufacturer. Panelboards, switchboards, breakers, etc., will match the existing building equipment.

All screws, bolts, washers, and other fasteners used in supporting fixtures, conduit, or outlets will be fabricated from rust-resisting metal and will be of a common replacement type design. No rivets or other non-replaceable type fasteners will be permitted. Use of tie wire is not acceptable. Powder actuated anchors are not permitted.

Provide reinforced concrete “housekeeping pads” for switchgear, motor control centers, transformers, etc. Pads should be a minimum of 4 inches high and project at least 6 inches beyond the footprint perimeter of the cabinet. Pads should match existing pads within the same room. Chamfer top edges 1/2 inch.

Testing of cables 600V or less and size No. 2 or larger will be meggered using an industry-approved “megger” with a minimum of 500V internal generating voltage. All inspection, cleaning and testing procedures will be in compliance with the recommendations and standards outlined in the “Maintenance Testing Specifications for Electrical Power Distribution Equipment and Systems,” latest edition, published by International Electrical Testing Association (NETA). Readings will be recorded in the presence of the design professional or an owner’s Representative. Provide a schedule of testing to the Engineer and the Authority construction project manager a minimum of three calendar days prior to testing. Insulation resistance test values will be no less than 50 megohms.

3.16.B Section 16060 - Grounding and Bonding

All branch circuit and feeder raceways will have a copper system ground conductor within the conduit throughout the entire length of the circuit and bonded to portions of the conduit that are metal by listed grounding bushings.

3.16.C Section 16075 - Electrical Identification

Equipment identification using phenolic plastic laminate nameplates will be as follows:

- a. Normal system will be 1/2-inch high white lettering on a black field
- b. Emergency system will be 1/2-inch high white lettering on a red field
- c. Uninterruptible power supply system will be 1/2 inch high white lettering on an orange field

3.16.D Section 16110 – Raceways

The entire installation will be in hot-dipped rigid galvanized conduit, intermediate metal conduit, heavy wall Schedule 40-PVC plastic conduit (in slab or underground only), or electric metallic tubing, unless specifically noted otherwise. Only heavy wall PVC (Schedule 40) will be used for all raceways trapped underground and in or under concrete slab on grade. Minimum conduit size for lighting, power, data, phone and fire alarm systems will be 3/4-inch C. All conduit will be UL-listed and labeled.

Conduit expansion fittings will be malleable iron, and will be hot-dipped galvanized inside and outside.

All raceways will be run in a neat and workmanlike manner, and will be properly supported from structural members (beams, joists, or slabs) in accordance with the latest edition of NEC using approved conduit clamps, hanger rods, and structural fasteners. Supporting conduit and boxes with wire is not approved. All raceways except those from surface-mounted switches, outlet boxes or panels, will be run concealed from view. Exposed raceways will be supported with clamp fasteners, with toggle bolt on hollow walls, and with lead expansion shields on masonry. Where PVC penetrates a floor from underground or in slab, a black mastic coated steel conduit elbow will be used. No PVC will be allowed anywhere except underground or in slab. Conduits will be run parallel and perpendicular to building beams wherever possible, exposed or concealed, and will be grouped in workmanlike fashion. Crisscrossing of conduits will be minimized. Multiple runs of raceways will be routed together. Raceways will not be located within six inches of other system components (HVAC ducts, chilled water lines, sprinkler lines, domestic water lines, bus ducts, etc.).

The contractor will prepare and submit coordination review drawings to Authority prior to installation of all multiple raceway conditions illustrating layout, elevations, and coordination with other building system components. All raceways will be installed as close as possible to the structure and at the highest elevation possible.

All raceways will have an insulated copper system ground conductor throughout the entire length of circuit installed within conduit in strict accordance with NEC.

Insulated bushings will be used on all rigid steel conduits terminating in panels, wire gutters, or cabinets.

All connections to motors or other vibrating equipment (except dry type transformers) or at other locations where required will be made with not less than 12 inches of flexible liquid-tight steel conduits, using special type of connectors with strain relief fittings at both terminations of conduit.

Expansion fittings will be installed in the following cases: In each conduit run wherever it crosses an expansion joint in the concrete structure; on one side of joint with its sliding sleeve end flush with joint, and with a length of bonding jumper in expansion equal to at least three times the normal width of joints; in each conduit run which mechanically attaches to separate structures to relieve strain caused by shift on one structure in relation to the other; in straight conduit run above ground which exceeds one hundred feet in length. Interval between expansion fittings in such a run will not be greater than 100 feet.

Electric metallic tubing (thin wall) may be installed inside buildings above ground floor where not subject to mechanical injury. All electrical metallic tubing will be joined using compression type steel fittings. All connectors will have insulated throats.

Rigid metallic conduit installed underground will be coated with waterproofing black mastic before installation, and all joints will be recoated after installation.

All temporary and permanent conductors (power, lighting, control, communications, lightning protection, etc.) must be placed in conduit or approved cable trays.

The contractor will furnish coordination drawings prior to installation which show layout and elevations of all multiple raceways.

Bus ducts will be separately supported using the manufacturer's standard recommended equipment allowing for removal of bus duct sections and inspection of all cover plates.

The minimum conduit size for power and lighting systems will be 3/4 inch conduit for all circuitry homeruns from the panelboard. Conduits branching off of the homerun conduit to devices may be 1/2 inch conduit, if it contains no more than 4 conductors per conduit (excluding the equipment grounding conductors), and phase conductors no larger than No. 12 AWG.

All systems (fire alarm, sound system, controls, etc.) conduits will be a minimum of 3/4 inch.

Catwalks and handrails will not be used to support raceways of any type.

All raceways crossing building expansion joints will be equipped with expansion-type fittings.

Sleeves will be used when conduits pass through walls, floors, and roofs, and will be of galvanized steel, sized to allow for a minimum 1/4 inch clearance. Fire rating integrity will be restored after penetration.

Flexible steel conduit will be limited to final connections to motors and transformers and will be restricted to 36 inches in length. Flexible steel conduit may also be used to connect light fixtures

to junction boxes in lengths not to exceed 4-6 feet. All flexible steel installations will be a continuous length with threadless hinged clamp-type fittings and a male end provided with a locknut.

All conduit must have steel compression-type connectors and couplings with non-removable insulated throats.

All conduit exposed to the weather will be rigid galvanized conduit.

All raceways (conduits, wireways, busways, etc.) and boxes will be independently supported from the building structure. Attachment to ceiling support system or the use of tie wire for raceway support is prohibited.

All raceways and boxes will be installed as close as possible to the structure and at the highest elevation possible. The contractor will prepare "coordination drawings" that establish MEP systems layering to ensure proper functioning and maintenance access for all ceiling cavity components.

All raceways will be installed parallel with the structural framing members.

Raceways and boxes will not be located within six inches of other systems (HVAC ducts, chilled water lines, sprinkler lines, water lines, bus ducts, etc.).

Multiple runs of raceways (two or more) will be routed together and supported by trapeze hangers consisting of all-thread rod and unistrut cross members. All multiple raceways will be installed horizontally. Conduit supports will be one-hole malleable straps, clamp-backs, or other accepted devices with suitable bolts. Caddy batwing-style straps, which clip to wire without the use of bolts, are not allowed.

Floor Boxes: Design type will allow for continuous raceway into the floor boxes without a junction box. Floor box raceways will be installed to allow for the first junction box to be located within the same room and floor level.

Maximum allowable wire or cable fill in a raceway will be 40%. This applies to all systems (fire alarm, low voltage controls, fiber optic, telephone, etc.).

Spare parts will be provided at the completion of the work as follows:

- a. Lamps: Provide a minimum of one case or six lamps, whichever is greater, for every type of lamp installed. Quantity may be increased with large-scale projects.
- b. Fuses: Provide a fuse cabinet with 3 spare fuses of each size and type used.

3.16.E Section 16120 - Conductors and Cables

Branch circuit and feeder conductors for electric power will be copper type THW or THWN. No aluminum wiring will be permitted. Wire in vicinity of heat-producing equipment will be type XHHW/L-S insulation. All wiring will be manufactured in the USA.

All copper taps and splices in No. 8 or smaller wire will be fastened together by means of "wirenut" connectors. All taps and splices in wire larger than No. 8 will be made with solderless type lugs and taped to provide insulation equal to wire. Stranded conductors #2 and larger should have compression type connectors.

All power feeders and branch circuits No. 8 and smaller will be wired using color-coded wire having the same color used for a system throughout the building. Power feeders above No. 8 will be either fully color-coded or black insulated and be similarly color-coded with tape in all junction boxes and panels. Tape will completely cover 1/3 of the length of conductor insulation within the box or panel.

Modular connectors, MC, AC, or any similar type cable wiring are prohibited. The intent is to allow removal of conductors without conduit replacement. All electrical wiring will be performed by conventional, industry standard methods with the use of conduit, wire, and wire nuts.

All electrical feeders will be run in continuous pieces without joints or splices.

All conductors will be copper. Branch circuit and feeder conductors No. 12 AWG and smaller will be solid. No. 8 AWG and larger will be stranded.

Cable extensions from raceway terminations will not exceed 5 feet.

Connections: Conductors No. 10 and smaller will be connected with pre-insulated twist-on spring connectors encased in a plastic shell and rated at not less than 105 degrees C. No exceptions. Wire nut manufacturers will be Ideal or accepted substitution. A minimum of 3/8-inch skirt will cover all bare wires. Self-stripping or stab-in type electrical wire connectors are prohibited. This includes connectors within lighting fixtures, signs, and equipment.

3.16.F Section 16130 – Raceways and Boxes

At all concealed boxes for electric lights, switches, wall receptacles, telephone outlets, etc., standard galvanized one-piece steel boxes will be provided. Surface outlet boxes and conduit bodies will be made of heavy cast aluminum or iron with external raised hubs. Trim rings will be of one-piece construction.

Boxes will be of such form and dimensions as to be adapted to the specific use, location, type of device or fixtures to be used, as well as number and size of conductors and arrangement, and size and number of conduits connecting thereto.

All flush boxes will be mounted so that covers and plates will be flush with finished surfaces without the use of shims, mats, or other devices. Plates will not support wiring devices. Where two or more switches are installed in the same location, gang switches together using one-piece boxes with common plate. Wall-mounted devices of different systems (switches, thermostats, etc.) will be coordinated for symmetry when located near each other on the same wall. Trim rings will be extended to within 1/8 inch of finish wall surface.

Installation of outlet or junction box will be limited to one extension box. Flush outlets will be mounted so that covers and plates will finish flush with finished surfaces without the use of shims, mats, or other devices not submitted for this purpose. Add-a-Depth rings or switch box extension rings (Steel City #SBEX) are not acceptable. Plates will not support wiring devices. Arrange switches together with a common plate where two or more are indicated in the same location. Wall-mounted devices of different systems (switches, thermostats, etc.) will be coordinated for symmetry when located near each other on the same wall. Through-wall type boxes will not be permitted.

3.16.G Section 16140 - Wiring Devices

Wiring devices will be specification grade. Switches will be silent type. Receptacles will be duplex grounding type, and will be provided at a maximum spacing of twenty-five feet in public areas.

Coverplates for all devices will be stainless steel. All outside receptacles (weatherproof) will be duplex grounding type with stainless steel hinged covers.

Voltage and ampere rating of switches will be marked on switch, and will conform to voltage of system to which applied.

Use 20 AMP premium specification grade receptacles. Provide hospital-grade receptacles in all areas used by housekeeping (corridors, public areas, etc.). All devices (switches, receptacles, etc.) will be terminated with side-wired screw terminals only. Stab-in wire connections held by spring tension are not permitted.

Color of devices will be ivory with stainless steel coverplates.

3.16.H Section 16190 - Supporting Devices

All supports, hangers, and inserts required to mount fixtures; conduit, cables, and pullboxes will be furnished and installed. All items will be supported from the structural portion of the building. Boxes and conduits will not be supported or fastened to ceiling suspension wires or to ceiling channels.

All conduits will be securely fastened in place at intervals of 10 feet maximum. Hangers, supports, or fastenings will be provided at each elbow and at the end of each straight run terminating at a box or cabinet. The use of perforated iron for supporting conduits will not be permitted. The required strength of the supporting equipment and size and type of anchors will be based on the combined weight of conduit, hanger, and cables.

Hangers will be made of durable materials suitable for the application involved.

With concrete or masonry construction, insert anchors will be installed with round head machine screws. An electric or hand drill will be used for drilling holes for all inserts in brick, concrete, or similar construction. CAUTION: No anchors or holes will be made in the structure without first consulting with the Structural Engineer of Record.

3.16.I Section 16289 - Transient Voltage Suppression

Provide external Transient Voltage Surge Suppression (TVSS) on the following conditions:

- a. Service entrance equipment
- b. Panelboards (with circuits serving known electronic equipment)
- c. Systems panels (fire alarm, security access control, computer clean power, etc.) on both the power feed and any wiring (signaling circuit, initiating device circuit, etc., shields), which extend beyond the building by either underground, aerial, or other methods such as walkways, bridges, etc. Also, device wiring located at high locations such as penthouses, parking garage roof levels, etc., should be included.
- d. Spark gap devices or devices incorporated in or installed within the panel in lieu of the external TVSS are not acceptable.

3.16.J Section 16415 - Automatic Transfer Switch (ATS)

Automatic Transfer Switch (ATS) will have a manual bypass isolation operating handle with transfer speed equal to automatic operation. Provide automatic and manual transfer switches manufactured by one of the following:

- a. Russelectric, Inc.
- b. Automatic Switch Company
- c. Zenith Company

3.16.K Section 16425 - Distribution Switchboards

Factory-assembled, metal-enclosed switchboard for distribution and control of power from incoming line terminals to outgoing feeder terminals, installed and tested in place.

Switchboard will include all protective devices and equipment as listed on drawings or as included in these specifications, with necessary interconnections, instrumentation, and control wiring.

3.16.K.1 Products – General

Switchboards with circuit breaker, fusible switch, or integrally fused circuit breaker branch protective devices will comply with NEMA PB2 as a minimum requirement. Switchboard will meet Underwriters' Laboratories enclosure requirements for service conditions.

Each cubicle will have UL label affixed, unless special construction prohibits and no labeling or listing is available.

The sides and tops will be covered with removable screw-on code gauge steel plates.

Switchboards will be completely self-supporting structures, 90 inches high.

3.16.K.2 Finish

All steel surfaces will be chemically cleaned and treated to provide a bond between paint and metal surfaces to help prevent the entrance of moisture and formation of rust under the paint film.

The switchboard exterior will be finished indoor light grey No. 61, ANSI Z55.1.

Apply corrosion-protective undercoating to undersurface.

3.16.K.3 Bussing and Terminations

Bus bars:

- a. Buses will be tin-plated copper sized on the basis of not more than
- b. The bus structure will be braced to withstand mechanical forces exerted during short circuit conditions as required to limit the system fault current.
- c. A copper ground bus will be furnished secured to each vertical section structure.

Bus connections will be front accessible.

When spaces for future devices are noted on the drawings, all necessary buses except for the device connecting straps will be furnished.

Where provisions for future sections are called for on drawings, all buses will be extended to last section, and be adaptable for extension.

Through bus that feeds additional sections to main section will have continuous current rating of 100% of rating of main device frame size.

Line and load terminations will be provided suitable for the size, number of conductors, and conductor material. Terminations will be accessible from the rear.

Provide full-height wiring gutter doors for quick access to wiring terminals.

All hardware will have high tensile strength, and have a suitably protective finish.

When called for on drawings, a bus duct stub will be suitable for a direct connection to the bus duct without cabling.

3.16.K.4 Accessories

A switchboard will be provided with adequate lifting provisions, and will be capable of being rolled or moved into installation position and bolted directly to the floor without the use of floor sills.

3.16.K.5 Control Wiring

Each control wiring conductor will have heat shrink identification labels on each end of termination. Terminations will be made to screw terminal strips using approved conductor terminals. All points of terminal strips are to be labeled to match conductor labeling.

3.16.K.6 Main Section

The following instruments and associated equipment will be provided when called for by the design professional or the Authority

- a. Ammeter
- b. Voltmeter
- c. Ammeter and voltmeter transfer switches
- d. Current and potential transformers required
- e. Fuses
- f. All interconnecting wiring required

Instruments to be 4-1/2 square with +1 % accuracy, panel mount type.

Ground fault protection system will be provided.

- a. System will consist of a ground sensor on line side of main switch or on load side of branch breaker encircling all phase conductors, including neutral connected to a solids ate ground relay switch which initiates shunt tripping of the main or branch circuit interrupting device.
- b. System on main incoming service will be adjustable from 200 to 1200 primary amperes, system on branch breakers will be adjustable from 50 to 200 primary amperes, and time current characteristics should provide 6 cycle operation at about ten times setting.
- c. Relay output will operate from 120v AC fused sources from main bus.
- d. Submit coordination diagram relays and demonstrate coordination.

3.16.K.7 Distribution Sections

Circuit breaker, fusible switch, or integrally fused circuit breaker branch protective devices will be group-mounted with necessary bar connections accessible from the front, and have a minimum interrupting rating as required to limit the system fault current.

3.16.L Section 16430 - Switchgear

All switchgear will be equipped with the following:

- a. Current carrying parts of the bus structure will be copper
- b. The neutral will be fully rated
- c. Provide a copper equipment grounding bus of the set screw type

Circuit breakers for applications other than panel boards will be bolt-on type.

Electrical distribution will be similar to Airsides A, E, and C with two TECO transformers and the main building switchgear in two sections with an open tie breaker.

Provide spare switchgear breaker for the largest size breaker and a space within the switchgear to house. Provide spare capacity for future.

3.16.M Section 16440 - Disconnect Switches

All disconnect switches will be heavy-duty type, unless specifically noted otherwise. Switches will be fusible or non-fusible and sized as noted on drawings.

Switches will be 240 volt rated on systems up to and including 120/208V and 600V rated on higher voltage system with NEMA 1 enclosure, unless otherwise noted. All switches for motors will be dual horsepower rated. All switches mounted outdoors will be NEMA type 4X (stainless steel).

Provide and install lugs on disconnect switches as required to accept conductors.

3.16.N Section 16442 - Panelboards

Panelboard branch circuit breakers will be bolt-on, thermal-magnetic, molded case type.

Panelboards will be equipped with a minimum of 3 spare breakers and 25 % spare capacity.

All panelboards will be equipped with the following:

- a. Current carrying parts of the bus structure will be copper.
- b. The neutral will be fully rated.
- c. Provide a copper equipment grounding bus of the set screw type.

3.16.O Section 16450 - Grounding

In general, all electrical equipment (metallic conduit, motor frames, panel board, etc.) will be bonded together with a green insulated or bare copper system grounding conductor in accordance with the specific requirements of Article 250 of the NEC. Insulating bonding conductor through the raceway system will be continuous from main switch ground bus to panel ground bar of each panel board, and from panel grounding bar of each panel board to branch circuit equipment and devices.

A main ground, bare copper conductor, NEC sized but in no case less than No. 2/0, will be run in conduit from the main switchgear to a driven ground field outside the building. The main building service grounds will have resistance to ground at no more than 5 OHMS.

Grounding conductors will be so installed as to permit shortest and most direct path from equipment to ground; be installed in metal conduit with both conductor and conduit bonded at each end; have connections accessible for inspections and made with approved solderless connectors brazed (or bolted) to the equipment or structure to be grounded; in no case be a current carrying conductor; have a green jacket unless it is bare copper; and be run in conduit with power and branch circuit conductors. The main grounding electrode conductor will be exothermically welded to ground rods.

All contact surfaces will be thoroughly cleaned before connections are made to ensure good metal-to-metal contact.

Mechanical lugs or wire terminals will be used to bond ground wires together or to junction boxes and panel cabinets and will be manufactured by Anderson, Buchanan, Thomas and Betts Company, or Burndy.

All exterior grade mounted equipment will have their enclosures grounded directly to a separate driven ground at the equipment in addition to the building ground connection.

3.16.P Section 16461 - Transformers

Dry type transformers will be factory assembled, metal enclosed, provided, and installed in place.

Dry type transformers will be UL-listed and certified to meet NEMA ST-1 with convection cooling. Transformers will be tested and rated for sound level in accordance with ASA-C89. 1-1961.

Class H insulation will be employed for transformers above 30 KVA with maximum temperature rise of 150 degrees C. over 40 degrees C ambient. Class F insulation will be employed for transformers up to and including 30 KVA with a maximum temperature rise of 115 degrees C. over 40 degrees C ambient. Transformers will be copper wound.

Three phase units will be wound delta-wye. Minimum impulse level will be 10 KV. Each three phase transformers will have three separate sets of coils. No Scott T connections, open delta, or two coil arrangements will be permitted.

Transformers will be mounted where accessible. No units may be mounted behind partitions, above ceilings, etc. Each transformer will be mounted on 3-inch concrete base extending 3 inches beyond all sides.

3.16.Q Section 16442 - Panelboards

Panelboards will be of dead front design, equipped with bolt-on, quick-make, circuit breakers of the thermal magnetic type and mains with lugs or main breakers are required. Panel bus will be tin-plated copper. Bus will be braced for a capacity equal to or greater than the available symmetrical fault current. Double and triple pole breakers will be of common trip, single handle type.

Typical cabinets will be surface-mounted (concrete or masonry walls) or flush-mounted (gypsum board/stud walls) and will be fabricated from galvanized steel with a standard baked enamel finish.

Panels and breakers will be rated for voltage and class of service to which applied. All panels will have locks and all will be keyed alike. Panels will be supplied with standard baked enamel finish, both back box and front, except flush panels will have galvanized backbones. All panel board cabinets will have a system grounding bar bonded to the panel board cabinet for connection of system grounding conductors system. This bar will be mechanically and electrically isolated from

the neutral bar. Panel fronts on flush panels will have completely concealed trim clamps and door hinges. A typewritten circuit direction listing the actual circuit numbers, type of load and room names will be mounted on inside of door.

3.16.R Section 16475 - Overcurrent Protective Devices

3.16.R.1 Description of System

Provide overcurrent protection for all wiring and equipment in accordance with the NEC, all federal, state and local codes as required and/or as shown on the drawings.

3.16.R.2 Circuit Breakers

Circuit breakers for lighting and appliance panelboards will be bolt-on type. Circuit breakers for power panelboards will be bolt-on.

All circuit breakers will be molded-case, quick-make, quick-break, thermal magnetic type, and will be UL-listed and rated for voltage and class of service to which applied.

Double and triple pole breakers will be of the common trip, single handle type.

Circuit breakers will have minimum rating of 10,000 amp interrupting capacity, unless required otherwise by the design professional.

3.16.R.3 Fuses

No fuses will be installed until equipment is ready to be energized and after tightening of all electrical connections, inspection of all ground conductors and a meggar test of adequate insulation to ground of all circuits.

Fuses rated 601 amperes and larger will be UL Class L and have a minimum time-delay of 45 seconds at 300% rating and have O-ring gas seals at the end bells.

Fuses rated 600 amperes or less, installed ahead of circuit breaker or circuit breaker panels, will be UL Class RK-1.

Fuses rated 600 amperes or less for all general power circuits will be dual-element, UL Class RK-5-time delay type. They will be self-protected from extraneous heat.

3.16.R.4 Spare Fuse Cabinet

10% (or a minimum of three) of each size and type of fuse will be placed in a spare fuse cabinet, wall-mounted near the electric service.

Cabinet will be sized as required to store all fuses neatly. Cabinet will contain shelves and /or slots as required to separate types of fuses. Cabinet door will be hinged with latch.

3.16.R.5 Identification Label

A fuse identification label, showing type and size, will be placed inside the door of each fused switch.

Labeling for rejection type fused switches will read:

WARNING!
USE ONLY CURRENT LIMITING FUSES
CLASS _____, TYPE _____, MFR _____

Label will be engraved in red laminated plastic.

3.16.S Section 16511 - Interior Lighting

All fixtures will be designed and installed with consideration for maintenance accessibility. Stairwell fixtures will be located so they are accessible from a ladder at each landing.

All public restroom fixtures will have battery backup in addition to an emergency circuit. Emergency circuit will have a key switch located in an accessible janitor's closet to allow for annual battery discharge.

Use photo controls in lieu of time locks whenever possible. Lighting control contactors will be electrically and mechanically held. (This allows for manual closing of a contractor when needed.)

All lighting fixtures and signs will be equipped with a renewable fuse in an external GLR fuse holder. Fuse placement will be in the most readily accessible location. An example would be to locate the pole-mounted fixture fuses at the bottom of the pole accessible from the handhold.

3.16.T Section 16670 - Lightning Protection

Lightning protection system will be designed in compliance with provisions of NFPA No. 780, "Standard for the Installation of Lightning Protection Systems."

The lightning protection system will be placed on the structure by experienced installers in compliance with provisions of the NFPA and Underwriters' Laboratories. Installers will be LPI (Lightning Protection Institute) certified, master, and journeyman in accordance with LPI standards. A UL Master Label and LPI certification will be required for the system.

Materials will comply in weight, size, and composition with the requirements of UL and the NFPA relating to this type of installation, and will be UL-labeled.

Air terminals will be solid copper with nickel-plated point, and will have proper base support for surface on which they are attached and will be securely anchored to this surface. Terminals will project a minimum of 10 inches above top of object to which attached.

Conductors will consist of commercially pure copper, complying with the weight and construction requirements of the Code, and will be coursed to interconnect with air terminals and, in general, provide a two-way minimum path to ground. The angle of any turn will not exceed 90 degrees, and will provide an approximately horizontal or downward course. Down conductors will be installed in concealed plastic conduit. Radius of bends will not be less than 8 inches.

Conductor fasteners will be of the same material as the conductor, having ample strength to support conductor. Where fasteners are to be mounted in masonry or structural work, they will be furnished to the contractor for installation during the construction of the project.

Ground connections will be made in accordance with requirements of all applicable codes. Ground rods will be placed in a minimum of two feet from building foundations. In addition to above artificial grounds, one down conductor of each two-path system will be connected to water piping system with approved water pipe type strap connector.

3.16 U Airfield Lighting

Airfield lighting will comply with FAA Advisory Circular 150/5340-30J Design and Installation Details for Airport Visual Aids. Additionally, the Authority prefers the installation of taxilane edge lights

along all aircraft aprons to better delineate island areas between adjacent taxiways/taxilanes and apron areas.

3.17 Telecommunications Infrastructure Standards

3.17.A General

The Hillsborough County Aviation Authority currently specifies the requirements for the installation and use of copper and fiber optic telecommunications cabling to support voice, data, video, security and all low voltage applications and services at Tampa International Airport. This document describes the minimum requirements, standards, specifications, and methods of execution pertaining to cable and infrastructure support for all telecommunications, data, video, security, and CCTV use at the Airport. It includes the furnishing, installation, testing and documentation of telecommunications copper and fiber optic cable, terminations, outlets, and related items for use throughout the Airport facilities.

3.17.A.1 Reference Standards

- a. The publications listed below form a part of the telecommunications infrastructure requirements to the extent referenced. The publications are referred to in the text by basic designation only. All publications are intended to be the most current editions available.
- b. Except where otherwise noted, all material and workmanship will conform to the following standards:
 - (1) ANSI/TIA-568-C.0 (February 2009), Generic Telecommunications Cabling for Customer Premises
 - (2) ANSI/TIA-568-C.1 (February 2009), Commercial Building Telecommunications Cabling Standard
 - (3) TIA-568-C.2 (August 2009), Balanced Twisted- Pair Telecommunications Cabling Components Standard
 - (4) ANSI/TIA-568-C.3 (June 2008), Optical Fiber Cabling Component Standard
 - (5) ANSI/TIA-569-B Commercial Building Standard for Telecommunications Pathways and Spaces

Notes:

1. Particular attention is to be given to Basic Building Elements - Telecommunications Closets and Equipment Rooms. There will be a minimum of one Telecommunications Closet established for each floor of a building.

2. Each Telecommunications closet will be provided with a lockable door that, if practical, will be integrated with TPAs' Access Control System. If this isn't possible, the door will have a lock compatible with the existing IT / Telecommunications' closet lock.

- (6) TIA/EIA-606-B Administration Standard for Commercial

Telecommunications Infrastructure

- (7) ANSI-J-STD-607-B1 Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications
- (8) TIA/EIA-758-A Customer Owned Outside Plant Telecommunications Infrastructure Standard
- (9) ANSI/TIA-862 Building Automation systems Cabling Standard for Commercial buildings
- (10) ANSI/TIA-942 Telecommunications Infrastructure Standard for Data Centers
- (11) ANSI/TIA-1005 Telecommunications Infrastructure Standards for Industrial Premises
- (12) ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial building Telecommunications Cabling
- (13) ANSI/NECA/BICSI-607-2011 Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings
- (14) ANSI/NFPA 70 National Electrical Code, CSA C22.1
- (15) BICSI Telecommunications Distribution Methods Manual (TDMM)
- (16) BICSI Telecommunications Cabling Installation Manual (TCIM) BICSI ITSIMM
- (17) County Codes and Regulations
- (18) Underwriters Laboratories (UL)
- (19) FCC -Federal Communications Commission
- (20) ADA Requirements
- (21) Occupational Safety and Health Regulations (OSHA)
- (22) National Fire Protection Association (NFPA)
- (23) Florida Statutes and Administrative Rules
- (24) Manufacturers Product Cabling Catalogs
- (25) Manufacturers Training Manuals (Design and Installation).

3.17.A.2 Submittals

- a. Materials & Equipment List: Prior to installation the contractor will submit for approval a complete list of materials, equipment, accessories, configurations and

installation methods proposed for work in accordance with these specifications. The list will include complete catalog identification numbers and models or system designator, quantities, options and catalogs "cuts."

b. As Built Drawings: The contractor will provide one set of reproducible drawings depicting the final installation details, including final cable locations, quantities and routing, upon completion of the project. The contractor will also provide as built drawings in electronic format. The formats are to be determined by TPA at the time of implementation of the project.

c. Cable Management System Documentation: The contractor will provide a listing in spreadsheet format of all horizontal and riser cables, indicating type of cable, origination and termination points and length. The contractor will provide this spreadsheet in electronic format, in Microsoft Excel (latest version available), using a specific spreadsheet format provided by TPA. The data will be entered into TPA's Cable Management System.

d. Record Drawings: The contractor will maintain and keep up to date a complete record set of drawings that will show every change from the Contract Drawings.

e. Room Labeling: Initial and all subsequent submittals will include a labeling scheme that reflects the labeling standards delineated in section 3.18 of the Design Criteria Manual.

3.17.A.3 Delivery, Storage, and Handling

a. Protection and Restoration: Suitably protect all equipment provided under this Division during construction. Restore all damaged surfaces and items to "like new" condition before a request for substantial completion inspection.

b. Handling: All materials will be properly protected and all conduit openings will be temporarily closed by the contractor to prevent obstruction and damage. Post notice prohibiting the use of all systems provided under this Contract, prior to completion of work and acceptance of all systems by the owner's representative. The contractor will take precautions to protect his materials from damage and theft.

c. Safeguards: The contractor will furnish, place and maintain proper safety guards for the prevention of accidents that might be caused by the workmanship, materials, equipment or systems provided under this contract.

d. Cleanup: Keep the job site free from all debris and rubbish. Remove all debris and rubbish from the site and leave premises in clean condition on a daily basis.

3.17.B Products

3.17.B.1 General – Materials Alternates and Substitutions

TPA has established standards for products to be used for telecommunications infrastructure to be installed at the Airport. These standards are established to ensure commonality of services throughout the Airport regardless of manufacturer, vendor or owner.

a. Alternates: Specified products or manufacturers that will be in compliance with the performance and quality provisions of the specifications and may be proposed for use by the contractor. Alternates will also be a different model number from those identified on the documents. Acceptable alternates are as listed on the documents. Alternates must be justified on the basis of need, cost or both as long as there is no identified reduction in quality and that all design parameters are met.

- b. Substitutions: Products of unnamed manufacturers. Substitutions will not be acceptable.
- c. The contractor is expected to base his bid on materials and equipment complying fully with the drawings and specification. In the event he bases his bid on materials or equipment which do not conform, he will be responsible for providing materials and equipment which fully conform at no change in his contract price. In any case, where a specific specification for any item that is required is not shown, the contractor will provide only the best quality equipment or material consistent with the quality of other specified equipment and material. The items of equipment will be provided in the quantity as shown by the drawings or in the quantity as specified herein.
- d. The use of acceptable equipment does not relieve the contractor of responsibility for the alternate equipment. The contractor, at no cost to the owner, will remove and replace with the specified equipment any equipment or system that shows evidence of improper operation, function, or size.
- e. It is the responsibility of the contractor to supply a working overall system. All equipment and material as well as labor must be provided whether or not specifically mentioned in the specification or shown by the drawings.
- f. The contractor selected for each Division 27 and 28 system must be certified by the manufacturer of the products, adhere to the engineering, installation and testing procedures and utilize the authorized manufacturer components and distribution channels in provisioning the Project.
- g. Contractor, as a minimum, must carry a current State issued limited energy license.
- h. Additional requirements as indicated on each individual specifications section.

3.17.B.2 Fiber Optic Backbone Cable Subsystem

- a. Single mode fiber cable used will have the following optical characteristics:

Size: Core/Cladding 9/125um

Attenuation	Bandwidth	Notes
1.0/1.0 dB/km@1310/1550	100 terahertz	OS1 – Tight Buffered/Inside Plant
0.4/0.4 dB/km@1310/1550	100 terahertz	OS2 – Loose Tube/Outside Plant

- b. Multimode fiber cable used will have the following characteristics:

Size: Core/Cladding 50/125um

Attenuation	Bandwidth	Notes
3.0/1.0 dB/km@850/1300	500/500 MHz-km	OM2 – Laser - rated
3.0/1.0 dB/km@850/1300	2000/500 MHz-km	OM3 – Optimized for 850 nm
3.0/1.0 dB/km@850/1300	3600/500 MHz-km	OM4 – Optimized for 850 nm

Size: Core/Cladding 62.5/125um

Attenuation	Bandwidth	Notes
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3.0/1.0 dB/km@1310/1550	160-200/500 MHz-km	OM1 – LAN fiber
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c. Inside backbone cable will consist of tight-buffered single mode cable consisting of multiple fiber bundles and a dielectric central strength member. The outer jacket will meet the NEC requirements for Riser or Plenum.

d. Outside plant fiber cable will be of water-blocked, loose tube, single mode construction. The cable will consist of multiple fiber bundles surrounding a dielectric central strength member, and covered with a fire resistant jacket.

e. Acceptable manufacturers: Corning, Optical Cable Corporation, Superior Essex, Comm Scope, Berk-Tek or approved equal.

3.17.B.3 Fiber Distribution Panels

a. Panels used for terminating outside plant and inside building fiber optic cables will be of the distribution type. Where feasible, all fiber distribution panels will be rack mounted. Panels will be low profile, and selected to occupy minimum rack spaces.

Distribution panels will have both termination bays and splice bays, with the proper number of LC panels/mounting plates with stainless steel couplers and splice organizer trays plus 20% for expansion.

b. Acceptable manufacturers: Panduit, Ortronics, Commscope, Leviton or approved equal.

3.17.B.4 Fiber Cable LC Connectors

a. LC compatible connector couplings will be able to accommodate ceramic connectors. The contractor will use couplings specifically rated by the manufacturer for high-speed applications.

b. Multimode and single mode fiber connectors will be LC compatible, epoxy type, with ceramic tips. The maximum average insertion loss specifications will be as follows:

(1) Singlemode: .75dB/connector

(2) Multimode: .75dB/connector

Acceptable manufacturers: Panduit, Leviton or approved equal.

3.17.B.5 Fiber Optic Patch Cables

a. Fiber patch cables will be appropriate length duplex LC-to-LC fiber patch cords for all fiber distribution panel ports.

b. The contractor will provide cable management rings and support brackets for routing and support of all fiber patch cables and will ensure equipment is in place that will protect the fiber patch cables from damage.

c. Acceptable manufacturers: Panduit, Leviton, or approved equal.

3.17.B.6 Interior Copper Cable Backbone Subsystem

- a. The interior copper cable backbone system will consist of the following:
 - (1) Multi-pair copper cable, UTP 4PR CAT 6 plenum and non plenum cable.
 - (2) 8 Position Modular (RJ45) Patch Panels and Jacks, 110 Punch Down Blocks, 66 Punch Down Blocks and Wire Management Devices.
 - (3) Fiber Optic – Conventional and Air Blown Fiber Optic Cables, Singlemode and Multimode, Connectors, Fiber Distribution and Termination Cabinets.
- b. The contractor will provide cable management rings and support brackets for routing and support of all interior copper backbone cables.
- c. Interior copper backbone cable will be UTP Category 6 cable minimum and will be in compliance with the TIA/EIA standards.
- d. Acceptable manufacturers: Berk-Tek, Superior Essex, or approved equal.

3.17.B.7 Outside Plant Copper Cable Subsystem

- a. Outside copper cable will be gel-filled to inhibit water penetration, and armored to enhance protection from external means. Outside copper cable will meet RUS PE-89 specifications.
- b. Acceptable manufactures: Superior Essex, or approved equal.

3.17.B.8 Cable Voltage Protection

The contractor will provide gas-tube voltage protection blocks for outside plant cables. Voltage protection blocks will be wall mounted with locking front cover. Acceptable manufacturers: Porta Systems or approved equal.

3.17.B.9 Horizontal Cable Subsystem

a. The horizontal cable subsystem will consist of Category 6 non shielded or foil shielded UTP and six strands of multimode, fiber optic cable end-to-end installation as identified in the latest ANSI/TIA568-C standard. Copper cables will consist of 4 twisted pair cable; either PVC-jacketed or plenum-rated as required in the environment where work is occurring. All cable will meet the following requirements:

- (1) Category 6 cable will meet all performance requirements as specified in the most current version of the ANSI/TIA 568-C.
- (2) Unless otherwise specified, the standard category 6 cable complement will be four 4-pair data cables. All category 6 cable will be color coded and placed in the face plate as follows:

Cable	Cable Color	Insert Color	Placement
Access Control and Video Management Systems	Red	Red	
Data 1	Blue	Blue - if available	Upper Left
Data 2	Blue	Blue – if available	Upper Right Left

Data 3	Blue	Blue – if available	Lower Left
Data 4	Blue	Blue – if available	Lower Right
Fiber 1*	Blue and Orange	Electric Ivory	Center Right
Fiber 2*	Green and Brown	Electric Ivory	Upper Right

*If installed

(3) Unless otherwise specified, the standard fiber installation will consist of two, two-strand fiber connections placed below the copper connections on the face plate as shown in section 3.18, page 4, of the DCM.

(4) Unless otherwise specified, all CAT 6 jacks will be Panduit part numbers CJS6X88TGY.

(5) Unless otherwise specified, all fiber jacks for the faceplates will be Panduit part number CMDJLCEI.

(6) Unless otherwise specified, all double-gang faceplates will be Panduit part number CFPF12EI-2G and all single gang faceplates will be Panduit part number CBEI.

b. Horizontal copper cable runs will not exceed 90 meters from the outlet to the IDF. If cable routing requires horizontal runs in excess of 90 meters, the contractor will notify TPA in advance of installation.

c. All fiber horizontal cable will be 6 strand, 50/125 multimode (OM3) micron cable.

d. Acceptable manufacturers: Panduit or approved equal for fiber; Panduit, Corning, Optical Cable Corporation or Superior for copper cable.

B.17.B.10 Station Cable Faceplates and Jacks

a. All faceplates used will have a capacity of a minimum of four outlets utilizing a square, single gang box that is 2 inches wide and as deep as physically permissible.

b. Data, voice and fiber communications jacks will meet all performance requirements as specified in the latest issue of the ANSI/TIA 568-C and will be wired to accommodate the T-568B wiring sequence.

c. Faceplates will be flush mounted. Any surface mounted boxes must be approved in advance by TPA.

d. Fiber inserts on the faceplate will have recessed inserts with a downward slope of 30 degrees.

e. All modular jacks & plugs used will comply with FCC part 68 specifications.

f. Metal faceplates may be used with prior approval from TPA.

g. Acceptable manufacturers: Panduit or approved equal.

3.17.B.11 Category 6 Patch Panels

- a. Category 6 patch panels will meet the ANSI/TIA requirements for Category 6 cross-connect and switching hardware.
- b. The contractor will provide Category 6, 8 Pos modular patch panels in all wiring closets adequate to support all installed Category 6 cables (data and voice), plus 20% growth in each wiring closet.
- c. Category 6 patch panels will include wire management components that will be used for routing of communications cable to and from telecommunications panels and equipment. These components will include:
 - (1) Wire slots to organize cables
 - (2) Cable brackets for support and routing
 - (3) Strain relief clips
 - (4) Wire management panels
- d. Acceptable 8 Pos modular patch panel manufacturers: Panduit, or approved equal.

3.17.B.12 Fiber Optic Distribution Panels

- a. Fiber Optic Patch Panels will meet the ANSI/TIA requirements for fiber optic hardware.
- b. The contractor will provide Fiber Optic LC patch panels in all wiring closets adequate to support all installed fiber optic cables plus a 20% growth in each wiring closet.
- c. Fiber Optic Distribution Panels will include management components that will be used for routing of communications cable to and from related Fiber Optic source equipment.
 - (1) Wire slots to organize cables
 - (2) Cable brackets for support and routing
 - (3) Strain relief clips
 - (4) Wire management panels
- d. Acceptable manufacturers: Panduit or approved equal.

3.17.B.13 Equipment Racks

- a. In each wiring closet the contractor will mount 8 Pos modular patch panels and fiber distribution panels in floor-mounted, 84" high, 19" equipment racks with cable management troughs. Furnish and install adequate racks to support rack-mounted fiber optic distribution panels and category 6, RJ-45 patch panels, and 20% growth.

- b. Acceptable manufacturers: B-Line, Chatsworth, X-Mark or approved equal.

3.17.B.14 Category Patch Cables and Fiber Optic Cross-Connect Cables

- a. The contractor will provide adequate Category 6 patch cables and Fiber Optic cross-connect cables of appropriate lengths to support all patch panel ports and Fiber Optic distribution panels installed.
- b. The contractor will not be responsible for installing patch cables. This specification only calls for furnishing the required patch cables to be installed.
- c. Acceptable manufacturers: Leviton, Siemon, Corning, Optical Cable Corporation, Comm Scope, Berk-Tek or approved equal.
- d. Prior to purchase of patch cables, the contractor will consult the Aviation Authority Telecom Group concerning cable length to be supplied.

3.17.B.15 Fiber and Cable Management

- a. Vertical Cable Management will be required for each side of the equipment rack. The cable management devices must be sized accurately for the cable types and maximum capacity. Drop-downs of Copper and Fiber cables will be accomplished utilizing conduit “waterfall”, Panduit Part Number CMW-KIT, and waterfall accessories as appropriate. The contractor will consult with the Aviation Authority Telcom Group to clarify any questions on this matter.
- b. Horizontal Cable Management is required below each patch panel and switch. A 24-port patch panel requires one horizontal cable manager below and a 48-port patch panel requires one horizontal cable manager above and below the patch panel. The use of patch panels larger than 48-ports is discouraged. The cable management devices must be sized accurately for the cable types and maximum capacity.
- c. Acceptable manufactures: Panduit or approved equal.

3.17.C Execution

3.17.C.1 Installation

- a. General Instructions
 - (1) The contractor will install all provided and furnished materials in accordance with manufacturer's specifications, recommendations and guidelines. Copies of the manufacturer's guidelines, specifications and recommendations will be provided by the contractor to TPA and will be made available on site to the contractor's personnel.
 - (2) Install all wiring and cabling in accordance with the National Electric Code (NEC) where the provisions of the NEC are applicable.
 - (3) Installation will be in conformance to generally acceptable telecommunications means and methods and the manufacturers' specifications. Stress on any cable during installation will not exceed manufacturers' specifications. All splicing and connections will be in accordance with industry-standard practices.

- (4) The contractor will coordinate installation of all cabling to promote ease of installation and efficient use of rack space, backboard space, conduits and cable trays.
- b. Fiber Optic Cable Plant Installation
- (1) All fiber cable will be terminated in LC connectors mounted in fiber distribution centers. The contractor will use fiber pigtails and splice trays at all distribution points.
 - (2) All Backbone fiber optic cables will be installed in innerduct tubing to protect and isolate it.
 - (3) All Horizontal fiber optic cables will be six strand, armored, multimode.
 - (4) Fiber optic cable will be installed in accordance with manufactures specifications. The contractor will not exceed the maximum pulling tension or minimum bend radius of the cable.
- c. Copper Outside Plant Installation Requirements
- (1) All outside plant cables will be terminated in 110 blocks.
 - (2) All copper outside plant cable will terminate in voltage protection units upon entering the wiring closet in each building.
 - (3) All copper outside plant copper cable will be installed in accordance with manufacturers' specifications. The contractor will not exceed the maximum pulling tension or minimum bend radius of the cable.
- d. Copper Inside Plant Backbone/Riser Subsystem
- (1) All cables will be terminated in 110 blocks or 8 Pos modular patch panels.
 - (2) All copper inside plant copper cable will be installed in accordance with manufacturers' specifications. The contractor will not exceed the maximum pulling tension or minimum bend radius of the cable.
- e. Horizontal Cabling
- (1) The standard for horizontal distribution systems will consist of a complete Category 6 installation, using UTP cables and/or fiber optic cables where national and local codes will allow for such installation. Any cable designated to be routed in spaces identified as riser or return air plenum spaces will conform to the installation requirements for these spaces by national and local codes, such as the use of riser and plenum rated cables.
 - (2) Electrical service boxes identified for use as communications outlets will be connected to the accessible ceiling locations via continuous and integral electrical metallic tubing (EMT) conduit, at a minimum. This conduit will be routed between the CO and the accessible ceiling designated communications cable tray where the end of the conduit will terminate no further than 6" to 12" from the point of cable tray exit, and in such a manner that there is no requirement to support the communication cable between the cable tray and the CO conduit. This CO and

conduit installation is a TPA requirement. If any deviation from this requirement is proposed by the contractor, the contractor will obtain explicit written permission from TPA for only the specified points of installation.

(a) If CO service boxes and integral conduit runs do not exist or specifically provided by others, then it will be the responsibility of the contractor to furnish and install them. The minimum installation requirements will be a double-gang box and a 1" conduit run. The conduit run will be provided with swept conduit bends, not to exceed 180° in total, such that the conduit run is horizontal to the ceiling and at the same level of the accessible ceiling communication cable tray within ±3 inches vertically.

(b) All conduits will be reamed to remove sharp inside edges and any open conduit end will have a bushing installed to protect the communications cable jacket.

(c) All conduits will be adequately supported at 48" intervals or less.

(d) It is understood that certain communications outlet conduit installations may be impractical due to pathway and space limitations such as routing, penetrations and architectural aesthetics. For such conditions, the contractor is required to submit an alternate pathway design and rational for TPA approval.

(e) When any cable is pulled through a CO conduit, an internal dragline is to be left in place to facilitate the installation of future cables.

(3) Between the end of the conduit stub-up and the wiring closet, the contractor will install appropriate cable tray of appropriate capacity to accommodate the expected full build-out at the area of the building facility being served. It is the expectation of TPA that cable tray be used in horizontal distribution. The contractor will install the appropriate cable tray support hardware. In no instance will the contractor attach cables to any other support hardware in the ceiling space. The cable tray will be supported at 48" intervals or less. The weight of maximum cable capacity will dictate a more frequent support.

(a) At locations where a cable tray cannot be accommodated due to floor/wall penetrations, structure and/or aesthetics, the cable routing must transition to other types of pathways. The contractor will utilize cable bridle rings or J-Hooks (open top cable supports) attached to hanger rod supports to secure the cable to the point of entry of the alternate pathways. Cable at these transition points between the cable tray and alternate pathways will be supported at spacing of 48" or less depending on the weight of the bundle.

(b) Under no circumstances will cable be laid on suspended ceiling or draped across other conduits, pipes, ducts, or other facilities installed along the path of the cable.

f. Route Preparation, Drilling and Coring

Field coordination with TPA will be required prior to installing cable trays (where specified), sleeves, wall or floor penetrations and/or cables.

g. Termination

(1) The contractor will terminate all conductors of all cables. Each copper outside plant and riser cable pair will be terminated contiguously on wall-mounted 110 blocks with protectors. Terminations will be in color code sequence from left to right and from top to bottom on each block for each cable. 110 blocks will be labeled in a permanent legible fashion, in compliance with TPA's approved labeling scheme.

(2) Fiber strands will be field terminated in rack-mounted fiber distribution panels on LC connectors according to the specification of the manufacturer. Only tool kits and consumables that are specified by the manufacturer will be utilized. Completed LC connectors will be placed into the sleeve of the fiber termination panel from left to right in color code sequence. Strands will be protected and secured within the fiber panel to ensure both strain relief and bend radius. The fiber cable will be tie wrapped (this means the total cable with all strands inside of outer jacket) at the point of entry of the patch panel to prevent strain on the strands. Where required, to secure the fiber optic cable from pulling tension, the Kevlar strength members will be separated from the fiber strands and attached to the panel by a clamp. Fiber connectors will be terminated on LC connectors using manufacturer-approved methods.

(3) The contractor will terminate horizontal cables in modular jack inserts at the outlet in accordance with the floor plans, using the T568B wiring sequence.

(4) The contractor will terminate horizontal cables on rack mounted Category 6, 8 Pos Modular patch panels and/or Fiber Optic Fiber Distribution Panels according to the T568B wiring sequence.

h. Site Survey

(1) Prior to placing any lateral, riser or outside plant cable, penetration, etc. the contractor will survey the site to see that job conditions do not impose any obstructions that would interfere with the safe and satisfactory placement of the cables, and arrange to remove any obstructions with TPA. The contractor will provide shop drawings for approval by TPA prior to starting work.

(2) The contractor is responsible for notifying TPA as soon as field conditions prevent proper installation.

(3) The contractor will verify site conditions and dimensions of equipment to ensure access for proper installation of equipment without disassembly that will void warranty, and will report in writing to TPA, prior to purchase or shipment of equipment involved, on conditions that may prevent proper installation.

i. Inspection

All cable will be inspected as it is pulled off the reel for any obvious defects. If defects are observed, further use of the cable from this reel will be halted.

j. Pulling Tension

(1) No cable will be installed with a pulling tension exceeding the maximum recommended by the manufacturer. Pulling tension should be monitored with a tension gauge.

(2) If multiple cables are to be pulled at one time, the contractor will make the necessary allowances to back off the pulling tension of the bundle.

(3) Cable pulls will be protected by means of an overload cutoff or breakaway clutch set at least 10% below the cable manufacturers' maximum recommended pulling tension.

k. Bend Radii

All cables will be installed with a bend radius greater than recommended by the manufacturer.

l. Slack

(1) The contractor will leave a service loop prior to termination and patching.

(2) Prior to termination, the contractor will leave a service loop for riser cables to provide some degree of flexibility and for service rearrangement.

m. Securing Methods

(1) The contractor will provide Velcro tie wraps, riser cable support grips, vertical and horizontal cable trays in wiring closets and other equipment spaces based upon field conditions to maintain orderly cable organization.

(2) The contractor will be responsible for securing all cabling in a way to satisfy any structural engineering requirements.

(3) The contractor will obtain required structural engineering related information for any item that may affect the infrastructure of the building, and submit the information to TPA for prior review and approval.

(4) The contractor will provide suspended platforms, threaded rods, strap hangers, brackets, shelves, stands or legs as necessary for floor, wall or ceiling mounting of equipment provided under this Section. The contractor will provide steel supports and hardware for proper installation of hangers, anchors, guides, etc., and will provide cut sheets, weights, and other pertinent data required for proper coordination of equipment support.

(5) Velcro tie wraps will be used at approximately 60-inch intervals to secure cables in cable trays and to provide strain relief at termination points.

n. Placing Cable in Conduit

(1) The contractor will verify that any conduits to be employed are clear of obstructions unless TPA has approved an exception in writing. For fiber, inner duct will be placed in conduit. A fishline and mandrel will be used to clear conduits of obstructions and as a guide for pulling the cable through.

(2) For riser cable, the cable strength members will be affixed to the pulling medium or, a properly sized "kellum" type grip will be employed to make the pull. Cable pull tension will be monitored during the pull with a tension meter as necessary and if mechanical pulling equipment is used, a clutch set at 10% below the cable manufacturer's maximum pulling tension will be used.

(3) A nylon dragline will be pulled along with each conduit run installed so that future cables may be pulled in that conduit. Conduit bushings will be used to protect the cable jacket from abrasion as it is pulled through conduit and at each exposed end.

o. Lubrication

As necessary, for cable pulls in conduit, the contractor will use only an approved lubricant compatible with the cable's outer jacket insulation.

p. Protection

During installation, and prior to final acceptance, the contractor will protect finished and unfinished work against damage and loss. In the event of such damage or loss, the contractor will replace or repair such work at no additional cost to TPA. As cable is installed, care must be taken to avoid nicks, kinks or other damage to the cable. Cable is to be labeled at each end as specified. Provide strain relief at each termination point and 24 inches of slack to allow for easy re-termination of the cable, if required later.

q. Cable Routes and Clearances

Unshielded twisted pair cable will be routed so as to maintain the following minimum distances from power sources:

Condition	Minimum Separation Distance		
	<2 kVA	2-5 kVA	>5 kVA
Unshielded power lines or electrical equipment in proximity to open or nonmetal pathways	5 in	12 in	24 in
Unshielded power lines or electrical equipment in proximity to grounded metal conduit pathway	2.5 in	6 in	12 in
Power lines enclosed in a grounded metal conduit (or equivalent shielding) in proximity to a grounded metal conduit pathway		3 in	6 in
Electrical motors and transformers			48 in

r. Grounding

(1) All metallic sheathed cables will be bonded and grounded. Riser cables will be bonded to the metal frames of the mounting hardware in the wiring closet using bonding clamps appropriate to the size of the cable.

(2) Each wiring closet will have a single ground point. This point is bonded to the integral building grounding system or to the local structural steel. All grounding and bonding in each wiring closet will be connected to that point either directly or through the use of ground bus connections.

(3) All cables with a metallic component, which enter a wiring closet from outside a building, will be grounded and bonded at the point of entrance with appropriate lightning protection.

s. Splicing

No splicing of any cables will be performed unless otherwise explicitly noted in the Drawings or pre-approved in writing by TPA.

t. Materials Management

(1) Equipment and materials will be properly stored, adequately protected and carefully handled to prevent damage until acceptance.

(2) The contractor will ensure delivery of cable, factory-packaged in containers or on reels. Storage of all components will be provided by the contractor including rental of containers or other suitable methods as specified.

u. Fire Stopping

(1) The contractor will suitably fire stop all riser shaft openings; horizontal sleeve penetrations, both ends of any horizontal conduits and all slot cuts in walls and under the raised access floors which are needed to facilitate cable access/egress.

(2) The contractor will verify to TPA's satisfaction that the integrity of all fire stops is maintained upon completion of the work.

v. Protection/Restoration of Premises

The contractor will, as required, during the progress of work, remove and properly dispose of resultant dirt and debris, hang protective plastic sheathing when specified and keep premises clean. Upon completion of work, the contractor will remove equipment and unused material provided for work.

w. Quality Assurance

(1) The work will be executed in full accordance with the current rulings of the latest applicable standards and all rulings by state, utility, and local authorities. Where codes conflict, the more stringent will apply. Where the specification requirements exceed the requirements of these authorities, codes, and standards, the specification requirements will prevail.

(2) The contractor will replace any imperfect or rejected work with work conforming to the requirements of the specification and will be satisfactory to TPA without extra cost to TPA.

(3) The contractor will report to TPA promptly in writing, whenever plans or specifications are believed to be at variance with these requirements and will not proceed with such work until further instructed in writing by TPA.

x. Abandoned and Future Cabling

(1) Abandoned cable will be removed from all pathways and spaces by the contractor anywhere the contractor is conducting new installations, renovations or replacement of existing cable plant backbone or horizontal pathways and space.

(2) Abandoned cable will be identified by the contractor, in consultation with TPA, for each project. Any cable later identified by the contractor as possibly abandoned will be brought to the attention of TPA.

(3) Any un-terminated communications cabling identified for future use by TPA will be documented by the contractor pursuant to TPA's cable management system specifications.

3.17.C.2 Testing

a. General Instructions

(1) For projects with a contract value in excess of \$25,000, testing will be performed by an independent testing agency, retained by and at the expense of the contractor. For projects valued at \$25,000 or less, inspections will be performed by the contractor.

(2) The contractor will thoroughly test, or have tested, all cables and connectors that they furnish and install. TPA requires certification that all pairs were tested and found to be 100% reliable end-to-end (block-to-block and block-to-receptacle); bad pairs/punch-downs and/terminations will not be used, but rather be corrected and/or replaced at no additional cost to TPA. The contractor will present all testing plans to TPA for approval prior to the start of testing.

(3) The contractor will provide a complete description of acceptance testing procedures and will notify TPA upon successful completion of acceptance testing.

b. General Rules

(1) The contractor will provide all labor, test equipment, and tools necessary to verify proper operation prior to final acceptance by TPA.

(2) Prior to any testing, the contractor will provide TPA with a two day minimum advance notice of the date testing is to begin. All test results shall be documented, and submitted to TPA for review, prior to final acceptance by TPA.

(3) The contractor will repair or replace all cable, connectors, and equipment supplied by the contractor, which do not meet acceptance criteria, prior to final acceptance by TPA.

c. Replacement

(1) Any cable, connector, or wiring block, patch panel or other device furnished by the contractor which tests below manufacturer's standards will be replaced at no additional cost to TPA. The replacement will be re-tested to verify compliance.

(2) Successful completion of all tests indicated below is required for acceptance.

d. Testing Procedures

(1) The contractor will provide the necessary test equipment to conduct the tests.

(2) Field tests may be required to be performed in the presence of TPA and/or its duly authorized representatives. The contractor will provide written documentation reporting the results of all tests.

e. Pre-Installation Testing

The contractor will obtain factory test data for each reel of cable including, but not limited to:

- (1) Physical Production Tests (tensile strength)
- (2) Transmission Production Tests

f. Fiber Optic Cable Test Procedures - Backbone and Horizontal

(1) Following the physical installation and termination of the fiber optic cables, the contractor will conduct any pre-checkout tests deemed necessary prior to the conduct of formal acceptance tests with the owner.

(2) The contractor will verify continuity of all optical fiber strands.

(3) The contractor will be responsible to perform optical loss (attenuation) measurements and Optical Time Domain Reflectometer (OTDR) tests. The contractor will document such items as the personnel involved in the testing, type of equipment utilized, equipment settings, the date tested, reel number (or cable ID when tested post-installation) and strand number. The contractor will be responsible to supply sufficient cable for the installation and to take whatever action is necessary to provide such cable at no additional cost to TPA.

(4) The contractor will provide written results, including actual trace records in As Built Drawings that the optical loss for each strand is within the limits established.

(5) If a fiber cable loss exceeds either the established optical loss or the manufacturer's standards, the contractor will first clean the connections at both ends and retest the cable. If loss is still excessive, the contractor will inspect the connections. Re-polishing or connector replacement may be required. If the connector terminations are determined to be acceptable, the cable may be defective. An Optical Time Domain Reflectometer (OTDR) will be used to locate cable breaks and points at which losses occur.

(6) In the event that the fiber continues to test outside of acceptable specifications, the contractor will replace the cable at no additional cost to TPA in accordance with TPA's schedule.

g. Acceptance Testing

The contractor will perform the tests and inspections described in this section in the presence of TPA. Each floor and closet will be tested individually and accepted on a per floor basis. The cabling system will be tested for compliance with the specifications for physical placement, electrical specifications, wiring accuracy, continuity, and proper labeling and identification. Document all test results.

h. Physical Inspection

Prior to conducting any transmission testing, the following visual inspections will be performed:

- (1) Verify that cable has been installed to comply with contract documents.
- (2) Check for physical damage to Distribution Panels and Termination Blocks.
- (3) Verify that outlets have been securely mounted and properly labeled.
- (4) Check that all cabling is properly jacketed, installed and labeled at both ends (to the appropriate block/panel in the TR).
- (5) Verify that all cable bends are within the manufacturer's minimum bend radius allowed.
- (6) Check and demonstrate that all cable shields have been correctly grounded or bonded.
- (7) Verify that the cable is properly supported for termination and long-term placement (approvals must be obtained from TPA).
- (8) Verify that all cables are properly supported and independent of any other support/hanger rods in the ceiling space.
- (9) Verify that cables have been terminated properly and in proper color code sequence.

i. Copper Cable Transmission Tests

(1) Electrical tests of copper cables will be performed only with connectors installed and cables punched down. Copper Riser and horizontal cables will be tested End-to-End from termination point to termination point via the appropriate punch-down on the termination block. 100% TESTING OF ALL PAIRS ON ALL CABLES IS REQUIRED. Manufacturer standard test equipment will be employed in addition to any special test gear required.

(2) All pairs of each cable will be electrically tested for:

- (a) Continuity - The measured resistance value will be recorded.
- (b) Opens
- (c) Ground Faults
- (d) Correct Termination - For the unshielded twisted pair, the correct color code will be punched down to be appropriate block/pin on the 110 block.
- (e) Reversals (Correct Polarity)
- (f) Splits
- (g) Crosses

(3) The contractor will create a punch list of bad pairs and re- terminate and, as necessary, replace any defective cables, connectors and/or panels.

j. Horizontal Station Cable Testing - Copper

(1) Perform testing, and certify Category 6 compliance on all horizontal cable subsystems. All components of each horizontal subsystem must be of the Category 6 rating (cable, jack insert, patch panel, patch and station cables) and the link must be tested. Test results will be documented on hard copy media and listed by outlet.

(2) The contractor will identify the test equipment and procedures that will be followed to complete and document the testing.

(3) Test measurements will be conducted for bandwidth up to 625MHz, and include the following:

- (a) Insertion Loss (Attenuation)
- (b) Propagation Delay
- (c) Delay Skew
- (d) NEXT (Near-End Crosstalk) Loss
- (e) PSNEXT (Power Sum Near-End Crosstalk) Loss
- (f) Return Loss
- (g) Wire Map
- (h) Length
- (i) ACRF (Attenuation-to-Crosstalk Ration, Far-End) Loss
PSACRF (Power Sum Attenuation-to-Crosstalk Far-End) Loss

3.17.C.3 General Instructions

a. The contractor will provide documentation enumerating termination panels and every cable run. Any additional documentation not explicitly listed that the contractor feels should be provided to facilitate a complete, working installation prior to acceptance by TPA will also be supplied.

b. Documentation of all installed cable, manhole racking diagrams and splicing diagrams will be provided in an electronic database suitable for direct entry into TPA's cable management system. Fiber optic OTDR test results will be provided in hardcopy format.

3.17.C.4 Cleaning

a. The contractor will clean up all work areas at the end of each day, removing all cartons, debris, emptied containers, etc. as the work progresses.

b. Just prior to inspection for substantial completion the contractor will perform all final cleaning and sealing of equipment required to bring the installation to optimum appearance.3.16.A.

3.18 Aviation Authority Labeling Standards

The Aviation Authority has implemented a labeling scheme for the labeling of all telecommunications cable, faceplates, patch panels, wiring blocks and equipment racks.

Building Identifiers

Each building on the airport property is designated by a two-character code as shown below.

Designation Building Name

AA	Airside A
AB	Airside A Baggage Sort Building
AC	Airside C
AE	Airside E
AF	Airside F
AM	Airfield Maintenance
CB	Cargo Building
CF	Canine Facility
CL	Cell Lot
CB	Customs Bldg
EP	Economy Remote Garage
EV	East Airfield Electrical Vault
FB	Airside F Baggage Sort Building
FS	Fire Station
FX	Federal Express Building
GA	Guard Shack for Airside A
GB	Check Point Bravo
GC	Guard Shack for Airside C
GE	Guard Shack for Airside E
GF	Guard Shack for Airside F
LP	Long Term Parking
NP	North Parking Lot
PO	Post Office
RB	Raytheon Building (Currently Signature Flight Services)
SB	Service Building
TB	Terminal Building
TP	Toll Plaza
WV	West Airfield Electrical Vault

Telecommunications Spaces

Telecommunications Rooms are defined using a seven (7)-character designation. The designation consists of the following:

Characters 1 & 2 - Building designation (i.e., TB = Terminal Building) Characters 3 & 4 – Floor designation (i.e., 04 = 4th floor, 71 = 71 foot level)

Characters 5, 6 & 7 – Room number (i.e., 880 = room 880) A list of current Telecommunications Spaces follows.

Terminal Building

<u>Location</u>	<u>Designation</u>
1 st Level	
A Core Bag Make-up	TB01280
B Core Bag Make-up	TB01380
C Core Bag Make-up	TB01680
D Core Bag Make-up	TB01780
2 nd Level	
2nd floor Comm Room	TB02680
NOC Server Room	TB02180
TSA Oversize	TB02380
Valet Door	TB02381
Behind Air Canada T/C	TB02682
Behind British Air T/C	TB02683

Behind Delta T/C TB02780

3rd Level
Suite B TB03980

48 Foot Level
48' Level A Core TB48180
48' Level B Core TB48480
48' Level C Core TB48580
48' Level D Core TB48880

71 Foot Level
71' Level A Core TB71180
71' Level B Core TB71480
71' Level C Core TB71580
71' Level D Core TB71880

4th Level
4th Floor Comm Room D Core TB04880
4th Floor Comm Room A Core TB04180
4th Floor Comm Room B Core TB04480
4th Floor Comm Room C Core TB04580
91st Foot Level
91' Level A Core TB91180
91' Level B Core TB91480
91' Level C Core TB91580
91' Level D Core TB91880

Long Term Parking
High Vehicle MDF LPHV680
Elev. Mach. Room A LP91880
Elev. Mach. Room B LP91580
Elev. Mach. Room C LP91180
Elev. Mach. Room D LP91480
Toll Plaza Office DATA IDF TP02581
Toll Plaza Office Voice IDF TP02580

Airsides

A/S-A MDF AA01580
A/S-A IDF-A AA01780
A/S-A IDF-B AA01680
A/S-A IDF-C AA01380
A/S-A Comm. Room AA01180
A/S-A Comm. Room AA01181
A/S-C MDF AC01780
A/S-C IDF -West AC01480
A/S-C IDF ----East AC01280
A/S-E MDF AE01380
A/S-E IDF-A AE01880
A/S-E IDF-B AE01680
A/S-E IDF-C AE01280
A/S-E IDF-D AE03380

A/S-E Shuttle Car Bay	AE01480
A/S-E Behind Delta Crown Rm	AE03580
A/S-F MDF	AF01980
A/S-F Shuttle Car Bay	AF01981
A/S-F TE	AF01480
A/S-F TE	AF01680

Outlying Buildings

Canine Facility MDF	CF01114
Airfield Maintenance MDF	AF02209
Airfield Maintenance	AF02180
Fire Station MDF	FS01370
Customs Bldg MDF	CS01980
Economy Parking Garage	EP01980
EPG Admin Bldg	EP01180
EPG Phase 2 (by Orange Elevators)	EP01204
A-Sort	AS01107

Backbone Cable Designations

Backbone cable designations will be based on the near-end and far-end of the cable. For example, a backbone cable from the 71 foot level, D Core of the Terminal Building to the Airside A MDF will be designated "TB71880/AA01580."

For backbone cables between telecommunications spaces within the same building, the building designation is dropped from the cable designation. For example, a cable between Airside A MDF and Airside A IDF-A will be designated "01580/01780."

In general, the 1st part of the cable designation is defined as the near-end cable termination point and the 2nd part of the cable designation is defined as the far-end.

Cable labels will be placed no more than three (3) inches from each end of the cable.

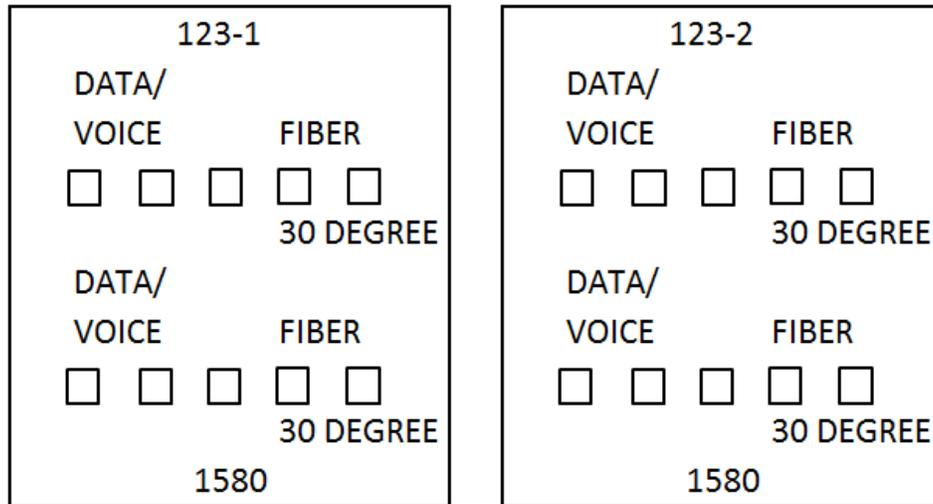
In cases where more than one cable exists between the same two points, the cable designation will include a modifier to indicate multiple cables, as in the following example:

- 1st Cable – AA01580/TB71880-1
- 2nd Cable – AA01580/TB71880-2

In cases where cables originating from different locations terminate in the same Telecommunications space, each cable will be terminated on a separate patch panel or wiring block.

Faceplates and Jacks

Faceplates will be labeled as illustrated on the following sketch:



In the above examples:

1. The faceplate labels include the faceplate identification number on the top, which consists of the room number (123) and the faceplate number in the room (-1) or (-2). In rooms with multiple faceplates, the numbering system begins with the first faceplate to the left of the entrance door, as you enter, and proceeds clockwise around the room.
2. The faceplate labeling also includes the identification of the Telecommunications Space (TS, wiring closet) in which the jacks terminate. Note that when labeling the faceplate, the two character building designation does not need to be applied.
3. Typically, there will be multiple jacks on each faceplate. Each jack on the faceplate will have a designation. Unused jacks will have “blanks’ inserted into their slots. On the double-gang faceplate shown above, the individual jacks will be identified (but not labeled on the faceplate) as follows:

Upper Left	123-1-1
Upper 2nd from Left	123-1-2
Upper 3rd from Left	123-1-3
Upper 4th from Left	123-1-4
Upper Right	123-1-5
Lower Left	123-1-6
Lower 2nd from Left	123-1-7
Lower 3rd from Left	123-1-8
Lower 4th from Left	123-1-9
Lower Right	123-1-10

4. The copper connections will be on jacks #2 and #7. Additional copper connections would go to jacks #1 and # 6 as needed.
5. The fiber connections will be on jacks #4 and #8.
6. Note that the Fiber connectors have a 30 Degree down slant on the faceplate.

The individual jack designations are not labeled on the faceplate due to space constraints. However, the jack designations are labeled in the Telecommunications Space on the appropriate patch panel or wiring block, as described below.

Each patch panel port will be labeled with the individual jack designation connected to each port. For example, the patch panel port connected to jack 123-1-1 will be labeled 12311. The hyphens and are deleted due to space constraints.

In telecommunications spaces with multiple patch panels, each patch panel is sequentially numbered beginning with number “1.”

Wiring Blocks

66 blocks will be covered with industry standard color-coded covers as follows:

- Interbuilding Backbone Cable Green
- 1st Level Riser (Backbone) Cable White
- 2nd Level Riser (Backbone) Cable Gray
- Horizontal Cable Blue

66 block covers will be labeled with the cable designation and pair count. For example: Cable 01580/01780 – Pairs 1-50

110 blocks will be labeled with the same information as found on the 66 block covers.

Section 4 – Miscellaneous

4.1 Safety Risk Management

All projects will be required to proactively identify potential safety risks and include consideration of reasonable measures to mitigate known safety risks. During the design phase, the design professional will coordinate with the Authority’s Project Team, Safety Management System (SMS) Manager and Risk Management Department via the Project Director, to make a professional assessment of the project’s overall level of safety risk by classifying it into low, medium or high risk. A determination of “low risk” will require no further action. A determination of “medium risk” will require a recommendation by the design professional of measures that should be considered for inclusion into the design that results in an acceptable level of risk. A determination of “high risk” will require that formal action be taken by the design professional as part of the design to mitigate the level of risk via a Safety Risk Assessment and formal Risk Mitigation Plan that results in an acceptable level of risk. The design professional will continue engagement with the SMS Manager on an as-needed basis during the construction of the project to assure that risk management is tracking in accordance with the determinations made during the design phase.

4.2 Environmental Matters

Local, state, and federal regulatory agencies have established air and water quality standards which are in effect at the Authority’s airports. The Authority provides criteria for dealing with potentially hazardous substances. Three topics include: property notifications, limitations on bringing hazardous substances onto construction projects, and a roadmap for managing pre-existing hazardous substance conditions on construction projects.

4.2.A Radon Gas and Other Property Condition Notifications

- a. Radon Gas: In accordance with requirements of the State, the following notification statement will be included in all agreements relating to rental of real property. This is provided for information purposes only. Radon is a naturally occurring radioactive gas that, when it has accumulated in a building in sufficient quantities, may present health risks to

persons who are exposed to it over time. Levels of radon that exceed federal and state guidelines have been found in buildings in Florida. Additional information regarding radon and radon testing may be obtained from your county health department.

- b. **Other Property Conditions:** Areas of Authority property are impacted by the past release of pollutants that are regulated by the FDEP. This is the result of historical airport operations, commercial and industrial activities that occurred prior to property acquisition, or naturally-occurring conditions. FDEP manages the State's site restoration program. FDEP requires site restoration to be commensurate with land use, public health and the environment. These provisions allow low levels of contaminants to remain in place and run with the land subject to the implementation of required controls including but not limited to property use restrictions, activity and use limitations, institutional controls, or engineering controls. At TPA, Authority worked with FDEP to develop Soil and Groundwater Use Regulations that memorialize these controls. The Soil Use Regulation provides a process for Authority to review and approve in advance all plans for soil excavation or disturbance. The Groundwater Use Regulation restricts drilling for water and requires that buildings used for human occupancy be piped to the public water system. Although the Soil and Groundwater Use Regulations apply to TPA, the same protections and standards are generally applied at all Authority property including the general aviation airports. As restoration projects are completed on Authority property, documents and maps are submitted to FDEP. FDEP maintains this information in an information repository that provides a self-service portal called Map Direct that allows map viewing and document download. Areas of Authority property that are undergoing a site restoration project, or have achieved a closed status, can be viewed in Map Direct. The Soil and Groundwater Use Regulations, and links to State radon protection maps and other property condition maps are posted on Authority website at www.TampaAirport.com > Learn about TPA > Airport Business > More Business Links – Radon Gas and Other Property Conditions.

4.2.B Hazardous Substance Limitations on Construction Projects

4.2.B.1 Design Phase Considerations

- i. Provided below is a list of new product material classes that are not authorized on Authority property. The design professional will review the list and ensure the construction drawings and specifications are consistent with this requirement. If any exceptions are requested or necessary due to the project scope, the design professional will schedule a coordination meeting with the owner's representative.

4.2.B.2 Construction Phase Considerations

- ii. Provided below is a list of new product material classes the contractor is not authorized to bring onto Authority property. Limited exceptions may be allowed; the contractor should schedule a coordination meeting with the owner's representative and design professional.
 - 1. **Asbestos:** Incorporation of asbestos in the project is not permitted on Authority property.
 - 2. **Lead:** Paint or primer containing lead is not permitted on Authority property.
 - 3. **PFAS:** Products or materials containing per- and polyfluoroalkyl substances (PFAS) are not permitted on Authority property. The project team should work closely with the owner's representative if the project scope involves PFAS-related products including but not limited to fire protection equipment and supplies, foam, carpeting, etc. Any product or

material that contains PFAS will only be permitted if the design professional prepares an alternatives analysis to determine if a non-PFAS alternative product or material is viable. If a non-PFAS alternative is determined to be viable, it may be used pending Authority review and approval of the analysis.

4. Hazardous Substances: Products or materials containing hazardous substances or characteristics, as defined below, are not permitted on Authority property.
- iii. Safety Data Sheets as required by law and pertaining to materials or substances used or consumed in the performance of the work, whether obtained by the design professional, contractor and/or tenant will be maintained at the worksite and made available to the owner's representative.

4.2.C Management of Existing Site Conditions

4.2.C.1 Design Phase Considerations

- iv. Provided below is a list of potential pre-existing hazardous substances that could be encountered on Authority projects that the project team will review, investigate and plan for to ensure the project complies with applicable regulations. The design professional will review the list and ensure the construction drawings and specifications are consistent with this requirement. If any exceptions are requested or necessary the design professional will schedule a coordination meeting with the owner's representative.
- v. The design professional will develop a plan to identify all potential occurrences of pre-existing hazardous substances to ensure worker and occupant/tenant safety, environmental, disposal, remediation and/or encapsulation requirements are met.
 1. The design professional will schedule a coordination meeting with the owner's representative to discuss this matter and request any historical documents that may be available for review. The Authority will disclose information actually known to and in the possession of the Authority regarding the presence of pollutants, hazardous substances, or other environmental conditions at the project site. The Authority does not warrant the accuracy or completeness of any such information.
 2. Depending on project-specific circumstances, the design professional will engage the services of a materials tester to assess field conditions. This includes but is not limited to asbestos surveys, indoor air quality/mold assessments, and lead field screening using a portable X-ray fluorescence (XRF) spectrometer. Other less common items that may warrant testing include petroleum products and metals, polychlorinated biphenyls (PCB), mercury-containing building elements and radioactive elements.
 3. The owner's representative will be notified immediately if soil or groundwater contamination or any potential pre-existing hazardous substances listed below are identified on Authority property.

4.2.C.2 Construction Phase Considerations

- vi. Provided below is a list of potential pre-existing hazardous substances that must be reviewed and possibly addressed during construction.

1. Asbestos: Asbestos is commonly found in buildings or underground in asbestos cement piping.
 2. Lead: Lead-based paint and primer is commonly found in painted structural steel, stair railings, overhead signs and certain traffic paint.
 3. PFAS: PFAS is commonly found in soil and groundwater, carpet products, and various firefighting and fire protection equipment and supplies including foam.
 4. Hazardous Substances: Hazardous Substances include products or materials containing hazardous substances or characteristics, as defined below. Petroleum and metals contamination in soil and groundwater is included in this section.
 5. Universal Wastes: Universal wastes commonly include used oil, batteries, mercury-containing equipment, mercury-containing lamps or bulbs, and fluorescent light ballasts that contain PCBs, pesticides and pharmaceuticals. For reference, the definition of universal waste is included in the definition of solid waste which is provided below.
- vii. If after commencement of construction unexpected pre-existing hazardous substances are discovered, the contractor will schedule a meeting with the design professional and owner's representative.
 - viii. Contractors should assume that all waste material, including rubble and debris, and hazardous substances will be removed from the Airport at the contractor's expense. No hazardous substance waste material will be stored or relocated within the Airport complex. Burning on Airport property is prohibited.

4.2.D Definitions

4.2.D.1 Hazardous Substance Definition:

Hazardous Substances are defined as any substance that (i) the presence of which requires investigation, reporting, removal or remediation under any Environmental Law; (ii) that is or becomes defined as a "hazardous waste," "hazardous substance," "hazardous material," "extremely hazardous substance," or other type of pollutant or contaminant under any applicable Environmental Law; (iii) that is toxic, reactive, explosive, corrosive, flammable, radioactive, carcinogenic, mutagenic, teratogenic, or otherwise hazardous and is or becomes regulated by any applicable Environmental Law; (iv) that is or contains oil, gasoline, diesel fuel, aviation fuel, or other petroleum hydrocarbons, products or derivatives, other than petroleum, crude oil, and petroleum products to the extent contained within regularly operated motor vehicles; (v) that is or contains PCBs, asbestos, radon, urea formaldehyde or any substance that contains PFAS; (vi) that is fungi or bacterial matter which reproduces through the release of spores or the splitting of cells, including but not limited to, mold (including, without limitation, penicillium/aspergillus and stachybotrys chartarum), and Legionella (legionella pneumophila); or (vii) the presence of which causes or threatens to cause a nuisance upon the Property or to adjacent property or poses or threatens to pose a hazard to the health or safety of any person, to plant or animal life, or to the environment, including, but not limited to sewage sludge, industrial slag, solvents and/or any other similar substances or materials.

4.2.D.2 Solid Waste Including Universal Waste Definition

Solid Waste including Universal Waste is defined as any waste that is or becomes defined as a “solid waste”, “waste”, “special waste”, “garbage”, or “commercial solid waste” under any environmental law or any waste that can require special handling and management, including but not limited to, white goods, waste tires, used oil, lead-acid batteries, construction and demolition debris, ash residue, yard trash, biological wastes, pesticides, pharmaceuticals and mercury-containing devices and lamps; or any waste that is not hazardous waste and that is not prohibited from disposal in a lined landfill or yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, or furniture other than appliances.

4.3 Airfield Lighting Control and Monitoring System

Any modifications to the existing airfield lighting system or Navigation Aids at Tampa International Airport will require an update to the “Airfield Lighting Control and Monitoring System” (ALCMS). All modifications and/or updates to the ALCMS must be done by Eaton Crouse-Hinds, 1200 Kennedy Road Windsor, CT 06095, USA, (860) 683-4300. This will include any changes, modification or updates to the system software and hardware including monitoring equipment and system computers.

4.4 Design Quality Control / Assurance

Quality Assurance and Quality Control (QA/QC) throughout the design phase is critically important to the Authority and the success of each project. All submitted information shall receive the appropriate level of quality control review by the design professional. It shall not be the Authority’s responsibility to provide the level of review that is required by the design professional and their subconsultants.

1. The design professional and subconsultants will submit, adhere to, and document observance of their respective corporate design quality review processes and manuals.
2. The design professional shall develop and formally submit a project specific Quality Control Plan (QCP) which outlines their proposed quality control process, timeline and review team’s organization including names of proposed reviewers.
3. Formal design QA/QC reviews will be conducted and incorporated into each submittal and all associated deliverables by the design team at 30%, 60%, 90%, 100%, and bid document milestones. Documentation of the reviews conducted is required as part of each submittal.
4. The design reviews should focus on the organization, clarity, accuracy and completeness of the information presented. At a minimum, design reviews should address technical content, biddability, and constructability included in the drawings and specifications.

4.5 Construction Cost Estimating

Accuracy and timing of construction cost estimates by the design team is vital to the design development of each project so that cost reporting and potential adjustments related to budget and/or project scope can be considered by the Authority as the design progresses from conceptual to final.

1. Each cost estimate shall include, at a minimum:
 - a. Submittals at milestones of 30%, 60%, 90%, 100%, and bid documents.
 - b. Consideration of the time necessary in the project schedule to develop and QA/QC review the cost estimate prior to submittal to the Authority and commensurate with the associated milestone deliverable.
 - c. Formatting of the estimate for comparison to the Authority’s Project Management Plan (PMP) estimate along with comparison to each previous estimate submitted along with comments

related to notable variances.

- d. Quantity and unit price detail commensurate with the particular stage of design.
- e. Below the line contingency amounts and percentages (e.g., escalation, design evolution, construction contingencies, etc.)
- f. Recommendation of an appropriate owner's allowance to be carried in the project/bid based on the particulars of the project.

Appendix A - Main Terminal Public Restroom Criteria

Toilet Partitions

American Accessory

304 series stainless steel, diamond textured

Doors: 1" thick, 22 gauge stainless steel #4 finish

Panels: 1" thick, 22 gauge stainless steel #4 finish

Ceiling Hung Pilasters: 1 1/4" thick, 26 gauge stainless steel #4 finish

Ceramic Floor Tile

Manufacturer : Stone Peak

Pattern: Materia 3D Selection

Color: Sisal

Size: 12" x 24"

Thickness: 9 mm

Finish: Honed

Grout: Truecolor, Almond - H153/Coffee D-G28

Ceramic Wall Tile

Manufacturer: Stone Peak

Pattern: Materia 3D Selection

Color: Sisal

Size: 12" x 24"

Thickness: 9 mm

Finish: Lappato

Grout: Truecolor, Almond - H153/Coffee D-G28

Quartz Surface Material

Manufacturer: Dupont Zodiaq

Color: Galaxy Black

Size: 1 1/8" Thick

Water Closets

Manufacturer: Kohler

Model: K-4323

Flush Valve: Zurn ZEMS6000 AV

Urinal

Manufacturer: Kohler

Model: UT104E

Lavatories

Sink: Kohler Verticyl K-2882

Color: 0-White

Faucet: Kohler K-13463

Soap Dispenser: Sloan SJS-1750 Foam

Toilet Accessories

Partition Mounted Seat-Cover Dispenser, Sanitary Napkin Disposal, Toilet Tissue Dispenser:

- Bobrick B-3571

Recessed Seat-Cover Dispenser, Sanitary Napkin Disposal, Toilet Tissue Dispenser:

- Bobrick B-3574

Recessed Seat-Cover and Toilet Tissue Dispenser

- Bobrick B-3474

Recessed Paper Towel Dispenser

- Bobrick B-35903

Recessed Paper Towel Dispenser and Waste Receptacle

- Bobrick B-3803

Recessed Napkin/Tampon Vendor

- Bobrick B-37063

Custom Paper Towel Dispenser/Mirror Combination Unit

- American Accessories, Inc. Maryland Series MD-1 Modified for TIA
- Bobrick B

Angle Mirror

- American Accessories Arkansas Series AR-Mirror 17.125" x 46"
- American Accessories Arkansas Series AR-Mirror 36" x 86"

Robe Hook

- Bobrick B-6716 Surface Mounted

Partition Door Stop

- Jack Knob 4153, Pilaster Mounted

Grab Bar

- Bobrick B-6806x48 48" stainless steel
- Bobrick B-6806x36 36" stainless steel

Fold Down Shower Seat

- Health Craft WS-36 SerenaSeat

Sharps Disposal

- Sharps Compliance, Inc. Items #50030, 10101, 50026

Electric Hand Dryer

- Dyson Airblade Model AB-02

Baby Changing Station

- Koala Kare Products Model KB110-SSRE Recess Mounted

Under Vanity Waste Receptacle

- American Accessories WA-7 modified