June 1, 2016

THE PORT AUTHORITY OF NY & NJ

REQUEST FOR PROPOSALS

FOR THE

LAGUARDIA AIRPORT

CENTRAL TERMINAL BUILDING REPLACEMENT PROJECT

(RFP NO. 33843)

PART II, VOLUME 3:

REQUIREMENTS AND PROVISIONS FOR WORK

FOR THE NEW IMPROVEMENTS

VERSION 6

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PART A - GENERAL CONDITIONS

1. GENERAL PROVISIONS

Part A – General Conditions of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements with the following additions:

All above ground conduit used in the Construction Work with respect to the New Improvements shall be rigid galvanized steel conduit, minimum size ³/₄".

PART B - TECHNICAL REQUIREMENTS

1. DESIGN AND CONSTRUCTION REQUIREMENTS

1.0 PROJECT DESCRIPTION

Section 1.0 - Project Description of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements with the following modifications:

The first two paragraphs of Section 1.0 shall be deleted and replaced with the following:

The Lessee shall be responsible for the completion of the D&C Work as described herein, in the Lease and other Project Documents with respect to the New Improvements. Please refer to the definition of the "Construction Project" in the Lease for a description of the D&C Work.

2.0 SUPPORTING PROJECTS

Section 2.0 – Supporting Projects of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

3.0 PROJECT MANAGEMENT SYSTEMS

Section 3.0 – Project Management Systems of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

4.0 DESIGN REVIEW RESPONSIBILITIES

Section 4.0 – Design Review Responsibilities of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements with the following additions:

4.1 Requirements

The Lessee shall adhere to the Port Authority's Tenant Construction Review Manual.

The Lessee shall adhere to the Port Authority's *Tenant Construction and Alteration Process Manual.*

The Lessee shall comply with the New Improvements Specifications.

The Lessee shall comply with the Port Authority Engineering Design Guidelines (Architecture, Civil, Electrical, Geotechnical, Mechanical, Structural, and Traffic) (the "Engineering Design Guidelines").

The Lessee shall provide final design calculations and diagrams for Port Authority Approval as required by Section 4.3 of the Design and Construction Requirements in the Requirements and Provisions for Work for the CTB Facilities, and the TCAP Manual. The Lessee shall submit complete design computations and design drawings, including but not limited to structural framing and supports, member design and foundations, and lighting calculations or any design calculations required by the TCAP, the New Improvements Specifications, or code. The Lessee shall also submit the necessary sustainable design documentation for Port Authority Approval in accordance with the Lease as required by Section 4.3 of the Design and Construction Requirements in the Requirements and Provisions for Work for the CTB Facilities, and the TCAP Manual.

- Calculations shall clearly distinguish between new and existing construction. Documents from which existing dimensions and existing member properties were obtained shall be referenced in the calculations.
- All technical software employed by the Lessee for analysis, design, or submission as a computer output/deliverable, used for assistance in making any of the project/technical decisions and/or demonstrating compliance with any Applicable Standards and the New Improvements Specifications, including those provisions specifically requested by the Port Authority, shall be validated by the Lessee. Validation shall ensure that the output results are acceptable, correct, and consistent with the input parameters and assumptions and shall ensure that the software is suitable and sufficient for the specific types of work encountered. This requirement for the validation of technical software applies to all

commercial off-the-shelf or in-house developed software (e.g., Excel spreadsheets and MathCAD worksheets).

- The Lessee shall submit with calculations, indexed and clearly identified input and output sheets including design constants, equations used and all references.
- All engineering calculation sheets shall be numbered, dated, and indexed and shall include the names of their originator(s) and checker(s). The index sheets shall define the total number of sheets submitted and shall bear the stamp and signature of an engineer holding a professional engineer's license in the State of New York who is familiar with and responsible for the design.

The Lessee shall submit to the Port Authority for Port Authority Approval, as part of the Submittal for the Phase 1 Preliminary Review as specified in the TCAP Manual, future bridge superstructure rehabilitation plan for each bridge structure. See Section 16.4.9 of these Design and Construction Requirements for additional information.

5.0 CONSTRUCTION RESPONSIBILITIES

Section 5.0 – Construction Responsibilities of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

6.0 QUALITY CONTROL / QUALITY ASSURANCE (QC/QA)

Section 6.0 – Quality Control / Quality Assurance (QC/QA) of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements with the following additions:

Under Section 6.1, the following shall be added:

The following additional requirements apply to the DQCP with respect to the New Improvements:

• DQCP shall be Signed and Sealed by a professional engineer licensed in the State of New York.

• At the completion of construction of each of the New Improvements, the Lessee shall submit to the Port Authority a letter, Signed and Sealed by a professional engineer licensed in the State of New York, certifying that the Lessee has performed the DQCP as defined prior to the commencement of construction of such New Improvement.

Under Section 6.6, the following shall be added:

The Port Authority Verification Review, Testing and Inspection Program will also include any testing and inspections detailed in the New Improvements Specifications.

It is understood New Improvement Specifications as provided by Reference Document will be subject to revision by the A/EOR for conformance with the design and subject to Port Authority approval. Adaptation of the New Improvement Specifications for the New Improvements will include the following:

- The A/EOR review all New Improvement Specifications and verify that all materials conform with the design intent and suitability to the purpose which they are being proposed;
- The A/EOR will determine the strength and structural properties for materials;
- Durability requirements will remain as outlined in the New Improvements Specifications unless A/EOR determines a higher standard is required for the intended purpose;

The A/EOR will review all materials for conformance with the design intent and New Improvement Specifications.

Design and Construction Requirements

7.0 ENVIRONMENTAL AND REGULATORY

Section 7.0 - Environmental and Regulatory of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

8.0 SUSTAINABLE DESIGN

Sustainable Design of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

Integration of Sustainability Issues amongst Different Documents

The Lease, this RPW and other documents reference the Port Authority's Sustainable Design Guidelines, comprising two parts: Part 1 Sustainable Building Guidelines, and Part 2 Sustainable Infrastructure Guidelines. This RPW, the EA, applicable LEED Rating Systems, and the Port Authority's Sustainable Design Guidelines may contain inconsistencies concerning certain sustainability baselines, standards and other issues. Notwithstanding any inconsistencies in those documents, or the order of precedence in the Lease or any other documents, the following shall govern:

1. LGP will comply with the Port Authority's Sustainable Building Guidelines for the West Parking Garage and Building 30.

2. LGP will demonstrate compliance with the ASHRAE 90.1 standards referenced by the applicable code and/or as specified in the Sustainable Building Guidelines (for reference see Categorization Checklist).

3. LGP will make provision for future installation of PV panels on the roof of the West Parking Garage.

9.0 SURVEY

Survey of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

10.0 UTILITIES

Utilities of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to New Improvements with the following additions:

In Section 10.2, General, the following shall be added:

- For limits of the Utility Work see the BOD. Additionally, see Preliminary Drawings for Contract LGA 124.223 WO #101 titled, "LaGuardia Airport Utility Trunk Line Relocations" for design intent of the Utility Work.
- All Utility Work shall consist of new materials and shall not reuse existing or used materials consistent with the plan of work.

Structural design and construction criteria shall, at a minimum, conform to the following:

- For landside Utility structures which are not specifically mentioned by the NYC Construction Code, the Lessee shall comply with the more stringent requirement of New York State Department of Transportation (NYSDOT) LRFD Bridge Design Specification and the latest American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specification.
- For landside lighting structures, traffic signal structures and utility pole structures, the Lessee shall comply with the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

In Section 10.3.2.2, Utility Relocations, 2. Utility Relocation Work, the following shall be added:

The Lessee shall install a Utility corridor south of the New CTB with the following Utilities: the low-pressure water line, high pressure water line, sanitary line, sanitary force main, storm sewer line, 600 V ductbank, natural gas line and communication ductbank. The Lessee shall coordinate with National Grid for the location and installation of the gas system.

In Section 10.3.3, Landside and Airside Utilities, 10.3.3.1 Electrical Utility Relocation, the following shall be added:

The 5 kV power to the East Field Lighting Vault, New CTB, New CHRP, and West Garage substations shall be provided from the West End Substation (WES) and/or East End Substation (EES) via a landside Utility trunk line and airside 5 Kv projects. The east and west portion of the Utility trunk line (5 kV ductbanks, 600 V ductbanks, and communication ductbank) will be constructed by the Port Authority. The Central part of the Utility trunk line shall be constructed by the Lessee as well as the high and low

pressure water, sanitary, drainage, and natural gas on the east section (east of 102^{nd} Street). The Lessee shall provide a minimum of two 10-5" FRE conduit ductbanks at least 20 feet apart. The 5 kV cables required for staging and phasing and final installation shall be installed in the Lessee installed portion of the trunk line and are the responsibility of the Lessee. The Lessee shall install manholes as required, but not more than 350 feet apart. All manholes shall be built in accordance with the Port Authority standards. For additional information, see the BOD.

The Lessee shall maintain 5 kV power from West End Substation and Central Substation (or EES once online) to Air Traffic Control Tower, East Field Lighting Vault, West Field Lighting Vault, ARFF Building, and Pump House #4 at all times during construction. The CES shall remain fully operational until the EES is fully commissioned and all existing loads are transferred to the EES or the WES.

In Section 10.4.3.3, Sanitary Sewer, the following shall be added:

Sewage lift stations, as required, shall deliver effluent to the proposed relocated sanitary force main. When multiple sewage lift stations are installed, sewage lift stations shall be installed in the parallel arrangements with demarcation of the Port Authority and tenants. Lift Stations Control System shall be connected to the facility SCADA system located remotely at the Port Authority Watch Engineer's Office.

The existing lift station located at Parking Lot 3 area is to be demolished by the Lessee. All effluent from the East Parking Garage, New Central Heating Refrigeration Plant (New CHRP), East End Substation and Terminal C and D shall be collected to the proposed lift station systems. Duplex lift station pits shall be made of prefabricated concrete material consisting of a wet chamber to receive effluent and to house the duplex sewage ejector and a dry chamber to house the shut-off and check valves. Normal and emergency power shall be provided for the lift stations. Weatherproof stainless steel NEMA 4X enclosure shall be used for the control panel of the duplex lift station systems.

Probe transducers and back up transducers shall be used for sensing high water levels and low water levels for activating and deactivating the pumps. All alarms signals such as pump failure, vibration and any other specific alarms implemented shall be monitored locally and by the SCADA system located remotely at the Port Authority Watch Engineer's Office.

In Section 10.4.3.5, Gas Services, the following shall be added:

Existing gas system shall remain in service until no longer needed. Each gas line shall be designed by the Lessee and approved by National Grid for the total load. Gas service shall be designed as per NYC Plumbing Code, NYC Fuel Gas Code, and conform to National Grid specifications and regulations. Gas valves have a 6 month long lead

period. All gas facility work shall be performed and completed by National Grid approved contractor(s) at the Lessee's cost. The Lessee shall retain the services and arrange for a National Grid representative present at all times. The Lessee shall coordinate with National Grid for the location and installation of the gas line.

The gas line and meter headers at the New CTB and the New CHRP shall be installed by the Lessee in coordination with the Port Authority and National Grid. The Lessee shall design the meter headers. National Grid shall furnish and deliver trunk line materials (pipe and valves) and back charge the Lessee (See MOU with National Grid). National Grid will design, furnish, deliver and install up to but not exceeding 50' of pipe from the termination points on Preliminary Drawings for Contract 124.223 WO#101 (WO#101) to the New CHRP and the New CTB, including regulators, meters and valve assemblies at no cost to the Port Authority, the Lessee or the Sublessees. For existing building gas systems, such as Hangar 1, 3, 5, 5A, 5B, FAA Control Tower, Terminals C and D, Taxi Stack area, National Grid will design, furnish and install from the termination point on WO#101 up to the gas regulators and connect to the existing building gas systems. Any pipe installed in excess of 50' and associated valves shall be furnished, delivered and installed by National Grid and back charged to the Lessee. The high gas pressure main meters and gas regulators and rigging must be locate outside of the building in a secured and fenced area for the New CTB and the New CHRP and installed by National Grid. Sub-metering inside the New CTB shall be coordinated with National Grid and installed and used in accordance with local jurisdiction.

The gas services shall extend from the Utility provided gas meter in the building or nearest the building. The Lessee shall supply adequate sleeves through the foundation and walls to allow for installation of gas services and meter to the building. The service shall be provided to three master gas meter rooms for the New CTB and one independent gas meter room for the New CHRP. Secure and fenced areas with gates shall be provided for high pressure gas supply.

The gas meter/regulator room shall be ventilated and fire rated in compliance with NYCBC. Gas branches for each concourse and the New CHRP shall be extended from Site mains to the gas meter rooms. Each service shall be equipped with safety shut-off valves.

Low-pressure natural gas shall be distributed to gas-fired mechanical equipment and food service tenants through mains, risers and branches with adequately sized main and header. A three-inch valved and capped gas line with individual Port Authority approved meters shall be provided for each food service tenant. All meters shall be located in the gas meter room.

All underground high-pressure piping and fittings shall be ASTM A106, seamless pipe, Schedule 40, Type B, and ASME steel welding fittings. Install insulator, fittings, and

cathodic protection on trunk line. Fittings shall be limited to 45 degree and 90 degree bends. Valves shall be installed a maximum of 250' apart on the trunk line. Maintain 3' clearance between gas main and other utilities and install below frost line with a minimum 3' cover. All underground piping shall have factory applied protective coating with corrosion-resistant polyethylene coating for use in corrosive atmosphere and shall be cathodically protected to prevent corrosion.

All welders must be certified/qualified by National Grid in accordance with National Grid specifications. All welds require 100% X-ray/NDT inspection by National Grid certified welding inspectors. All costs associated with the X-ray/NDT inspection and any additional testing requested by National Grid will be at National Grid's expense. Welding requirement in accordance with National Grid standards must be met prior to acceptance. The Lessee shall coordinate welding inspection with National Grid.

Gate Station will be furnished, delivered and installed by National Grid and may be located off of Airport property. National Grid will assume all costs/fees associated with the Gate Station, including but not limited to connection to the trunk line.

Upon completion of the gas system the gas line limits will be as follows:

- The gas pipes and valves installed by the Lessee under WO#101 are National Grid property and shall be maintained and operated by National Grid.
- The gas pipe (installed by the Lessee) from and including the meter and regulator assemblies to the buildings are National Grid's property and shall be maintained and operated by National Grid. The meter and regulator assemblies shall be provided and installed by National Grid.

The gas pipe from the meter into and within the buildings belongs to the tenants and shall be installed, maintained and operated by the Lessee / tenants.

• The Gate Station is National Grid's property and will be constructed, maintained and operated by National Grid.

In Section 10.4.3.6 Communications, the following shall be added:

The Lessee shall install communication and 600V ductbanks with a minimum of one 8-5" ductbank consisting of PVC conduits for communication and one 6-4" ductbank consisting of PVC conduits for 600V power. The Lessee shall connect Central portion of ductbanks to the East and West portion of communication, 5kV, and 600V ductbanks. The Lessee shall install all manholes and handholes as required. All manholes and handholes shall be built per the New Improvements Specifications, Reference Documents and Applicable Standards.

This work refers to both Fiber Optic and Copper Communications lines as owned and/or as utilized by a local third party Utility, the Port Authority, or any of the current facility tenants, agencies, or lessees. Any communication lines (cables, conduit and/or ductbank) that are in or adjacent to new construction areas or meet the requirements of Section 10.4.2 above shall be removed as required and in full accordance with provisions and requirements as listed in Section 24.3.6 of the Design and Construction Requirements.

The Communication lines for the New CTB shall be serviced by the provision of third part data and voice Utility demarcations and Port Authority connections to Port Authority PAWANET. Demolition of the existing utility and PAWANET connections to the Existing CTB is the responsibility of the Lessee. Refer to Section 12 of the Design and Construction Requirements for guidance and requirements for the demolition of the Utility lines and duct banks.

11.0 GEOTECHNICAL

Section 11.0 – Geotechnical of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

See also Section 31.0 Geotechnical for Elevated Roads & Bridges.

12.0 DEMOLITION

Section 12.0 – Demolition of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

13.0 DESIGN APPROACH

Section 13.0 – Design Approach of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

14.0 NEW CENTRAL TERMINAL BUILDING (NEW CTB)

Section 14.0 – New Central Terminal Building (New CTB) of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

15.0 AIRSIDE FACILITIES

Section 15.0 – Airside Facilities of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to New Improvements.

In Section 15.2, Scope, the following shall be added:

The Lessee shall design and construct the pavement and Utilities associated with the transition from the Lessee apron and taxilane and to the adjacent taxiways. This D&C Work shall be coordinated with and include the Port Authority's design package LGA124.223 WO#202 Medium Voltage Distribution in Central Terminal Area. The Lessee shall complete all D&C Work necessary for the restoration of the apron, taxilane, and taxiway including signage, pavement markings and lighting, pavement and foundation, and Utilities.

In Section 15.3, Requirements, the following shall be added:

The Lessee shall perform design in accordance with the New Improvements Specifications.

16.0 LANDSIDE FACILITIES

16.1 Mandatory Requirements

- Adhesive and friction type anchors are not permitted to be used for overhead application and in condition where anchor is subject to sustained tensile load. Prior to installation of anchor, the Lessee shall perform non-destructive testing to ensure proposed drill hole will not damage and embedded structural elements such as rebar or embedded steel plates. Design and installation of anchor shall conform to anchor manufacturer's specification.
- The Lessee shall preserve the future rail right of way.

16.2 Scope

This Section 16 provides certain design and construction details regarding the requirements of the Landside facilities.

The Lessee shall design and construct the following:

- Landside roadway system including bridges, tunnels, and temporary roads (the "Roadway Network");
- New signage, lighting, ITS, and other Landside systems; and
- Utility Trunk Lines within the Construction Site.

The Roadway Network shall be designed based on the anticipated peak traffic load with improved roadway geometry, simplified signage and maximizing free flow of traffic movements to ease congestion. See Section 30 - Traffic and Intelligent Transportation Systems (ITS) for additional requirements.

The LGA Airport signing shall enable travelers to navigate into, through, and out of the LGA Airport facilities. The signing will include guide signs, regulatory and warning signs, pedestrian and vehicle wayfinding signs, and roadway variable message signs. Pole-based area lighting for primary roadway circulation and pendent or surface mount fixtures for lower roadways will be designed and installed. See Section 30.4 - Traffic Control Devices Design Criteria for additional requirements.

For the Terminal Frontage Roadway Design, the Lessee shall include infrastructure for Intelligent Transportation System (ITS) work that can be incorporated as part of the overall LGA Airport ITS Masterplan. All roadway ITS equipment will be furnished and installed by the Lessee, and operated and maintained by the Port Authority. ITS equipment shall be provided with communications connectivity as required by the ITS system back to the New CTB in compliance with Section 24.3.6.3 of these Design and Construction Requirements.

Frontage barriers shall be concrete and shall be consistent with the Headhouse radial column grid. See Section 30.2.2 (Frontage Roadway Layout) for additional requirements.

Prior to the commencement of any construction activities within the NYC Department of Parks & Recreation's jurisdiction, the Lessee will obtain construction permits and erect temporary chain link fence, at minimum height of 6' to protect all existing trees to remain within the area of construction.

The Lessee shall relocate the existing FAA Weather Station located in Parking Lot 3 to a location to be coordinated with the FAA. The Lessee shall coordinate with the FAA with respect to the following:

- 1. The new FAA Weather Station must be located in the same approximate area. The FAA shall approve the final location.
- 2. The Lessee shall provide a 140 foot steel pole (high rigidity) with a lowering platform. The pole shall be galvanized and anchored in an appropriate footing/foundation meeting code requirements.
- 3. The Lessee shall install the FAA Weather Station (provided by FAA) equipment at the new location. The Lessee shall be responsible for all other supporting infrastructure.
- 4. The Lessee shall install a fence to protect the pole. The fence shall be approximately 35 feet by 24 feet and shall be 8 feet high. The fence shall include 3 strands of barbed wire on top of the fence. The fence shall have locking access gates, one for pedestrian entrance and one for vehicle entrance. The area within the fence shall be concrete paved and all pavement and fencing shall be grounded.
- 5. The Lessee shall provide guardrails as needed to protect fence from vehicle traffic. The guardrails shall not inhibit vehicle gate operations.
- 6. The Lessee shall provide all mountings for electrical enclosure. All electrical enclosure shall be grounded.
- 7. The Lessee shall provide a lightning arrestor (120/240 Volt, 3 Wires, 100 KAmps) with stainless steel enclosure.
- 8. The Lessee shall provide electrical power and an electrical panel with the following characteristics:
 - a. Electrical Panel shall be 100 Amp, 120/240 Volt, Single Phase, 3 Wire type with 30 Amp, 2 pole breaker and six single pole 20 Amp breakers in a N3R rated enclosure.
 - b. Ground Fault receptacle shall be 20 Amp, 125 Volt in a weatherproof box and cover.
 - c. Panel shall be protected by a 4 inch by 4 inch rain tight trough.

- 9. The Lessee shall provide an area type luminaire, 70 Watt metal halide (similar to GE type PM17, GE Catalogue # P17MO7MM2LS5GRF). The luminaire shall include photoelectric control and lamps mounted on 2 inch conduits.
- 10. The Lessee shall provide power and communication in conduits to the relocated weather station location. All conduits shall be rigid galvanized steel conduit.

The Port Authority has initiated the Supporting Projects on the Landside areas of the LGA Airport in preparation for and support of the Work. The following requirements are intended to be consistent with the Supporting Projects that may be in various stages of development/construction during the Work by the Lessee.

16.3 Requirements

The design shall be in accordance with the Port Authority Engineering Design Guidelines as well as the AASHTO Roadside Design Guide. The design shall take into account existing conditions, design criteria, structural foundations, and impacts to both existing and new Utilities and provide for a right-of-way to accommodate a potential future heavy rail system.

The Lessee is entitled to eight (8) hours of lane closures at night in order to facilitate delivery and steel erection of the Central Hall structure.

The Frontage Road structure shall be a bridge on multiple levels leading to the arrivals and departures entrances on the Landside of the New CTB. The system shall be designed for all load combinations, including wind loads and seismic loads based on appropriate values in the New York City area and following the AASHTO LRFD and NYSDOT LRFD bridge design specifications.

The superstructure shall meet the demands of being curved, have the ability to span the designated distance, and be able to meet clearance requirements in limited vertical clearance envelop. Design life for all bridges shall be a minimum of 75 years.

All stormwater drainage systems shall comply with the regulatory requirements of NYSDEC. The Landside construction shall require removal of significant areas of existing pavement. The existing Utilities in conflict with the new construction shall be removed, relocated or abandoned as detailed in Section 10 of the CTB RPW.

Frontage Roads

- A. Provide 900 linear feet of Departures curb frontage; 900 linear of Arrivals curb frontage and 900 linear feet of HOV frontage.
- B. Arrivals and Departures frontage roadways shall be 49 feet wide.
- C. Arrivals frontage roadway width shall consist of:
 - two 12-ft. drop off/pick up lane,

- two 11-ft. bypass lanes,
- one 3-ft. outer shoulders.
- D. Departures frontage roadway shall consist of:
 - two 12-ft. drop off/pick up lane,
 - two 11-ft. bypass lanes,
 - one 3-ft. outer shoulders.
- E. The Ground Level/HOV frontage shall be 52 feet wide and shall consist of:
 - one 13-ft. drop off/pick up lane,
 - two 11-ft. bypass lanes,
 - one striped 3-ft. median,
 - one 11-ft. HOV/bypass lane,
 - one 3-ft. shoulder.

See Section 30.2.2. - Frontage Roadway Layout for additional frontage requirements.

16.3.1 Codes and Standards

All codes and standards shall use the edition adopted by the NYC Construction Codes.

The design and installation shall comply with the requirements of the Applicable Standards, including, but not limited to the following (and their replacements):

- AASHTO: A Policy on Geometric Design of Highways and Streets
- AASHTO: Roadside Design Guide
- AASHTO: LRFD Bridge Design Specifications
- AASHTO: Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals
- New York State Department of Transportation (NYSDOT) LRFD Bridge Design Specification
- NYSDOT Standard Design Specifications for Structural Supports for Overhead Sign Structures
- New York City Building Code
- FHWA: Manual on Uniform Traffic Control Devices (MUTCD)
- FHWA: Standard Highway Signs
- FAA AC 150/5200-33B Hazardous Wildlife Attractants On Or Near Airports
- PANYNJ "Traffic Engineering Design Guidelines"
- PANYNJ Traffic Standard Details and Specifications
- PANYNJ Traffic Signal Design and Drawing Preparation Guidelines
- PANYNJ "Civil Engineering Design Guidelines"

- PANYNJ "Structural Engineering Design Guidelines"
- PANYNJ "Architecture Engineering Design Guidelines"
- PANYNJ "Electrical Engineering Design Guidelines"
- PANYNJ "Geotechnical Engineering Design Guidelines"
- PANYNJ "Mechanical Engineering Design Guidelines"
- PANYNJ "Sustainable Infrastructure Guidelines"
- Applicable ADA Standards
- New York City Electrical Code
- NYC Construction Codes
- National Electrical Manufacturers Association
 - Standard for Traffic Control Systems (Publication No. TS-1)
 - Standard for Traffic Control Assemblies (Publication No. TS-2)
 - National Transportation Communications for Intelligent Transportation Systems Protocol (NTCIP) Standards: NTCIP 1201 Global Object Definitions, NTCIP 1203 Object Definitions for Dynamic Message Signs, and NTCIP 2001 Class B Profile
 - Standards for Enclosures for Electrical Equipment (Publication No. 250)
 - Standard for Wiring Devices Dimensional Requirements (publication No. WD6)
- Underwriters Laboratories Inc.
 - UL 467 Grounding and Bonding Equipment
- PANYNJ Traffic Engineering CADD Graphic Standards
- PANYNJ Intersection Signalization Procedures
- Traffic Detector Handbook
- Standards and Guidelines for Port Authority Technology
- AISC Certification Program Category Sbd (Terminal) and Sbr (Frontage Roads), as applicable
- AISC Code of Standard Practices for Steel Buildings and Bridges
- AWS Welding Code and qualification tests
 ASNT SNT-TC-1A Level II Qualifications
- AWS Certified Welding Inspector criteria
- Frontage Road "Fracture Critical Members" shall meet AASHTO/AWS D1.5 Bridge Welding Code, including Charpy Impact Notch Toughness Test requirements for Zone 2.
- NFPA 70E: Standard for Electrical Safety in the Workplace
- FM (Factory Mutual) Guidelines
- ACRP Report 25, Volume 1: Airport Passenger Terminal Planning and Design
- AASHTO: GL-6 Roadway Lighting Design Guide
- AASHTO: Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition, 2009
- FHWA: Traffic Monitoring Guide
- PANYNJ Intersection Signalization Procedure

- PANYNJ Roadside and Median Barrier Design Guide
- PANYNJ Airport Roadway Sign Design Manual
- PANYNJ Manual for Pedestrian Signing & Wayfinding
- PANYNJ ITS Design Guidelines
- Transportation Research Board Highway Capacity Manual
- Applicable FAA Standards
- New York State Department of Transportation, Highway Design Manual
- National Electrical Manufacturers Association
 - NEMA TS4: Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements
 - NEMA 250: Enclosures for Electrical Equipment (100 Volts Max)
 - National Transportation Communications for Intelligent Transportation
- Underwriters Laboratories Inc.
 - Standard 802.15.4: Wireless Medium Access Control and Physical Layer Specifications for Low-Rate Wireless Personal Area Networks, Institute of Electrical and Electronics Engineers (IEEE)

16.3.2 Traffic Control Devices

Signage, parking signage, pavement markings, and roadside barriers shall be designed in accordance with the Engineering Design Guidelines, the Port Authority Traffic Design Guidelines and Traffic Standard Details and Specifications and the Manual of Uniform Traffic Control Devices (MUTCD). See Section 30.4 Traffic Control Devices Design Criteria for additional requirements.

16.4 Design Criteria

16.4.1 Roadway Geometric

- For purposes of this RPW, "BOD" is defined as Exhibit 21 to the Lease.
- All roadways and all associated geometric elements within the jurisdiction of the Port Authority shall be designed in accordance with the Engineering Design Guidelines.
- The public roads include all State, County, and local roads. Public roads shall meet the geometric design criteria of the appropriate responsible agencies (State, County, or City). Incidental work of the Construction Project may affect local streets in the jurisdiction of the Borough of Queens, New York City. Compliance with their designs and both operational and permits regulations is required.
- Ramps

Ramps within the Port Authority's jurisdiction, including widths, shoulders, acceleration and deceleration lengths shall comply with the AASHTO "A Policy on Geometric Design of Highways and Streets". Ramp grades shall be 6% maximum. Ramps within the jurisdiction of another Governmental Entity shall be designed in accordance with that entity's standards.

• Sidewalks

Sidewalks and curb cuts shall be provided in accordance with ADA Requirements.

- Fixed Roadside Objects
 - On Structure Fixed object must be located behind or atop the structure rail.
 - On Grade Proper protection or sufficient roadside clearance to fixed objects shall be provided.
- Horizontal and Vertical Clearance

The minimum horizontal and vertical clearance for heavy/light rail shall be in accordance with requirements in the American Railway Engineering and Maintenance-of-Way Association's (AREMA) Manual for Railway Engineering.

- Roadway Pavement Design
 - Roadway pavement within the jurisdiction of the Port Authority shall be designed in accordance with the Port Authority Engineering Design Guidelines. The roadway pavement for local streets and roads to carry projected traffic loads shall comply with local agency requirements.
 - Roadways adjacent to and crossing the project area that are disturbed by the construction activities shall match the in-place surface type and structure of the existing roadways, unless otherwise specified. The Lessee shall design all tie-in work to avoid differential problems, accounting for such factors as total surfacing

thickness, minimum structural requirements, subbase thickness, and frost-free characteristics.

• Design Vehicle

The following design vehicles shall be used for geometric design of roadways:

- Terminal Roadways Coach Bus
- Loading Dock WB-50
- Taxi Ramps and Roadways AASHTO Single Unit Truck (SU-30) design vehicle.

16.4.2 Roadside Barriers and Curbs

Roadside barriers and curbs shall be designed in accordance with the AASHTO Roadside Design Guide, the Port Authority Civil Design Guidelines, the Port Authority Traffic Design Guidelines and Traffic Standard Details and Specifications, and the AASHTO Roadside Design Guide. See Section 30.4 Traffic Control Devices Design Criteria for additional requirements.

16.4.3 Roadway Lighting

Roadway lighting shall be designed in accordance with the Port Authority Electrical Design Guidelines.

16.4.4 Retaining Wall

Structural design of retaining walls shall conform to the latest NYSDOT requirements.

16.4.5 Roadway Signage Support Structures

Structural design of overhead sign structures shall conform to the latest NYSDOT requirements.

16.4.6 Material Requirements

• All concrete shall comply with the requirements of Table 16.4.6 for minimum 28day design compressive strength (f[°]c):

TABLE 16.4.6			
Location	f'c (psi)		
Cast-in-place deck slab	6,000		
Pre-cast deck slab panels (prestressed and/or post-tensioned) and Cast-in-place closure pours	6,000		
Prestressed girders	8,000		
Pre-cast piers	6,000		

Cast-in-place piers	6,000
Footings and Abutments	5,000
Barriers	5,000
Drilled Shafts	4,000
Tremie Seals	4,000

- Acceptance Testing for Concrete Pavement and Structural Decks:
 - Rapid Chloride permeability Test (ASTM T-277), less than 1000 coulombs in 28 day Accelerated Test.
- Structural Steel Requirements Terminal and Frontage
 - All welds visually inspected by AWS certified welding inspector.
 - All full penetration welds 100% tested by ultrasound or radiographic testing.
 - All defects found visually in partial penetration and fillet welds shall be nondestructively tested by magnetic particle or dye-penetrant methods. A minimum of 10% of the length of partial penetration and fillet welds shall be tested.
 - High strength bolts shipments shall have a mill certification. Bolts shall be sampled and tested using the "Shipping Lot Method" defined in ASTM.

16.4.7 Future Rail Right of Way

The Redevelopment Program has designated a right-of-way for future rail which is designed to meet heavy rail geometric requirements, with an elevated station to be located in front of the New CTB and a second station located across from Terminals C and D. During the Phased Construction O&M Period the Lessee shall be required to coordinate all construction activities by taking into consideration the future rail line right-of-way. The future station at the New CTB will be located in front of the Central Hall between the Terminal Frontage and Eastbound Circulation Road.

16.4.8 Equipment and System Testing

All equipment and newly installed systems shall be tested as required by all Applicable Law and Applicable Standards.

16.4.9 Structural Requirements

Structural design, construction and demolition criteria shall, at a minimum, conform to the following, unless otherwise noted:
1. For bridge structures, tunnel structures, and retaining wall structures, comply with the more stringent requirement of New York State Department of Transportation (NYSDOT) LRFD Bridge Design Specification and American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specification. In addition, the vehicular design live loads shall include Striker 4500 Fire Truck.

2. For overhead and cantilever traffic sign structures, comply with the more stringent requirement of NYSDOT Standard Design Specifications for Structural Supports for Overhead Sign Structures and AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. In addition, layout of the sign structures shall follow NYSDOT standard and details, except foundation details shall be determined based on site soil condition. Minimum sign structure design wind speed shall be at 110 mph. Apply wind pressure to maximum sign area per NYSDOT standard.

3. For landside lighting structures, traffic signal structures and utilities pole structures, comply with the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.

4. All roadway bridges, including terminal frontage roadway bridges, shall be designed with flexibility to allow replacement of bridge superstructures at the end of their service life with proper roadway closure so that continuous vehicle and pedestrian access to all levels of terminal buildings can be maintained. The Engineer of Record shall submit future bridge superstructure rehabilitation plan for Port Authority Approval, as part of the Submittal for the Phase 1 Preliminary Review as specified in the TCAP Manual, for each bridge. Plan shall include complete removal and replacement procedure of bridge superstructure and lane closure requirement, to demonstrate normal airport operation can be maintained during replacement of bridge superstructures. Future bridge superstructure rehabilitation plans shall be Signed and Sealed by a professional engineer licensed in the State of New York.

5. All bridge superstructure and substructure construction materials shall conform to the New Improvements Specifications. Any other bridge construction materials and fabrication not included in the New Improvements Specifications shall conform to the latest NYSDOT specifications.

6. All bolts, nuts, washers and other miscellaneous hardware for bridge superstructure shall be mechanically galvanized. All concrete steel reinforcing bars shall be epoxy-coated or galvanized at the Lessee's option.

7. All structural steel in bridge construction shall be cleaned and painted in accordance with Port Authority New Improvements Specification 09910 "Painting". Paint system shall be S-1G or S-1S listed in Port Authority New Improvements Specification 09910, Appendix "B", at Engineer of Record's option.

8. New Bridges shall follow LGA Airport standard naming convention. New bridge names shall begin with "L" designation. In order to eliminate duplication with existing bridge names, numbering shall begin at 21. For clarity, bridge names shall start at "L-21".

16.4.10 Landscaping

All landscaping must be in compliance with the Port Authority's Aviation Landscape and Sustainable Design Criteria manual included in the Applicable Standards.

17.0 FEDERAL AGENCY REQUIREMENTS

Section 17.0 - Federal Agency Requirements of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

18.0 CONSOLIDATED RECEIVING WAREHOUSE AND DISTRIBUTION (CRWD) FACILITIES

Section 18.0 – Consolidated Receiving Warehouse and Distribution (CRWD) Facilities of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

19.0 NEW CENTRAL HEATING AND REFRIGERATION PLANT (NEW CHRP)

Section 19.0 – New Central Heating and Refrigeration Plant (New CHRP) of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

20.0 SECURITY PERFORMANCE REQUIREMENTS

Section 20.0 – Security Performance Requirements of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

21.0 BAGGAGE HANDLING SYSTEM

Section 21.0 – Baggage Handling System Security Performance Requirements of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

22.0 ELECTRICAL AND LIGHTING SYSTEMS

Section 22.0 – Electrical and Lighting Systems of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

23.0 MECHANICAL AND FIRE PROTECTION SYSTEM FOR NEW CTB

Section 23.0 – Mechanical and Fire Protection System for New CTB of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

24.0 ELECTRONICS AND COMMUNICATIONS SYSTEMS

Section 24.0 – Electronics and Communications Systems of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

25.0 COMMISSIONING AND ACTIVATION

Section 25.0 – Commissioning and Activation of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

26.0 FLOOD HAZARD MITIGATION

Section 26.0 – Flood Hazard Mitigation of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements.

27.0 PORT AUTHORITY AND VENDOR/SERVICE PROVIDERS SPACE REQUIREMENTS

Section 27.0 – Port Authority and Vendor/Service Providers Space Requirements of the Requirements and Provisions for Work for the CTB Facilities is hereby deleted in toto and shall not apply to the New Improvements.

28.0 WEST GARAGE STRUCTURE

28.1 General

This Section 28.1 provides design and construction detail requirements regarding the new West Garage and site improvements.

28.2 Scope

The Lessee shall be responsible for the completion of design and construction for the West Garage, as detailed in the Available Documents, Section 4 (West Garage Documents for the New Improvements), subject to Port Authority-approved modifications in the BOD.

28.3 Requirements

28.3.1 Program Requirements

- The West Garage shall be a complementary structure to the New CTB Facilities and shall provide convenient parking for the New CTB patrons.
- The West Garage shall provide at a minimum 3080 parking spaces upon completion of the project.
- The West Garage shall be open to allow natural ventilation, with the exception of the façade blocking the view to the Air Traffic Control Tower.
- The garage shall be consistent with code requirements based on open garage code criteria.
- Patrons entering the garage will pick a ticket upon entry. Exiting patrons will exit through pay islands where they can either present a prepaid ticket validated in the terminal at pay-on-foot stations, pay via EZ-Pass or pay cashier. Refer to Toll Collection section for requirements.
- The roof design shall accommodate the future installation of PV panels (See Sustainable Design Section, Draft Project Credit Checklist for more details on PV panels). Minimum Vertical Clearance from Floor below to Bottom of Structure above:
 - (a) Ground Level: 9'-6"
 - (b) All other levels: 8'-0"
- No Utilities will be allowed in the footprint of the West Garage.
- Lighting shall be provided as per the requirements for Lighting.

- Vertical transportation shall be provided using mechanical glass-enclosed elevators in accordance with the requirements for mechanical vertical transportation.
- The Lessee shall provide all signage required for egress, life safety, accessibility, etc., which must be in accordance with all applicable codes and standards.
- The design solution provided shall incorporate the protective design strategies as outlined in the relevant sections of the LaGuardia Airport Redevelopment Program's Protective Design Narrative (PDN), dated September 09, 2013. Any deviation from the strategies provided by the PDN must be approved by the Port Authority.
- The Lessee shall provide pedestrian friendly grading transitions from the garage stairs to the sidewalk at all phases of the Project.
- An elevated pedestrian connector and at-grade access between the West Garage to the New CTB shall be provided. The Lessee shall provide a temporary at-grade and elevated covered walkway with site lighting from the West Garage to the Existing or New CTB during the construction of the pedestrian connector. The Lessee shall provide detour pedestrian signage that shall be left in place until the connector is operational.
- Security Systems shall be in full compliance with Terminal Systems as defined by requirements in Section 24.
- The Lessee shall designate a minimum of five percent of the total vehicle parking capacity as preferred parking for low-emitting and fuel-efficient vehicles. Preferred parking refers to the parking spots that are closest to the main entrance to the terminal (exclusive of spots for handicapped persons). Of these spaces, provide (5) with electrical charging capability. In addition, provide electrical charging capacity for (10) additional spaces with electrical charging capability.

28.3.2 Codes and Standards

All D&C Work required to be performed under this Section 28 shall comply with the following:

- 1. Air Conditioning and Refrigeration Institute (ARI)
- 2. Air Movement and Control Association (AMCA)
- 3. Airport Cooperative Research Program (ACRP)
 - ACRP Report 25, Volume 1: Airport Passenger Terminal Planning and Design
- 4. American Association of State Highway and Transportation Officials (AASHTO)
 - AASHTO: A Policy on Geometric Design of Highways and Streets
 - AASHTO: GL-6 Roadway Lighting Design Guide
 - AASHTO: Roadside Design Guide

- AASHTO: LRFD Bridge Design Specifications, Fifth Edition, together with the 2010 Interim Revisions
- AASHTO; Guide for Design of Pavement Structures
- 5. American Gas Association (AGA)
- 6. American Gear Manufacturers Association Standards (AGMA)
 - 460.04 Practice for Gear Motors
 - 461.01 Practice for Worm Gear Motors
- 7. American National Standards Institute (ANSI)
 - ANSI A-12.1 Safety Code for Floor and Wall Openings, Railing & Toe Boards
 - ANSI/ICC A117.1 Accessible and Usable Buildings and Facilities
 - ANSI B-20.1 Safety Code for Conveyors, Cableways, and Related Equipment
 - ANSI B-20.9 Transmission Roller Chains and Sprocket Teeth
 - ANSI B31.1: Power Piping
 - ANSI C-33.1 Safety Standard for Flexible Cord and Fixture Wire
 - ANSI S3.41 American National Standard Audible Emergency Evacuation Signal (2008)
 - ANSI Z53.1: Safety Color Code
- 8. American Petroleum Institute (API)
- 9. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE)
 - ASHRAE Standard 15: Safety Standard for Refrigeration System
 - ASHRAE Standard 52.2-2007: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size
 - ASHRAE Standard 55-2004: Thermal Environmental Conditions for Human Occupancy
 - ASHRAE Standard 62.1-2007: Ventilation for Acceptable Indoor Air Quality
 - ASHRAE Standard 90.1-2007: Energy Standard for Buildings Except Low-Rise Residential Buildings
 - ASHRAE/IES STANDARD 90.1-2010 (or version current at time of project bid issue)
- 10. American Society of Mechanical Engineers (ASME)
 - ASME: Boiler and Pressure Vessel Code (BPVC)
 - ASME: Code for Pressure Piping
 - ASME A17.1: Safety Code for Elevators and Escalators
 - ASME B20.1 Safety Standards for Conveyors and Related Equipment and all addenda
- 11. American Society of Plumbing Engineers (ASPE)
- 12. American Society of Sanitary Engineers (ASSE)
- 13. American Society for Testing Materials (ASTM)
 - A-36 Structural Steel
 - A-794 Sheets and Coils cold rolled

- A-569 Sheets & Strip hot rolled
- A-307 Fasteners (Bolts)
- A-563 Fasteners (Nuts)
- F-844 Fasteners (Washers)
- 14. American Water Works Association (AWWA)
- 15. American Welding Society (AWS)
 - AWS A2.0: Standard Welding Symbols
 - AWS-C1.1 Recommended Practice for Resistance Welding in Building Construction
 - AWS D1.0: Welder Qualifications
 - AWS D1.1 Latest Edition
 - ANSI / AASHTO / AWS Bridge Welding Code, 6th Edition, 2010
 - Standard welding practice in building construction
- 16. Americans with Disabilities Act (ADA), 2012 (or latest)
 - Title III (28 CFR Part 36) ADA ADOPTED July 1, 1994 (Updated September 15, 2010)
- 17. Americans with Disabilities Act Accessibility Guidelines (ADAAG)
 - ADAAG published in 28 CFR Part 36 Federal Register
 - ADAAG for Titles I (Employees) and III (Public Accommodation)
- 18. American Wood Preservers Association (AWPA)
 - A. C-27 Fire Retardant Wood
- 19. Architectural & Transportation Barriers Compliance Board (ATBCB)
- 20. Associated Air Balancing Bureau (NEBB) Standards
- 21. BOCA National Building Code.
- 22. Building Industry Consulting Services International (BISCI)
- 23. Code of Federal Regulations (CFR)
 - CFR Title 14, Part 77: Safe, Efficient Use, and Preservation of the Navigable Airspace
- 24. Conveyor Equipment Manufacturers Association (CEMA)
 - ANSI/CEMA 402-1992 Belt Conveyors
 - ANSI/CEMA B105.1-1992 Specifications for Welded Steel Conveyor Pulleys with Compression-type Hubs
- 25. Cooling Tower Institute (CTI)
- 26. Council Of American Building Officials (CABO)
 - CABO/ANSI A117.1 American National Standards for Buildings and Facilities Providing Accessibility and Usability for Physically Handicapped People
- 27. Electrical Testing Laboratories, Inc. (ETL)
- 28. Electronic Institute of America (EIA)
- 29. Factory Mutual (FM)
- 30. Federal Aviation Administration (FAA)

- FAA AC 150/5220-21C: Aircraft Boarding Equipment
- FAA AC 150/5300-13A: Airport Design
- FAA AC 150/5320-5B: Airport Drainage
- FAA AC 150/5360-13: Planning and Design Guidelines for Airport Terminal Facilities
- FAA Federal Aviation Regulations (FARS 14 CFR)
- FAA Order 8260.3B: US Standards for Terminal Instrument Procedures
- Applicable FAA Advisory Circulars
- 31. Federal Communications Commission (FCC)
- 32. Federal Highway Administration (FHWA)
 - FHWA: Manual on Uniform Traffic Control Devices (MUTCD)
 - FHWA: Standard Highway Signs
- 33. Green Building Council (USGBC)
- 34. Highway Capacity Manual (2010)
- 35. Illumination Engineering Society of North America (IESNA)
 - IES Handbook 10th Ed.
 - IES RP-8-00 Roadway Lighting
- 36. Institute of Electrical and Electronic Engineers (IEEE)
- 37. Instrument Society of America (ISA)
- 38. Insulated Cable Engineers Association (ICEA)
- 39. International Air Transport Association (IATA)
 - IATA Airport Development Reference Manual
- 40. International Building Code (IBC)
- 41. International Civil Aviation Organization (ICAO)
 - ICAO Aerodrome Design Manual, Part 4: Visual Aids
 - ICAO Annex 14, Volume I: Aerodrome Design and Operations
- 42. International Gas Code
- 43. International Electrical Testing Association (INETA)
- 44. International Energy Conservation Code (IECC)
- 45. International Fire Code (IFC), 2010
- 46. Leadership in Energy and Environmental Design (LEED) New Construction Version 4.0
 - Central Heating and Refrigeration Plant, Gold Certification
 - Central Terminal Building, Gold Certification
- 47. Mechanical Plumbing and Fire Protection 3
- 48. National Association of Corrosion Engineers (NACE)
- 49. National Board of Boiler and Pressure Vessel Inspectors
- 50. National Board Synopsis of Boiler and Pressure Vessel Laws, Rules & Regulations, 2012
- 51. National Bureau of Standards (NBS)
 - Handbook H28 Screw-Thread Standards

- 52. National Electric Code (NEC), 2011
- 53. National Electric Safety Code (NESC), 2012
- 54. National Electrical Contractors Association (NECA)
- 55. National Electrical Manufacturers Association (NEMA) Standards
 - IC-S Industrial Controls and Systems
 - MG-1 Motors and Gear Motors
 - National Transportation Communications for Intelligent Transportation Systems
 - Protocol (NTCIP) Standards: NTCIP 1201 Global Object Definitions, NTCIP 1203 Object Definitions for Dynamic Message Signs, and NTCIP 2001 Class B Profile
 - Standards for Enclosures for Electrical Equipment (Publication No. 250)
 - Standard for Traffic Control Systems (Publication No. TS-1)
 - Standard for Traffic Control Assemblies (Publication No. TS-2)
 - Standards for Wiring Devices Dimensional Requirements (Publication No. WD6)
- 56. National Environmental Balancing Bureau (NEBB)
- 57. National Fire Protection Association (NFPA)
 - NFPA 13: Standard for the Installation of Sprinkler Systems
 - NFPA 14: Standard for the Installation of Standpipe and Hose Systems
 - NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection
 - NFPA 24: Standard for the Installation of Private Fire Service Mains and Their Appurtenances
 - NFPA-30 Standard for the Installation of Oil-burning Equipment
 - NFPA 31: Standard for the Installation of Oil-Burning Equipment
 - NFPA-37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2008 Edition
 - NFPA 54: National Fuel Gas Code
 - NFPA 70: National Electric Code (NEC)
 - NFPA 70: National Electric Code Article 760 (NEC)
 - NFPA 70E: Standard for Electrical Safety in the Workplace
 - NFPA 72: National Fire Alarm and Signaling Code
 - NFPA No. 79 Electrical Standards for Industrial Machinery
 - NFPA No. 80 Standard for Fire Doors and Fire Windows
 - NFPA 85: Boiler and Combustion Systems Hazards Code
 - NFPA 90A Standard for the installation of Air Conditioning and Ventilation Systems
 - NFPA 101: Life Safety Code, 2006
 - NFPA 110: Standard for Emergency and Standby Power Systems
 - NFPA 407: Standard for Aircraft Fuel Servicing

- NFPA 415 "Standard on Airport Terminal Buildings, Fueling Ramp Drainage, and Loading Walkways"
- NFPA-780 Standard for the installation of Lightning Protection System.
- 58. National Institute for Occupational Safety & Health (NIOSH) Guidelines
- 59. National Standard Plumbing Code
- 60. New York City Board of Standards and Appeals (BSA)
- 61. New York City Building Code (NYC BC)
- 62. New York City Construction Code (NYCCC)
- 63. New York City Department of Environmental Protection (NYC DEP)
 - NYC DEP Bureau of Water Supply and Wastewater Collection
- 64. New York City Electrical Code
- 65. New York City Energy Conservation Code (NYCECC), 2012
- 66. New York City Environmental Protection Agency (EPA) Regulations
- 67. New York City Fire Code (NYCFC), 2008
- 68. New York City Fuel Gas Code (NYCFGC), 2008
- 69. New York City Local Law 86, Amends the New York City charter, in relation to green building standards for certain capital projects
- 70. New York City Mechanical Code, 2008
- 71. New York City Plumbing Code, 2008
- 72. New York City Plumbing Code, Accessibility Codes and Standards
 - NYSDEC SWPPP (6YNCRR-750)
 - NYSDEC Storm Water Management Design Manual
- 73. New York State Air Resources (6NYCRR-201)
- 74. New York State Department of Transportation
 - NYSDOT Bridge Design Manual (BDM)
 - NYSDOT Bridge Detail Sheets (BD Sheets) USC
 - NYSDOT Highway Design Manual (HDM)
 - NYSDOT LRFD Blue Pages" dated September 2011
 - NYSDOT LRFD Bridge Design Specifications dated December 2011
 - NYSDOT Steel Construction Manual
- 75. New York State Energy Conservation and Construction Code (NYSECCC)
- 76. New York State Environmental Quality Review (6NYCRR-617)
- 77. New York State SWPPP (6YNCRR-750)
- 78. New York State Storm Water Management Design Manual
- 79. New York State Technical Guidance for Site Investigation and Remediation (NYSDEC DER-10)
- 80. Occupational Safety and Health Administration (OSHA)
 - 29 CFR Part 1910 -211 (Definitions)
 - 29 CFR Part 1910 212 (General Industry Standards and Requirements)
 - 29 CFR Part 1917.48 (Conveyors)

- 29 CFR Part 1926.555 (Conveyors, Construction Industry Standards)
 - Williams-Steiger Occupational Safety and Health Act (OSHA), Public Law 91.596, most current version
- 81. Office of State Health Planning and Development (OSHPD)
- 82. Petroleum Equipment Institute (PEI)
- 83. Port Authority of New York and New Jersey (PANYNJ) Standards
 - PANYNJ Civil Engineering Design Guidelines
 - PANYNJ Electrical/Electronics Engineering Design Guidelines
 - PANY&NJ Engineering Department's Engineering / Architecture Design Division CAD/BIM Standards
 - PANYNJ Intersection Signalization Procedure
 - PANYNJ New Improvements Specifications
 - PANYNJ Standards and Guidelines for Port Authority Technology
 - PANYNJ Sustainable Design Guidelines, August 15, 2007
 - PANYNJ Sustainable Infrastructure Guidelines, March 23, 2011
 - PANYNJ Technology Services Department (TSD) standards
 - PANYNJ Tenant Alteration Procedures and Standards Guide
 - PANYNJ Tenant Construction Review Manual
 - PANYNJ Traffic Engineering CADD Graphic Standards
 - PANYNJ "Traffic Engineering Design Guidelines"
 - PANYNJ Traffic Signal Design and Drawing Preparation Guidelines
 - PANYNJ Traffic Standard Details and Specifications
- 84. Port Authority of New York and New Jersey Engineering Department Sustainable Building Guidelines, August 15, 2007.Steel Structures Painting Council (SSPC)
- 85. USGBC Leadership in Energy and Environmental Design (LEED©). LEED for New Construction v3.0 Rating System.
- 86. Telecommunications Institute of America (TIA)
- 87. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- 88. Traffic Detector Handbook
- 89. Transportation Security Administration (TSA)
- 90. Underwriters Laboratories (UL) components must be labeled appropriately
 - UL 38 Manually Activated Signaling Boxes.
 - UL 228 Door Holders for Fire Protective Signaling Systems
 - UL 268 Smoke Detectors for Fire Protective Signaling Systems
 - UL 268A Smoke Detectors for Duct Applications
 - UL 346 Waterflow Indicators for Fire Protective Signaling Systems
 - UL 464 Audible Signaling Appliances
 - UL 467 Grounding and Bonding Equipment
 - UL 521 Heat Detectors for Fire Protective Signaling Systems
 - UL 864 Control Units for Fire Protective Signaling Systems

- UL 1481 Power Supplies for Fire Protective Signaling Systems
- UL 1638 Visual Signaling Appliances
- UL 1971 Visual Notification Appliances
- 91. United Facilities Criteria (UFC)
- 92. United States Customs and Border Protection
- 93. United States Environmental Protection Agency (USEPA)
- 94. Earthquake provisions as required by local code
- 95. All applicable federal, state and local codes

28.3.3 [Reserved.]

28.3.4 Security Design

The Lessee shall provide security design in conformance with the requirements of Section 20.

28.3.5 Geotechnical

The Lessee shall perform foundation design in accordance with the latest provisions of Building Code of New York State and the New Improvements Specifications. The design, at minimum, shall include:

- 1) Deep foundation design
- 2) Down drag calculations
- 3) Settlement calculations
- 4) Site-specific seismic analysis.*

*The Baseline Site Specific Seismic Response Spectrum is provided in the Geotechnical Report (see Available Documents).

Additional geotechnical information for the West Garage is provided in the Available Documents.

28.3.6 Site Improvements

28.3.6.1. Site Work

This Section specifies the design criteria for the Civil Work. The BOD summarizes the design requirements for civil work for the West Parking Garage.

The Lessee shall develop construction staging plans, including temporary roadways, associated site work and utilities, and coordinate with MOT. Staging Plans shall define work areas based on required work hours, and facility operations.

The Lessee shall provide design and support drawings.

A. Criteria

1. Roadways

For the roadways inside and the perimeter of the West Garage, see Section 16.0 Utilities.

- For existing and proposed Utilities, see Section 10.
- Storm drainage runoff and treatment design shall address current storm water practice in accordance with NYS Storm Management Design manual.
- All temporary construction chain link fences and gates shall be eight feet in height, metallic coated, and new upon installation. Refer to Section 32.3.f.

28.3.6.2. Toll Plaza

See Drawings for Contract LGA-124.207R titled, "LaGuardia Airport Utilities, Roadway and Toll Plaza in support of the West Parking Garage" for details of the Toll Plaza systems subject to Port Authority-approved modifications in the BOD.

The toll booths shall be provided with positive pressurization, heating and air conditioning.

100% outside air HVAC unit shall be installed in the Mechanical Room on the ground floor and distribute conditioned air to each toll booth.

The Lessee shall provide local control for the HVAC system with provision for future integration into a building management system (BMS).

28.3.6.2.1 Parking Control System

The design will provide each toll plaza with a connection point to an evenly distributed, redundant local area network connection point that provides for high-speed optical connectivity.

The design will provide for a telecommunications demark enclosure with fiber optic connectivity and will ensure that end-of-line connections are within industry standard distance limitations in all locations. The future Parking Control System shall be located

in the Main Distribution Frame room (MDF). Two 2" conduits per booth shall be provided to support future Parking Booths on the West side of the parking garage.

28.3.6.2.2 Sole Source/Sole Brand Requirements

A. Sole Brand

The Lessee shall provide the following by 3M (Federal APD) / Secondary: MARK IV

- 1. Any electronics that are related to the toll island including:
 - a. Gates;
 - b. Card Readers;
 - c. Toll booth electronics including cashier, telephones and intercom; and
 - d. EZ-Pass antenna equipment and associated hardware.

B. Sole Source

The Lessee shall provide EZ-Pass LED Signs by Solari Corporation.

C. Sole Source

The Lessee shall provide Panic Button Electronics by KRATOS/HBE.

D. Sole Source

The Lessee shall provide Toll Booths by PAR-KUT International, Inc.

For additional information regarding the equipment referenced in this Section 28.3.6.2.2, see Sole Source/Sole Brand Information included as an Available Document for the West Garage.

28.3.7 Architectural

No bracing of any type may be located at the drive isles, pedestrian paths or at the exterior building face.

No spray-on fireproofing shall be used on the project.

All vehicle parking spaces contributing to the space count shall be located within the garage superstructure and footprint.

Natural Ventilation - shall comply with the 2008 New York City Building Code Section 406.3.3.1.

Site line Mitigation – All views of the Air Traffic Control Tower (ATCT) must be blocked from within the West Garage and the uppermost level.

All requirements to accommodate PV panels must be installed, including right-of-way for cabling and future equipment rooms and support structures.

Should the Lessee decide to install PV panels as part of the sustainability design, then the Lessee shall coordinate with the Port Authority and obtain both Port Authority and FAA concurrence on the PV panel installation, including solar glare analysis.

Conduit Routing – All conduit, raceways, piping, exposed ductwork shall be installed in an orderly manner, parallel to structure, where possible. All conduit, raceways, piping, exposed HVAC ductwork shall be grouped and run tight to the structural grid. No conduit, raceways, piping, exposed HVAC ductwork may drop below the bottom of the structural tee. The visual presence of conduit, raceways, piping and exposed HVAC ductwork shall be minimized. At the exit plaza HVAC ductwork shall be coordinated with lighting fixtures, signage, and associated equipment. Refer to contract LGA – 124.207R for further information on systems requirements and layouts.

Wayfinding

- a) Pedestrian pathways are to be unobstructed and marked throughout garage.
- b) To encourage movement to vertical transportation throughout the garage, the Lessee shall provide increased illumination and bold signage at the point of entry to the vertical transportation.
- c) Elevator doors, cabs, and any windscreens to be constructed primarily of clear glass for visual connectivity.
- d) All stairwells to be visually open.

Elevator Enclosure and Cab

- a) Laminated glass to be used for vision panels in elevator cab, elevator cab doors and hoistway doors. The elevator hoistway shall be back-painted glass.
- b) Laminated glass must conform to ANSI 297.1, 16 CFR Part 1201, or CANKGSB-12.1, whichever is applicable (see Part 91. Markings as specified in the applicable standard must be on each separate piece of glass and must remain visible after installation.

Lighting

- a) Lighting design must provide a sufficient light level to allow for proper functioning of security system, including cameras, to operate as specified.
- b) The point source of lighting must be shielded in a way that the source is not visible at the exterior of the garage.
- c) Provide evenly distributed, diffuse natural and artificial light throughout the garage.

Finishes

- a) All finish treatments used must be durable and low maintenance for high traffic exterior public space.
- b) Ease of maintenance is required in all finishes and materials use in project.
- c) Galvanic protection to be provided between dissimilar metals.
- d) Exposed precast stair face shall be cast in such a way to provide a clean, smooth, high quality finish.

Façade Constructability

a) The façade screen must be designed and constructed in a manner that is repeatable throughout the future buildings on the LaGuardia Airport campus and must conform to or be compatible with the Engineering Design Guidelines.

Functional Space Requirements

The following are the program requirements for elements and spaces that supplement requirements specified elsewhere in these Design and Construction Requirements and Room Data Sheets:

- a) Electrical Distribution Room
- b) Electronics Distribution Room
- c) Janitor Closet
 - Provide a service sink
 - Provide framing structure/ blocking for storage shelving and mop rack (provided by others)
 - Each Janitor's closet will have a hose bib on the outside of the room in the Garage.
- d) Water Service Room
- e) Sump Pump Room
- f) Elevator Control Room.

Materials and Finishes

- a) General Materials and Finishes. See New Improvements Specifications for detailed information and for all other elements not specifically mentioned herein.
- b) All exposed edges of precast stair shall have even and smooth finished surface.

The Lessee shall include all mock ups per the New Improvements Specifications, including, but not limited to:

- a) Stair handrail and guardrail condition
- b) Exterior metal screen mock-up to include support frame, connections, and fins, painted with the specified paint.
- c) Glass Fiber Reinforced Concrete panels
- d) Elevator enclosure
- e) Vehicular Barrier at a Structural Column.
- f) Tensioned Fabric Roofing.

28.3.8 Structural

Structural design and construction criteria shall, at a minimum, conform to the latest New York City Building Code, unless otherwise noted.

West Garage shall be designed for a minimum of 50 psf live load on each level.

West Garage shall be designed for a minimum of 10 psf superimposed dead load on each level to account for weight of Architectural, Electrical and Mechanical components and systems.

West Garage shall be designed to accommodate maximum loading encountered for roof level snow removal operation.

In addition to NYC Building Code section 1603.3.1.3, the maximum design wheels configuration and wheels spacing of vehicle permitted to enter West Garage shall be clearly identified.

West Garage perimeter vehicle barriers shall be designed for a minimum 10,000 lbs ultimate point load at 18" above the finished floor.

West Garage Cast-In-Place Concrete Material Requirement:

1. Concrete shall comply with the New Improvements Specifications Section 03301. Pipe pile fill, drilled concrete piers, grade beams, and pile caps shall comply with Performance Category VI. All other structural elements shall comply with Performance Category IV. All concrete shall have a minimum compressive strength of 4,000 psi at 28 days.

- 2. All concrete riding surfaces shall receive a "broom finish".
- 3. Besides reinforcing bar coupler systems, concrete embedded steel hardware shall be hot dip galvanized per ASTM A153. Any damaged galvanizing is to be cleaned and touched up with galvanizing paint in the field.

West Garage Precast Concrete Material Requirement:

- 1. Concrete shall comply with the New Improvements Specifications Section 03301. All concrete shall comply with Performance Category IV. All concrete shall have a minimum compressive strength of 5,000 psi at 28 days.
- 2. All concrete riding surfaces shall receive a "broom finish".
- 3. All precast double tee to double tee flange connections, hardware, steel connection bolts, nuts, washers, plates, coil rods and coil inserts shall be hot-dipped galvanized steel. Any damaged galvanizing is to be cleaned and touched up with galvanizing paint in the field.

All steel reinforcing bars for West Garage construction shall be either epoxy-coated or hot-dip galvanized. Reinforcing bar coupler systems shall be compatible with the selected coating of reinforcing bars.

Expansion Joints system shall be heavy duty, watertight and ADA compliant. Preformed seal with continuous integral rubber seal side flanges shall be secured utilizing metal reinforced rubber anchor blocks. Design expansion joint connection shall qualify for expansion joint manufacturer's material warranty.

Adhesive and friction type anchors are not permitted to be used for overhead application and in condition where anchor is subject to sustained tensile load. Prior to installation of anchor, perform non-destructive testing to ensure proposed drill hole will not damage any embedded structural elements such as rebar or embedded steel plates. Design and installation of anchor shall conform to anchor manufacturer's specification.

Exterior signs and luminaries supports shall be designed in accordance with the latest AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. Interior signs and luminaries supports shall be designed in accordance with New York City Building Code, but not less than a minimum lateral wind gust pressure of 15 psf applied to the surface of signs, luminaries and supports.

All signs (exterior or interior) which require routine cleaning or servicing shall be designed for all anticipated additional loads, but not less than a 100 lb concentrated horizontal live load and a 300 lb concentrated vertical live load applied simultaneously at a point, which can develop the most critical effect. The additional concentrated loads shall be applied in combination with the sign and support dead load only and not concurrent with wind or seismic loads.

The Structural System utilized in the West Garage shall be designed to prevent global/progressive collapse of the building in the event of a structural column being damaged or destroyed. The structural framing shall be designed so that only the bays framing into the affected column will be subject to local collapse and all adjacent bays will remain standing. In addition, Structural System utilized in the West Garage must incorporate the protective design strategies as outlined in the relevant sections of the LaGuardia Airport Redevelopment Program's Protective Design Narrative (PDN), dated September 09, 2013. Any deviation from the strategies provided by the PDN must be approved by the Port Authority.

28.3.9 Mechanical, Plumbing, Fire Protection

The Lessee shall provide Plumbing Infrastructure including, but not limited to, Domestic Water Distribution (both hot and cold water), Sanitary Drainage, and Storm Water Drainage all in accordance with codes and requirements.

- A. Plumbing Systems
 - Reduce Pressure Zone (RPZ) Backflow Preventer shall be placed on the incoming domestic water service line downstream of the NYC approved meter assembly including remote reader and strainer. The RPZ assembly and associated water supply and valves shall be located in the water service room with adequate heat and lighting.
 - Verify that the water pressure available from the site water system is adequate to provide pressure at the top most remote plumbing fixture.
 - All domestic water piping and all horizontal storm piping shall be insulated and heat traced when located within the unheated garage areas. Weatherproof and frost proof molded fiberglass insulation shall be a minimum of 3 inches if piping is not provided with heat trace.
 - Non-freeze wall hydrants shall be provided outside of the janitor closet on each floor and around the building for general maintenance. The exterior wall hydrants shall be spaced a maximum of 200-feet apart outside the building.
 - Janitor closets must be located on each floor. Toilet Room(s) must be located on the ground floor. Hot and cold water shall be provided in each toilet room and janitor's closet.
 - Floor drains shall be provided in the toilet room(s), water service room(s), mechanical room(s) and parking garage area(s).
 - Provide duplex sewage ejector with SCADA compatible control panel. Elevators shall have sump pumps in elevator pits. Both ejector and sump pumps shall be heavy-duty submersible pumps with a quick removal system with normal and emergency power and built-in overload protection. The discharge

piping shall be galvanized steel schedule 40 piping with galvanized threaded cast iron drainage fittings.

- Underground domestic water piping shall be class 54 ductile iron cement lined tar coated, seal coated, bell and spigot water pipe with 350 psig ductile iron fittings and flanged connection on service inside building.
- Underground sanitary waste, vent and storm water piping shall be cast iron hub and spigot soil pipe and fittings, ASTM A-74, extra heavy underground.
- Aboveground sanitary waste and vent piping shall be cast iron hubless soil pipe and heavy-duty neoprene fittings with stainless steel couplings.

B. Fire Protection Systems

- The West Garage shall have a new 8-inch fire service that extends 5-feet outside the water service room.
- The 8-inch fire service shall consist of a house control valve, double check detector assembly (DCDA) backflow preventer and a fire service control valve. The fire service shall be located within the Water Service Room. The Water Service Room shall be provided with heat and lighting. The fire service shall comply with the requirements of the NYCDEP. The fire water supply main in the unheated garage area shall be insulated and heat traced.
- The parking structure shall be provided with Class I manual dry standpipe system. A manual dry valve with tamper switch and automatic alarm shall be connected to the dry standpipe system and the 8-inch fire service. The valve shall be located within the water service room.
- The parking structure shall be provided with Fire Department Siamese connections located on the exterior walls and connected to the dry fire standpipe distribution main inside the building.
- 2¹/₂ Class 1 Fire Hose Valves shall be provided with lien hose and cover bag at each level of each stairwell; and at columns, cabinets shall be mounted to the column.
- A $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x $2\frac{1}{2}$ " x 6" roof manifold shall be provided at the top of stair.
- Provide auxiliary fire hose valve(s) on each level where such area cannot be reached within 150 feet of the hose connection.
- Fire standpipe riser control valves(s) with tamper switch shall be provided at the bottom of each fire standpipe riser.
- The Parking Garage shall be provided with a fully automatic dry pipe sprinkler system. The automatic dry pipe sprinkler system shall be based on ordinary hazard group 1 occupancy. Each dedicated dry valve assembly shall be zoned for a maximum of 52,000 sq. ft. The dry valve assemblies, with associated appurtenances including air compressor and accelerator, shall be located in the valve control room on each floor.

• Fire extinguishers shall be provided in compliance with NYC Building Code and NFPA 10. A wheeled 150lb, type B, fire extinguisher shall be provided at each level next to each of the staircases. These wheeled fire extinguishers shall be housed in a wire cage shown on the drawings in accordance with the New Improvements Specifications, Reference Documents and Applicable Standards.

28.3.10 Mechanical Vertical Transportation

The proposed elevator system shall meet the anticipated demand associated with arriving and departing passengers.

1. DESIGN CRITERIA

- A. Heavy duty passenger elevators, 4000 lb at 350 fpm (traction equipment) to handle the expected number of passengers with an Average Interval of 47-seconds. Elevators shall meet all provisions of ADA and NYCBC stretcher requirements. Elevator platform size for the recommended 4000 lb elevators is 8'-0" wide by 6'-2" deep with 4'-0" wide center opening doors. The platform width and depth along with the 4'-0" doors shall allow Smart Carts to be easily loaded and unloaded without impacting overall elevator service.
- B. Type of Elevator required: Machine Room-Less (MRL) type traction equipment is recommended for the West Garage.

2. OPERATION PERFORMANCE

- A. The control system shall provide smooth acceleration and deceleration with 1/8" leveling accuracy at all landings, from no load to full rated load in the elevator, under normal or unloading conditions. The self-leveling shall, within its zone, be entirely automatic and independent of the operating device and shall correct for over travel and under travel. The car shall remain at the landing irrespective of load. Clearance between the car sill and the hoistway landing shall not exceed 1 ¹/₄ inch.
- B. The door open and door close time shall be based on the Code requirements with a door delay feature. The door delay is the minimum acceptable time from notification that a car is answering a call (lantern and audible signal) until the doors of the car start to close.
- C. Car Call: The minimum acceptable time for doors to remain fully open shall not be less than 5 seconds.
- D. The speed of the elevator shall not vary +/- 5% under loading conditions.
- E. Ride Quality: The elevator shall provide smooth and quiet ride, free of rumbles, bumps, vibrations, jerk and sway.
- F. Prior to the handover to the Port Authority, the elevators shall be adjusted as required to meet these performance requirements.

3. MANUFACTURERS

- A. The elevator shall be a product of individuals, firms or corporations regularly engaged in manufacturing elevators comparable with this contract and in satisfactory operation for a period of not less than five years. B. Qualified Manufacturers:
 - 1) Fujitec Elevator Company.
 - 2) Hollister-Whitney Elevator Corporation.
 - 3) KONE Elevator Company.
 - 4) MCE (Motion Control Engineering Company, Inc.).
 - 5) Otis Elevator Company.
 - 6) Schindler Elevator Company.
 - 7) ThyssenKrupp Elevator Company.
 - 8) Approved Equal.

4. MATERIALS

- A. Aluminum: Extrusions as per ASTM B221.
- B. Plywood: PS-1-83, A-D Interior Grade Douglas fir. Fire treat per AWPA with a suitable water-soluble fire retardant formation; U.L. FR-S fire hazard classification.
- C. Plastic Laminates: As per NEMA LD-3, with suitable backer sheets to minimize warping, fire rated Grade HGF, .062 inch thick.
- D. Stainless Steel Interior Applications: As per ASTM A167, Type 302/304 series, with finish as specified.
- E. Stainless Steel Exterior Applications: As per ASTM A167, Type 316 series, with finish as specified.
- F. Patterned Stainless Steel: As per ASTM A167, Type 304, rigidized stainless steel pattern 5WL®, with satin finish as specified. G. Bronze: CDA Alloy 280 Muntz Metal.
- H. Structural Steel: AS per ASTM A36.
- I. Steel Tubing: ASTM A500, Grade B.
- J. Glass: Clear laminated safety glass, complying with ANSI Z97.1, nominal 9/16" thickness.

5. CONTROL EQUIPMENT

- A. Controller: The Lessee shall provide enclosed controller panels with ventilated cabinets and hinged or removable doors and provide permanently marked symbols or letters identical to those on wiring diagrams adjacent to each component.
- 6. OPERATING SYSTEMS

- A. The Lessee shall provide a closed-loop solid-state microprocessor system to provide operation as indicated.
- B. Components: The microprocessor based group dispatcher and communications network shall be designed and installed to meet the following requirements:
 - 1) Provisions shall be made in the dispatch computer so that the elevator system dispatching can be modified at a future time. The system shall be so designed that the modifications to the software shall be all that is required to revise the dispatching. It shall be further designed so that there shall be minimum shut down time should changes be required.
 - 2) The latching circuitry (outputs) shall be fail-safe design that turns off all the outputs in the event of a processor malfunction.
 - 3) Power Supplies: All power supplies utilized shall be UL recognized. They shall all have short-circuit protection.
 - 4) Frame: All assemblies, power supplies, chassis, switches, relays, and other items shall be securely mounted on a substantial, self-supporting steel frame. The equipment shall be completely enclosed with covers. No equipment is to be mounted on the covers.
 - 5) Wiring: All factory wiring shall utilize UL labeled copper wires. All wiring interconnections shall be neatly routed. All wiring connections to stude of terminals shall be made by means of solder or solderless lugs.
 - 6) Marking: All components shall be clearly and permanently identified adjacent to each device and shall be identical to the wiring diagram.
 - 7) The Lessee shall provide extender boards when computing devices are used inside a computer chassis so as to have access to the printed circuit cards utilized.
 - 8) Electronic time delay devices shall use stable capacitor or crystals as the time base.
 - 9) Terminals shall be provided for a future connection to a computerized test system. An adequate number of terminals shall be provided so as to monitor all of the various functions of the elevators. These shall include but not be limited to car positions, running functions up and down, door open and close, hall and car calls, door protective devices, safety circuits, elevator recapture, etc.
- C. Printed Circuits and Related Hardware:
 - 1) All printed circuit board edge connections shall be gold plated.
 - 2) All solid-state hardware and devices shall have built-in noise suppression devices that provide a high level of noise immunity.
 - 3) Power supplies shall have noise suppression devices provided.

- 4) All inputs from external devices (such as pushbuttons) and all outputs to external devices (such as indicators, relays) shall be isolated.
- 5) The use of relays as input/output devices is not acceptable.
- 6) A separate regulated power supply shall be used for each computer chassis.
- 7) The control circuits shall be so designed so that one side of the power supply is grounded to provide for testing.
- 8) Under no circumstances shall the safety circuits be affected by accidental grounding of any part of the system.
- 9) In the event of a power failure or interruption, the system shall be designed so that it shall start properly when power is returned.
- 10) System memory shall be provided so that data shall not be lost in the event of a power failure or disturbance.

Note: Conduits or other wiring shall not be exposed in the lobby or other occupied parts of the building.

- D. Speed Regulation:
- 1) The rate of acceleration and deceleration of the cars under any condition of load shall be as nearly constant as is possible with the method of control specified and employed and shall be independent of the operating devices in the car.
- 2) The acceleration, deceleration and velocity shall all be computer controlled. The detection of velocity and position of the car shall be fed into the computer. The computer shall compare this information with the velocity profile and adjust as necessary to insure a fast and smooth acceleration and deceleration curve. The maximum acceleration/deceleration shall be 4 feet/sec^2 and shall change uniformly.
- 3) Entire elevator equipment including hoisting machines and controllers shall operate without irregularities and quietly by use of high-grade materials, first class workmanship and adjustments.

7. ADJUSTING, CLEANING, LUBRICATION AND PAINTING

- A. The Lessee shall perform the following work prior to final testing and acceptance:
 - 1) Adjust all equipment for optimum performance, including controllers, motors, drives, landing systems, hoistway switches, door operating equipment and safety equipment to achieve the required performance levels.
 - 2) Thoroughly clean all equipment and equipment areas free of all dust, dirt, debris and excessive oil and grease.
 - 3) Lubricate all equipment in accordance with manufacturer's guidelines.

- 4) Patch and paint exposed work soiled or damaged during installation. Repair to match adjoining work prior to final acceptance.
- 5) Clean and paint the following equipment and areas: pit floor and machine room floor.

8. INSTRUCTIONS

- A. Upon completion of all D&C Work with respect to the elevator, the Lessee shall schedule an instruction period. Instructions shall be given by competent supervisory personnel and shall apply to actual field conditions. The instructions shall cover, but shall not be limited to the following:
 - 1) Operation of elevators under emergency conditions, maintenance, adjustment, troubleshooting and diagnostic procedures.
 - 2) Operation of elevator fire recall system and tenant security system.
 - 3) Operation of elevator communication, door reversal device, etc.
 - 4) The Lessee shall provide a minimum of one year maintenance for all equipment and systems to be assigned upon acceptance.

28.3.11 Electrical and Fire Alarm

1. Electric Service

Electric service to the West Parking Garage shall consist of two 5kV feeders from the West Electric Substation (WES) to the substation located at the ground level of the West Parking Garage. The exact source and feeder numbers are to be confirmed and coordinated with the Port Authority.

- 2. Temporary Light and Power
 - A. The Lessee shall make provision for temporary light and power for the duration of construction.
- 3. Ductbank and Manhole Systems
 - A. See Part B, Section 10 of the Design and Construction Requirements for additional information.
 - B. The Lessee shall provide one empty spare 5" FRE conduit per 5kV feeder in each duct bank.
- 4. 5kV Class Feeder Cables
 - A. Two 4160-volt feeders consisting of 3-conductor 500kcmil 5 kV class flat strap cable as manufactured by Kerite, Okonite, or Pirelli, shall be spliced in the nearest manholes to the existing cables from West Electric Substation and terminate on the double-ended 5kV/480V substation in the West Parking Garage.

- 5. Service and Distribution Voltages: The following service distribution voltages shall be provided in accordance with general industry practice for electrical equipment and devices.
 - A. 4160V service (typical voltage level 4330V)
 - B. 480/277V, 3 phase, 4 wire power distribution.
 - C. 480 volts, 3 phase motors rated 1/2 horsepower and above.
 - D. 120 volts, single phase motors rated 1/3 horsepower and below.
 - E. 277 volts, single phase LED and fluorescent lighting.
 - F. 480 volts, 3 phase electric heating equipment rated at 3.6 kW or more.
 - G. 277 volts, single phase electric heating equipment rated above 1 kW but less than 3.6 kW.
 - H. 120 volts, single phase electric heating equipment rated 1 kW or less.
 - I. 120 volts, single phase receptacle and appliance loads.
- 6. Equipment
 - A. The 5kV/480V substation and the generator shall be installed in new dedicated rooms in the West Garage. The substation room shall be designed with enough clearance to allow for the complete removal and replacement of all equipment. Other electrical equipment including panelboards and dry-type distribution transformers shall be installed in dedicated electrical distribution rooms at each level. The minimum size of each electrical distribution room shall be 10 feet by 8 feet. The Lessee shall provide clear space around the equipment. Electrical distribution rooms shall be ventilated to maintain a maximum indoor temperature of 104 deg F. At least 50% blank wall space shall be provided for future conduits and equipment.
 - B. Enclosures for outdoor equipment shall be rated NEMA 4X stainless steel, and located to be protected against physical damage.
 - C. Motor controllers shall be located in mechanical equipment rooms.
 - D. Electrical equipment such as power distribution panels, lighting and appliance panels, and dry-type step-down transformers shall be located in electrical equipment rooms.
 - E. All floor mounted electrical equipment shall be on minimum 6" high concrete pads extending 4" beyond the equipment.
- 7. Voltage Drop
 - A. Feeders and branch circuits shall be sized to compensate for voltage drop such that the total voltage drop shall not exceed 5% from power source to load served. The voltage drop for feeders shall be limited to 2%.
- 8. Short Circuit Current and Arc Fault Analysis
- A. The Lessee shall perform three phase fault calculations from the substation to the panelboard level to determine the ratings of the electrical distribution system equipment. Electrical equipment shall be fully rated; downstream panelboards shall be coordinated with upstream equipment for the available short circuit current. The Lessee shall perform an arc flash analysis based on the actual equipment provided. The Lessee shall provide Arc Flash mitigation measures to allow Personal Protective Equipment (PPE) rating of the switchgear as described in the NFPA 70E shall be no higher than Category 2, or 8cal/cm2. The Lessee shall apply labels to equipment indicating appropriate levels of personal protective equipment.
- 9. Power factor
 - A. Equipment shall be selected to provide the maximum power factor provided for readily available ballasts and motors. Space shall be provided for future capacitors to be provided if operating system power factor is below 0.95.
- 10. Total Harmonic Distortion Design Considerations
 - A. Equipment that can generate non-linear loads shall be selected to limit the contribution of non-linear loads into the electrical distribution system. The generator shall be sized to handle the anticipated non-linear load on the system.
- 11. Transient Voltage Surge Suppression Design
 - A. The Lessee shall provide transient voltage surge suppression at the substation.
 - B. Panel Protection: The Lessee shall provide transient voltage surge suppression at local panels serving sensitive loads such as electronic equipment.
- 12. Energy Conservation
 - A. A lighting control strategy shall be designed that automatically switches off lighting in unoccupied enclosed spaces by means of occupancy sensors operating in vacancy mode (manual ON, automatic OFF). In the parking areas of the garage, lighting shall be controlled by motion sensors integral to the lighting fixtures such that light output decreases to 50% after a delay when no motion is detected. Daylight sensors shall be incorporated where appropriate. Exterior lighting shall be controlled by photocells.
 - B. Energy efficient motors, transformers and lighting fixtures (lamps and ballasts) shall be specified.
- 13. Lightning Protection System
 - A. The Lessee shall provide a lightning protection system complying with the following Codes: Lightning Protection Institute (LPI) 175, NFPA 780, and UL 96A. This shall include all air terminals, conductors, connections, ground rods and ground grid. Incoming electric and communications services shall be provided with surge arresters. The lightning protection system shall be designed by a certified lightning protection designer in order to obtain a UL Lightning Protection Inspection Certificate.
- 14. Substation

- A. The Lessee shall provide a double-ended 5kV/480V substation. The substation shall consist of the following equipment:
 - 1) Substation minimum short circuit rating: 270 MVA
 - 2) Two 5KV Class load interrupter switches (manufactured by S&C no substitutions)
 - 3) Two 5kV Class grounding switches (manufactured by S&C no substitutions)
 - 4) Two metering compartments
 - 5) Two 1000 KVA, 4.33 KV/ 480 V step-down cast coil type transformers.
 - 6) Two 480 volt main breakers, electrically operated, drawout type
 - 7) One tie breaker, electrically operated, drawout type
 - 8) Digital metering systems (Powerlogic ION 7330 manufactured by Schneider Electric, Square-D no substitutions)
 - 9) Six Feeder breakers, drawout type
 - 10) Two fully equipped spaces
 - 11) One automatic throwover with control power and UPS
 - 12) Two electric meters.
 - 13) One electric totalizer.
- 15. Power Distribution Panelboards
 - A. Power Distribution Panelboards shall be provided with a main circuit breaker, copper bus and with molded case, thermal magnetic bolt-on feeder circuit breakers. Breakers 225A and larger shall have interchangeable trips. Enclosures shall be surface mounted, indoor type, made from Code-gauge galvanized steel. Each breaker shall have a dedicated bolt-on steel cover. The Lessee shall provide capacity for entrance and exit plazas, two outside lifting stations, outside roadway lighting and 25% spare breakers for future use in every panelboard.
- 16. Lighting and Appliance Panelboards
 - A. Lighting and Appliance Panelboards shall be provided with a main circuit breaker, copper bus and with molded case, thermal magnetic bolt-on branch circuit breakers. Enclosures shall be surface mounted, indoor type, made from Code-gauge galvanized steel with door-in-door trim. The Lessee shall provide spare breakers and 40% spaces for future use.
- 17. Lighting
 - A. The Lessee shall provide interior lighting throughout the Parking Garage, in public spaces and in non-public spaces and exterior façade lighting as detailed in the Preliminary Drawings for Contract LGA 124.207R titled, "LaGuardia Airport Utilities,"

Roadway and Toll Plaza in support of West Parking Garage" subject to Port Authorityapproved modifications in the BOD.

- B. The lighting requirements shall be in accordance with the Port Authority Engineering Design Guidelines and Section 28.3.12. Lighting.
- C. Provide lighting at the substation and the generator with battery ballasts.
- D. Light fixtures where subject to physical damage such as in mechanical/electrical rooms shall be fitted out with wire guards.
- E. Light fixtures where subject to exterior conditions or in pits shall be weatherproof.
- F. Exterior façade lighting and adjacent parking and street and roadway lighting and signaling and control shall be provided. Power for roadway and street lighting shall be fed from the West garage emergency distribution. G. Refer to Section 14 for additional requirements.
- 18. Branch Circuits
 - A. The Lessee shall provide branch circuits to serve lighting, power, security, communications, Smarte Carte vending, heat trace, mechanical equipment, electric vehicle charging stations, and other loads as required.
 - B. The Lessee shall provide lighting at the roof-mounted substation and the generator sufficient to permit night-time working.
 - C. The Lessee shall reconnect the lift stations to the West Garage emergency power distribution system.
- 19. Generator
 - A. The Lessee shall provide a 400kW diesel-fueled emergency generator. The packaged engine-generator set shall be UL 2200 listed and housed in an integral weatherproof enclosure. Provide a 270-gallon day tank.
 - B. The emergency generator shall provide backup power to emergency and optional standby loads of the garage in the event of loss of normal power.
 - C. The diesel fuel tank shall be located at grade and shall be a UL 2085 listed steel-walled tank with insulation, secondary containment, and monolithic concrete encasement providing vehicle impact and projectile resistance. The tank shall be equipped with integral leak detection. The tank shall be sized for 24 hours running at full load.
- 20. Emergency and Optional Standby Loads
 - A. Emergency loads shall be designed with automatic transfer switches to provide emergency power within 10 seconds of normal power loss and to satisfy Code requirements. Emergency loads shall include, but shall not necessarily be limited to:
 - 1) Emergency egress lighting.
 - 2) Fire alarm and rescue systems.

- 3) Egress signage.
- 4) Elevators
- 5) Communication systems.
- 6) Sewage ejector pumps.
- 7) Sump pumps
- 8) UPS for communications equipment. 9) Fire suppression systems.
- B. Elevators shall be arranged to transfer to emergency power in sequence, return to the designated landing, open the doors, and disconnect from the emergency power source.
- C. Optional standby loads shall have a lower priority than emergency loads and shall provide power within 60 seconds.
- 21. Conduit
 - A. The minimum conduit size shall be ³/₄-inch, supported independently of other systems.
 - B. Use 5-inch FRE (fiber reinforced epoxy) conduit for 5kV underground feeders in concrete-encased ductbanks and for 5kV concrete-encased risers.
 - C. Use PVC coated rigid galvanized steel conduits with threaded fittings for all outdoor above grade installations.
 - D. Use rigid galvanized steel conduits with threaded fittings for all other above-grade installations.
 - E. Use Schedule 40 PVC conduits in concrete-encased ductbanks for 600-volt underground feeders and for underground communications.
 - F. The conduits shall be in accordance with PA Specification sections 16110 and 16115.
 - G. Refer to Section 28.3.7 regarding conduit routing.
- 22. Outlet Boxes and Pull Boxes
 - A. Outlet boxes for concealed installations in indoor dry locations shall be stamped rigid galvanized steel, 4 inch square or size required by code.
 - B. Outlet boxes for exposed installations shall be cast metal alloy.
 - C. Pull boxes shall be galvanized sheet steel with screw on-covers.
- 23. Receptacles and Electric Vehicle Charging Stations
 - A. Duplex receptacles shall be industrial specification grade, grounded, 20A, 125 volts, 2 pole, 3 wire, side wired, copper alloy with screw terminals. Ground fault interrupting type shall be self- protecting feed-through.
 - B. Convenience receptacles shall be located at approximately 30 feet intervals along the perimeter walls of the West Parking Garage. Connect up to six receptacles per branch circuit. Provide GFI-type circuit breakers to protect the branch circuits. The Lessee

shall provide wet location covers for receptacles, except that receptacles on roof level shall have rain tight-in-use covers.

- C. Ground fault interrupting type receptacles shall be located within 6 feet of any water source and in the elevator pit. Connect up to six outlets on a branch circuit. The elevator pit receptacle shall be on a dedicated circuit.
- D. Each enclosed space shall have duplex receptacles spaced such that no point measured horizontally along the floor line of the wall space is more than 6 feet from a receptacle outlet. Connect up to six receptacles on a branch circuit.
- E. The Lessee shall install five charging stations for electric vehicles and the infrastructure to support an additional ten future charging stations. The charging stations shall be furnished by Coulomb Technologies or another vendor selected by the Port Authority.
- 24. Switches and Occupancy Sensors
 - A. Wall switches shall be specification-grade, 120-277 volt, 20A, single pole toggle type.
 - B. Wall-mounted occupancy sensors shall be solid-state type set to operate in the vacancy mode manual ON, automatic OFF.
 - C. Ceiling-mounted occupancy sensors shall be dual technology type.
 - D. Disconnect switches shall be heavy duty, horsepower rated, 600 volts.
- 25. Wires and Cables
 - A. The Lessee shall provide 600-volt wires and cables in accordance with the New Improvements Specifications Section 16120.
 - B. Provide medium-voltage flat strap cable in accordance with the New Improvements Specifications Section 16121.
- 26. Local Motor Controls
 - A. The Lessee shall provide motor starters for mechanical equipment.
- 27. Grounding System
 - A. Provide a complete ground consisting of a 250 kcmil bare copper wire and driven ground rods with exothermic welds. The ground grid shall be connected to structural steel and to the lightning protection system.
 - B. For medium-voltage cables the flat strap shall serve as the equipment grounding conductor. For all other feeders and branch circuits provide a separate equipment grounding conductor run in the same raceway as the current-carrying conductors. C. The electrical system and transformers shall be grounded per code.
 - C. For additional grounding requirements see selected sections of the Written Criteria.
- 28. Heat Tracing

- A. The Lessee shall provide heat tracing systems for piping in accordance with the codes and requirements. Heat tracing shall be by means of self-regulating electric heating cables.
- 29. Photovoltaic System

A. The Lessee shall make provisions for a rooftop photovoltaic system installation. The maximum installed capacity of the system is 2 MW utilizing 320W Sunpower E19-320 or equal photovoltaic panels. Multiple strings of panels are paralleled via combiners and terminate on four 500kW utility interactive inverters similar to Satcon PowerGate Plus 500 kW UL. The outputs of the four inverters shall terminate on Low Voltage PV switchgear located in the dedicated room on the roof. The 480V output of the switchgear shall be stepped up by a transformer to utility voltage and through a net metering arrangement, connected directly into the Con Edison network. The connection requirements of the utility shall be strictly adhered to. A concrete encased pathway with required splice chambers from the roof to the ground level and a closest manhole as coordinated with the utility shall be provided. The system shall be designed with the Con Edison concurrence.

- 30. Flood Water Detection
 - A. The Lessee shall provide water detectors in the electrical distribution rooms at level 1 of the West Garage. The Lessee shall position the water sensor probes 6 inches above the finished floor. Each detector shall have a relay output to a corresponding contactor located at level 2. In the event that water is sensed, the detector shall cause the contactor to de-energize level 1 panelboards (other than the emergency panelboard) and shall sound an alarm.
- 31. Fire Alarm System Description
 - A. A complete, integrated and operating fire alarm, detection, control and monitoring system shall be designed and installed throughout the West Parking Garage.
 - B. The fire alarm system in its entirety shall be in compliance with all applicable codes and standards. Accessory and ancillary components as required shall be certified or cataloged by the manufacturer and UL listed.
 - C. The Fire Alarm Control Panel shall be located inside the electrical room nearest the vehicle entrance at ground level of the West Parking Garage. The FACP shall be comparable to Siemens Fire Finder XLS and interfaced with the existing Siemens's Cerberus Pyrotronics Fire Command Center located at the Airport Rescue and Fire Fighting Building. The Lessee shall provide a dedicated fiber optic connection to the Fire Command Center and coordinate the work with the Port Authority.
- 36. Fire alarm signal initiation shall be by one or more of the following devices:
 - A. Manual stations.
 - B. Heat detectors.
 - C. Combination smoke/heat detectors.

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- D. Smoke detectors.
- E. Fire extinguishing system operation.
- F. Fire standpipe system.
- 37. A fire alarm signal shall initiate the following actions (as a minimum):
 - A. Alarm notification appliances shall operate continuously.
 - B. Identify alarms at the Fire Alarm Control Panel.
 - C. Identify alarms at the existing master Fire Command Center.
 - D. Recall elevators.
 - E. Stop people movers.
 - F. Transmit an alarm signal to the remote alarm receiving station.
 - G. Activate voice/alarm communication system.
 - H. Fan shutdown.
 - I. Close smoke dampers in air ducts of system serving zone where alarm was initiated.
 - J. Record events in the system memory.
 - K. Record events by the system printer.
 - L. Provide alarm-monitoring outputs to existing Energy Management
 - M. Control System local Direct Digital Control (DDC) Panel.
- 38. Fire alarm supervisory signal initiation shall be by the following device or action: A. Operation of a fire-protection system valve tamper switch.
- 39. System trouble signal initiation shall be by one or more of the following devices or actions (as a minimum):
 - A. Open circuits, shorts and grounds of wiring for initiating device, signaling line, and notification-appliance circuits.
 - B. Opening, tampering, or removal of alarm-initiating and supervisory signal-initiating devices.
 - C. Loss of primary power at the Fire Alarm Control Panel.
 - D. Ground or a single break in Fire Alarm Control Panel internal circuits.
 - E. Abnormal ac voltage at the Fire Alarm Control Panel.
 - F. A break in standby battery circuitry.
 - G. Failure of battery charging.
 - H. Abnormal position of any switch at the Fire Alarm Control Panel or annunciator.
 - I. Derangement of the emergency power source.

- J. Low-air-pressure switch operation on a dry-pipe or pre-action sprinkler system.
- 40. System Trouble and Supervisory Signal Actions.
 - A. Ring trouble bell and annunciate at the existing Fire Command Center. Record the event on system printer.
- 41. Return to Normal.
 - A. Send a signal to the Fire Command Center to return to normal mode after the system has been reset.
- 42. The Lessee shall submit the following calculations:
 - A. Load Calculations
 - B. Transformer Sizing Calculations
 - C. Generator Sizing Calculations
 - D. Short Circuit Calculations
 - E. Wiring Sizing Calculations
 - F. Voltage Drop Calculations
 - G. Panel board Sizing Calculations
 - H. Conduit Sizing Calculations
 - I. Normal and Emergency Lighting Calculations
 - J. All calculations to be submitted at the completion of Design Development to the Port Authority.
- 43. Sole Source/Sole Brand Requirements:
 - A. Sole Source:
 - i The Lessee shall provide 5kV S&C Metal Enclosed Switchgear, Indoor Double Bay Assembly by "S&C Electric Company".
 - B. Sole Brand:
 - i The Lessee shall provide the following by Schneider Electric Products:
 - a ION7330 Advanced Power Meters manufactured by Schneider Electric
 - b NEMA 12 Ethernet Enclosure with prewired Lantronix ION protocol converter, Ethernet switch, SC connectors and 120VAC 1-pole circuit breaker.
 - c ION Enterprise software version and graphics upgrades by Schneider Electric

- d Installation services of ION7330, Ethernet Enclosure and integrating and updating existing screens in SCADA Central Monitoring Station.
- C. Sole Brand:

Siemens FireFinder XLS Fire Alarm System is presently replacing the MXL System throughout LaGuardia Airport. Fire alarm equipment to be installed in the West Parking Garage shall become a part of the existing fire alarm system. In order to stay compatible and ensure functionality and seamless Integration, Siemens fire alarm components shall be utilized. FireFinder XLS Fire Alarm system is manufactured by Siemens Building Technologies, Inc.

28.3.12 Lighting

1. Performance Criteria

A. Illuminance Standards (Normal Operations)

1) Interior Parking Decks

a) Drive Aisles

5 foot-candles minimum average illumination at deck level 1.5 average/minimum ratio not exceeded

b) Parking Bays

3.5 foot-candles minimum average illumination at deck level 2.0 average/minimum ratio not exceeded

c) Stairs

Landings: 15 foot-candles average, 5:1 average/minimum ratio

Stair runs: 5 foot-candles average, 2.5:1 average/minimum ratio

d) Pedestrian Circulation (raised walkways or paint-delineated zones at vertical circulation)

Walking zone: 10-15 foot-candles average, 2:1 average/minimum ratio

- 2) Roof Parking Deck (Roof Canopy Overhead)
 - a) Drive Aisles

5 foot-candles minimum average illumination at deck level 1.5 average/minimum ratio not exceeded

b) Parking Bays

3.5 foot-candles minimum average illumination at deck level

- 2.0 average/minimum ratio not exceeded
- 3) Garage Auto Entrance
 - a) Entrance-bay Drive Aisle (Normal operation, electric light illumination only)

Day: 25 foot-candles minimum average illumination at deck level

Night: 5 foot-candles

- 4) Perimeter Sidewalk Connecting Egress Stairs
 - a) 2.5 foot-candles minimum average illumination at pavement
 - b) 2:1 average/minimum ratio not exceeded
- B. Illuminance Standards (Emergency Operation)
 - 1) The following are to be lighted as egress paths for emergency egress:
 - a) Drive Aisles (at least 50% width)

Average 2.9 foot-candles can be achieved with (1) row of fixtures per aisle (50% parking fixtures per garage level)

b) Pedestrian Circulation walkways

Average 3 foot-candles can be achieved with (1) row of fixtures per aisle (33% downlights per garage level)

c) Stairs

Average 5 foot-candles at landings and 2 foot-candles on stair runs can be achieved with (1) fixture per landing aisle (50% downlights per stair)

- C. Energy Performance Standards
 - 1) Parking Garage Lighting Power Density (LPD)

- a) The lighting design for the garage shall not exceed the allowable lighting power density (Building Area Method) for a parking garage. The design standard, per ASHRAE 90.1-2010, is 0.25 W/sf.
- b) The Basis of Design lighting system, as currently documented has an LPD not exceeding 0.15 W/sf for all lighting associated with levels 1-6 except MEP spaces.
- 2) Exterior Screen Lighting
 - a) The connected load of the architectural uplighting system for the garage's exterior screen shall not exceed 0.2W/sf of lighted screen area, per ASHRAE 90.1-2010 limits for Lighting Zone 4 ("high activity commercial district"). The lighted area of the screen is to be considered as the projected area of the screen from the level of the uplight fixture trough up to the top of the screen at Level 6.
- D. Performance Documentation
 - 1) The Lessee shall submit documentation to the Port Authority of the illuminance and energy performance of the lighting system as provided.
- 2. Lighting Design Description
 - A. Guiding Criteria
 - 1) The Lessee shall provide a light environment that assists in way-finding and provides adequate illumination for rapid decision-making.
 - 2) The following criteria shall guide the selection of light fixtures:
 - i. LED source, for good photometric performance, consistent light color with good CRI, and low long-term operating cost.
 - ii. Exterior-type construction (UL Wet Location, IP 65). Partially or fully sealed construction improves photometric performance and reduces risk of corrosion or failure due to environmental conditions.
 - iii. Consistent light color (4000K, 70+ CRI) for all fixtures in facility, to the degree practical, in support of a finished and inviting appearance and to assist motorists in recognizing their vehicles.
 - B. Parking Deck Lighting System
 - 1) LED-based purpose-designed system, Pendant mount, Type 5 distribution, square or rectangular pattern oriented for improved shielding in drive-lane direction of travel.
 - 2) Fixtures adjacent to perimeter in bays not having opaque walls shall have glare shields by fixture vendor configured to limit the direct illumination incident on a

vertical surface at the edge of the parking deck to no more than 0.2 foot-candles, in order to reduce the visibility of the lighting system from the outside.

- C. Roof Deck Lighting System
 - 1) Similar fixtures and layout to interior deck lighting. The Lessee shall provide secondary structure as required to location fixtures. Secondary structure finish shall comply with specification requirements for primary exterior structure. Fixture mounting hardware shall be provided by fixture vendors, and shall be finished to match fixtures. All fixture mounting fasteners shall be type 316 stainless steel.
- D. Pedestrian Lighting System
 - 1) LED-based pendant-mount exterior-type downlights adjacent to stairs and at stair landings
 - 2) LED-based pendant downlights at elevator and bridge landing circulation.
 - 3) Fixture supports as per requirements of section 4.C.1 above.
- E. Architectural Screen Lighting
 - 1) LED-based (RGBW color changing) linear narrow-beam façade-grazing uplights, bracket mounted within architectural troughs integrated with perimeter screen system. Fixture power-data cabling daisy-chained between fixtures for limited home-run circuiting and ease of maintenance.
 - 2) Similar system having wider distribution integrated with projected landings to elevator doors to express screen lighting effect at elevator entrances.
- F. Pedestrian Sidewalk Lighting
 - 1) LED-based bracket-mount exterior-type area lights integrated with exterior screen support structure and surface-mounted to east perimeter screen wall. Distribution Type 1 and 2.
- G. Lighting Control
 - 1) Conventional circuit-based control for timeclock/photosensor operation, maintenance use, and local daylight harvesting.
 - Parking Deck Lighting (all levels): Local motion sensors at each fixture, 30' range, adjustable delay, dual-level switched (100%-50%). Central photo-sensor enables operation of lighting within perimeter zones (within 30' of perimeter) whenever daylight illuminance is <u>less</u> than setpoint, with time delay.
 - 3) Stair Lighting (including walkway lighting adjacent to elevator/bridge entrances): Daylight harvesting control: Roof photo-sensor (open loop control) operates on-off

control at threshold set to ensure lights on whenever daylight illuminance is <u>less</u> than setpoint, with time delay.

- 4) Level Auto Entrance Parking Bay Lighting: Basic system operates with similar lighting in parking bays. Daylight only system (per designations on Preliminary Drawings in LGA-124.207R subject to Port Authority-approved modifications in the BOD): Roof photo-sensor (open loop control) operates on/off control at threshold set to ensure lights <u>OFF</u> whenever daylight illuminance is less than setpoint, with time delay.
- 5) Architectural Screen Lighting / Elevator Entrance Accent: Dusk-dawn operation via roof-mounted photocell or astronomical timeclock. Displayed color selection via controller and software provided by system vendor. Controller shall have capability to synchronize color selection operation with similar system installed in East Garage, via secure IP connection.

28.3.13 Electronics and Communication Systems

Systems shall be an extension of and be in full compliance with the New CTB Systems as defined by requirements in Section 24.3.6.3.

28.3.14 Sustainability

Refer to Section 8.

28.3.15 Traffic

Design Criteria

- A. Geometric Design Criteria for parking spaces, aisles, ramps, etc.
 - (1) Parking Stalls:
 - (a) Regular Stalls: 18 feet x 8.5 feet (L x W) minimum for 90 degree parking.
 - (b) ADA Parking Stalls: 18 feet x 8.5 feet, with at least one 5 foot wide aisle parallel to each stall. The pedestrian aisle shall be marked and shall be of equal length to the stall. Refer to Preliminary Drawings for Contract LGA124.207S titled, "LaGuardia Airport Design and Construction of the West Parking Garage".
 - (c) Van Accessible ADA parking Stalls: 18 feet x 11 feet, with at least one 5 foot wide aisle parallel to each stall. The pedestrian aisle shall be marked and shall be of equal length to the stall. Preliminary Drawings for Contract

LGA124.207S titled, "LaGuardia Airport Design and Construction of the West Parking Garage".

- (2) Drive aisles:
- (a) Floor drive aisles: 24 feet wide minimum adjacent to 90 degree parking.
- (b) Ramp drive aisles:24 feet wide minimum (with parking)
- (3) Minimum Vertical Clearance (Posted)
- (a) Ground Level: 9'-3"
- (b) All other levels: 7'-9" (All levels require a 3" buffer between posted sign clearance and vertical clearance of any overhead obstructions including signs, pipes, etc.)
- (4) Design Vehicle
- (a) Upper Floors: AASHTO "P" Vehicle
- (b) Ground Floor: AASHTO "P" Vehicle; ADA Compliant Van
- (5) Vehicle Ramp Grades:
- (a) Ramps with Parking: 5% Max

B. Sight Lines

Shear walls or any sight line obstruction shall not be located within the first 4 parking stalls where drive aisles intersect to improve visibility and sight lines. All shear walls shall include openings for improved visibility.

- C. Permanent and Temporary Signing
 - (1) All Regulatory signs shall be fabricated and installed in accordance with the Federal Highway Administration (FHWA) "Manual of Uniform Traffic Control Devices (MUTCD) for Streets and Highways", latest edition, except as noted.
 - (2) Vehicle and pedestrian wayfinding signs shall be designed, fabricated, and installed in accordance with the PANYNJ Airport Roadway Sign Design Manual. Sign mounting details are available in as detailed in the Preliminary Drawings for Contract LGA 124.207S titled, "LaGuardia Airport Design and

Construction of West Parking Garage" subject to Port Authority- approved modifications in the BOD.

- D. Permanent and Temporary Pavement Markings
 - (1) Pavement marking design, configurations, and materials shall be in accordance with the PANY&NJ Traffic Engineering Design Guidelines, Standard Details, and specifications, except as noted.
 - (2) All pavement markings shall be installed in accordance with the Federal Highway Administration (FHWA) "Manual of Uniform Traffic Control Devices (MUTCD) for Streets and Highways", latest edition, except as noted.
 - (3) Provide a 2' wide hatched access area to parking spaces located next to physical walls.
- E. Traffic Related Safety Devices

Devices include vertical clearance detection, bollards, wheel stops, guiderails, and barriers. Design and device installation shall be in accordance with New Improvements Specifications, Reference Documents and Applicable Standards.

- (1) Vertical Clearance (Over-height) Detection
 - (a) Over-height detection shall be installed on the ground floor at all entrances to the garage, and at ramp to the upper levels. The detection device shall conform to the Preliminary Drawings for Contract LGA124.207S titled, "LaGuardia Airport Design and Construction of the West Parking Garage". An equivalently functioning device may be substituted with the approval of the Port Authority. Port Authority Approval must be received prior to equipment purchase and installation.
- (2) Garage Interior Railings and Vehicle Barriers
 - (a) Interior railings and vehicle barriers shall be a minimum 42" in height. The spacing between horizontal elements of the railings/barriers shall be 4" or less.
- (3) Bollards
 - (a) Bollard placement shall be in accordance with the PANY&NJ Traffic Engineering Design Guidelines and the PANY&NJ Standard Details.
- F. Parking Guidance System
 - (1) The Intelligent Parking Guidance System (IPGS) shall be used to provide motor vehicle operators an indication parking availability and control the

Variable Message Signs being furnished as part of the D&C Work with respect to the New Improvements. The system shall conform to the criteria and requirements of the New Improvements Specifications Section 11151 – Parking Guidance Signs, as well as the Codes and Standards referenced in Section 16.3.1 and Section 30.1.

- (2) Tower VMS shall be ground mounted. Two line VMS shall be ceiling mounted at each level and ground mounted at the roof level.
- G. ADA Compliance

The garage shall provide parking spaces, passageways and clearances compliant with ADA Guidelines, latest edition.

- H. Designated Parking
 - (1) Provisions shall be made for Low Emitting/ Fuel Efficient Vehicle (LE/FE) only designated parking. See Sustainability for criteria. Within these designated spaces or in addition to them, provisions shall be made for the inclusion of electric vehicle charging stations. The number and installation requirements shall be determined based on coordination with the Port Authority.
 - (2) Five (5) electric vehicle charging stations shall be placed in the garage. Installation requirements shall be determined based on coordination with the Port Authority. The Garage shall have power provisions to add an additional ten (10) charging stations sometime in the future.
 - (3) Provisions shall be made for ADA accessible parking spaces, in accordance with the ADAAG, latest edition. Van Accessible parking spaces shall be grouped on the first (ground) level.
- I. Maintenance of Traffic (M.O.T.) and Work Area Protection
 - (1) M.O.T. and work area protection shall be provided to accommodate all work items within the scope of the Project, including but not limited to the following:
 - (a) M.O.T. required to remove and also reinstall the overhead sign structure as indicated in the Preliminary Drawings for Contract LGA-124.207S titled, "LaGuardia Airport Design and Construction of the West Parking Garage" subject to Port Authority-approved modifications in the BOD;
 - (b) M.O.T. required for pedestrian detours necessary to provide circulation around the work area during construction, and to and from the Garage after completion; and
 - (c) M.O.T. required for any utility work within the public traveled way.

- (2) All temporary traffic control and work area protection devices shall be fabricated and installed in accordance with Part 6 entitled "Temporary Traffic Control" of the Federal Highway Administration (FHWA) "Manual of Uniform Traffic Control Devices (MUTCD) for Streets and Highways", latest edition, except as noted.
- (3) See Division 1 clause entitled "Maintenance of Traffic and Work Area Protection" for additional requirements.

28.3.16 System Testing and Commissioning

All equipment and newly installed systems shall be tested as required by all Applicable Laws and Applicable Standards.

Commissioning and Activation of all facilities that are part of the Construction Project shall be in accordance with Section 25 of the Design and Construction Requirements in the Requirements and Provisions for Work for the CTB Facilities.

28.3.17 Mechanical - HVAC

Design Criteria

The parking garage shall be naturally ventilated per NYCBC Section 406.3.3. A minimum of 50% wall openings shall be achieved in compliance with NYCBC Section 406.3.3.1 so that no mechanical ventilation is required.

Rooms requiring AC year round shall be served by DX AC units.

Temperature and humidity conditions:

Outside design conditions

Winter *13°F. dry bulb (DB) Summer *89°F. dry bulb / *73°F. wet bulb

* Based on ASHRAE 90.1, Latest Edition, 1% design conditions for New York City, NYCBC and the NYC Energy Conservation Construction Code

Indoor Conditions

The HVAC systems shall be designed to provide 75°F DB and a 50% RH (plus or minus 10% during summer months and a 70°F DB (no humidity control) during winter months in all areas, except the following:

	Summer		Winter	
	Temperature Deg F (DB)	Relative	Temperature Deg F (DB)	Relative
Area Designation		Humidity		Humidity
		(±10%)		(±10%)
Electrical Equipment Rooms	(1)	-	60	-
Substation	(1)	-	60	-
Backup Distribution Rooms	(1)	-	60	-
Mechanical Equipment Rooms	(1)	-	60	-
Fuel Storage Tank Room	(3)	-	60	-
Electronics Equipment Room	72	50	72	40
Radio Equipment Room	72	50	72	40
Sewer Ejector Room	(1)	-	60	-
Fire Service Room	(1)	-	60	-
Water Service Room	(1)	-	60	-
Valve Control Room	(1)	-	60	-
Elevator Equipment Room	85(4)	50	85(4)	50
Janitor Closets	(1)	-	60	-
Staff Facility Room	75	50	60	50
Toilets	75	50	60	-

(1)

Ventilated Only: Ventilation rate based on maintaining ambient temperature +10 degrees

(2)

Ventilation rate will be based on the New York City Mechanical Code Section MC 404 and arranged to operate automatically upon detection of carbon monoxide level of 25 ppm.

(3)

The Fuel Oil Storage Areas Ventilation shall be in accordance with Section 1305.13.3.4 of the New York City Mechanical Code.

(4)

Elevator Equipment Rooms will be air conditioned to a maximum temperature of 85°F, or as recommended by the equipment manufacturer.

Design and Construction Requirements

29.0 BUILDING 30

29.1 General

This Section 29 provides design and construction detail requirements regarding the interior improvements to Building 30.

This Section 29 also specifies the assumptions, references and design criteria for the electronics design within the area of work defined at Building 30, formally known as the Police Emergency Garage, including: structured cabling, IT consolidated network, radio, wireless, IP phone systems, security, and the cabling infrastructure.

29.2 Scope

The Lessee shall be responsible for the completion of design and construction of the Building 30 improvements, as detailed in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements and coordination/assistance with relocation of Port Authority staff.

The Lessee shall provide systems as listed in this Section 29 and as shown on Sheet A-400.00 and A-401.00 of the Building 30 Plans and Documents for the New Improvements to support Building 30 and its associated facilities.

For the Operations Command Center (OCC) shown as Room 05 on Sheet A-200.00, the Lessee shall complete a Concept of Operations plan in conformance with the requirements of Section 24.3.3. The Concept of Operations for the OCC shall be developed in conformance with the Port Authority Concept of Operations Development Guide (ConOps Lite) and may be included in the overall Lessee Concept of Operations for Electronics and Communications Systems. The removed sections, such as Operation scenarios, must be included in the overall Lessee Concept of Operations cenarios, must be included in the overall Lessee Concept of the OCC shall be coordinated with the Port Authority's operations personnel. The final Lessee Concept of Operations for the OCC shall be subject to Port Authority Approval (by the Port Authority's operations personnel) prior to ordering of equipment or installation.

The Lessee shall be responsible for the design, construction and installation of the electronics and communication systems for the facilities constructed as part of the Construction Project as shown, but not limited to, this Section 29. The Lessee shall ensure these systems conform to the requirements of this Section 29 and of Section 24 for all elements of the Construction Project.

Asbestos abatement in Building 30 will be performed by the Lessee in accordance with the Additional ACM Allowance provisions in the Lease.

29.3 References

- The room and device location requirements listed throughout Section 29 are based on revised Building 30 floor plans as directed by LGA Management and designed under "LGA Building 30 First and Second Floor Renovations" by Jeffrey Berman Architects dated November 2013.
- Existing conditions and Outside Plant connectivity based on information gathered as a result of a PANYNJ EADD Stage 1 Report entitled "Decommissioning of the Police Emergency Garage" issued February of 2013 under PID#12723000.

29.4 Requirements

29.4.1 Program

Building 30 is located on the Marine Terminal Road at La Guardia Airport.

Building 30 is a one-story metal clad steel-framed structure with a partial second floor. A portion of the building includes concrete slabs supported by encased steel beams and columns. The garage has a metal deck roof supported by steel framing. The first floor is approximately 105' long by 65' wide at the office area and 75' long by 50' wide at the garage. The second floor is approximately 85' long by 45' wide. The building was used for offices of the Airport Police and storage of rescue vehicles. The building was renovated and expanded in the early 1980's.

The proposed used for this structure is to house Port Authority Operation Unit 303. Operation

Unit 303 is presently located in the Existing CTB and needs to be relocated from the Existing CTB to Building 30 in order to support future CTB redevelopment. Operation Unit 303 consists of approximately 67 people and its daily function is to coordinate, direct and respond to airside and landside operational needs of LaGuardia Airport.

The scope of work includes demolition of existing interior partitions and construction of new Architectural and MEP systems all as specified in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements. The retrofitting of the first floor includes separating public functions such as Driver Training and FAA Part 139 Kiosk Training from Operational functions by AOA line. The AOA side houses Operation's Control Center (OCC), Conference Rooms, Locker Rooms, Break Room and offices for the Operation's staff. In order to make this work ADA compliant the work also includes adding an elevator for second floor handicap access. Design shall be in accordance with New Improvements Specifications, Reference Documents and Applicable Standards. Contract documents shall be prepared in accordance with the E/A Design Division CAD Standard Manual, latest edition.

Extent of removals are as dimensioned in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements.

The program requirements for elements and spaces are as generally dimensioned in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements. The Lessee shall develop final plans based on meetings and discussions with Port Authority stakeholders.

The requirements for the Operational Control Center (OCC) equipment to be relocated to Building 30 are as generally programmed in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements (A400-A401). OCC layout shall be in accordance with the Concept of Operations Building 30-OCC. The final OCC configuration shall be coordinated with the Port Authority.

The Lessee shall provide MDF and Communications Data Room square footage space requirements and layout per Building 30 Port Authority approved layout, Building 30 Systems Matrix and in accordance with the Concept of Operations Building 30- OCC. The Lessee shall calculate and provide the space necessary for the accommodation of head end equipment and servers for the systems to be relocated to Building 30.

29.4.2 Codes and Standards

The design and construction of the entire installation shall comply with the NYC Construction and Building Codes, the TCRM published by the Port Authority, the Fire Code of New York

City, all other Applicable Standards including, but not limited to, those listed on Building 30 - Design Drawings as detailed in the Available Documents, Section 6, Building 30 Plans and Documents for the New Improvements.

In addition, all systems shall be designed and shall perform in accordance with the relevant Applicable Standards. The designer shall utilize all Applicable Law(s), guidelines and Applicable Standards necessary for the proper design of each system and shall list all standards applied to the design in any applicable Design Documents and Construction Documents. The guidelines and standards included in this document shall be interpreted as requirements.

The design and construction shall be performed in accordance with the Applicable Standards, including, but not limited to, the following:

- 49 CFR Part 1520 Protection of Security Sensitive Information
- 49 CFR Part 1540 Civil Aviation Security: General Rules
- 49 CFR Part 1542 Airport Security
- Access Control System Units, UL 294 (1999)
- All applicable federal, state, and local codes
- American National Standards Institute (ANSI)
- ANSI/IEEE Standards
- Anti-Theft Alarm and Devices, UL 1037 (1999)

- Building Code of the City of New York (Latest edition)
- Building Industry Consulting Service International, Inc. (BICSI)
- Central Station Burglar Alarm Units, UL 1610 (1998)
- Code of Federal Regulation (CFR) CFR Title 49, and associated Federal Aviation Regulation (FAR) Documents
- Comply with the latest Transportation Security Administration (TSA) requirements.
- Electrical Testing Laboratories, Inc. (ETL)
- Electronic Institute of America (EIA)
- Federal Aviation Administration (FAA)
- Federal Communications Commission (FCC)
- Fire Department of New York (FDNY), including latest bulletins
- Holdup Alarm Units and Systems, UL 636 (1996)
- Installation and Classification of Mercantile and Burglar Alarm Systems, UL 681 (1999)
- Institute of Electrical and Electronic Engineers (IEEE)
- International Building Code (IBC)
- National Electric Code, (NEC)
- National Electric Safety Code (NESC)
- National Electrical Manufacturer Association (NEMA)
- National Fire Protection Association National Electric Code, NFPA 70 (2005) Code for Safety to Life from Fire in Buildings and Structures, NFPA 101 (2001)
- National Fire Protection Association (NFPA) Regulations
- PANYNJ Engineering Design Guidelines: Electronics, Electrical, or other applicable disciplines
- PANYNJ Technology Services Department (TSD) standards
- PANYNJ "Standards & Guidelines for Port Authority Technology," version 8.3, dated August 30,2011
- PANYNJ "Agency CCTV Standards" version 5.1 (or latest version)
- PANYNJ Concept of Operations Development Guide
- Port Authority Information Security Handbook
- Power Supplies, UL 1012 (2005)
- Printed Circuit Boards, UL 796 (1999)

- Proprietary Burglar Alarm Units and Systems, UL 1076 (1995)
- Recommended Practices for Surge Voltages in Low Voltage AC Power Circuits, ANSI C62.41 (1991)
- Telecommunications Institute of America (TIA)
- The Americans with Disabilities Act (ADA)
- Underwriters Laboratories Inc. (UL)
- Unified Facilities Criteria (UFC)
- FEMA Requirements.

All systems designated to be designed shall be designed in accordance with the Port Authority's New Improvements Specifications and requirements as listed under Section 24.

29.4.3 Sole Source Requirements

The Lessee shall contract with the following for the following systems (no substitutions are permitted).

- For CCTV, Emergency Intercoms and Access Controls including all material, labor, supervision, software programming, and database configuration for the new Security System. This system will provide for alarm monitoring and access control integration, related to the LaGuardia Airport Redevelopment Program. To support these requirements, contract KRATOS/HBE
 - KRATOS/HBE shall provide /install security hardware, provide database back up, make all database changes, remove all unused software, correct/ remove any related points referenced in the existing system.
- The Port Authority shall contract with the Port Authority's Perimeter Intrusion Detection System (PIDS) provider.
- This business relationship in any of the above cases may or may not be in effect upon commencement of this project. The Lessee will be required to form a business relationship with any new system provider/maintainer.

29.4.4 Structured Cabling (General)

The Structured Cabling System for the building shall consist of the pathways and spaces (the infrastructure) and cabling that will support a number of Technology Systems (i.e. communications and low-voltage systems) required within the facility and communications to the facility through an outside plant communications duct bank. The Structured Cabling System must be designed to support these systems during the infrastructure's working life and shall

conform to the Port Authority (PA) communications infrastructure requirements noted in Section 24.3.6.3.

29.4.4.1. Structured Cabling System (External)

Recognized as Outside Plant systems (OSP).

The Lessee shall connect the OSP Cabling Backbone utilizing these ductbank systems to Port Authority communication manholes in accordance with the LGA Fiber Optic Network Master Plan (latest edition) and in coordination with parallel PANYNJ programs providing ductbanks and similar infrastructure which connect other portions of the facility.

The Lessee shall extend the existing Fiber Optic connections supporting the SONET Node from their current location to their new location within Building 30. Connection currently enters the Building 30 garage from landside handhole HH-29D1.

In addition to the work described above in Section 29.6.2.3, the Lessee shall provide (2) spare 4" trade size conduits each with 200lb pull-strings from the point where the conduit from HH-29D1 enters the building to the new MDF for future use.

All communication connections and systems listed in this Section shall comply with the requirements listed in Sections 10 and 24.3.6.3.

29.4.4.2. Structured Cabling System (Internal)

The Structured Cabling System shall consist of both copper lines and fiber optic cable as needed and determined below and in full conformance with requirements as defined in Section 24.

Refer to list below for individual room requirements.

Room	Structured Cabling Requirement		
First Floor			
Existing Vestibule 01	1 (1) port 1 voice for Courtesy Phone on wall.		
Driver Training 02	4 (4) port 2/2 data/voice in furniture.		
Conference Room 03	2 (4) port 2/2 data/voice in furniture		
	1 (4) port 2/2 data/voice in wall for monitor/screen/system.		
Training Kiosks 04	40 (2) port 1/1 data/voice in kiosk.		
Ops Comm Center 05	24 data and 24 voice in center of space terminated into separate patch panels to be mounted in console system.		
	12 (4) port 2/2 data/voice evenly distributed along walls.		
	2 (4) port 4 data in ceiling above console location.		

Office 07	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 08	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 09	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 10	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 11	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 12	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 13	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Staff Cubicles 14	1 (4) port 2/2 data/voice for each of 6 stations in furniture.
Office 15	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Room	Structured Cabling Requirement
Staff Cubicles 17	1 (4) port 2/2 data/voice for each of 4 stations in furniture.
Office 18	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Reception 19	2 (4) port 2/2 data/voice for reception desk
	1 (4) port 2/2 data/voice on back wall for office machines
Office 20	3 (4) port 2/2 data/voice evenly distributed along walls without
	doors.
Office 21	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Breakroom 26	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Staff Cubicles 27	1 (2) port 2 data mounted on wan to support video mointor.
Copy/Fax 28	1 (4) port 2/2 data/voice on back wall for office machines
Firearms 30	1 (1) port 2/2 data voice on back wan for onlee machines.
Flevator Lobby 31	1 (1) port 1 voice for Courtesy Phone on wall
Elevator Machine 32	1 (2) port 1/1 data/voice for elevator cab communications
	1 (2) port 1/1 data/voice for crevator cab communications.

Second Floor	
Office 33	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 34	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Office 35	3 (4) port 2/2 data/voice evenly distributed along walls without doors.
Conference 36	2 (4) port 2/2 data/voice in furniture
	1 (4) port 2/2 data/voice in wall for monitor/screen/system.
Clerical 37	1 (4) port 2/2 data/voice for each of 4 stations in furniture.4 (4) port 2/2 data/voice evenly distributed along walls.
Locker 38	1 (1) port 1 voice for Courtesy Phone on wall.
Locker 41	1 (1) port 1 voice for Courtesy Phone on wall.
Conference 42	2 (4) port 2/2 data/voice in furniture
	1 (4) port 2/2 data/voice in wall for monitor/screen/system.
Conference 43	2 (4) port 2/2 data/voice in furniture
	1 (4) port 2/2 data/voice in wall for monitor/screen/system.

Additional requirements are as follows:

- The existing SONET Node cabinet and supporting elements within the existing garage space will be relocated by PANYNJ TSD to a new location within the building. The Lessee shall provide a telecommunications room listed as the building MDF which shall meet the Electronics Space Requirements as defined in Section 29.6.4, which shall support this relocated Node.
- The Fire Alarm System cabinet and supporting elements within the existing garage space must be relocated within the building to a telecommunications room listed as the building MDF which shall meet the Electronics Space Requirements as defined in Section 29.6.4.
- Inbound OSP ductbanks and communications connections shall be extended from their current position within the building to the telecommunications room listed as the building MDF which shall meet the Electronics Space Requirements as defined in Section 29.6.4.
- Each floor to be provided with an IDF designed to support data and voice distribution to locations on that particular floor. Room must meet the Electronics Space Requirements as defined in Section 29.6.4.

All communication connections and systems listed in this Section shall comply with the requirements listed in Section 24.3.6.

29.4.5 Electronic Space Requirements

An electronics space is any space specifically intended to support passive and/or active components as required by the various electronics systems defined herein. Examples of such spaces include but may not be limited to: MDF's, IDF's and Communication Utility Entrances

The MDF shall support the following:

- Horizontal or vertical cable distribution of voice and data shall do so utilizing EIA standard 19" rack systems. The number of racks required will be determined based on the Building 30 Systems Matrix to meet the Concept of Operations Building 30, OCC requirements.
- Support for active hardware and equipment used by the systems defined herein shall be done utilizing EIA standard 19" wide by 32" minimum usable depth 42 RU or greater floor standing cabinet enclosure systems. Provide a minimum of 5 cabinets in the MDF.

Each IDF shall support the following:

- Horizontal or vertical cable distribution of voice and data shall do so utilizing EIA standard 19" rack systems. Provide a minimum of 2 racks in the IDF for this use.
- Support for active hardware and equipment used by the systems defined herein shall be done utilizing EIA standard 19" wide by 32" minimum usable depth 42 RU or greater floor standing cabinet enclosure systems. Provide a minimum of 4 cabinets in the IDF.

Data and Voice Cable distribution within Electronic Spaces shall be facilitated by an overhead ladder rack system with a minimum width of 12".

Horizontal Backbone connections for voice and data systems between IDF locations if required by the final design to be facilitated using a ladder rack system.

All communication connections and systems listed in this Section 29.4.5 shall comply with the requirements listed in Section 24.3.5.3.

29.4.6 Grounding

An Electronics Grounding and Bonding System shall be designed and installed for the building. This grounding system shall provide a uniform ground within all electronics spaces, to ensure safe and reliable operation of the communications and low-voltage equipment and systems. Grounding shall meet the requirements and practices of applicable authorities and codes and conform to applicable requirements as listed in Section 24. In addition, the electronics grounding and bonding system shall conform to the ANSI-J-STD-607-A "Commercial Building Grounding (Earthing) and Bonding Requirements for Electronics" standard.

29.4.7 Redundancy

The Lessee shall comply with the requirements listed in Section 24.3.6.3.

29.4.8 PAWANET

The Lessee shall coordinate all work related to the relocation of the SONET Node with PANYNJ TSD.

PAWANET connectivity at Building 30 is accomplished through an existing SONET Node located in the garage area of the building. The node supports a network which provides the necessary bandwidth for various communications systems to distribute and share data throughout the Premises. The network forms the electronic infrastructure allowing different communications systems to effectively share bandwidth using various protocols.

The applications that are currently running on the LGA network that would be needed for Building 30 are varied and include but are not limited to telephone systems security cameras, and PANYNJ data connections.

Work on the specific hardware components of the PAWANET system including the SONET Node relocation and potential upgrade is by PANYNJ TSD.

29.4.9 Security Systems

29.4.9.1. Perimeter Intrusion Detection System – PIDS

The PIDS scope is governed by Section 10.11 of the Lease and Section 24.3.5.2 of the CTB RPW is incorporated in toto.

29.4.9.2. Video Surveillance System – VSS

The design shall provide an IP (Internet Protocol) Power over Ethernet supported video surveillance system. The design will be an expansion off an existing centralized Verint / Nextiva video control and distributed recording system. This system will be based off the PANYNJ system standard and will support the program in concordance with PANYNJ and TSD policy as well as meeting any requirements as defined by the authority under a delivered Concept of Operations.

Systems shall be connected for purposes of monitoring and control and be in full compliance with the New CTB Systems as defined by requirements in Section 24.3.5.2.

29.4.9.2.1 Video Surveillance System Cameras

Surveillance cameras and types of areas are dependent on the physical configuration of the project elements, the security needs of the Lessee and the Port Authority.

Video Surveillance shall be provided as follows:

• In Elevator Lobby 31 facing doors to Garage.

- In Existing Corridor outside Existing Mechanical Room facing Landside Single Door at end of hall.
- Outside Existing Vestibule 1 facing approach walk.
- Outside of Airside Door next to Ops Comm Center facing exit from door from Hallway 16.
- Two (2) cameras on airside of building exterior monitoring ramp.
- Back to back ceiling mount cameras in center of garage bays monitoring bay doors.

Systems shall be in full compliance with the New CTB Systems as defined by requirements in Section 24.3.5.2.

The cameras for the VSS shall be designed and installed by the Lessee, after coordination with the Port Authority (including PAPD) on the type and location of each camera. The cameras for the VSS shall comply with the Port Authority CCTV Standards and shall be integrated (by the Port Authority) into the Port Authority's Video Management System.

The CCTV images associated with the VSS shall only traverse the Port Authority network (PAWANET) and be viewable on command by the Port Authority.

29.4.9.2.2 VSS System Network Based Recording

The Port Authority will provide recording equipment for camera systems in the MDF for Port Authority use.

The Lessee to provide all other equipment including, but not limited to, Rack/Cabinet space, UPS and back-up power, conduit, wiring, cameras and mounts, workstations, etc.

Systems shall be an extension of and be in full compliance with Terminal Systems as shown in Section 24.3.5.2.

29.4.9.3. Access Control

The design shall provide an IP (Internet Protocol) based access control system. The design will be an expansion off an existing centralized Lenel digital access control system. This system will be based off the PANYNJ system standard and will support the program in concordance with PANYNJ and TSD policy as well as meeting any requirements as defined by the Port Authority under a delivered Concept of Operations.

Access Control shall be provided as follows:

- Ops Comm Ctr and all Communications Rooms doors shall be provided with Card Entry / Request Exit.
- Airside door exiting Hallway 16 shall be provided with Card Entry and Exit and is to be configured as an Emergency Egress Door.
- Elevator Lobby 31 door to Airside shall be provided with Card Entry and Exit.

- Overhead bay door on airside or garage to be provided with door contact for status. Authorized use by key from interior.
- Garage door exiting to Airside shall be provided with Card Entry and Exit.
- Roof Hatch and Roof Access Doors to be provided with door contact for status. Authorized use by key from interior.
- The CAS system will be connected to SONET (or PAWANET if interface is available) by the Port Authority and become an extension of 24.3.5.2.

29.4.10 Fire Alarm and Life Safety Communications

Fire Alarm and Life Safety systems shall be installed according to Section 23.3.3 and in accordance with all Applicable Laws and Applicable Standards. The Lessee installed Fire Alarm systems shall be compatible with Siemens FireFinder XLS Series systems as presently installed at the Port Authority's monitoring locations at LGA Airport.

Siemens FireFinder XLS Fire Alarm System manufactured by Siemens Building Technologies, Inc. is presently replacing the MXL System throughout LaGuardia Airport. Fire alarm equipment to be installed in Building 30 shall become a part of the existing fire alarm system. In order to stay compatible and ensure functionality and seamless Integration, Siemens fire alarm components shall be utilized.

29.4.11 Telephone System

The design shall provide cable infrastructure and outlet support for an IP (Internet Protocol) based digital telephone system to be provided by PANYNJ TSD. The system will be an expansion off the existing LGA system, which in itself is an expansion of the Port Authority Cisco IP Phone System currently maintained by PANYNJ TSD. This system will have the capacity to provide phone service both internally and to direct outside lines for the purposes of supporting staff needs, elevator call phones, and public access such as courtesy phones.

Connectivity shall be provided by the Structured Cabling System (SCS).

The system shall provide for phone connections via the elevator umbilical to cab phones.

System shall provide multi-user conference call sets for conference rooms. The Port Authority shall provide one set for every 100 square feet of conference room space.

System shall provide for an Administrator / Receptionist set for the Receptionist area.

The Port Authority telephones will use the PAWANET to connect to the facility.

Systems shall be an extension of and be in full compliance with Terminal Systems as shown in Section 24.3.5.3.

29.4.12 Emergency Telephones

Emergency telephones shall be provided to report emergency calls to the Port Authority Police Desk.

Emergency telephone calls provided to the Port Authority Police Desk shall be routed over the

PAWANET.

Emergency telephones shall be compatible with PAWANET technology.

Emergency telephones shall be recorded on the Port Authority existing voice recorder system at the Port Authority OCC.

Telephones in elevators shall have the same requirements as Emergency telephones.

Emergency telephones shall be vandal resistant and/or weather proof according to the areas of use. Design shall include illuminations and signage to clearly identify emergency phones from a distance.

29.4.13 Emergency Alert Notification System (EANS).

This is a telephone based system activated from the Control Tower which sends emergency messages to various locations at the airport (e.g. ARFF. Maintenance shop etc.) and also to locations outside the airport such as local FDNY, NYC OEM etc. The Lessee shall extend the existing phone connection from the current entry point within the building to the new location of the Building 30 EANS Phone at the OCC. Connections shall support (1) Master Station and (1) Desk Communicator.

The Lessee shall extend an auxiliary EANS telephone connection into the MDF for future use.

29.4.14 Broadcast Television System

Broadcast / satellite TV provisions shall be provided via satellite connectivity to the facility. It shall be in full compliance with the system provided for the New CTB and as defined under Section 24.

Broadcast Video connectivity between the New CTB and Building 30 shall be fully bidirectional so as to permit emergency messages as defined in Section 24 to be sent to the New CTB. Refer to Section 24.3.5.3, Multimedia Visual Display System.

Broadcast television shall be extended to monitors to be placed in the following locations:

- Ops Comm Center 5 (4) Individual and Independent monitors. Ops Comm Center shall have the ability to generate video signals for the purpose of broadcasting emergency messages as defined in 24.3.5.3 Multimedia Visual Display System
- Breakroom 26 (1) Individual and Independent monitor
- Conference Rooms 3, 42 and 43 (2) Individual and Independent monitors per room.

The broadcast television signal shall be distributed through the structured cable system in each of the IDF's.

The Lessee shall coordinate the channel content of the system with the Port Authority.

Systems shall be in full compliance with the New CTB Systems as defined by requirements in Section 24.3.5.3.

29.4.15 Public Safety Radio

The Port Authority Public Safety Department has a region wide simulcast trunked 800 MHz radio system.

The Port Authority shall perform a Base-Line empirical radio coverage test within the existing Building 30 structure. The Lessee shall perform follow-on verification empirical radio coverage test(s) upon completion of Building 30 renovation. Testing shall be conducted with at least one test point per 100 sq. ft. to document trunking and backup 800 MHz. Levels less than -90 dBm shall require enhanced radio coverage if reliability is less than 97%. If deficient, the Lessee shall provide in-building DAS using NPSPAC limited amplifiers. No frequencies outside the NPSPAC band shall be reradiated.

The radio design shall comply with Motorola R56 standard inclusive of lightning protection, grounding, etc.

Intelligibility shall be 3.4 DAQ at -93dBm or better. Systems shall be an extension of and be in full compliance with Motorola R56 standards inclusive of lightning protection, grounding, etc., and with Terminal Systems as defined by requirements in Section 24.3.5.3.

29.4.16 Building Management System (BMS)

See Section 23.3.2.2 for BMS requirements.

Any wireless communications for BMS shall be provided as a business application as per the "Internet/ Wi-Fi/High Speed Data" system.

29.4.17 SCADA System

SCADA systems have traditionally used combinations of radio and direct wired connections for the remote management or monitoring of equipment and/or systems with the SCADA data traveling over the building structured cabling system.

The Lessee shall provide communication cabling and infrastructure to support the SCADA systems required in Sections 22 and 23 of these Design and Construction Requirements. The SCADA electronic system shall include firewalls that meet Federal standards applicable to protection of critical control systems.

29.4.18 Equipment and System Testing

All equipment and newly installed systems shall be tested as required by all Applicable Laws and Applicable Standards.

Commissioning and Activation of all facilities that are part of the Construction Project shall be in accordance with Section 25 of the Design and Construction Requirements in the Requirements and Provisions for Work for the CTB Facilities.

Design and Construction Requirements

30.0 TRAFFIC AND INTELLIGENT TRANSPORTATION SYSTEM (ITS)30.1 Codes and Standards

The design and construction of Traffic and the ITS shall be performed in accordance with all Applicable Laws and Applicable Standards, including, but not limited to, the following (and their replacements):

- ACRP Report 25, Volume 1: Airport Passenger Terminal Planning and Design
- AASHTO: A Policy on Geometric Design of Highways and Streets
- AASHTO: GL-6 Roadway Lighting Design Guide
- AASHTO: Roadside Design Guide
- AASHTO: Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 5th Edition, 2009
- AASHTO: Standard Specifications for Highway Bridges
- FHWA: Manual on Uniform Traffic Control Devices (MUTCD)
- FHWA: Standard Highway Signs
- FHWA: Traffic Monitoring Guide
- PANYNJ Intersection Signalization Procedure
- PANYNJ Traffic Engineering CADD Graphic Standards
- PANYNJ Traffic Signal Design and Drawing Preparation Guidelines
- PANYNJ Traffic Standard Details and Specifications
- PANYNJ Roadside and Median Barrier Design Guide
- PANYNJ Airport Roadway Sign Design Manual
- PANYNJ Manual for Pedestrian Signing & Wayfinding
- PANYNJ ITS Design Guidelines
- PANYNJ LaGuardia Airport Master Plan
- Traffic Detector Handbook
- Transportation Research Board Highway Capacity Manual
- Applicable FAA Standards
- Applicable ADA standards
- National Electrical Manufacturers Association
- Standard for Traffic Control Systems (Publication No. TS-1)

- Standard for Traffic Control Assemblies (Publication No. TS-2)
- NEMA TS4: Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements
- NEMA 250: Enclosures for Electrical Equipment (100 Volts Max)
- National Transportation Communications for Intelligent Transportation
- Systems Protocol (NTCIP) Standards: NTCIP 1201 Global Object Definitions, NTCIP 1203 Object Definitions for Dynamic Message Signs, and NTCIP 2001 Class B Profile
- Standards for Enclosures for Electrical Equipment (Publication No. 250)
- Standards for Wiring Devices Dimensional Requirements (Publication No. WD6)
- Underwriters Laboratories Inc.
- UL 467 Grounding and Bonding Equipment
- Standard 802.15.4: Wireless Medium Access Control and Physical Layer Specifications for Low-Rate Wireless Personal Area Networks, Institute of Electrical and Electronics Engineers (IEEE).

30.2 Traffic Planning and Design Criteria

30.2.1 Landside

- A. The Port Authority has adopted Level of Service (LOS) C/D as the design service level threshold for the on-airport roadways due to the time-critical nature of airport-related travel and the general lack of alternative travel paths on-airport roadways. Upper-bound threshold values for LOS (defined by the flow at the transition point to the next LOS, e.g., LOS C to LOS D) are to be derived for each key segment based upon service volume information provided in the Highway Capacity Manual, 2010 ACRP Report 40, and airport specific values provided by the Port Authority. Terminal roadway analyses must consider the specific geometry of each segment, including the number of lanes, design speed, the effect of heavy vehicles and the presence of weaving movements. For signalized and non-signalized intersections, the traffic analysis must include the volume to capacity (v/c) ratio, average delay, and approach queue lengths. The anticipated queue length at an intersection shall not be of a length to interfere with the operation of upstream intersections or the terminal frontages.
- B. Traffic capacity analysis of the future airport roadway plan (roadways, intersections and frontages) shall be performed based upon Highway Capacity Manual procedures, 2010 ACRP Report 40, and using VISSIM software version 5.4 and SYNCHRO software version 8.0. The analysis shall be performed for the airport peak hours and peak periods. The AM peak hour (7:30am-8:30am) and

PM peak hour (3:30pm-4:30pm). The AM peak period (6am-10am) and PM peak period (3pm-7pm) peak periods.

- C. Design Speed
 - On-airport roads: minimum 20 mph
 - Ramps to/from GCP: minimum 35 mph; desirable 40 mph
 - Airport roadways shall meet the peak hour (AM & PM) traffic demands for

Terminals A, B, C & D based on design for 34 MAAP passengers

- Provision of Ground Transportation facilities located at the CTB at grade
- ROWs not to preclude future light rail or heavy rail access to the CTB and east end Terminals.
- Any loading dock provided shall have a full width dictated by the maneuvering of a WB-62 design vehicle truck (i.e., 90-degree turn).
- Optimize free flowing traffic movements throughout the terminal roadways where possible
- Clear and free-flowing access from the Grand Central Parkway to the terminals

30.2.2 Frontage Roadway Layout

- A. The Lessee shall provide 900 linear feet of Departures curb frontage; 900 linear of Arrivals curb frontage and 900 linear feet of HOV frontage.
- B. Arrivals and Departures frontage roadways shall be 49 feet wide.
- C. Arrivals frontage roadway width shall consist of:
 - two 11-ft. drop off/pick up lane,
 - two 12-ft. bypass lanes,
 - one 3-ft. outer shoulders.
- D. Departures frontage roadway shall consist of:
 - two 11-ft. drop off/pick up lane,
 - two 12-ft. bypass lanes,
 - one 3 ft. outer shoulders.
- E. The Ground Level/HOV frontage shall be 52 feet wide and shall consist of:
 - one 10-ft. drop off/pick up lane,
- two 12-ft. bypass lanes,
- one striped 3-ft. median,
- one 12-ft. HOV/bypass lane,
- one 3-ft. shoulder.
- F. See Preliminary Frontage Analysis Summary Tables in Attachment 4.
- G. The Lessee shall provide ADA passenger loading and unloading zones along the terminal frontages as shown in Exhibit A-"Terminal Frontage ADA Passenger Loading and Unloading Zone" in Attachment 5.
- H. Pedestrian frontage sidewalks shall be a minimum width of 30-ft.
- I. Pedestrian frontage islands shall be a minimum width of 30-ft.

30.2.3 Pedestrian & Bicycle Access

Pedestrian and bicycle access shall be provided in conjunction with airport and city bus stop locations. The Lessee shall allow for pedestrian access to the LGA Airport from across the Grand Central Parkway from 94th St and 102nd St, and pedestrian movement around airport between Terminals and facilities.

- A. Functional Requirements
 - 1. City Bus Stops:
 - Existing stop at the intersection between 23rd Ave. and Ditmars Blvd. to remain
 - Existing stops at Terminal C and D to remain
 - New stop at new CTB HOV frontage
 - New stop at 94th street off ramp
 - 2. Airport Bus Stops:
 - Existing stops at Terminal C and D to remain
 - New stop at new CTB HOV frontage
 - New stop at 94th street off ramp
 - 3. Pedestrian Access:
 - Provide pedestrian access to terminals from 94th Street and 102nd St.
 - 4. Bicycle Access:
 - New bicycle storage at the existing bus stop at west end of Terminal C frontage.

New bicycle storage at the new bus stop at 94th street off ramp.

30.2.4 Taxis

- A. New taxihold for New CTB to be located to provide quick access for the taxis to reach the new terminal arrivals curbside.
- B. New taxihold for New CTB shall provide 300 spaces.

30.3 Roadway Geometric Design Criteria

- A. Roadway Widths
 - 3 Lanes = 42 ft. (3-12 ft. lanes; 2-3 ft. shoulders)
 - 2 Lanes = 30 ft. (2-12 ft. lanes; 2-3 ft. shoulders) subject to exception to accommodate sidewalk directly to Delta Terminal C from 102nd Street. Any variation from Section 30.3 of this RPW shall be presented to the PA for review and approval.
 - 1 Lane = 21 ft. (1-15 ft. lane; 2-3 ft. shoulders)
- B. Curve Widening

Curve widening shall be applied over the length of the horizontal transition curve. If horizontal transition curves are not used, curve widening will be applied over the super-elevation runoff length. The design widths for curve widening will follow latest *AASHTO: A Policy on Geometric Design of Highways and Streets*.

C. Shoulders

At Grade and On Structure – provide a minimum of 3 feet paved shoulders before non-mountable and mountable curbs (subject to exception to accommodate sidewalk directly to Delta Terminal C from 102^{nd} Street). Any variation from Section 30.3 of this RPW shall be presented to the PA for review and approval.

D. Sidewalks

Sidewalks shall be a minimum 10 feet wide except along terminal frontages. Any change in sidewalk width shall be presented to the Port Authority for review and approval.

Frontage sidewalks shall be designed as part of the New CTB.

E. Fixed Roadside Objects

- Maintain proper roadway clear zone free of any obstructions, where possible.
- On structures, fixed objects must be located behind or atop the structure rail so that the rail has a smooth surface that will not snag errant vehicles. On grade, proper protection or sufficient roadside clearance to fixed objects shall be provided as required to protect vehicles and pedestrians from existing and proposed fixed roadside objects. Impact attenuators shall be installed at the gore areas of diverging roadways on structures and on grade.
- See PANYNJ Roadside and Median Barrier Design Guide.
- F. Vertical Clearance

The following minimum clearances shall be provided except as required to comply with the Security Performance Requirements in Section 20 of this RPW:

Item	Minimum Vertical Clearance
Roadway	14.5 ft.
Overhead Sign Structure	15.5 ft.
Overhead Traffic Signal	15.5 ft. minimum; 17.5 ft. maximum

G. Design Vehicle

The following design vehicles shall be used for geometric design of roadways:

- Terminal Roadways Coach Bus
- Taxi Ramps and Roadways AASHTO Single Unit Truck (SU-30) design vehicle.
- H. Parking
 - Regular Parking Stall Dimensions: Minimum 8.5 feet x 18 feet (W x L).
 - Regular ADA Parking Stall: 8.5 feet x 18 feet, with at least one 5 foot wide aisle parallel to each stall. The pedestrian aisle shall be marked and shall be of equal length to the stall.

- Van Accessible ADA Parking Stall: 11 feet x 18 feet, with at least one 5 foot wide aisle parallel to each stall. The pedestrian aisle shall be marked and shall be of equal length to the stall.
- Parking Drive Aisles: 24-feet wide minimum for two-way aisles.
- Entry and exit plazas designs shall conform to PANYNJ standards.

30.4 Traffic Control Devices Design Criteria

A. Roadway Signing

All roadway signing (vehicular and pedestrian) shall follow MUTCD, Port Authority's Manual for Pedestrian Signing & Wayfinding, and Port Authority's Airport Roadway Sign Design Manual. Design all roadway guide signs using the Gerber Omega software produced by Gerber Scientific Products, Tolland, Connecticut. The Port Authority will provide all available electronic files (Gerber, CAD and JPEG versions) of logos and symbols used on airport signs upon request.

All Terminal signing will be clear and direct for pedestrians and motorists, utilizing color-coding and symbols to enhance wayfinding. Also, variable message signs will be installed informing motorists of changes in operation of parking and terminals.

Provide adequate lighting to ensure the proper visibility and to produce the required retroreflectivity qualities in accordance with the MUTCD.

For all steel sign structures, steel is to be galvanized and painted with a two-coat system against corrosion, paint color to match 'Durnar Charcoal Grey 5LA87818'.

B. Parking Signing

All parking signing (vehicular and pedestrian) shall follow MUTCD, the Port Authority's Manual for Pedestrian Signing & Wayfinding, and Port Authority's Airport Roadway Sign Design Manual. Design all parking lot guide signs using the Gerber Omega software produced by Gerber Scientific Products, Tolland, Connecticut. The Port Authority will provide all available electronic files (Gerber, CAD and JPEG versions) of logos and symbols used on airport signs upon request.

For all steel sign structures, steel is to be galvanized and painted with a two-coat system against corrosion, paint color to match 'Durnar Charcoal Grey 5LA87818'.

C. Pavement Markings

Pavement marking design shall be based on the MUTCD (latest edition) and the PANYNJ Traffic Guidelines, Standard Details, and Specifications.

D. Roadside Barriers and Attenuators

The Lessee shall minimize use of roadside barrier by locating fixed objects beyond the clear zone and minimizing side slopes and determine the conditions that warrant installation of roadside barrier and the dimensional characteristics of the installations,

based on AASHTO's Roadside Design Guide. The Lessee shall design slopes to avoid the need for a roadside barrier whenever possible.

Roadside barriers must be provided where warranted by the presence of adjacent roadside obstacles within the roadway clear zone. These barriers may be in the form of guide rails or concrete barriers, and may additionally require the use of end treatment or impact attenuators. The selection, placement, and installation of these devices shall be determined based on engineering judgment and in accordance with AASHTO Roadside Design Guide, the PANYNJ Roadside and Median Barrier Design Guide, Traffic standard Details and Specifications and manufacturer's recommendation.

The proposed roadside barrier type for the landside roadway structures (i.e., bridges, retaining walls, etc.) shall be 2'-8" high, half section permanent jersey shape concrete barrier. The barrier shall also include a 10" high, ornamental rail mounted on top for a total height of 42" or a concrete barrier of the same height pending Port Authority approval. The selected bridge barrier/parapet must meet the AASHTO structural requirement as a test level TL-4 barrier. Bridge and retaining wall mounted pedestrian and security fencing requirements and fencing plan limits are to be determined.

30.5 Traffic Signals

Traffic Signal contract drawings shall be prepared showing the traffic signal layouts, striping, signing, phasing, timing, vehicle detection, wiring, pullboxes, conduits, and controller cabinets. The Lessee shall prepare signal phasing and timing based upon capacity analysis and design the foundations and associated traffic signal structures using the Port Authority standard details as a baseline.

Develop traffic signal designs using the PANYNJ Traffic Signal Design and Drawing Preparation Guidelines, with reference to other publications and codes listed under the Codes and Standards section of this document.

The Lessee shall prepare contract drawings detailing the communication system connecting all new and existing traffic signals to the Authority's Centralized Traffic Signal Management System – Siemens Tactics. The system shall be in compliance with NTCIP standards and capable of being monitored and controlled over the PAWANET at terminals located at the LGA Communications Desk and the TMC at 4 World Trade Center. All LGA Airport traffic signals shall be configured into the Seimens Tactics system and (GUI) interface. All traffic signal poles bases and mounting hardware shall be powder-coated as specified by the Port Authority. Powder-coating shall be done by the pole manufacturer during fabrication. The controller cabinets, cabinet skirts and signal heads shall not be powder coated. Color shall match "Durnar Charcoal Grey 5LA87818".

30.6 Intelligent Transportation System (ITS)

30.6.1 Scope

The Lessee shall design and construct the ITS Sub-Systems to fulfill the requirements and functionality as required in this Section. All ITS Sub-System components and devices shall be located per the Port Authority's LaGuardia Airport ITS Master Plan. The Lessee shall coordinate the ITS system design with the design of all other Project systems and fully integrate each Sub-System into the overall ITS. All ITS sub-systems shall connect securely via fiber communications to a PA wide fiber back bone. ITS SubSystems, with the exception of the TRANSMIT readers, shall be integrated into

PAWANET.

Servers for each of the ITS Sub-Systems shall be provided and installed by the Port Authority in the operations center. The Lessee shall provide the Port Authority with the specifications for each server component associated with the ITS System for procurement by the Port Authority and the software for each ITS Sub-System for installation by the Port Authority into each server.

The Lessee shall obtain all ITS Sub-Systems licenses for hardware and software procured by the Lessee. All software and hardware (with the exception of devices) licensing shall be transferable to the Port Authority at the time when the Sub-System is operational. The Lessee shall provide for the maintenance of the communications network from the facility network switch to each device within the project limits.

The Lessee shall provide electronics, electrical components and infrastructure for the Intelligent Transportation System (ITS), defined as the following component SubSystems:

- Closed Circuit Television System (CCTV);
- Roadway Weather Information System (RWIS);
- Dynamic Message Signs (DMS);
- Vehicles Detection Count System (VDS); and
- TRANSMIT Readers.

Required ITS Sub-System components consist of all electrical items and electronics described by this document including ITS devices, frames and structures upon which ITS components shall be mounted, panel boards, equipment, enclosures, conduit, pull boxes, junction boxes, mounting hardware, fiber optic, cabling, switches, lights, power assemblies and related items.

The Work shall include all commissioning and testing for each Sub-System installed by the Lessee, from each individual ITS device installed to the termination point at the facility network switch. The Lessee shall provide all necessary training for each SubSystem and coordinate testing and commissioning of each Sub-System with the Port Authority following completion of the Work.

30.6.2 Administrative Requirements

A. Personnel

The Design team shall consist of electrical or electronics engineers to design all ITS.

1. Electronics/ITS Engineer

The design effort shall be led by an Electronics/ITS Engineer, licensed in State of New York, having a minimum of 10 years practicing experience in electrical and electronics design and responsible for the design of similar transportation systems for at least 3 other infrastructure projects of similar scale as the New Improvements. The Electronics/ITS Engineer (ITS) shall be separate from, but work in close coordination with the Electrical Engineer for work to be performed. The Electronics/ITS Engineer shall be available for the duration of the Design Work and on an as-needed basis for the duration of the Construction Work until completion. The Electronics/ITS Engineer shall Sign and Seal all final ITS plans and calculations as well as preparation of the plans as outlined in this Section.

2. ITS System Integrator

The Lessee shall provide an ITS System Integrator to perform the following:

- Integrate each of the Sub-Systems into the ITS;
- Coordinate with the Port Authority for linking ITS sub-systems with PAWANET;
- Coordinate linking ITS to a future Advanced Traffic Management System (ATMS);
- Coordinate and supervise all commissioning and testing of the ITS Sub-Systems, individually and the ITS in its entirety for Work performed by the Lessee;
- Coordinate and assist the Port Authority in testing and commissioning the complete ITS, including work performed by the Port Authority.

The ITS System Integrator shall be available for the duration of the Design Work and on an as-needed basis for the duration of the Construction Work and be available during all testing and commissioning of each ITS Sub-System.

The ITS System Integrator may be the Lead Electronics/ITS Engineer provided the individual possesses the experience to perform both roles.

B. Standards

The Lessee shall design the System components in accordance with the following publications (latest edition):

- Standard Specifications for Structural Supports of Highway Signs, Luminaires and Traffic Signals, AASHTO;
- Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, US Department of Transportation, Federal Highway Administration (FHWA);
- NTCIP 1203: For all ITS field devices. Object Definitions for Dynamic Message Signs (DMS), National Transportation Communications for ITS Protocol (NTCIP);
- Traffic Monitoring Guide, FHWA;
- Standard 802.15.4: Wireless Medium Access Control and Physical Layer Specifications for Low-Rate Wireless Personal Area Networks, Institute of Electrical and Electronics Engineers (IEEE);
- NEMA TS4: Hardware Standards for Dynamic Message Signs (DMS) with NTCIP Requirements;
- NEMA 250: Enclosures for Electrical Equipment (100 Volts Max), NEMA;
- Optical Fiber Cable Components Standard, TIA/EIA.

30.6.3 General Requirements

1. Native Communication Protocol

The Lessee shall use the National Transportation Communications for ITS Protocol (NTCIP) standard for communications among all Systems specified below:

- Closed Circuit Television System (CCTV);
- Roadway Weather Information System (RWIS);

- Dynamic Message Signs (DMS); and
- Vehicle Detection Count System (VDS).

NTCIP shall be utilized as the native communication protocol for each System's devices. Protocol converters shall not be utilized to achieve NTCIP conformance.

2. Access and Control of ITS Data

The Lessee shall provide access to ITS system data, via a data collaboration environment for testing and operation of all ITS. Monitor and Control Functionality of ITS shall be provided to the Port Authority. In addition, the Lessee shall provide provisions within the ITS system for the introduction of the Advanced Traffic Management System (ATMS). All Work associated with procurement, installation and replacement of the data collaboration environment with the ATMS shall be by the Port Authority.

3. Environmentally and Non-Environmentally Controlled Locations

All system components and devices installed at an exterior location, whether or not the device or component is within an enclosure, shall meet the following performance requirements:

- operable between temperatures of -25 °F to +140°F;
- operable between with relative humidity between 5% to 95 %;
- operable with an atmosphere of 5% salinity based on salinity salt fog test in accordance with ASTM B-117.

All system components and devices installed at an interior location shall meet all specified performance requirements for the following ambient conditions:

- Heated areas: fully operable for temperatures between 32°F and 120°F;
- Unheated areas: fully operable for temperatures between 0°F and 120°F;
- Relative Humidity: fully operable with relative humidity between 5% to 95%.

30.6.4 Design Requirements

1. Communications Network Plan

The Lessee shall provide a Communications Network Plan that defines the fiber and wireless communications for the ITS Sub-Systems. The Communications Network Plan shall be submitted to the Port Authority for Port Authority Approval.

2. ITS System Design

All ITS work shall be based on conceptual design (LGA - ITS Master Plan) provided by the Port Authority and shall be coordinated through the Port Authority as appropriate.

All ITS sub-systems design shall be based on the Port Authority's ITS Design Guidelines, ITS Standard Specifications and ITS Standard Design Details.

Designer must obtain the latest version of these documents from the Authority.

The Lessee shall submit the ITS design report to the Port Authority for Port Authority Approval including final design drawings, technical specifications, and cost estimates for identified subsystems and their integration to perform surveillance, control, and information dissemination functions.

3. TRANSMIT Readers

Four (4) TRANSMIT Reader locations shall be installed as identified in the LGAITS Master plan. TRANSCOM shall be retained by the Lessee to furnish equipment to be installed by the Lessee. The Lessee shall coordinate with the Port Authority on retaining TRANSCOM as a proprietary vendor. TRANSCOM shall program the equipment.

Each Reader location shall be provided with 20-Ampere 120-Volt AC electrical service. A minimum of two (2) antennas shall be utilized to cover three (3) lanes of traffic at each TRANSMIT Reader location. The antennas shall be mounted directly above the lane dividing line, at 10 degrees +/- 5 degrees from horizontal. Each Reader location shall include all TRANSCOM required hardware consisting of: reader hardware, Kapsch antennas, lane kits, cables, cabinet and all associated connections and equipment needed to collect vehicular data and communicate with the PANYNJ server. Communications support for ITS systems shall be in conformance with Section 24.3.6.3.

30.6.5 ITS Power Infrastructure

The Lessee shall install all common electrical and power components for each ITS SubSystem including, conduits, transformers, breakers and panel boards, power equipment, wiring, foundations, and maintenance platforms.

1. ITS Power Equipment Cabinet

The Lessee shall furnish and install the power equipment cabinets which are easily accessible for maintenance, terminate the power cables at the main disconnect within the Utility Structures, furnish, install, and connect power wiring on the load side of the main disconnect, as necessary to provide a complete and operational power distribution system, and provide grounding as required by the National Electric Code.

2. Transformer

The Lessee shall install transformers with at least 50% reserve capacity available to provide 120 Volt secondary output to the ITS equipment. All transformers provided of each type shall be manufactured by the same manufacturer, and shall have the same dimensions. The Lessee shall locate transformers on the maintenance platforms beneath the roadway, terminate the primary and secondary cables, and provide ground for separately derived systems as per the National Electrical Code.

3. Power Panel

The Lessee shall install Power Panels/Circuit Breakers as necessary to provide circuit protection for both the secondary and primary wiring. All Panels provided of each type shall be manufactured by the same manufacturer, and shall have the same dimensions. Stand-alone breakers where used shall be of the bolt-on type.

4. ITS Maintenance Platform

The Lessee shall provide maintenance platforms for servicing ITS System control cabinets and power cabinets containing electrical, communications and data infrastructure. The maintenance platforms shall be safely and easily accessible.

30.6.6 Construction Requirements

The Lessee shall construct all ITS Sub-systems in accordance with the design plans, system specifications and manufacture's recommendations. Control equipment to be housed within the System Control Cabinets.

1. Fiber Optic Cable

The Lessee shall ensure all proper procedures and precautions are followed to identify and protect buried fiber optic lines from damage or destruction.

2. System Control Cabinets

The Lessee shall design the ITS System to consolidate control equipment into centralized, System Control Cabinets. The Electronics/ITS Engineer shall identify the locations of the System Control Cabinets. Platforms shall be provided at the System Control Cabinets to perform maintenance and servicing.

3. TRANSMIT Readers

The Lessee shall install TRANSMIT Readers and all associated equipment in accordance with the requirements and specifications provided by TRANSCOM.

30.6.7 Testing Requirements

The Lessee shall prepare an ITS Testing Plan to incorporate the staging requirements for testing. The ITS Testing plan shall be submitted to the Port Authority for Port Authority Approval, as part of the Submittal for the Phase 1 Preliminary Review as specified in the TCAP Manual. All component and ITS Sub-System tests shall be conducted in accordance with the recommendations of each component and sub-system manufacturer. The Lessee shall complete ITS testing on a tiered approach, consisting of Component Testing, Sub-System Testing, and Operational Testing as defined in the ITS Testing Plan. The limits of responsibility for the Lessee for testing of the ITS System shall extend from each individual device to the facility network switch. All tests shall be coordinated, conducted and observed by the ITS System Integrator who shall submit a signed ITS Testing Report to the Port Authority. The ITS Testing Report shall provide a written record of all test procedures, results and any system modifications, equipment replacement etc. performed during testing. The ITS Testing Report shall be submitted following successful completion of all ITS tests.

Operational Tests for each ITS Sub-System shall be conducted in conjunction with the Port Authority and shall test the ability of ITS data to reach the Port Authority Communications Desk and the ability for the Port Authority Communication Desk to control the different systems. The ITS System Integrator shall coordinate and attend all Operational Tests. All Operational Test results shall be co-signed by the ITS System Integrator and a representative of the Port Authority. The Port Authority shall be responsible for ITS operational performance from the facility network switch to the Port Authority's Communications Desk including integration to PAWANET and installation of security protocols at the facility network switch.

The Port Authority reserves the right to witness all component and Sub-System testing. The Lessee shall provide the Port Authority with 7 days' notice prior to any component or Sub-System test.

The Lessee shall repair, replace or modify any component, device or Sub-System found to be defective during testing. All such remedial work shall be the responsibility and at no cost to the Port Authority. All ITS Sub-Systems shall be completely operational as designed and as required by the Project Documents at the completion of the Testing Program.

1. CCTV Sub-System

The ITS System Integrator shall oversee the installation, system configuration, commissioning and testing of the CCTV Sub-System. Testing shall include verification of proper camera operation, communication between the cameras and video encoders, and verification of power to each CCTV camera. The Final Acceptance Test Plan for this sub-system, shall be included in the ITS Testing Plan.

The Final Acceptance Test results shall be documented, signed by the ITS System Integrator and incorporated into the ITS Testing Report.

2. Roadway Weather Information Sub-System

A representative of the manufacturer of the RWIS and the ITS System Integrator shall oversee the installation, system configuration, commissioning and testing of the RWIS sub-system. Testing shall include the functionality of the atmospheric and pavement sensors, the power supply and the communications between the RWIS Remote Processing Unit and the sensors. The Final Acceptance Test Plan for this sub-system, shall be included in the ITS Testing Plan.

The Final Acceptance Test results shall be documented, signed by the system's manufacturer representative and the ITS System Integrator and incorporated into the ITS Testing Report.

3. Dynamic Message Signs (DMS)

A representative of the manufacturer and the ITS System Integrator shall over-see the installation, system configuration, commissioning and testing of the DMS subsystem. Testing shall include verifying the functionality of the DMS System Controls by confirming communications between a remote diagnostic port and the DMS signs. The Final Acceptance Test Plan for this sub-system, shall be included in the ITS Testing Plan.

The Final Acceptance Test results shall be documented, signed by the representative for the manufacturer and the ITS System Integrator and incorporated into the ITS Testing Report.

4. Vehicle Detection Count Sub-System

A representative of the system's manufacturer and ITS System Integrator shall oversee the installation, system configuration, commissioning and testing. Testing shall include verification of proper sensor operation, access point operation, and communications to the Network Switch Demarcation.

Software services shall include configuration of the Wireless Access Point and coordination with the Port Authority to its Host Computer as it pertains to the traffic detection.

The Final Acceptance Test Plan for this sub-system, for inclusion in the ITS Testing Plan, shall include the following, and shall be completed after all components have been installed, configured, and integration-tested:

- all diagnostic routines provided by the manufacturer;
- confirmation of proper wiring, grounding, and attachment to pole mounted system support;
- proper operation of the detection system, provided over a one-hour period comparing system counts to counts obtained by observation of live traffic;
- accurate reporting of traffic speed;
- demonstration of real-time traffic detection data received at the control room server; and
- a 10-day operational test of all functionality from the control room.

The Final Acceptance Test results shall be documented, signed by system manufacturer's representative and incorporated in to the ITS Testing Report.

5. System Acceptance Testing

The Final Acceptance Test Plan for this sub-system, for inclusion in the ITS Testing Plan shall be completed after all components have been installed, configured, and integration-tested. A representative of the system's manufacturer and ITS System Integrator shall oversee the installation, system configuration, commissioning and testing.

The tests shall be performed to ensure that all specified functions are working properly and shall demonstrate that all traffic data functions conform to this Section. All tests shall be witnessed by the Port Authority. The Lessee shall provide the Port Authority with 5 days' notice of the test.

The Final Acceptance Test results shall be documented, signed by system manufacturer's representative and incorporated in to the ITS Testing Report.

6. Continuous Operating Test

A continuous operating test shall be coordinated, scheduled and monitored by the ITS Integrator and conducted by the Port Authority following the successful completion of the system acceptance testing and shall consist of continuous operation of the system's on-site equipment for 30 consecutive calendar days. Failure of the system to record, store, and process data or failure of the system to perform the real time functions meeting the requirements set forth in this Section for an accumulated time exceeding 3 hours during the 30 consecutive calendar day period shall be cause for any deficiencies to be corrected and for the continuous operating test to be started over.

Failure of the Host Computer or its peripheral equipment or of a communication link not furnished to transmit data shall not be cause for restarting the 30 consecutive calendar day continuous operating test provided that it is demonstrated to the satisfaction of the Port Authority that the failure is not caused by any of the furnished equipment.

The Continuous Operating Acceptance Test results shall be documented, signed by the ITS System Integrator and a representative of the Port Authority and included in the ITS Testing Report.

7. TRANSMIT Readers

The Lessee shall verify proper operation of the TRANSMIT Readers through a testing and commissioning program provided by TRANSCOM and include in the ITS Testing Report.

30.6.8 Training Requirements

The Lessee shall perform training following acceptance of each ITS sub-system, with the exception of the TRANSMIT readers, for the Port Authority staff. Training shall be conducted by the manufacturer's technical service personnel or factory authorized representative. The training sessions shall include all material and manuals required for each participant.

TRANSCOM shall provide training for their staff to maintain and service the TRANSMIT readers and associated system.

1. Operational Training

The Lessee shall provide operational training for a minimum of 16 hours for each accepted ITS sub-system.

2. Maintenance Training

Maintenance training shall be conducted by the manufacturer's technical service personnel or factory authorized representative and provided for a minimum of 40 hours for each accepted ITS sub-system. The Lessee shall include in the training operation instructions, theory of operation, circuit description, preventive maintenance procedures, troubleshooting and repair of all equipment specified herein. The Lessee shall include with the training all material and manuals required for each participant.

3. Operations and Maintenance Manuals

Maintenance Manuals for each component and sub-system of the ITS System and Operations Manuals for each sub-system shall be submitted to the Port Authority. Operations and Maintenance Manuals for the TRANSMIT readers are not required to be submitted as TRANSCOM shall be solely responsible for maintenance.

30.6.9 ITS Submittals

At a minimum, the Lessee shall submit the following Submittals in both electronic and hardcopy formats to the Port Authority:

Submittal	Approval Type	Schedule
Communications Network Plan	Port Authority Approval	Prior to start of ITS system design work
ITS System Design Report	Port Authority Approval	Prior to start of ITS system design work
ITS Testing Plan	Port Authority	28 days prior to the
	Comment	test of any ITS subsystem

ITS Testing Report	Port Authority Comment	5 days following completion of test(s)
Operations and	Port Authority	Prior to placing SubSystem into
Maintenance Manuals	Comment	service

Acceptable electronic formats include Microsoft Word, Microsoft Excel, or Adobe Acrobat (.PDF) files, unless otherwise indicated.

30.7 Construction Staging Plan

The Lessee shall prepare a Construction Staging Plan, developing and evaluating schemes for staging complex demolition and construction work and a draft report and drawings documenting the recommended construction staging plan. The report shall include but not be limited to a traffic analysis of all roadways/intersections in all stages of construction to verify that acceptable Levels of Service and queuing will be maintained as determined by the Port Authority.

Traffic capacity analysis of the airport roadway during construction (roadways, intersections and frontages) shall be performed based upon Highway Capacity Manual procedures, 2010 ACRP Report 40, and using VISSIM software version 5.4 and SYNCHRO software version 8.0. The analysis shall be performed for the LGA Airport peak hours and peak periods. The AM peak hour (7:30 am-8:30 am) and PM peak hour (3:30pm-4:30pm). The AM peak period (6am-10am) and PM peak period (3pm-7pm) peak periods.

30.8 Maintenance of Traffic and Work Area Protection

The MOT drawings shall show the appropriate temporary traffic control devices for maintaining access for all vehicles, pedestrians, bicycles, and construction operations. This may include temporary signs, pavement markings, traffic signals, barriers, impact attenuators, and ADA compliant pedestrian access. Temporary traffic signal designs shall conform to the current Federal Manual on Uniform Traffic Control Devices (MUTCD) in addition to the requirements of the agency having jurisdiction.

The construction of the new Roadway Network will require close coordination with other ongoing construction activities within the LGA Airport and Airport operations. A construction sequence for the bridges and roadways shall be established based on a coordinated traffic maintenance plan and construction schedule, as well as specific site requirements. The transition of the Roadway Network from temporary to permanent will be staged to minimize disruption of services to the various terminal operations, and

accommodate the functional arrangement to the surrounding facilities, such as the existing and new terminal, parking garages and LGA Airport deliveries.

M.O.T. and work area protection shall be provided to accommodate all work items within the scope of the Construction Project, including but not limited to the following:

- M.O.T. required for any Utility work within the public traveled way.
- M.O.T. required for pedestrian detours necessary to provide circulation around the work area during construction.
- Minimizing impacts to the Grand Central Parkway during construction.
- Maintaining all required vehicular circulation movements.
- Providing alternative means of Terminal access for passengers and meeter/greeters (i.e. shuttle services) if pedestrian access from parking is not available during any phase of construction.
- Minimizing the extent of landside operational impacts during construction.
- Parking facilities shall have pedestrian access provided within LGA Airport boundaries. If pedestrian access in not available, the parking facilities shall be served by a shuttle service.

All temporary traffic control and work area protection devices shall be fabricated and installed in accordance with Part 6 entitled "Temporary Traffic Control" of the Federal Highway Administration (FHWA) "Manual of Uniform Traffic Control Devices (MUTCD) for Streets and Highways", latest edition, except as noted.

See Section 32 (Traffic Operations Criteria During Construction) for additional requirements.

30.9 Design Submittals

Unless otherwise indicated, provide all submittals in both electronic format and hardcopy format.

- A. Preliminary Design
 - 1. The Lessee shall submit drawings/documents for Port Authority Approval. The final decisions on issues of adequacy of the drawings and their scale will be by the Port Authority. The Submittals shall include, but not be limited to, the following items:
 - Draft construction staging report with traffic analysis.

- Conceptual Maintenance of Traffic and Work Area Protection Plans indicating closures, temporary diversions, temporary signs, temporary traffic signals, duration of closures, detour routes and hours of work.
- Submittals demonstrating compliance with Section 30.2 through

Section 30.4, and Section 32.

- Sign Layout Plans and Tables for both permanent and temporary traffic signs. The plans shall indicate the locations of all signs and the tables shall indicate the overall sign dimensions, letter dimensions, message on sign, and colors.
- Pavement Marking Plans showing layout and location of pavement markings and type of marking.
- Parking Guidance Systems drawings. The drawings shall include a plan and details sufficient to show the layout and functionality of the system.
- ITS Communications Network Plan and ITS System Design

Report as specified in Section 30.6.

- 2. Specifications
 - Preliminary list of Specifications.
 - Final list of Specifications, plus copies of any special specifications related to ITS.
- 3. Sole Source Items
 - □ [Reserved.]
- 4. Final Design and Contract Drawings
 - The Lessee shall submit all Final Contract Drawings addressing all the Port Authority's comments from preliminary Submittals. The scale of all details shall be sufficient to show all relationships and materials clearly.
- B. Construction Services

- 1. Upon completion of construction, the Lessee shall modify the Contract Drawings to "Drawings of Record" conditions and certify the same. The Lessee shall furnish "as-built" information that is to be used to create the Drawings of Record.
- 2. The Lessee shall prepare final Traffic Signal (TS) Drawing and signal timing plan that reflects the final field conditions to be approved by the Port Authority.

Design and Construction Requirements

31.0 GEOTECHNICAL REQUIREMENTS FOR ELEVATED ROADWAYS AND BRIDGES

- 1) The Lessee shall review the information listed in the Geotechnical Available Documents. If as part of the design effort, it is determined that additional subsurface soil investigation and testing is required, the Lessee shall prepare the scope of work, perform the additional borings and field or laboratory testing as required, and submit the newly obtained information to the Authority for record. The Lessee shall use its own Contractor to perform the subsurface investigation and shall submit the results to the Port Authority in a Geotechnical Report. Prior to performing the investigation, the Lessee shall coordinate with the Port Authority to develop a mutually agreeable format for recording the data that will facilitate the incorporation of the data into the Port Authority's Subsurface Information Data Base. At the minimum, the information shall be tabulated and contain the Boring Number and the "As-Drilled' Boring coordinates in NAD83 and NAVD88 coordinate systems. Access to the site for performing the subsurface investigation shall be coordinated with the Port Authority.
- 2) The Lessee shall perform site-specific seismic analysis for new elevated roadways and bridge structures in accordance with AASHTO LRFD Bridge Design Specifications and the NYSDOT Blue Pages. The following two levels of earthquakes shall be considered:
 - a) On-Airport Bridges (Essential Classification)
 - b) For Bridge over the GCP (Critical Classification).
- 3) The Lessee shall evaluate alternative foundation types for the various roadway structures. This evaluation shall take into account soil conditions, proximity to existing structures and Utilities, foundation footprint, low headroom conditions, airport height restrictions, and static and seismic loading.
- 4) At the minimum, the Lessee shall perform design and analysis in accordance with ASHTO LRFD Bridge Design Specifications for the following geotechnical items for both the non-seismic and seismic conditions:

a) Deep Foundations

- Tapered Steel Piles
- Only the following deep foundations shall be evaluated and considered for design
- Steel Pipe Piles
- Caissons/Drilled Shafts socketed in rock

- Minipiles in areas with low head room
- The design of deep foundations shall include evaluation of downdrag effects
- b) Where required retaining structures and embankment design
- c) Where required underground utility support design
- d) Settlement evaluation for structures, not supported on deep foundations
- e) Prior to proceeding to final design, submit a geotechnical design recommendation report which summarizes the geotechnical design evaluated for items 4a through 4d above. The report shall include preliminary calculations to verify the geotechnical design recommendations.
- 5) Pile capacities shall be verified by static (3 axial and 3 lateral tests) and dynamic (PDA) load tests (5% of piles). Caisson capacities shall be verified by the Osterberg Cell Load Test Method (2 Tests). Caisson integrities shall be verified by the Cross-hole Sonic Logging Test Method (All Caissons).
- 6) All nearby structures located within 100 feet of construction shall be monitored for vibration and vibration induced settlements. For structures in excess of 100 feet, the Lessee shall perform analysis to demonstrate that vibrations will not be an issue. The Lessee shall develop the monitoring plan and Stop Work Limits for vibration and settlement readings at nearby structures. Stop Work Limits for vibration induced settlements shall not exceed 2 in/sec. Stop Work Limits for net vibration induced settlements and differential settlement shall not exceed 1 inch. The Lessee shall submit the monitoring plan to the Port Authority for Port Authority Comment prior to commencing construction activity that would cause vibrations at nearby structures. For Work in the vicinity of the ATCT, refer to Section 17 for special requirements.
- 7) The Lessee shall prepare custom specifications for work not covered by the New Improvements Specifications.

Design and Construction Requirements

32.0 TRAFFIC OPERATIONS CRITERIA DURING CONSTRUCTION

The following stipulations in the implementation and modifications of maintenance of traffic (MOT) plans for vehicles and pedestrians shall apply:

32.1 Compliance Monitoring

- The Lessee must employ a traffic engineer who is a licensed professional engineer in the State of New York who will serve as the MOT Engineer-in-Charge (EIC) and holds a Professional Traffic Operations Engineer (PTOE) certification. The EIC shall have a minimum of 15 years' experience in design and construction of MOT in airports or in a dense urban environment unless otherwise allowed by the Port Authority. The EIC shall be charged with review and execution of all MOT plans, monitoring vehicular and pedestrian safety and monitoring of general traffic operations during construction.
- The EIC must certify that all MOT plans have been prepared to the Port Authority's satisfaction and comply with the Port Authority specifications outlined below. A summary report must be provided to the Port Authority detailing the results of all analyses/studies performed to determine impacts to vehicles, pedestrians, traffic operations for each stage/phase of construction, and the mitigation measures that will be employed.
- The EIC is responsible for identifying all other pedestrian and vehicular issues that may not have been identified during design but must also be addressed to maintain safe and effective flow of traffic during construction.
- A Customer Experience Monitor (CEM) must be assigned to monitor all customer experience quality of life issues (listed in Section 32.3) to ensure they are addressed in a satisfactory timeframe.
- The CEM must submit a weekly report to the Port Authority summarizing the condition and adjustments to quality of life issues (listed in Section 32.3).

32.2 Traffic Management and Performance Metrics for Establishing and Maintaining Airport Operations

- a. Transportation Management Plan
 - i. The Authority will coordinate the preparation of a Transportation Management Plan (TMP), which will include this Project in coordination with other LGA Airport projects and regional projects. A TMP Committee will be established, comprised of key stakeholders with the Authority. This TMP Committee will meet on a frequent and

ongoing basis, coordinating on work zone conflicts, maintenance of traffic overlaps, roadway diversions, detours, and lane closures.

- ii. The Lessee Maintenance of Traffic Engineer-in-Charge (E.I.C) shall become a member of the TMP Committee along with any other Lessee team members as appropriate and will collaborate with the Port Authority. The Lessee will prepare and submit construction staging and maintenance of traffic plans with any supporting analysis and provide with the appropriate material and necessary input to update the TMP.
- iii. Any maintenance of traffic, detours, diversions, or lane closures affecting off-LGA Airport property shall be coordinated with the Authority and affected external agencies, such as NYCDOT and NYSDOT. The Authority can assist the Lessee for the external agencies coordination.
- b. Roadway Construction Staging

Roadway construction staging and maintenance of traffic shall be provided to maintain all traffic movements to and from the terminal including recirculation, connections to and from parking, and inter-terminal connections. If all traffic movement cannot be maintained, then the construction staging and maintenance of traffic shall be provided with consideration based on the following order of priority.

- i. Diversion of traffic Provide temporary diversion lanes with sufficient capacity.
- ii. Roadway detours If detours are used in construction staging, such detour with required documents shall be provided to the PA for approval.
- iii. Roadway lane closures If lane closures are used in construction staging, the roadway with the lane closure shall provide sufficient capacity.
- iv. Below are criteria related to the vehicular entrance and exit points of the airport;

Inbound Access

- 94th Street and Grand Central Parkway Eastbound Flyover Ramp Access shall not be closed concurrently
- Grand Central Parkway Westbound Access to the LGA airport shall be maintained at all times
- 94th Street and 102nd Street LGA Airport access shall not be closed concurrently
- Grand Central Parkway Westbound exit to 94th Street shall be maintained at all times
 - c. Roadway Operations
 - i. The existing capacity of all roadways (including entry/exit ramps), frontages, and walkways must be maintained throughout the duration of the project, to the greatest extent possible. Any reduction in vehicle or

pedestrian capacity must be reviewed and approved by the Port Authority and, potentially, NYCDOT and NYSDOT, prior to implementation.

- ii. The Lessee shall maintain existing level of service for all intersections. Any reduction in level of service must be reviewed and approved by the Port Authority.
- iii. The Lessee shall analyze roadway delay and levels of service at areas affected by construction activity. The analyses shall include vehicle turning movement and classification counts. The analyses must incorporate the use of standard traffic analysis tools (e.g., Synchro, VISSIM, etc.), and include intersections, weaving sections, vehicle queuing, and ramps. The analysis must be presented to the Port Authority for review and approval before construction activities commence in a roadway.
- iv. Obtain approval from the TMP Committee prior to any roadway closings on or off LGA Airport property and notify the LGA Operation Control Center (LGAOCC) prior to any lane reductions or street closings on State or City roadways.
- v. All existing traffic signals shall be maintained in working condition at all times until Substantial Completion. The Lessee shall not disconnect, remove or otherwise make traffic signals non-functional without providing temporary replacement equivalent signal faces, supporting poles and overhead wiring, or other temporary traffic control measures, as directed by the EIC in consultation with the Port Authority and, potentially, NYCDOT. All proposed temporary signals shall follow codes and standards specified in Section 16.3.1 of this RPW, as directed by Section 30.5 of this RPW.
- vi. Any reduction in level of service in any intersection must be reviewed and approved by the Port Authority.
- d. Scheduling
 - i. Construction activities will be scheduled in coordination with other projects at LGA Airport. The construction schedule must be approved by the Port Authority REO.
 - ii. City and State construction timing restrictions, as they apply to off-LGA Airport roads, shall be adhered to, including the City's annual "Holiday Construction Embargo".
 - iii. To facilitate the flow of traffic, the permissible work hours may be modified by the Port Authority, NYCDOT, and/or NYSDOT.
- e. Terminal Frontages Arrival/Departure Loading Zones

- i. The necessary linear feet of curb space and number of lanes required for acceptable operations in the loading zones shall be maintained
- f. Sidewalks, Walkways, and Crosswalks
 - i. The Lessee shall analyze sidewalk, walkway, and crosswalk operations by examining the flow rate of pedestrians. The analysis must be presented to the Port Authority for Port Authority Approval before construction activities commence in a sidewalk, walkway, or crosswalk.
 - ii. The analysis shall incorporate the evaluation of pedestrian flow rates, queuing, crosswalk operations, Skycaps/curb side check-in areas, and/or access points to the terminals, parking, etc.
- g Parking
 - i. See Section 32.6, Parking Plan for requirements regarding the minimum number of public parking spaces that must be maintained within the CTB and East End Terminals area of LGA Airport by the Lessee throughout construction.
 - ii. If pedestrian access is compromised by the Lessee's construction activity, the Lessee shall provide any necessary shuttle buses or other transport services to accommodate customers
- h Taxis
- A. Taxi Holds
 - 1. If the taxi holds are affected by construction activity, the Lessee shall provide a designated area with capacity to accommodate 200 vehicles.
 - 2. Any newly designated taxi stacks must be within close proximity of the CTB. The location of the new designated taxi hold must be approved by the Port Authority.
- ii. Taxi Loading Areas
 - 1. If a taxi loading area is affected by construction activity, the Lessee shall provide a designated taxi loading area. The location of the loading area must be approved by the Port Authority.
- i. Public Bus Stops

i. The Lessee shall maintain the existing bus stop at the intersection between 23^{rd} Ave and Ditmars Blvd., and curbside bus access for NYCT buses at all times, including existing stops at Terminal C and D.

- ii. Bus stop relocations shall adhere to current wayfinding signing. If construction activity necessitates temporarily moving existing bus stops to a different location, then current wayfinding signing (indoor and outdoor) must be modified to correctly direct passengers.
- iii. If any alteration to any existing bus stop is required, the Lessee shall submit a plan to the Port Authority for Port Authority Approval, and obtain any required approval from NYCT.
- j. Private Carrier, Car Rental Shuttles, Hotel Shuttles, Employee Shuttles, and
 - A. Airport Buses
 - i. The Lessee shall maintain curbside bus access for private airport transport providers, car rental shuttles, and hotel shuttles.
 - ii. Bus stop relocations shall adhere to current wayfinding. If construction activity necessitates temporarily moving existing stops to a different location, then current wayfinding signing (indoor and outdoor) must be modified to correctly direct passengers. iii. The Lessee shall coordinate any modifications with affected providers and the Port Authority, to obtain any required approvals.
 - k. Fire Hydrants
 - i. The Lessee shall maintain and not obstruct fire hydrants located within or adjacent to the work zone without the prior approval of the Port Authority

REO.

32.3 Customer Experience

- a. Lighting
 - i. The CEM shall identify pedestrian walkways and corridors within the site where supplemental lighting will provide a safer and more inviting pedestrian experience. All walkways shall be provided with sufficient lighting. In addition, the Lessee shall check and verify supplemental lighting is functioning and is mounted properly, once a week and at the discretion of the Port Authority REO.
 - ii. All roadways shall have sufficient lighting at all times. Existing roadway light fixtures that need to be removed due to construction activity shall be replaced with temporary lighting. Upon completion of construction, temporary lighting shall be replaced with permanent lighting fixtures.

- iii. See Section 4.2 LGA Airport Construction Safety Requirements subsection G.2 for additional requirements.
- b. Wayfinding

The Lessee shall provide clear and visible vehicular and pedestrian wayfinding signs, particularly when construction detours are in place—per the approved MOT plans.

- c. Signing
 - i. Temporary construction signs shall be installed at all locations as shown on approved MOT plans.
 - ii. All existing signs that are incompatible with construction activities shall be removed for the duration of work in progress instead of covered, wherever possible. Any removed existing signs shall be stored at a safe location for future use (if still applicable). When an existing sign is to be removed, the respective agency of jurisdiction must be notified prior to removal.
 - iii. Temporary and permanent traffic signs shall comply with applicable Port Authority signing and Manual of Uniform Traffic Control Devices (MUTCD) standards.
 - iv. During the snow season, the Lessee shall post "Lift Plow" signs at all locations and directions where they have installed steel plates in the roadway.
- d. Pavement Markings
 - i. Any existing pavement markings (e.g., lane striping, crosswalks, etc.) that interfere or conflict with the proposed temporary or permanent pavement markings shall be removed completely from the roadbed. The Lessee shall maintain all temporary pavement markings in good condition.
 - ii. The Lessee shall provide temporary pavement markings in accordance with approved MOT plans immediately after the existing pavement markings have been removed. No unmarked pavement will be permitted at any time. All proposed pavement marking shall be in accordance with PANYNJ Pavement Marking Material Guidelines.
- e. Temporary Traffic Control Devices
 - i. Concrete barriers must be maintained in good working condition (no cracks or dents, marking-free) throughout the duration of the project. Barriers shall be repaired or replaced if they do not meet these standards or at the discretion of the Port Authority REO.

- ii. Traffic control devices (barrels, drums, cones, signs, etc.) must be maintained in good working condition throughout the duration of the project. They should be repaired or replaced if they do not meet these standards or at the discretion of the Port Authority REO.
- iii. The Lessee shall keep all construction equipment within the work zone at all times, except where approved by the Port Authority. Errant equipment not in use must be removed from public areas. All equipment present at and around the construction site shall be in accordance with the approved MOT plans.
- iv. Traffic control devices (barricades, signs, etc.) shall be placed as not to impede with vehicular and pedestrian sight lines to maintain user visibility. Edges of construction zones should be adjusted if they do not meet these standards or at the discretion of the Port Authority REO.
- f. Fencing
 - i. Fence wraps or netting shall be installed on fencing adjacent to public areas, which will maintain visibility standards but still provide an aesthetic improvement to the site. The Lessee shall also repair worn and damaged fencing on a regular basis or at the discretion of the EIC or CEM. Subject to Port Authority Approval, the Lessee will provide and install decorative fence wrap treatments, where possible, to beautify the Construction Site and enhance the airport visitor experience over the duration of the project.
 - ii. All excavations shall be adequately fenced to preclude entry by the public. The Lessee shall provide adequate protection for pedestrians when working in close proximity to active pedestrian access ways.
- g. Walkways
 - i. The Lessee shall maintain the integrity of all permanent and temporary walkways at all times and maintain sidewalk surfaces without any trip hazards, including installation of non-skid steel plates neatly and flush.
 - ii. At locations where puddling and drainage due to construction activity are observed, the Lessee shall install pre-constructed, flush, wooden walkways or other porous materials to improve drainage, at the discretion of the Port Authority REO.
 - iii. The Lessee shall remove snow and ice on all temporary and permanent pedestrian walkways at all times within the Premises and complete removal of snow and/or ice within two (2) hours after the snow has stopped falling. When water is used for construction activities, the Lessee shall ensure that the water does not freeze on the walkway or roadway and maintain a clear and safe travel path.

- iv. All permanent and temporary pedestrian facilities (including sidewalks, walkways, and crosswalks) shall maintain compliance with the Americans with Disabilities Act of 1990 (ADA), including all applicable regulations concerning width and grading. Pedestrian ramps shall be installed where needed.
- v. Pedestrian access shall be provided in conjunction with LGA Airport and City bus stop locations. The Lessee shall allow for pedestrian access to the LGA Airport from across the Grand Central Parkway from 94th St, and pedestrian movement around the LGA Airport between the Terminals and facilities.
- vi. When temporary pedestrian facilities are provided to detour pedestrians, the rerouted pedestrian facilities shall be approved by the Port Authority.
- h. Truck wheels and concrete truck drums shall be washed within the construction work areas prior to departing the work area to minimize the tracking of dust and dirt onto public roadways.
 - ii. Truck loads must be covered at all times outside of construction work areas to prevent the dispersal of dust and construction materials onto public roadways.
 - iii. Excessive engine idling of construction vehicles and equipment is prohibited at all times.
 - iv. Construction vehicles shall stage at official staging areas, as designated by the approved MOT plans or at the discretion of the Port Authority REO.
 - v. All commercial vehicles are required to enter the LGA Airport at the nearest authorized entrance to an individual work area and leave the LGA Airport at the nearest authorized exit. The Lessee is advised that there may be height and/or width restrictions for structures at LGA Airport and it is incumbent upon the Lessee to assure that his/her vehicles do not exceed these restrictions.
 - vi. Construction vehicles shall not exceed the posted weight and height restrictions for any street, highway, bridge, or viaduct section that must be traveled upon.
- i. Personal Vehicles

The Lessee's personal vehicles are prohibited from parking in construction work zones or loading zones. Designated parking areas shall be established, as the discretion of the Port Authority REO, to accommodate Lessee vehicle parking.

j. Cleanliness

- i. The Construction Site, roadways, walkways, and all affected and adjacent properties near the work zone shall be maintained in a clean and orderly manner. This includes sweeping and removal of trash from roadways and walkways at the start and finish of construction shifts.
- ii. Smoking is permitted only in officially designated areas outside of each terminal. Smoking within or adjacent to the work zones is prohibited.
- k. Public Communication (Advance Notification)

The Lessee shall designate an outreach coordinator to ensure that relevant stakeholders (to be identified by the Port Authority) are informed of upcoming and ongoing construction activities. Formal public outreach will be performed by the Port Authority.

32.4 Cranes

See Section 5.9 of the General Conditions for additional requirements.

Operation of a crane, derrick, shovel or other similar equipment for any and all work within the LGA Airport and roadways under other jurisdictions, shall be carried out by the Lessee in accordance with the rules, regulations and requirements of NYCDOT and NYCDOB and shall comply with all provisions of the New York City Noise Control Code as well as any other Applicable Standards. In addition, if this equipment is to be placed so that any part of the load will be superimposed on the sidewalk or roadway, the Lessee must certify the following:

- i. The sidewalk or roadway area and the supporting subgrade can safely bear the crane load. Should the condition of the sidewalk or roadway area require that the crane be distributed over a larger area that afforded by the elements of the crane, the Engineer of Record shall furnish the full dimensioned details of the load distribution;
- ii. The Engineer of Record has taken all necessary measures to ascertain that there is no vault or other structures underneath the sidewalk area or that if a vault or structure does exist its roof is sufficiently strong to support the load to be superimposed thereof; and
- iii. The sheeting or retaining walls supporting any excavations adjoining the sidewalk or roadway area required to carry a load have been examined by the Engineer of Record and have been found to be sufficiently strong to support the area carrying the crane load. Should the crane be employed making any excavation adjacent to the crane, the Engineer of Record shall specify the sheeting or retaining wall reinforcement required to support the crane.

32.5 Subsurface Utilities and Overhead Structures

The Lessee shall determine the location of and provide protection from damage or loss of all subsurface Utilities and overhead structures in the construction area. The Lessee shall provide contingency work plan for work near essential or critical infrastructure. Prior to commencement of Work, the Lessee shall prepare a detailed work plan including provisions for emergency response if a critical Utility or infrastructure is damaged. The Lessee shall submit contingency plan to the Port Authority for Port Authority Comment.

Emergency response plan shall include the Lessee and Contractor emergency contact information, availability of resources (appropriately skilled labor, materials, and equipment) to immediately rectify any damage and restore service. In the event of any damage or loss to such subsurface Utilities and overhead structures, the Lessee shall promptly replace or repair such Utilities and structures, as directed by the Port Authority or any other agency having jurisdiction thereof or by the owner thereof.

32.6 Parking Plan

The Lessee shall be responsible for managing the public parking supply affected by construction during the construction phase. The Lessee shall provide a Parking Plan indicating the proposed mitigation strategies for the public parking supply deficit during each phase of the D&C Work in accordance with the following requirements.

It is anticipated that the Lessee will schedule the closure of Parking Lots 1 thru 3 in accordance with their construction-phasing plan for the New CTB, West Garage and other New Improvements. Closure of Lots 2 and 3, which is dependent upon opening the Port Authority's new East Parking Garage in front of Terminal C, will create a shortfall in the overall public parking supply that serves the terminal area (existing CTB and Terminals C & D). The Lessee shall not close Lots 2 and 3 until given written permission by the Port Authority.

Patrons of the Existing CTB will be most impacted as they are currently served by Lots 1 thru 3. Opening of the Lessee's new parking structure (identified as the West Garage in the Port Authority plan), is a critical component of the Port Authority's parking deficit mitigation strategy.

Parking Plan Requirements

The Lessee shall provide, at a minimum, the following public parking spaces:

- 1. Lot 1 may be closed upon request, to advance investigative work to support West Garage design. Lot 3 may be closed upon Lease execution and Port Authority issuance of Notice to Proceed. Closure of Lot 2 is to be coordinated with the Port Authority in accordance with the Parking Plan.
- 2. The Lessee Parking Structure shall be completed by January 31, 2018.

The Parking Plan shall include detailed descriptions of how the Lessee plans to minimize Projected Parking Deficiencies due to construction activities, including construction work-arounds. The Parking Plan may consider the following mitigation strategies more fully described in the Interim Parking Analysis provided in the Part IV Available Documents of the New Improvements Project Documents that the Port Authority may assist in implementing:

Port Authority Implemented Mitigation

- Lot 5 Valet for Long-Term Parking
- Congestion Pricing (rate increase)
- Continuous Public Outreach
- Encourage Modal Splits
- Monitor Demand and Encourage Off-Airport Parking.

Lessee Implemented Mitigation

- Phased Opening of the West Garage
- Other mitigation listed in Interim Parking Analysis
- Other Lessee proposed mitigation.

The Parking Plan shall be approved by the Port Authority prior to implementation.
PART C - APPLICABLE STANDARDS

Part C - Applicable Standards of the Requirements and Provisions for Work for the CTB Facilities shall be included in this document in toto and shall apply to the New Improvements as applicable.

The Port Authority of New York and New Jersey LaGuardia Airport CTB Replacement Project

Attachment 4

Preliminary Frontage Analysis Summaries

The Port Authority of New York and New Jersey LaGuardia Airport CTB Replacement Project

LAGUARDIA AIRPORT TERMINAL REDEVELOPMENT PROGRAM

Preliminary Frontage Analysis Summary^[1,2,3,4]

LGA 34 MAAP Schedule (Option B) for GMS Input (Dated: June 2011) eering

PANYN	U Tra	ffic	Engine
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				Can vehicles	3	Vehicle	es per H (Dwell	lour at ing De	t the Fremand)	ontage	0			Av	erage	Dwell 1	lime (s	ec)		Fro	(ft)	
Terminal	Frontage	Frontage Peak Hour	Analysis Description	dwell in adjacent lane ?	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Total Volume	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Frontage length required for LOS C\D	Summation of Frontage length required for LOS C/D	Design Frontage Length
	Departures Frontage	AM (4:45-5:45)	Veh Types 1,2,3	Y	567	406	582					1,555	103	66	66					781	781	900
DING	HOV Arrivals	АМ	MTA Buses	N	· ·			40				40				121				165	970	
BUILI			Courtesy Vehs	N					173			173					71			210		000
INAL	Frontage	(10:45-11:45)	Or-Airport Vans/Buses	N						74		74						105		225	820	900
TERM			Off-Airport Vans/Buses	N							68	68							107	220		
RALT			Private Autos	Y	681							681	118							558	930	
CENT	Arrivals Frontage ⁽⁵⁾	PM (21:30-22:30)	Yellow Taxis	N		540						540		49						200		930
			For-Hires	Ŷ			177					177			94					172		

Notes:

[1] This frontage analysis is used to calculate the effective frontage length.

[2] The analysis does not take into account the friction between vehicles loading and unloading passengers and vehicles that want to access the frontage curb.

[3] The analysis does not take into account the effects of triple parking/standing on a 3-lane frontage roadway (2-lane loading/unloading and a 1-lane thru).

[4] The analysis does not take into account the effects of pedestrian crosswalks at the frontages.

(5) HOVs picking-up or dropping-off passengers are located at the dedicated HOV Arrivals and Departures Frontage.

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Version 6 Requirements and Provisions for Work for the New Improvements

With Adjusted Modal Splits

The Port Authority of New York and New Jersey LaGuardia Airport New Improvements

The Port Authority of New York and New Jersey LaGuardia Airport New Improvements

				Can vehicles	1	Vehicle	s per H (Dwell	lour at ing De	tthe Fi	rontage				Av	erage	Dwell 1	lime (s	vec)						
Terminal	Frontage	Frontage Peak Hour	Analysis Description	dwell in adjacent lane ?	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Total Volume	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Frontage length required for LOS C\D	Summation of frontage length required for LOS C/D	Design Frontage Length	Available Frontage Length ⁽⁶⁾	Design Length / Availabi Length
	Departures Frontage	AM (4:00-5:00)	Common Frontage ^[3]	¥	254	149	152	3	22	22	14	616	110	88	87	123	51	70	74	443	443	450	515	87%
			Private Autos	Ŷ	251							251	118							251				
			Yellow Taxis	N		251						251		52						1.00	1			
TA			For-Hines	Y			135					135			94			1		143	1			
DEL	Arrivals Frontage	AM (9:45-10:45)	MTA Buses	N				9				9				120				55	854	860	1005	86%
			Courtesy Vehs	N					63			63					84			105				
			On-Airport Vans/Buses	N						14		14						133		90	1			
			Off-Airport Vans/Busies	N							21	21							121	110	1			

LAGUARDIA AIRPORT TERMINAL REDEVELOPMENT PROGRAM Preliminary Frontage Analysis Summary^[1,2,3,4] LGA 34 MAAP Schedule (Option B) for GMS input (Dated: June 2013)

Notes:

[1] This frontage analysis is used to calculate the effective frontage length.

2] The analysis does not take into account the friction between vehicles loading and unloading passengers and vehicles that want to access the frontage curb.

[3] The analysis does not take into account the effects of triple parking/standing on a 3-lane frontage roadway (2-lane loading/unloading and a 1-lane thru).

[4] The analysis does not take into account the effects of pedestrian crosswalks at the frontages.

[5] All vehicle types share a common frontage.

I6I The available frontage lengths are based on field measurements conducted on January 2012.

With Adjusted Modal Splits

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The Port Authority of New York and New Jersey LaGuardia Airport New Improvements

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for the New Improv	equirements and Provisions fo	Ve
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LAGUARDIA AIRPORT TERMINAL REDEVELOPMENT PROGRAM Preliminary Frontage Analysis Summary^(1,2,3,4) LGA 34 MAAP Schedule (Option B) for GMS input (Dated: June 2011)

BANYNI Troffic Engineering

				Can vehicles	10	Vehicle	sper i (Dwel	four a	mand)	rontog	0			Av	erage	Dwell 1	îme (s	ec)			Frontage L	ength (ft)	_	_
Terminai	Frontage	Frontage Peak Hour	Analysis Description	dwell in adjacent lane ?	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Total Volume	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Frontage length required for LOS C\D	Summation of frontage length required for LOS C/D	Design Frontage Length	Available Frontage Length ^[6]	Design Length / Available Length
	Departures Frontage	AM (4:15-5:15)	Common Frontage ⁽⁵⁾	Y	298	255	268	7	18	8	19	873	114	77	82	123	51	70	74	570	570	580	675	86%
			Private Autos	Y	303							303	87							243				
s			Yellow Taxis	N		287						287		24						80				
WAY			For-Hires	Y			196					196			124					215				
S AIR	Arrivals Frontage	PM (21:15-22:15)	MTA Buses	N				12				12				120				55	953	960	1335	72%
2		and the second second second	Courtesy Vehs	N					43			43					84			105				
			On-Airport Vans/Buses	N						12		12						133		90	1			
			Off-Airport Vans/Busies	N							28	28		2 D	1				121	165	1			

Notes:

[1] This frontage analysis is used to calculate the effective frontage length.

[2] The analysis does not take into account the friction between vehicles loading and unloading passengers and vehicles that want to access the frontage curb.

[3] The analysis does not take into account the effects of triple parking/standing on a 3-lane frontage roadway (2-lane loading/unloading and a 1-lane thru).

[4] The analysis does not take into account the effects of pedestrian crosswalks at the frontages.

[5] All vehicle types share a common frontage.

(5) The available frontage lengths are based on field measurements conducted on January 2012. The available length for the Arrivals frontage does not include the HOV area (145 ft.) in the western concourse and the outer frontage.

With Adjusted Modal Splits

The Port Authority of New York and New Jersey LaGuardia Airport New Improvements

				Can vehicles	8	Vehicle	s per l (Dwell	iour at Ing De	the Fr mand)	ontage			2	Av	erage	Dweil 1	Fime (s	ec)		Frontage Length (ft)					
Terminal	Frontage	Frontage Peak Hour	Analysis Description	dwell in adjacent lane ?	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Total Volume	Private Autos (#1)	Yellow Taxis (#2)	For-Hires (#3)	MTA Buses (#4)	Courtesy Vehs (#5)	On-Airport Vans/Buses (#6)	Off-Airport Vans/Buses (#7)	Frontage length required for LOS C\D	Summation of frontage length required for LOS C/D	Design Frontage Length	Available Frontage Length ¹⁶¹	Design Length / Available Length	
	Departures Frontage	AM (4:30-5:30)	Common Frontage ^{IN}	Y	38	127	85	2	5	2	8	272	107	75	76	123	51	70	74	215	215	215	215	100%	
_			Private Autos	Y	34							34	112							72					
MINA			Yellow Taxis	N		118						118		46						60					
TER			For-Hires	¥			83					83			101					115					
EAIR	Arrivals Frontage	AM (11:15-12:15)	MTA Busies	N				15				15				120				110	547	550	540	102%	
IARIN		A41.07.070777.420	Courtesy Vehs	N					8			8					84			35					
ž			On-Airport Vans/Buses	N						2		2						133		45	1				
			Off-Airport Vani/Busies	N							14	14							121	110	1				

LAGUARDIA AIRPORT TERMINAL REDEVELOPMENT PROGRAM Preliminary Frontage Analysis Summary^[1,2,3,4] LGA 34 MAAP Schedule (Option B) for GMS input (Dated: June 2011)

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[1] This frontage analysis is used to calculate the effective frontage length.

[2] The analysis does not take into account the friction between vehicles loading and unloading passengers and vehicles that want to access the frontage curb.

[3] The analysis does not take into account the effects of triple parking/standing on a 3-lane frontage roadway (2-lane loading/unloading and a 1-lane thru).

[4] The analysis does not take into account the effects of pedestrian crosswalks at the frontages.

[5] All vehicle types share a common frontage.

[6] The available frontage lengths are based on field measurements conducted on January 2012.

With Adjusted Modal Splits

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Attachment 5





The Port Authority of New York and New Jersey LaGuardia Airport New Improvements

Version 6 Requirements and Provisions for Work for the New Improvements Attachment 5

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