

FEDEX FREIGHT REGIONAL - PROTO-TYPE “BUILD TO SUIT” PROJECT MANUAL

Dated: 11/16/23

PART 1 – REQUEST FOR PROPOSAL (RFP)

SECTION 0 - SCOPE OF WORK

0.1 GENERAL INFORMATION AND BIDDING DOCUMENTS

- A. FedEx Freight, Inc. is an operating company of FedEx Corporation, Memphis, Tennessee. FedEx Freight, Inc. Harrison Group is located at 2200 Forward Drive, Harrison, AR 72601.
- B. The Developer is requested to submit a proposal to provide a complete turnkey Build-to-Suit project comprising of the design, development and lease of the project for the FedEx Freight, Inc. Service Center, located on Moore Road Jonesboro, AR.
- C. The Developer shall use the services of a registered architect and engineers to provide a full set of construction documents including drawings and specifications and the use of a general contractor licensed to perform the project construction work. The work shall be completed and a lease executed for the project in accordance with the attached FedEx Freight, Inc. Contract Documents listed below:
 1. Project Manual as furnished by FedEx Freight, Inc. dated 11/16/23
 2. Proto-type Drawings as furnished by FedEx Freight, Inc. dated 11/16/23, including the following drawings;

COVER

CV – COVER SHEET

SITE

SD1.01 – SITE DEVELOPMENT PLAN
SD1.02 – ALTA SURVEY PLAN
SD1.03 – PAVEMENT DESIGN CRITERIA
SD2.00 – MISCELLANEOUS SITE DETAILS
SD2.01 – SECURITY TURNSTILE DETAILS
SD2.02 – TRUCK ENTRANCE SECURITY DETAILS
SD2.03 – EMPLOYEE ENTRANCE SECURITY DETAILS

STRUCTURAL

F1.20 - DOCK FOUNDATION & JOINT LAYOUT PLAN

ARCHITECTURAL

A1.01 – OFFICE FLOOR PLAN
A1.20 - DOCK BAYS FLOOR PLAN
A1.22 – ELECTRIC FORKLIFT CHARGERS
A1.23 – ELECTRIC FORKLIFT CHARGER DETAILS
A1.81 - SHOP OVERALL FLOOR PLAN
A1.82 - SHOP FLOOR PLAN – BAYS
A2.01 – OFFICE BUILDING ELEVATIONS
A2.20 - DOCK ELEVATIONS
A2.81 - SHOP BUILDING ELEVATIONS
A2.82 - SHOP BUILDING SECTIONS
A3.00 – ARCHITECTURAL WINDOW & DOOR SCHEDULES
A3.01 – ARCHITECTURAL LEGEND, FINISH & INSTALL SCHEDULES
A3.05 – ARCHITECTURAL PARTITION TYPES
A3.10 – ARCHITECTURAL DETAILS & SECTIONS
A3.16 – ARCHITECTURAL CONCRETE WALL SECTIONS
A3.80 – ARCHITECTURAL SHOP DETAILS
A4.00 – OFFICE MILLWORK ELEVATIONS & DETAILS
A4.01 – TYPICAL MILLWORK SECTIONS & DETAILS

A4.05 – DOCK – MILLWORK DETAILS

PLUMBING

- P1.01 – OFFICE PLUMBING PLAN
- P1.81 - SHOP PLUMBING PLAN
- P1.82 - SHOP PLUMBING PLAN

MECHANICAL

- M1.01 – OFFICE HVAC ZONING PLAN
- MEP1.00 – ELECTRICAL & PLUMBING SCHEDULES

ELECTRICAL

- E1.01 – OFFICE LIGHTING & REFLECTED CEILING PLAN
- E1.02 – OFFICE POWER PLAN
- E1.03 – OFFICE DATA & SECURITY PLAN
- E1.20 - DOCK LIGHTING
- E1.21 - DOCK POWER & DATA PLAN
- E1.81 - SHOP LIGHTING & REFLECTED CEILING PLAN
- E1.83 - SHOP POWER, DATA & SECURITY PLAN
- E1.84 - SHOP POWER, DATA & SECURITY PLAN
- E2.00 – ELECTRICAL DETAILS
- E2.01 – ELECTRICAL DETAILS
- E2.02 – ELECTRICAL DETAILS

LUBRICATION

- L1.81 - SHOP LUBRICATION PLAN
- L1.82 - SHOP LUBRICATION PLAN

AXLE SCALE

- AS1.01 – WEIGH TRONIX AXLE SCALE PLAN & DETAILS

AST FUELING

- AST1.30 – AST DUAL LANE, SINGLE TANK PLAN & ELEVS
- AST3.00 – AST LUBE SHED PLAN, ELEVATIONS & EQUIPMENT SCHEDULE

3. Any and all Addendums and Request for Information (RFI's) issued to the Developer by FedEx Freight, Inc. Facility Design & Construction department.
- D. The referenced contract documents are minimum standards considered to be for the construction of the facility and site improvements. FedEx Freight, Inc. recognizes that local regulations or codes may necessitate modifications to these documents should they be more stringent. The design of the facility and its resulting construction must comply with all local, state and federal codes, ordinance and other regulations, all of which shall be included in the lease price. The Developer and/or his assigns will be responsible for all costs and risks associated with the project. At the completion of the facility's construction, FedEx Freight, Inc. will lease the facility from the Developer based on a triple net lease.
- E. Questions or clarifications in regards to the construction documents shall be made in the form of a Request for Information (RFI). RFI requests shall be submitted on the FXF Template (attached in RFP package). Each RFI shall list each question or clarification in numerical order. Each RFI shall be submitted in consecutive order i.e. 1-1, 1-2; 2-1, 2-2; 3-1, 3-2... etc, with each being clearly dated and to include the name of the Developer and General Contractor making request.

Requests for Information will be received until January 4, 2024 in order to address any issues & distribute to bidders for possible costs adjustments prior to bid submittal. RFI's submitted after this timeline will not be responded to. All questions pertaining to this project shall be submitted in the form of an RFI and shall be submitted to FedEx Freight, Inc. by the Developer to the following listed below:

0.2 PROJECT LOCATION

- A. FedEx Freight, Inc. in certain factors requires that a Service Center be located in an area dictated by its operations. These factors include, but are not limited to the following:
 - 1. Market share goal and business plan levels for five (5) years.
 - 2. Business transactions are summarized by zip code, which determines optimum location of a facility.
 - 3. Facility analysis which includes a door study based on arrival averages that determines unload and load door requirements.
 - 4. Current zoning.
 - 5. Optimum land size to allow for expansion of facility.

- B. A site location has been identified that contains approximately **27.4** acres of land more or less and is located along Moore Road in the city of Jonesboro, AR.

0.3 DESIGN AND CONSTRUCTION INFORMATION FOR THE PROJECT

- A. The project scope described herein shall serve as a base upon which to formulate a proposal only, and in no way shall be deemed as complete. The Developer shall utilize the attached proto-type plans and specifications as necessary to submit a proposal for the construction of the project. Scope of work includes, but not limited to the following:
 - 1. **Building Requirements**
 - a. Service Center – approximately **28,498** square feet (total area) initial build-out:
 - 1.) Office Area – The office areas in this building shall be a single story structure, attached to the dock area as shown in the drawings, containing approximately **5,858** square feet of office area to house support and operations personnel. Construction of the office building shall utilize pre-engineered metal building structural steel construction by use of straight steel columns. The roof shall consist of steel purlins supported by rigid steel frames, banded vinyl-faced roof insulation system, single sloped metal panel roof system. Exterior finish of the Office Building shall be v-jointed concrete tilt wall panels or v-jointed pre-cast concrete panels. The office building shall be attached to the dock area as shown on drawings.
 - 2.) Dock Area - The dock area shall be approximately **22,640** square feet of area to handle the sorting and delivery of the freight processed in the facility. The facility will contain a total of **48** coiling O/H doors of which 46 will be designated as revenue producing doors, 1 door(s) to serve as a service ramp and 1 door serving as a trash door. The dock facility shall be constructed utilizing pre-engineered metal building components and shall abut the office building as shown in the drawings. The dock doors will be protected by 10' wide overhead canopy along both sides of the building. The dock shall be designed and constructed so as to allow for the future construction of an additional 25 dock doors, approximately 12,880 square feet. Dock shall be designed for initial 12 electric forklifts and 4 future electric forklifts.
 - 3.) Future Break Room Pod – Attached to one side of the terminal (dock) building will be a service pod containing approximately 1,011 square feet of area. Included therein will be break room/restrooms/janitor/storage areas.
 - 4.) Storm Shelter(s) – Where indicated on Site Development Plan provide building integrated storm shelter(s) as shown and specified elsewhere in the RFP.

 - b. Shop Maintenance Facility – The shop maintenance facility area shall be approximately **9,718** square feet of office/break/storage/work areas for the preventive maintenance function for the vehicles assigned this facility. Construction shall be pre-engineered metal building components. Scope of work

shall include the installation of FFXF supplied equipment as outlined in this RFP and in the proto-type drawings. The shop shall be designed and constructed so as to allow for the future construction of an additional 1 full width service bays, approximately 2,500 square feet.

- a. Storm Shelter(s) – Where indicated on Site Development Plan provide building integrated storm shelter(s) as shown and specified elsewhere in the RFP.
- c. Fuel Facility AST - Detached, but adjacent to the Shop Facility is a Fueling Facility covered by 1 canopy(s) each containing approximately **1,920** square feet of area. The fueling service area shall contain 1 AST 20,000 gal diesel storage tank(s) located where shown on the proto-type drawings. Scope of work shall include the installation of raised structural concrete pads to place the AST(s) and a concrete pad(s) under and around the fuel canopy(s) from which the fueling dispensers and remaining area will be utilized to fuel FedEx Freight trucks. Work shall include a 12’x16’ portable building for the storage of oil, window shield washer fluid and antifreeze barrels as described elsewhere in this manual and on proto-type drawings.

2. Site Requirements

- a. Equipment Yard -This area shall be designed for truck staging, parking and movement area on both sides of the building for the movement of trucks to/from the dock areas of the building as shown on the site development drawings.
- b. Employee/ Visitor Parking - parking area shall be sized to handle vehicle parking spaces excluding any handicap spaces required by the local governing authorities or as shown on site development plans.
- c. Site Utilities – Provide all site utilities as required to support the current and future facilities and operations. Utility requirements for the site shall be based on the following assumptions:
 1. 480/3/60 electrical service to support the facility including site lighting.
 2. Natural gas- for use in heating of the office area and as required and based on standard facility designs.
 3. Water Service- including domestic potable water service and fire protection service as required capable of providing and maintaining fire protection via fire hydrants and fire sprinkler system. Include and install services for proposed and all future expansions.
 4. Sanitary sewer/septic system. Include and install services for proposed and all future expansions.
 5. Storm sewer/retention system.
 6. Telecommunication/Data Service: Developer to provide Telephone Communication and Fiber Utility into building Telco Room(s). Developer to provide underground conduits from utility service point into Telco Room(s). Refer to Security Card Access Control Section for additional scope of work required.
 7. No utilities shall be located or extended underneath the Dock footings, foundations, or slab. No wet utilities shall be located overhead or within the Dock space except the dry-pipe sprinkler system. All wet utilities shall be located outside of the Dock limits to the Office, Pod, or Maintenance Bay spaces they serve. Electric, Gas, and Data utilities are allowed overhead or within the Dock space for all items serving the Dock and Pods.
- d. Entrances –Vehicular entrances to the site are required for incoming/outgoing truck traffic and equipment and installation for employee and visitor’s vehicle. All road modifications required for the project by the local or state governing authority, including but not limited to the addition of turnoff shoulders, widening of the road, turning lanes, re-striping of the road, etc., shall be included in the scope of the project. It is the responsibility of the bidders to contact these governing agencies to determine the extent of the road modifications required to meet the operational requirements of the project.

0.4 ALLOWANCE

- A. The Developer/General Contractor shall include in the Lease Amount all allowance(s) as stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as set forth in the Contract Documents.
- B. Unless otherwise provided elsewhere in the Contract Documents:
 1. Allowances shall cover the cost to the Developer/General Contractor of all materials and equipment delivered at the site including all required taxes, less applicable trade discounts.

2. Cost to the Developer/General Contractor for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for the stated allowance amount shall be included in the Lease amount and is not included in the allowance.
- C. The following items have been identified in the Contract Documents as allowances. Refer to Contract Documents for required scope of work as some allowances may or may not be applicable:
1. None identified
- D. All other cost associated with this project shall be identified as a hard bid cost and shall be submitted on the attached Cost Breakdown Form.

0.5 RESPONSIBILITIES OF ~~DEVELOPER~~ GENERAL CONTRACTOR

- ~~A. The Developer shall reimburse the Due Diligence Developer for any and all due diligence costs and expenses incurred. Reimbursement of due diligence costs shall be included in the Developer's bid. Under no circumstance shall FXF be responsible for paying any such costs unless agreed in writing.~~
- ~~B. The Developer shall keep full and accurate accounting records of all cost incurred and items billed in connection with the work. These records shall be open to audit by FedEx Freight, Inc., FedEx Corporation or by an authorized representative during performance of the Work and for a period of three (3) years after occupancy.~~
- ~~C. Because of the inherent financial and management difficulties that construction projects can entail, the following are stipulated as pre-conditions for submitting a proposal:~~
- ~~D. Land Acquisition~~
- ~~1. The Developer will be responsible for all the costs associated with the acquisition of the land, including cost of land, development cost, realtor fees, financing, obtaining and payment for all permits and impact fees, finder fees, closing cost, legal fees, taxes, deeds, surveys, due diligence cost (including a mandatory Phase I environmental report), soil borings and any other associated purchase and development costs. Under no circumstances shall FXF be responsible for obtaining or paying for any such costs unless agreed in writing. Otherwise all cost shall be made part of the lease agreement.~~
- E. Site Work
1. Include vegetation removal, mass and fine grading, installation of storm drains, sewer, environmental pollution abatement measures and landscaping as required by local authorities during construction and as provided in the contract documents.
 2. All costs related to required on and off site improvements.
- F. Property Improvements
1. The successful Developer will be responsible for full turnkey construction of the proposed facility. The successful bidder will be responsible for all permits, all impact fees, utility connection fees, materials, labor, inspection and testing fees, surveys, finance charge, taxes and insurance during construction.
 2. Developer will construct, per the listed contract documents, all improvements on the site selected, including previously mentioned site work, paving, sidewalks and buildings.
 3. Developer shall provide adequate and appropriate supervision in order to perform all work in a quality-conscious manner, protect materials from damage, maintain a safe and secure job site, erect at its expense any and all safety barriers and measures and in general conformed to all applicable local, state and federal rules and regulations concerning employee safety and health and as outlined in the contract documents.
- G. Project Management
1. The Developer shall provide and assign to the project a Project Manager that shall be responsible for the day to day management of the project, representing the Developers interest and to provide assurance the project is in compliance with the terms of the lease as agreed upon by the Developer and FXF. In no circumstances should the Developer's Project Manager be hired or employed by the General Contractor and/or any of their sub-contractors. Fees for any such services shall be paid by the Developer.
 2. The Developer's Project Manager shall provide, to the Developer and FXF, weekly construction reports and photo documentation of the work in progress. The Developer's Project Manager shall also be present on site each day that the work is in progress until work is completed. The Developer's Project Manager shall

- attend all scheduled project meetings with the general contractor and key sub-contractors, then submit meeting minutes to FXF Project Manager for their review.
3. The Developer's Project Manager shall be responsible to serve as the gateway for all written and verbal correspondence between the General Contractor and FXF or vice versa. Duties shall include but not be necessarily limited to; emails, RFI's, construction reports, construction schedules, review of shop drawings prior to delivery of and review by FXF and any all other correspondence either written and or spoken.

0.14 CONFIDENTIALITY

- A. FedEx Freight, Inc. requires that all information regarding this transaction remain confidential and not be discussed with anyone who is not associated with the pertinent people within your company or people that are

directly related with your efforts to submit the requested proposal. No publicity or news releases pertaining to the RFP or project may be released by any firm or individuals associated with the project without prior written approval of FedEx Freight, Inc. or FedEx Corporation.

End of Part 1 - RFP

PART 2 – SPECIFICATIONS

SECTION 1 - GENERAL CONDITIONS

1.0 GENERAL

- A. This Guideline Specification is not intended in any way to replace any construction specifications, alter any applicable local, state or federal codes, regulations, or any other requirements that may be necessary for permits or the meeting of any architectural, engineering or construction standards. It will be the responsibility of the Developer to meet all necessary local, state and federal requirements related to the proposed facilities. All labor and materials shown are furnished and installed by the Developer unless otherwise noted.
- B. The Developer warrants to FedEx Freight, Inc. that all materials and equipment furnished under this Specification will be new unless otherwise specified, and that all work will be good quality, free from faults and defects and in conformance with the attached design criteria. All Work not so conforming to these standards may be considered defective. If required by FXF the Developer will furnish satisfactory evidence as to the kind and quality of materials and equipment.
- C. If, within one year after the Substantial Completion of Work or designated portion thereof, or within one year acceptance by FXF of designated equipment, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the specification, any of the Work is found to be defective or not in accordance with the specification, the Developer will respond within 30 days and provide a schedule for correction after receipt of written notification of such condition. FXF will give such notice promptly after discovery of the condition.

1.1 DEFINITIONS

- A. For purposes of this specification, when referring to the Project Manual and/or Drawings the following definitions shall apply:
 - 1. “Owner” shall mean Developer.
 - 2. “Developer” shall mean individual or organization submitting the Bid to develop, disclose acquire or cause to develop the referenced project. Reference may also be made to “Landlord” or “Lessor” in a build-to Lease facility.
 - 3. “Contractor” shall mean General Contractor performing the work.
 - 4. “Lessee” shall mean FedEx Freight, Inc. (FXF).
 - 5. “Architect/Engineer” shall mean architect and/or engineer as hired by Developer or Contractor.
 - 6. “FXF” shall mean FedEx Freight, Inc.
 - 7. “As Built’s shall mean revised set of drawings submitted by the contractor upon completion of this project. The drawings shall reflect all changes made in the specifications and construction drawings that were made during the construction process and shall show the exact dimensions, geometry and locations, hidden and/or not hidden of all elements of the work completed under the contract. This shall include locations of exterior conduits and conductors and all on-site utility lines.

1.2 DESIGN SERVICES

- A. The Developer shall, under his direct supervision, provide and pay for all design consultant services required for the development of project specifications and construction drawings, the cost of which shall be included in the Developer’s proposed lease rate. These services shall include preparation of all architectural/engineering/landscaping construction documents, shop drawing reviews, and all other detailed information or drawings necessary to obtain Federal, State and Local permits. Plans shall be reviewed by, and bear the seal of an architect/engineer/landscape architect registered in the state where project is to be constructed. Work shall not be considered as a “Design Build” project and General Contractor shall not hire or direct services of any design consultant, architect, engineer or testing service associated with project.
- B. Once the successful Developer has been selected and once a lease agreement has been entered into, the Developer is required to direct his/her Project Manager along with the Architect-of-Record and Engineers, to hold a Pre-Design meeting with selected personnel within the FedEx Freight Facility Design & Construction Department. The meeting shall be scheduled a minimum of 14 days in advance and shall be held by the Developer in the city where the selected site is located. Developer shall provide an off-site meeting location with a conference room large enough to accommodate all Architects, Engineers & Design Consultants

associated with the project as well as FXF Staff & Developer Staff. The Sr. Staff Architect and or Staff Architect for the project will contact the Developer once the project has been awarded to schedule the meeting.

- C. All construction document drawings shall be drawn in 24" x 36" format. Drawings submitted in 30" x 40" format or larger will not be acceptable.
- D. Construction documents shall be designed in conformance with all applicable federal, state and local building codes and ordinances. A code summary sheet shall be included in the final construction drawings. Building Occupancy Type shall be S1 and designed to meet all code requirements, which if required by local fire marshal, may include dock draft curtains, smoke vents on building roofs, additional dock exits while maintaining revenue door counts & other items as required to obtain all Building Occupancy Permit(s).
- E. Owner shall provide a property survey indicating boundaries, easements, available utilities and topography of land within the property boundaries. (24" x 36" format).
- F. Design of site work related items shall be by a registered engineer, (i.e. roads, swales, storm water management, detention/retention areas, etc.). (24" x 36" format).
- G. All final design layouts including site design, office and customer center design, related details, mechanical, electrical, and electrical design shall be reviewed and approved by Lessee before actual construction begins. (24" x 36" format).
- H. The Developer shall provide FedEx Freight, Inc. with one (1) complete set of construction drawings bearing the seal of a licensed architect and engineer plus one complete set of **PDF** drawings bound into single pdf document with 300 dpi resolutions. The drawings shall include, but not be limited to the following:
 - 1. Drawing Index & Code Summary Sheet
 - 2. Site Plan with Location Map
 - 3. Site Grading Plan(s)
 - 4. Site Utility Plan(s)
 - 5. Site Security Details
 - 6. Paving Plan and Details
 - 7. Structural Foundation Plan(s) and Details
 - 8. Floor Plan(s)
 - 9. Building Elevation(s)
 - 10. Reflected Ceiling Plan(s)
 - 11. Millwork Elevation(s) and Details
 - 12. Room Finish / Door and Window Schedules
 - 13. Mechanical Plan(s) and Schedules
 - 14. Plumbing Plan(s) and Schedules
 - 15. Electrical Plan(s) and Schedules
 - 16. Fuel Island and associated Fueling System
 - 17. Fuel Island Lubrication Plan and Details
 - 18. Shop Lubrication Plan
 - 19. Site Lighting Photometric Plan with Calculations
- I. Construction documents that are submitted to FXF shall be provided with all required drawings, City review comments, are deemed to be 100% complete and ready to start the work. Drawings and specifications submitted to FXF shall include the Construction Drawing Check List from Tab 11, signed by Developer's Project Manager stating that the construction documents meet all requirements of the proto-type drawings and specifications, along with consultant approval letters as noted below.
- J. Construction shall not begin until such time fully City approved plans have been submitted and building permit has been issued. Should the Developer/General Contractor begin construction before City approved drawings are complete, they will accept full financial responsibility for correction of the work not in compliance with the proto-type drawings and specifications and at no additional cost to Lessee.

- K. Consultant Approval Letters:
 - 1. Provide stamped and signed letter from Geotech Engineer stating that they have reviewed the site related civil and structural drawings associated with this project and are satisfied that the construction documents comply with their recommendations in their geotech report prepared for this site as well as meeting the pavement life-cycle loads required elsewhere in this project manual.
 - 2. Provide stamped and signed letter from Civil Engineer stating that they have reviewed the geotech report prepared for this site and designed their pavement systems according to the Geotech Engineer's recommendations and identified areas to be undercut in their drawings.
- L. Once final construction documents have addressed all City review comments, the Developer shall furnish one (1) set of bond prints & one (1) set of pdf digital files to FXF. These construction documents shall be used to construct the work and it shall be general contractor's responsibility to verify that they are maintained on-site at all times along with the RFP documents.
- M. Developer shall instruct General Contractor to provide each sub-contractor with City approved plans and specifications as related to their portion of the work prior to construction start-up of the project. General Contractor shall provide written notice of compliance to Developer for distribution to FXF Project Manager.
- N. At completion of project, Developer working through Contractor shall furnish to Lessee a set of "As-Built" construction drawings and other closeout documents. Refer to Tab 17 for requirements.

1.3 CONTRACT ADMINISTRATION

- A. All specified work will be completed under the supervision of a field superintendent employed by the General Contractor.
- B. Representatives of the Owner and Lessee may visit and inspect the work at all times during the construction progress and the General Contractor shall provide sufficient and safe facilities for such inspection.
- C. Contractor shall comply with all Federal, State and Local life safety measures including OSHA.
- D. When the changes in the work are ordered which increase or decrease the scope of work, the work shall be performed for the net cost to the Contractor plus a fee. This fee shall include all indirect costs, overhead and profit and shall be a maximum total of eight percent (8%) of the net cost. This fee shall include Landlord, sub-contractor and/or General Contractor's fee.

1.4 GOVERNING CODES

- A. It shall comply with all statutes, laws, ordinance, regulations, rules and orders bearing on the conduct of work of any federal, state, local, municipal or other authority having jurisdiction. Should the Developer perform any work contrary to any statutes, laws, ordinances, regulations, rules and orders, it shall bear costs, losses and damages arising from and shall indemnify and hold harmless FedEx and its subsidiaries.
- B. Building envelope and foundation systems shall be designed to meet all Local/State/Federal energy code requirements. Architects shall provide COMcheck certification as proof of compliance when construction drawings are submitted to FXF for review.
- C. Mechanical/Electrical/Plumbing systems shall be designed to meet all Local/State/Federal energy code requirements, considering spaces classified as heated, semi-heated or as otherwise noted. Engineers shall provide COMcheck certification as proof of compliance when construction drawings are submitted to FXF for review.
- D. On site drinking water shall be provided for FXF employees and shall meet all Federal, State and Local standards for safe human consumption with test results provided to FXF for environmental review.
- E. Contractor shall coordinate all phases of construction with local zoning, building and fire officials to ensure compliance.

- F. Developer is to ensure that all aspects of the building(s) and site are designed and constructed in accordance with the American and Disabilities Act of 1990, as amended. Attention will be given to the lobby area, ramps and sidewalks, door handles, drinking fountains, washroom facilities and providing of parking spaces as required.
- G. Contractor and his architect and/or engineer to design and construct the project in accordance with the following appropriate codes of current edition as approved and adopted by local jurisdiction where construction is scheduled to take place:
- American Concrete Institute (ACI)
 - American Disability Act (ADA)
 - Uniform Building Code (UBC))
 - Uniform Mechanical code (UMC)
 - Uniform Plumbing Code (UPC)
 - Uniform Fire Code (UFC)
 - Southern Standard Building Code (SBC)
 - International Building Code (IBC)
 - National Fire Protection Association (NFPA)
 - National Electrical Code (NEC)
 - International Energy Conservation Code (IECC)
 - American Society of Heating and Air-Conditioning Engineers 90.1 Energy Standards for Buildings (ASHRAE 90.1)
 - Other codes as applicable

1.5 SHOP DRAWINGS

- A. The contractor and his sub-contractor are required to submit shop drawings of the products scheduled to be installed as part of the work. Shop drawings shall be revised by the responsible architect and/or engineer who designed or specified the product under their discipline.
- B. All materials and workmanship specified herein shall be considered the minimum acceptable standards and, unless noted otherwise, materials of approved equal quality may be substituted if agreed in writing, in advance with FXF. Therefore, no material substitutions of specified material shall be made without prior approval from FedEx Freight Facility Design & Construction Department. Material specifications and samples shall be submitted for approval in writing prior to commencement of work, indicating justification for request and that product requested for substitution meets product as specified. Product substitution requests without proper documentation will not be considered or reviewed.
- C. Complete sets of each shop drawing submittal shall be sent to the General Contractor for review and approval and then shall be forwarded to the Architect and/or Engineer of Record for their review and approval. Once these reviews are complete the shop drawings shall be sent to the Developers Project Manager for their review and approval. Once reviewed and approved, a complete and marked up set shall be forwarded to FXF Project Manager via SharePoint site for their review and comments prior to the Developers General Contractor or sub-contractor, submitting them for the building permits, ordering of products and/or the commencement of construction. FXF will retain a stamped set on SharePoint and will send notice to the Developer's Project Manager via SharePoint. It will be the Developers Project Manager's responsibility to return the stamped shop drawing(s) to the appropriate party. The review of the shop drawings by the Developer and FXF is not intended as a design check and does not relieve the Developer or the General Contractor, Engineer or Architect of any errors or omissions in the construction documents. It shall not be FXF responsibility to approve, but only review for compliance with the intended contract documents, and terms of the lease. It shall be the architect's and/or engineers of record responsibility to review the shop drawing submittals for compliance to the construction documents.
- D. The Contractor shall submit as a minimum, the following Shop Drawings and product data as applicable. FXF reserves the right to require Shop Drawings and product data for other items and/or equipment not listed below. Shop Drawings and product data submittals that deviate from the requirements of the Contract Documents shall be brought to FXF's attention, in writing at the time of submission.

1. Concrete mix designs for all types of concrete products including differing psi strengths
2. Asphalt pavement design for Heavy Duty and Light Duty
3. Engineering calculations for the paving design as set forth in the Project Manual
4. Landscaping / Irrigation Plan and proposed plant types and sizes
5. Photometric study of proposed site lighting, including light fixture type
6. Security Fencing
7. Metal Fabrications as described in Section 5.2 of the Project Manual
8. Architectural Millwork drawings
9. Hollow metal door and window frames
10. Overhead Coiling Doors
11. Overhead Sectional Doors
12. Finish Hardware and Keying Schedule
13. Toilet Accessories
14. Dock Levelers, if other than DLM
15. Pre-engineer Metal Building Drawings
16. Fuel Canopy
17. Fueling System
18. Lube Shed Lubrication
19. Shop Lubrication System
20. Fire Protection system
21. Fire Alarm System
22. Security Card Access System for site and building, and proof of installer's certification
23. Light Fixtures
24. Emergency Back-up Generator and AST Switch
25. Room Finish Color Selections
26. Security Gates at Yard Entry & Employee Parking
27. Other items as determined by FXF Construction Project Manager

1.6 PERMITS, FEES AND TAXES

- A. Developer/Contractor shall pay for and procure all Federal, State and Local building and/or construction permits as required to construct work.
- B. Developer/Contractor shall pay all sales, use and payroll taxes as required by various governing authorities.
- C. Developer/Contractor shall pay for all impact fees, water and sewer tap fees, electrical fees, gas fees and other connection fees as needed for construction purposes.
- D. 60 days prior to completion, Lessor shall forward all utility account numbers to FXF Construction Project Manager for transfer of accounts. Lessee shall commence payment of utilities upon substantial completion and/or signed operational complete certificate.

1.7 CONSTRUCTION SCHEDULE

- A. The Developer and/or his contractor shall submit a fully developed Gantt chart construction schedule produced in electronic format prior to Lease execution. The schedule shall identify the jobsite critical path planned workdays/hours per week and include allotted time for weather related delays, etc. appropriate for the area. The chart shall provide a separate bar for each construction activity and vertical lines identifying the first working day of each week. Completion shall be indicated in advance of the date established for Substantial Completion.
- B. Include, but do not necessarily limit indicated activity to:
 1. Project mobilization
 2. Submittal & approval of Shop Drawings & Samples
 3. Procurement of equipment and critical materials.
 4. Fabrication of special material and equipment, and its installation and testing
 5. Final clean-up
 6. Final inspection and testing in order to obtain Certificate of Occupancy.
 7. All activities that effect process, required start dates and completion dates.

- C. Should the project advance or fall behind the anticipated construction schedule more than 20 days, the contractor shall immediately revise the construction schedule reflecting such changes.
- D. Copies of the construction schedule shall be provided to Owner and Lessee.

1.8 TESTING

- A. The Developer shall be required to secure and retain the services of a geo-tech engineer to perform and submit a geo-tech report of sub-surface conditions. The report shall include reporting of on-site soil materials, soil classifications, soil bearing capacities, design recommendations for foundations and design recommendations for both flexible and rigid paving design per the criteria as set forth in Section 2.3 and Section 2.4.
- B. All testing reports shall be communicated via Email or SharePoint site. The following list of FXF personnel shall be included in all testing reports:
 - 1. FXF Construction Project Manager
 - 2. Manager of Construction
 - 3. Sr. Staff Architect or Staff Architect
- C. Prior to beginning earthwork and concrete operations the Developer shall secure and pay for independent services of a soil engineer and testing laboratory. Such services shall be hired independent of the General Contractor doing the work, with cost for such services to be paid by the Developer.
- D. Required testing services and observations shall include the following:
 - 1. Soils Testing
 - a. Moisture/density curves.
 - b. Compaction testing of fill materials in preparation of sub-grade.
 - c. Inspection of (proof rolling) of final lift or grade and re-compaction of deficient area until proper compaction is obtained.
 - d. Continuous on-site observations of moisture conditioning during entire operation and testing of each lift.
 - e. On-site observations as required for placement of lime stabilization and/or select fill during select periods of the operation and associated compaction testing.
 - 2. Concrete Testing
 - a. Conduct slump test of batched concrete.
 - b. Conduct air entrainment test when applicable.
 - c. Casting of concrete cylinders for determining required compressive strength of concrete as specified elsewhere.
 - d. Conduct core testing as needed and where low cylinder breaks occur.
 - 3. Floor flatness and Levelness testing as required by Section 3.3 of this specification.
 - 4. Coring (Asphalt and concrete paving sections)
 - a. Provide coring of all concrete and asphalt paving sections as required to determine proper paving depths, compressive strength and proper size placement of reinforcing steel.
 - b. Concrete paving - take cores at the rate of one (1) core per 10,000 sq. ft. of all concrete paved areas or a minimum of one (1) core per paved area if under the 10,000 sq. ft. rule. If any placed pavement section is determined to be 1/2" or more in thickness than that as specified and or as designed, provide additional testing as directed by FXF.
 - c. Asphalt paving - take cores at the rate of one (1) core per 20,000 sq. ft. of all asphalted paved areas. If it has been determined that if any placed pavement section is determined to be 1/2" or more in thickness than that as specified and or as designed, provide additional testing as directed by FXF.
 - d. Provide a full written report reporting findings.
- E. Concrete Test Cylinders - provide one (1) set of concrete cylinders, four (4) cylinders each for determining compressive strengths.
- F. Provide quantities based on the following:
 - 1. Concrete paving: 1 set for every 120 cy or one day's placements.
 - 2. Floor slabs: 1 set for every 80 cy or one day's placement.
 - 3. Foundations: 1 set for every 100 cy or one day placement.

- G. Concrete cylinders shall be broken at the following cycles, with the minimum of design strength to be achieved:
- | | |
|--------------------------|----------------------------------------------------------------------------------------|
| Cylinder 1 @ 7 days | 85% of specified design strength |
| Cylinder 2 @ 28 days | 100% of specified design strength |
| Cylinder 3 @ 56 days | 105% of specified design strength |
| Cylinder 4 @ as required | Cylinder can be discarded if 56 day break exceeds
100% of specified design strength |
- H. Prior to casting cylinders, provide slump testing of concrete. It shall be the testing engineer's and/or field technician's responsibility to reject all materials that do not fall within maximum slump requirement of 3 inch +/- 1 inch slump. Loads with a slump greater than 4" shall be immediately rejected and promptly removed from the project site. It shall be the responsibility of the testing technician present at the job site and the general contractor's superintendent to comply with these requirements.
- I. The testing company shall provide detailed written reports. Furnish the Developer, General Contractor and Lessee with the copies of each report within 24 hours of specimen.
- J. Provide other testing and inspections as required by governmental agencies having jurisdiction.

1.9 SHIPPING AND HANDLING DURING CONSTRUCTION

- A. The Developer, Contractor and/or their sub-contractors shall utilize the shipping services of FedEx Freight, Inc., a subsidiary of FedEx Corporation, when shipping LTL. (Less than truck load). Exceptions to using FedEx Freight, Inc. include when shipping via flatbed, when shipping by a contract freighter and when an article is longer than 25' in length. Under no exception shall another LTL carrier be allowed unless previously approved by FedEx Freight, Inc. All cost associated with shipping shall be included in lease price.

1.10 REDLINE / AS-BUILT DRAWINGS

- A. During the construction process the contractors project superintendent shall be fully responsible to keep one (1) set of "Approved" construction documents (drawings and specifications) on-site in the job trailer which shall be used as a master set of "Redline" drawings reflecting all changes made in the specifications and working drawings during the construction process, and shall show the exact dimensions, geometry, and location of all elements of the work completed under the contract.
- B. This set of redline drawings shall be updated at a minimum once a week noting any change made during construction and exact location of concealed underground utilities, including plumbing and sewer lines and electrical conduits.
- C. Identifying marks shall be clouded, dated and initialed by person making the change or comment. During the construction process, FFX Construction Project Manager shall periodically review the master redline set to determine mark-ups are being made and if the drawings are currently up to date.
- D. Once the project has been completed the set redline mark-ups and comments shall be incorporated into the final "As Built" drawings and these final As Built drawings shall be included in the close-out documents.

1.11 CLEANING

- A. Contractor shall keep the premises free, at all times, from excess accumulations of waste and debris.
- B. Contractor shall present the completed project to the Owner in a "broom clean" condition. Office areas shall be cleaned, dusted, glass and horizontal surfaces polished, floors damped mopped, VCT floors waxed (if shown in drawings, refer to Resilient Flooring and Base Section) and all ceramic tile properly sealed as recommended by tile manufacturer.
- C. Dock floors shall be power swept and in dust and dirt free condition.
- D. All exterior paved surfaces shall be mechanically swept of all dirt, mud, gravel and landscape material and left in a clean state.

1.12 CONTRACT CLOSEOUT DOCUMENTS

- A. As part of the final acceptance of the Project, the Developer, working in conjunction with their General Contractor shall cause to prepare and provide contract closeout documents as outlined in Tab 17.

1.13 INSURANCE

- A. Builder's risk: Throughout the construction of the Improvements, Developer shall maintain in force with respect to the Improvements a policy of multiple peril (all-risk) builder's risk insurance that has been written by an insurer reasonably satisfactory to FedEx Freight, Inc. on a completed value basis in an amount equal to the full replacement cost of the Improvements and that contains no exclusions from coverage that FedEx Freight, Inc. determines to be objectionable. That policy must name FedEx Freight, Inc. as additional insured and must assure FedEx Freight, Inc. that its coverage will continue for FedEx Freight, Inc. benefit notwithstanding any act or omission on Developer's part. That policy must provide that no cancellation, surrender or material change will become effective unless FedEx Freight, Inc. receives written notice at least 30 days in advance of the time at which that cancellation, surrender or material change becomes effective. The form of that policy must otherwise be reasonably satisfactory to FedEx Freight, Inc.
- B. In the event that it is necessary to operate permanently installed equipment on other than a testing basis or in the event it is necessary for the Developer or FedEx Freight, Inc. to occupy a part of or the entire building, the Builder's Risk Insurance Policy must be endorsed to permit same.

1.14 PROJECT COMPLETION FOR TENANT MOVE-IN

- A. Developer shall assure that General Contractor has priced in their base bid to allow for the following individuals and/or trades to be on 24-hr call for immediate response on Saturday and Sunday prior to Tenant's Monday scheduled start-up of business operations:
 - a. Electrical Contractor
 - b. Data Contractor
 - c. Security Contractor
 - d. Mechanical/Plumbing Contractor
- B. Developer shall provide provisions to assure that their assigned Project Manager shall physically be on site Saturday and Sunday prior to Tenant's Monday scheduled start-up of business operations in order to assist in the immediate correction of non-compliant work and shall also be on 24-hr call when away from site during this time period.
- C. Developer shall assure that General Contractor has priced in their base bid to provide provisions to assure that their assigned Project Superintendent shall physically be on site Saturday and Sunday prior to Tenant's Monday scheduled start-up of business operations in order to assist in the immediate correction of non-compliant work and shall also be on 24-hr call when away from site during this time period.

1.15 LEED CERTIFICATION (Not Used)

SECTION 2 – SITE WORK

2.1 EARTHWORK

- A. Provide all materials, labor and equipment necessary to complete all earthwork as shown on drawings.
- B. Earthwork preparation to be provided for the building area, parking areas, driveways, loading dock and landscaping.
- C. Provide a clean and level site with all building pads brought to proper sub-grade elevations.
- D. Perform all excavation and backfill operations necessary for footings, piers, walls and grade beams.
- E. Place and compact under slab fill at all building and apron locations.
- F. All materials and placement shall be furnished and installed to ASTM Standards.

- G. Compact all graded soils to 95% density (Standard Proctor).
- H. Immediately contact soils engineer if abnormal or questionable soil conditions are encountered.
- I. Provide barricades, warning lights and signs and/or shoring at all open holes to ensure public and construction safety.
- J. Provide geo-tech testing/reporting of onsite materials to determine proper engineering practices. Refer to Section 1.8.
- K. Include any and all cost associated with de-watering of the site as a result of construction or subterranean conditions.
- L. Provide an underground storm drainage system for connecting of all downspouts from the proposed buildings.

2.2 PAVEMENT, EARTHWORK AND EXCAVATION

- A. All clearing, grubbing and any work which disturbs the existing ground surface shall comply with all local and state regulations regarding erosion and sedimentation control.
- B. The earthwork contractor shall stockpile on site a sufficient amount of fertile topsoil in order to provide a minimum of 6" thick layer of topsoil at all areas scheduled to remain green areas on site. Should a sufficient amount of topsoil not be available, the earthwork contractor shall import topsoil.
- C. Additional fill required to raise grades, which may consist of approved on-site soils and/or off-site borrow, shall be free of all debris, organics, and clumps and shall be adjusted to the proper moisture content before compacted in 8 inch maximum layers. Each layer to be compacted to 95% density (Standard Proctor) per ASTM D698.
- D. Select fill under slabs and pavement areas shall be placed in 8 inch maximum layers of loose material. Each layer to be compacted to 95% density (Standard Proctor) per ASTM D698.
- E. Provide sheet flow and/or underground drainage/storm water systems which will adequately drain the premises in a manner which is lawful. The yard shall have a constant 1.5% slope away from the building, to 60 feet perpendicular from all building(s) exterior walls; beyond that, the yard shall have a minimum 1.5% slope and maximum 2.5% slope, to facilitate drainage.
- F. Grading of dock apron areas shall provide finish grades that produce a 49-inch dock height. Dock apron shall be designed with Potential Vertical Rise (PVR) limited to maximum one (1) inch uplift above dock finished floor elevation at dock stem wall and shall be noted as such in geo-tech report prepared for this site.
- G. Entrance and exit driveways shall be in accordance with the plans and shall not exceed a continuous slope of 5% maximum to facilitate tractors pulling multiple trailers.
- H. Provide retention/detention ponds and/or underground piping and basins sized to accommodate full development expansion and designed in accordance with all applicable regulations.
- I. A grading plan shall be submitted to FedEx Freight, Inc. for review prior to construction.
- J. Provide Geo-textiles or geo-grids, if required, for soil stabilization and installed in strict accordance with manufacturer's recommendations.

2.3 BITUMINOUS PAVING – Not Used

2.4 ASPHALT SEALER – Not Used

2.5 CONCRETE PAVING

- A. All reinforced concrete paving shall be of not less than #4 rebar; welded wire fabric not allowed; fiber mesh or steel pins not allowed.
- B. Provide all material, labor and equipment necessary to complete all concrete paving as shown on the drawings.
- C. Concrete paving shall be designed, engineered and constructed in accordance with American Concrete Institute publication ACI 330R-08 Guide for Design and Construction of Concrete Parking Lots.
- D. Concrete shall conform to ASTM C94 requirements.
- E. Concrete to be delivered by an approved redi-mix supplier and a design mix data sheet provided for each compressive strength. Fly-ash shall be permitted only at exterior pavement applications.
- F. Specified concrete compressive strength to be obtained during the 28 day cure period. Contractor to provide necessary testing laboratory services. Refer to Section 1.8.
- G. Concrete paving to receive a medium broom finish at right angles to the traffic pattern and sloped as noted on the plans.
- H. All exposed exterior concrete to be air-entrained.
- I. Design and construction concrete paving with expansion joints, saw joints and construction joints with an area, no larger than 15'x15'. Saw joints to be cut to a depth of 1/3 the slab thickness.
- J. Expansion joint material to be minimum of 1/2" wide, full slab depth, bituminous fiber board.
- K. All expansion joints, construction joints and saw joints to have backer rod and elastomeric joint sealant material applied. All joints shall be cleaned as recommended by sealant manufacturer. Sealant pull tests shall be completed with a manufacturer's representative on site to administer. If pull tests fail, sealant shall be replaced at no additional cost to FXF. Conduct tests on basis of five tests per 1,000 feet and one test per 1,000 feet additional. Refer to Section 7.4 for material type.
- L. Pavement design shall be based on a 25-year life expectancy with a serviceability index of 2.0, a modulus of sub grade reaction of 100 psi, compressive strength of 4000 psi at 28 days, and a traffic volume of:
 - 150 trailers/day
 - 61-80 door facility
- M. Pavement design loads shall be as follows:

Design life	25 years used in calculating load repetitions
Total Truck/Trailers Weight	72,000 pounds gross
Tractor Maximum Front Axle	8,000 pounds
Tractor Maximum Rear Axle – Tandem	16,000 pounds (i.e., 32,000 pounds for two axles)
Average Trailer Axle Load Equivalency Factor	16,000 pound Equivalent Single Axle Loads
- N. Concrete paving to receive one coat of white pigmented concrete sealer equal to L & M W-2 white pigmented sealer.
- O. Provide the use of smooth steel dowels when designing concrete pavement for load transfer from one paving section to another. Design in accordance with ACI 330R-08.
- P. Consultant Approval Letters: Refer to Section 1.2.K for requirements.
- Q. Keyways are not allowed.

2.6 SITE TRAFFIC SIGNAGE/MARKINGS

- A. Provide all material, labor and equipment necessary to furnish the site traffic signage as shown on the drawings or as required by local authorities.

- B. All materials to comply with ADA standards.
- C. Handicap parking signs shall consist of a white rectangle with longer dimension vertical, having a green message and a blue and white international symbol for the barrier-free environment. This sign shall include the words: “Disabled Parking - State Permit Required” and “Violators fined up to \$200.00”.
- D. Furnish with standard mount. Mount with bottom of sign of 5 feet above grade. Sign shall comply with requirement of the ADA.
- E. Schedule of signs:
 - 1. Handicap Parking - Each - 12” x 18” or as required by local code or jurisdiction, (one sign per handicapped parking space, where indicated on drawings).
- F. All vehicular parking spaces i.e. employee and equipment markings shall be laid out and marked with striping paint as shown on site plan.
- G. Traffic paint shall be 100% acrylic, one component, factory mixed, quick drying and non-bleeding conforming to FS-TT-P-1952f, Type III vehicle, color - yellow.

2.7 LANDSCAPING and IRRIGATION

- A. Provide all material, labor and equipment necessary to complete the landscaping.
- B. Cost shall be included in the contract for all landscaping work (labor and materials) to include irrigation system, grass sod, seeding, trees, shrubs, weed barrier, separation fabric, edging, rock and/or wood mulch.
- C. There shall be a sufficient amount of fertile topsoil stockpiled on-site in order to provide a minimum of 6” thick layer of topsoil at all areas scheduled or shown to remain green on site plan. Should a sufficient amount of topsoil not be available, topsoil shall be imported.
- D. All planter areas shall have weed barrier installed prior to installation of rock or mulch material. When placing mulch it shall be placed at a thickness of 6”. All planter areas shall be separated from grass areas with metal edging or other approved edging materials.
- E. All planted trees shall be properly staked and tied.
- F. Landscaping to be designed with plant materials which comply with local codes and ordinances, where applicable, and installed by local nurserymen. Landscaping and irrigation in front of and adjacent to Service Center Office is required. Plant materials shall be warranted for a period of one year. During and/or prior to end of warranty period dead or diseased plants shall be replaced.
- G. Unpaved landscaped areas of the site shall be seeded, stabilized or sodded and prepared in accordance with applicable landscaping code requirements. Additional landscaping, such as trees, screening, storm water drainage areas, etc., shall be provided in accordance with applicable codes.
- H. When providing turf grass seed to cover disturbed areas, turf grass must be fully established for at least one month before a punch list is completed. Final completion will not be given until turf grass is established and confirmed by the FXF construction project manager.
- I. An underground irrigation system shall be provided to supply 100% head coverage of all landscaped planter areas and grassed yard areas, i.e. open areas bordering the office, green areas separating employee parking lot from office, areas fronting entrance drives and areas fronting public R/W’s.
- J. The irrigation system shall be constructed of un-plasticized PVC piping, 2 ½” and under SDR 26, Class 200 and 3” and over, SDR 26, Class 160. Sprinkler heads, pumps, valves and associated equipment shall be TORO or Rainbird or approved equal. Irrigation system shall be connected to landscape water meter, separate from domestic water meter, with backflow preventer and installed as required to meet local codes.

- K. Controller shall be microprocessor based solid state controller capable of fully automatic or manual operation of system.
- L. All landscaped planter beds in shall be properly maintained and made weed free prior to FXF acceptance of the facility. Grass areas shall be properly graded and raked with all rock larger than 1-1/2" diameter removed prior to planting of grass. Once grass has been established areas shall be mowed and trimmed prior to FXF acceptance.
- M. All landscaping plantings shall be covered under warranty for a period of one year after acceptance of the project by FXF. During that period any and all diseased, distressed, dead or improperly placed plantings shall be replaced.

2.8 YARD LIGHTING

- A. Site lighting shall be designed and constructed to provide a minimum sustained illumination level of one (1) foot-candle; average levels are not acceptable. Photometric studies shall be provided during the design phase for FXF review and approval. Provide site lighting at yard entry drive, within all areas that are under fence including yard equipment parking areas, auto parking areas, adjacent green spaces, and future expansion areas.
- B. Fixtures shall be energy efficient LED lamps of sufficient wattage, number and spacing to achieve design illumination level previously noted. Refer to LED fixtures as scheduled in RFP drawings. Site photo-metric drawing required for FXF review and approval.
- C. Fixtures shall be mounted to 35' high standard steel (painted) or aluminum poles with appropriate mounting hardware.
- D. Conductors to light poles shall be fed underground. Provide underground conduits as required.
- E. Provide lighting protection by means of Charge Dissipation Terminal (CDT), equal to TerraStat TS-400, mounted at top of all site light poles. Provide ETL National Recognized Testing Laboratory (NRTL) ANSI/UL 1449 Third Edition listed Surge Protective Device (SPD) equal to PowerTrip PT-LP or PT-HW-050 Series devices. Provide an approved grounding kit at each exterior site light pole assembly. SPD equipment and grounding kit shall be scheduled and shown in site lighting construction drawings.
- F. All light pole bases shall be cast-in-place concrete piers with a minimum of 4' exposure with light poles mounted to top secured with appropriate anchor bolts. Piers shall be designed and engineered to resist wind loads as required by building code and/or by local jurisdiction.
- G. All light pole bases and poles that are located around the perimeter of yard shall be located a minimum of 10' outside the curb line.
- H. Prior to the project completion each light pole standard shall be number in sequence with 3" black vinyl numbers placed at base of pole and within view from the yard.
- I. Contractor shall schedule evening site visit(s) to spot check lumen levels, using light meter, at all dim and/or bright areas across entire site, minimum of one reading between each pole. Document readings & locations on photometric plan; provide information to FedEx Freight Project Manager. Adjust luminaries as required to meet design levels, retest deficient areas with light meter & document new readings.

2.9 SECURITY FENCING

- A. Provide and install security fencing where shown on drawings. Fencing shall be constructed to provide security from exterior intrusion.
- B. Provide fencing entrance gates, passage, gates, fitting and fastening devices as required. Verify proper location prior to placement so to avoid extending over property lines and easements.
- C. Materials
 - 1. No. 9 gauge fence fabric, 2 inch mesh, top and bottom selvages twisted and barbed, coated in Black PVC.

2. Corner, end and pull posts – 2.375 in. OD pipe, coated in Black PVC.
3. Line post – 1.90 in OD galvanized steel pipe, coated in Black PVC.
4. Top rail – 1.66 in OD galvanized steel pipe, coated in Black PVC.
5. Tension wire – 7 gauge galvanized steel, located at bottom of fabric, coated in Black PVC.
6. Wire ties – 11 gauge, coated in Black PVC.
7. Port Brace – provide at corner end posts and pull posts, coated in Black PVC.
8. Stretcher bars – provide for each gate and at end post, coated in Black PVC.
9. Barb wire – 3 strands, coated in Black PVC.
10. Personnel / Maintenance Gates – For convenience of moving maintenance equipment provide swing gates of sizes as shown on the drawings complete with latches, stops, keepers, hinges and with three strains of barb wire on top. Provide fabric to match that as specified elsewhere.
11. Gate posts – Provide post with the minimum size
 - a. Gate with leaf width:

6 ft or less	4.00 OD x .160
6ft –13ft	4.00 OD x .226
13ft – 18ft	6.625 OD x .280
18ft – 23 ft	8.625 OD x .322
12. Incorporate Security Turnstiles and Handicapped Gates within construction of security fencing as specified in Security Card Access Control Section of this Project Manual.
13. Knox Boxes - Where local ordinances require the use of Knox Boxes or other devices, including remote electronic opening devices, all required devices shall be included in scope of work.

D. Type and Height

1. Perimeter security fence – Provide 6’ high fencing fabric with 3 strands of barb wire. Total fence height 7’-0”. Maximum 2 inch clearance between finished grade and bottom fence fabric.
2. Security between employee parking and equipment yard- Provide 6’ high fencing fabric. No barb wire required. Maximum 2 inch clearance between finished grade and bottom fence fabric.

2.10 HEAVY DUTY CANTILEVERED SLIDE GATE - NOT USED

2.11 HIGH SPEED VEHICULAR SECURITY GATES – NOT USED

2.12 CHAIN LINK VERTICAL PIVOT GATES

- A. Provide and install Chain Link Vertical Pivot Gates at truck entry and/or employee parking entry, where shown in drawings and as specified herein.
- B. Provide structural columns, drive units, controller and gate panels equal to:

VPG2490 Vertical Pivot Gate Chainlink 300 as manufactured by:
 AutoGate, Inc.
 7306 Driver Road
 PO Box 50
 Berlin Heights, OH 44814
 Tel: 800-944-4283
- C. Commercial vertical gate operator for continuous duty, shall open and close vertical gates, to provide convenience and security. Gate operator shall be wired to operate gates using security card access system as specified elsewhere in this manual. The 1/2-hp right angle locking worm drive operator utilizes 240 Volt AC single phase power. Control voltage in each case is 5 Volt DC. Operator shall be rated to open/close gates weighing 1,500 lbs to 2,500 lbs maximum.
- D. Employee Parking: Provide three in-ground safety sensing loops per gate and provide UL325-5th edition compliant entrapment protection at each gate location.
- E. Yard Parking: Provide two in-ground safety sensing loops per gate and provide UL325-2010 compliant entrapment protection at each gate location.

- F. Operator shall be warranted by manufacturer to installer for a period of three (3) years from date of install against defects in materials or workmanship. Defective part(s) shall be repaired or replaced at no charge, at manufacturer's option. Operator(s) shall be mounted on concrete pads. Include gear motor heater where temperatures are below 25 degrees F for three days or more, and extreme cold package in locations where temperatures are below 0 degrees F for 3 days or more. Provide additional power for each option provided.
 - 1. If facility does not have emergency power backup, provide battery powered back up DC drive system. Operator shall run on 24V DC current integral power supply with stand-by battery systems with built in battery maintainer and over-charge protection. System shall include two 12V sealed marine batteries complying with gate operator manufacturer's requirements.
- G. Frame shall be fabricated from structural aluminum alloy extrusions with primary top and bottom members being round in shape. Assemble gate frames by welding at corners. Provide coated aircraft cable or masted wind bracing with continuous tube elements which attach to the operator and extend a minimum of 2/3 the length of the gate. Wind bracing shall also be secured to the bottom of the gate with strut plates. Gate frame shall be designed to resist a minimum of 75 mph wind speeds or exceed that to comply with all regional wind loading code requirements.
- H. Gate fabric shall be black pvc coated chain link fabric, 6 feet clear in height. Extend gate post and vertical frame members 12 inches above top of chainlink fabric for three strands of barbed wire. Each gate shall have clear opening width as indicated on drawings up to 30 feet maximum. Security clearance between bottom rail and pavement shall be 8" maximum.
- I. Work shall be coordinated with electrical contractor for installation of required power and controller conduits. After installation is complete, gate system shall be inspected by AutoGate Field Technician to verify system is fully operation and functional; make all necessary adjustments; provide report to FXX Project Manager.
- J. Where local ordinances require the use of Knox Boxes or other devices, including remote electronic opening devices, all required devices shall be included in scope of work.

PART 3 - CONCRETE

3.1 CONCRETE FORM WORK

- A. Forms shall be provided as necessary to properly place all cast-in-place concrete to the sizes and dimensions required.
- B. Form work to meet the recommendation of ACI 347R as minimum requirements.
- C. All forms to be cleaned and a non-staining form oil applied before concrete placement.
- D. Install all pipe chases, conduits, electrical boxes, cavities, slots, sleeves, water stops, and other embedded parts as required.
- E. Exposed concrete formed surfaces shall receive a smooth flat-formed surface; all tie holes, honey combing and rough areas to be patched to match surrounding surfaces.

3.2 CONCRETE REINFORCEMENT

- A. All reinforced concrete dock slabs shall be of not less than #3 rebar; refer to foundation plan & details; welded wire fabric not allowed; fiber mesh or steel pins not allowed.
- B. Provide all material and equipment necessary to furnish the concrete reinforcement as shown on drawings.
- C. Reinforcing steel to be installed as per Architectural/Structural Engineer's drawings, specifications and ACI 315-65 requirements.
- D. Provide shop drawings for review by structural engineer.

- E. Reinforcement to be free to excessive rust, loose scales or other coating of any character which would reduce or destroy the bond.
- F. Reinforcing shall be deformed bars, grade 60, ASTM A 615. Use of reinforcing mats or welded wire fabric is not allowed. Reinforcing shall be installed in all concrete floors and stoops as noted on structural drawings per ASTM A 185. Provide appropriate metal or plastic chair for supporting of reinforcing.
- G. Reinforcement to be positioned to maximize for designed structural effect, and comply with CRSI Standards.

3.3 CAST-IN-PLACE CONCRETE

- A. This section of work includes cast-in place concrete for the following areas;
 - 1. Office floor slabs
 - 2. Dock foundations and slabs
 - 3. Shop Maintenance foundations and slabs
 - 4. Exterior concrete work
- B. Provide all material and equipment necessary to complete all cast-in-place concrete as shown on plans.
- C. Usage of water reducing agents and plasticizers shall be submitted to engineer and architect of record for approval.
- D. Cast-in-place concrete to be installed as designed on the architectural and structural engineer drawings.
- E. Concrete shall conform to ASTM C94 requirements.
- F. Concrete to be delivered by an approved redi-mix supplier and a design mix data sheet provided for each compressive strength used in work. Fly-ash permitted only at following exterior areas: sidewalks, dolly pads, relay pads, aprons, curbs, fuel islands or pavement.
- G. Specified concrete compressive strength to be obtained during the 28 day cure period. Project Contractor to provide testing laboratories services. Refer to Section 1.8.
- H. Burnished/Polished concrete floor slabs shall exceed ANSI A137.1 Wet Dynamic Coefficient of Friction testing value of 0.42.
- I. Interior Concrete Slabs – Surfaces shall receive concrete sealers & hardeners as per Section and 3.8 Waxed based curing agents are not allowed. Refer to Section 3.3.O for floor flatness requirements for all areas listed below:
 - 1. Office – See Proto-type Plans
 - a. Concrete shall receive powered machine-troweled smooth surface, burnished to gloss finish or as required for preparation of finished floor. Application of hand-troweled smooth finish allowed only at areas inaccessible for powered machine-troweled smooth finish.
 - 2. Dock – See Proto-type Plans
 - a. Concrete shall receive powered machine-troweled smooth, burnished to gloss finish. Application of hand-troweled smooth finish allowed only at areas inaccessible for powered machine-troweled smooth finish.
 - 3. Shop – See Proto-type Plans
 - a. Shop Core (Break Room, Parts Room, Restrooms/Locker Rooms, CBE, Office, Janitor, Wash Area, Hallway, Sprinkler, Telco, and Meeting Room) Concrete shall receive powered machine-troweled smooth surface, burnished to gloss finish or as required for preparation of finished floor. Application of hand-troweled smooth finish allowed only at areas inaccessible for powered machine-troweled smooth finish.
 - b. Shop Bay concrete shall receive powered machine-troweled smooth, burnished to gloss finish. Application of hand-troweled smooth finish allowed only at areas inaccessible for powered machine-troweled smooth finish.

- J. All floors scheduled to receive burnished concrete finish shall be fully protected at all times during construction to prevent oils, dirt, metal, excessive water, other potentially damaging materials and wheel traffic for the duration of the project. All trades shall be informed that the slab must be protected at all times. A non-staining protective barrier, approved by the manufacturer shall be used to shield the floor from contaminants, before, during and after finishing of floor. Protection measures shall begin immediately after the concrete slab is poured.
- K. Exterior concrete (sidewalks, dolly pads, dock aprons and ramps) to receive a light broom finish at right angles to the traffic pattern and sloped as noted on the plans. Provide expansion joints and saw joints using good engineering practice.
- L. All exposed exterior concrete to be air-entrained.
- M. Provide saw joints at the dock warehouse immediately as possible to prevent shrinkage cracking of the slab. Saw joints shall be placed at a maximum of 15 foot centers, each way. Note: use of metal formed keyways are not allowed. Load transfer shall be provided by the use of smooth metal dowels.
- N. All expansion and saw joints at dock area to be filled full depth with semi-rigid epoxy sealant. Joints to be overfilled with joint filler and cut off flush with concrete floor after cured. Sealant equal to Versaflex SL/75 – 100% solids, rapid curing polyurea filler. Contact Roy Harvey 913-948-1006.
 - 1. Joints to be filled full depth before the SealHard has been applied and concrete surface has cured and surface is dry.
 - 2. Use gas or electric powered clean-out saw w/ concrete saw blade 1/8” to 3/16” wide to remove debris full depth from joint, abrading inside of side walls. Vacuum joints after saw cut prior to filler installation.
 - 3. Fill construction and control joints full depth, using two pass process, 50% fill first pass, second pass fill slightly above grade.
 - 4. Once joint filler has fully cured, the overfilled latten material shall be stuck flush with surface of concrete.
- O. The following concrete mixes are to be provided with a maximum slump of 3 inch +/- 1 inch. Interior Office and Dock slabs shall have concrete mix designs using small/medium/large aggregate sizes. Mixes exceeding the specified slump shall be rejected and promptly removed from the project site. (Furnish laboratory concrete mix designs approved by structural engineer of record prior to delivery to site.)

1. Footings/pads	4000 psi min.
2. Foundations Walls/Piers	5000 psi min.
3. Exterior Concrete (air entrained)	4000 psi min.
4. Interior Office and Dock floors	4000 psi min.
5. Shop floors	4000 psi min.
- P. Cast-in-place concrete and accessories to be provided as follows:

1. Footings/Pads/Piers/Foundation Walls	As required by design
2. Interior Floors at Office areas	4” thick, Laser Screed
3. Storage, Load Dock and Shop areas	6” thick (reinforced), Laser Screed
4. Vapor Barriers (below slab conditioned spaces only)	10 mil poly
5. Curing agent (all floors non-waxed based)	1 coat L&M Cure
6. Exterior Stoops & Sidewalks	5” thick
7. Monolithic parking curb at Trailer parking	8” wide x 24” deep (reinforced)
- Q. Provide monolithic slab finishes to the following flatness tolerances according to ACI 117.
 - 1. Dock floor slabs and Shop Service Bay floor slabs:
 - a. Overall values of flatness, (F) 45 with minimum local value of 40; overall value of levelness, (L) 35 with minimum value of 30. Within 72 hours of slab placement, provide floor flatness/levelness testing as per ASTM E 1155. Issue formal report after completion of testing to FXF Senior Manager and FXF Project Manager.
 - b. Correction of Flatness/Levelness defects in the floor shall be corrected only by removal and replacement of the defective slabs. All areas requiring replacement will be identified by the testing laboratory and all corrected areas must be re-measured for final approval.
 - c. Provide curvature testing at construction joints.

1. 24-inch curvature (value “q” as defined in ASTM E 1155) shall not exceed 0.150 inch at all construction joints.
 2. Measure 24-inch curvature with a dipstick floor profiler. Measure at right angles to the joint and make at least one measurement for each 10 feet of joint length.
2. Office and Shop Non-Service Bay floor slabs:
 - a. Overall values of flatness, (F) 50 with minimum local value of 45; and of levelness, (L) 40 with minimum value of 35. Floor areas at office, pod and shop non-service bays shall be placed via laser screed. Within 72 hours of slab placement, provide floor flatness/levelness testing as per ASTM E 1155. Issue formal report after completion of testing to FXF Senior Manager and FXF Project Manager.
 - b. Correction of Flatness/Levelness defects in the floor shall be corrected only by removal and replacement of the defective slabs. All areas requiring replacement will be identified by the testing laboratory and all corrected areas must be re-measured for final approval.
 - c. Provide curvature testing at construction joints
 1. 24-inch curvature (value “q” as defined in ASTM E 1155) shall not exceed 0.150 inch at all construction joints.
 2. Measure 24-inch curvature with a dipstick floor profiler. Measure at right angles to the joint and make at least one measurement for each 10 feet of joint length.
 - d. Float: Consolidate surface with floats. Cut down high spots with 20 foot certified straight edge struck across the surface; do not tamp. Uses of mechanically driven or ridden floats are not acceptable.
 - e. Protect freshly placed concrete from premature drying by moist curing or by moisture-retaining cover curing method.
- R. Installation of the following embedment items to be included:
1. Anchor bolts
 2. 6” Pipe Bollards
 3. 12” structural C-Channel (at edge of dock)
 4. Steel reinforcing bars
 5. Flag Pole base
 6. Other embedment’s as required, shown or not shown in the drawings as required to proper attached equipment, devices or materials.
- S. Repair all defective surfaces to ASTM Standards, if defects cannot be properly repaired, remove and replace.
- T. Hand rubbing of formed vertical surfaces:
1. Repair defects of surfaces which will be exposed to view; remove fins and other projections; then provide grout rub finish as follows:
 - a. Combine one part cement to 1-1/2 parts fine sand by volume and mix with water and bonding admixture to consistency of thick paint. Add bonding admixture to water in accordance with the manufacturer's directions. Blend white and gray Portland cements to produce a color matching the color of the surrounding concrete. Wet the surface of the concrete sufficiently to prevent adsorption of water from the grout, then apply grout. Immediately after applying the grout, scrub the surface with a cork float or stone to coat the surface and fill small holes. While grout is still plastic, remove excess grout by scraping or rubbing with clean burlap, a rubber float or other means to produce a uniformly textured surface. Keep surface damp for at least 36 hours after rubbing. Complete any area in the same day it is started, with units of area being natural breaks in the finished surfaces.
 - b. All stem walls, foundation walls, or other exposed vertical concrete surfaces, unless noted otherwise, shall be hand rubbed.
- U. Minor surface cracking of the building floor (i.e., office, dock and shop maintenance) concrete slabs caused by shrinkage and deemed to be acceptable by FX architect or project manager shall be thoroughly routed out, cleaned and properly sealed using Versa Flex 75, grey.

3.4 POLISHED CONCRETE FINISHING (NOT USED)

3.5 ARCHITECTURAL PRE-CAST CONCRETE

- A. Provide plant constructed pre-cast architectural concrete building components as indicated on plans.
- B. Construct as per Architectural Pre-cast Association (APA) and American Concrete Institute (ACI) standards.
- C. Comply with all local and state building codes and regulations of other governing agencies having jurisdiction, addressing:
 - 1. Wind loads.
 - 2. Seismic Loads.
 - 3. Building dynamics, thermal, live and concentrated loads.
 - 4. Any related items not listed above.
- D. Samples and Mock-Ups:
 - 1. Provide color and texture range samples for lessee approval prior to fabrication.
 - 2. After sample approval, but before fabrication, construct 3' x 3' panel mock-up of each selected material and reveal joint condition. Mock-up to be representative of finished work and constructed on site for approval by lessee.
 - 3. One full size mock-up with window unit shall be constructed and hose tested for water tightness in presence of lessee.
- E. Portland Cement: ASTM C150, Type I or III, white or gray to achieve desired finish color. Use only one brand, type and color from same mill.
- F. Reinforcing Bars: ASTM A615, grade 40 or 60 unless otherwise required to meet structural design.
- G. Connection Materials: For Pre-Cast Units
 - 1. Steel shapes and plates: ASTM A36.
 - 2. Anchor Bolts: ASTM A307 Carbon Steel or ASTM 325 High Strength; bolts, nuts and washers.
 - 3. Welded Headed Studs: AWS D1.1, Type B.
- H. Finish: For steel connection materials
 - 1. Hot-Dip galvanized, ASTM A123 or A153, steel exposed to weather, interior wall cavities or moisture.
 - 2. Shop prime remaining steel shapes: SSPG-Paint 25.
 - 3. Anchor bolts, nuts, washers; Cadmium plated, ASTM A563, Grade C.
- I. Grout Materials: For Pre-Cast Units
 - 1. Cement Grout: Cement ASTM C150; Sand ASTM C404; Ratio 1 cement: 2.5 sand.
 - 2. Non-Shrink Grout: ASTM C1107.
 - 3. Epoxy-Resin Grout: Two-component mineral-filled epoxy-resin, ASTM C881.
- J. Concrete Design Mixes:
 - 1. Limit use of fly ash and granulated blast-furnace slag to 20% replacement of portland cement by weight.
 - 2. Compressive strength at 28 days: 5000 psi.
 - 3. Water cement ratio: 0.40 to 0.45.
 - 4. Water absorption: 6% by weight.
- K. Fabrication Tolerances: Fabricate architectural pre-cast concrete units straight and true to size and shape with exposed edges and corners precise and true so a finished unit complies with Pre-cast/Prestressed Concrete Institute (PCI) MNL 117 Product Tolerances as well as position tolerances for cast-in items.
- L. Finishes:
 - 1. Panel faces and other pre-cast units shall be free of joint marks, grain and other obvious defects. Corners and reveal joints, including false joints shall be uniform, straight and sharp.
 - 2. Sand-Blast Finish: Use proper abrasive grit, equipment, application techniques and cleaning procedures to expose aggregate and surrounding matrix surfaces.
 - 3. Finish unexposed surfaces architectural pre-cast units by smooth float finish.

- M. Defective Work: Architectural pre-cast concrete units that do not comply with acceptability requirements in PCI MNL 117, including concrete strength, manufacturing tolerances, color and texture range are unacceptable. Replace with units which meet requirements.
- N. Cleaning:
 1. Clean all surfaces of pre-cast concrete to be exposed to view prior to shipping.
 2. Clean mortar, plaster, fireproofing, weld slag and any other harmful material from concrete surfaces and adjacent materials.
 3. Clean exposed surfaces of pre-cast concrete units after erection and completion of joint treatment to remove weld marks, dirt, stains and any other markings.
 4. Use cleaning materials and processes which will not damage exposed pre-cast finish or damage adjacent materials.

3.6 TILT-UP PRE-CAST CONCRETE

- A. Provide and erect tilt-up site cast, concrete wall panels, load bearing, poured into mold and erected to final position.
- B. Include all required supports, devices and attachments required.
- C. Include panels engineered by structured engineer and designed wall panels to resist the stresses caused by erection of the wall panels.
- D. It shall be the Contractor's responsibility to erect the panels in a manner that will be both safe to personnel and property and to brace and otherwise protect the panels against wind and other forces that may occur during construction and until connections to the permanent structural systems are complete.
- E. Submittals:
 1. Submit manufacturer's current data for bond breakers, grouts and patching materials.
 2. Prepare shop drawings for construction showing all reinforcing, lifting devices, weld plates, reveals, form liner and other accessory items. Panel lifting design and reinforcing shall be certified by a structural engineer registered in the state where the project is located.
- F. Products:
 1. Basic concrete materials in accordance with Section 03300.
 2. Curing compound: Liquid membrane-forming compound complying with ASTM C 309, Type Class A and B, water based.
 3. Bond Breaker: Product shall be a non-staining, bond breaker compatible with the curing compound and sealer/hardener as specified in Section 3.6, no exceptions.
 4. Grout: Provide non-shrink typo, manufacturers pre-mixed compound capable of developing over 5,000 psi compressive strength in 28 days.
 5. Sacking materials: Portland cement and water, mixed to a uniform creamy paste.
 6. Reinforcing:
 - a.) Meet ACI 533.1R, Chapter 7.
 - b.) Bars, meet ASTM A615, grade 60, except ties may be grade 40.
 - c.) Welded wire fabric not allowed.
 - d.) Tie wire, 16 gauge annealed steel wire.
 - e.) Bar supports prefabricated accessories complying with CRS1 Manual of Standard Practice MSP-1-80.
 7. Forms-Wood material to maintain forms in good alignment and to produce required finish. External form bracing shall be equal to Aztec "Tilt Bracket" System with self-adhering plastic shoe and reusable plastic bracket to prevent displacement during casing operations.
 8. Reveals-Acceptable materials for forming reveals include medium density fiberboard, or high density extruded polystyrene foam with a minimum 40 psi compressive strength.
- G. Lifting Devices, Inserts and Braces
 1. Acceptable manufacturer:

- a.) Burke
 - b.) Dayton Superior
 - c.) Richmond Screw Anchor
2. Panel braces shall be designed by the approved manufacturer. Comply with the recommendations of the Tilt-Up Associations Guidelines for Temporary Wind Bracing of Tilt-Up Concrete Panels. During Construction tilt up panels shall not be braced from constructed office, dock and shop maintenance slabs.

H. Execution

1. Coordinate site cast tilt-up operations with work of other sections to expedite the work.
2. Concrete slabs constructed for use at the office, pods, shops, aprons, yard equipment parking may **not** be used as a casting slab for on-site construction of tilt-up precast concrete panels.
3. Apply bond breaker to casting slab in accordance with manufacturer recommendation.
4. Place forms to minimize damage to casting slab surface, using rigid forms and constructed to maintain uniform in shape, size and finish.
5. Lay out panels in a manner that will minimize joints in panel faces.
6. Maintain consistent quality during construction.
7. Fabricate connecting devices, plates, angles, items fit to steel framing member's inserts and accessories.
8. Locate hoisting devices to permit removal after erection.
9. Provide concrete test cylinders for each cast panel. In the event the concrete tests indicate a 7-day or 28-day strength below that as specified. The owner may require core specimens to be taken and tested at the Contractor's expense. If core test falls below minimum requirements, the concrete in place will be deemed defective and shall be removed and replaced at the Contractor's expense. Any demolition or repair of other materials or systems as a result of defective concrete shall be at the Contractor's expense.
10. Protect placed concrete from premature drying and excessively hot or cold temperatures. Apply liquid membrane curing compound.

I. Finish

1. Exterior surfaces shall have a smooth finish with all fins removed and blemishes corrected. Surface shall be left ready to receive coatings.
2. Interior surfaces, exposed, shall have smooth steel trowel finish.
3. All defects which are exposed to view shall be corrected before final finish. All visible returns, edges, etc., shall be patched, rubbed and otherwise finished to match adjacent surfaces.
4. Patch panels with grout where lifting hooks or other devices have been removed. Plastic insert covers are not acceptable.

J. Fabrication Tolerances – Unless otherwise approved by Architect, provide panels conforming to casting tolerances as specified below:

1. Panel height and width
 - a.) Up to 20 feet: ¼ inch max.
 - b.) 20 to 30 feet: 3/8 inch max.
 - c.) Each additional 10 ft increment: 1/8 inch max.
2. Panel thickness: 3/16 inch max average variation through any vertical or horizontal cross section.
3. Skew of Panel or Opening: Measured as difference in length of the two diagonals.
 - a.) Per 6 feet of diagonal: 1/8 inch max.
 - b.) Maximum total difference: ½ inch.
4. Panel Openings:
 - a.) Size: ¼ inch max.
 - b.) Location of Centerline: ¼ inch max.
5. Location and Placement of Embedded Items:
 - a.) Inserts, Bolts, & Pipe Sleeves: 3/8 inch.
 - b.) Weld Plate Embedment's: 1 inch for location, ¼ inch for tipping and flushness.
6. Maximum bowing of units: Length of bow/360.

3.7 SHOT BLAST/DOCK STRIPING

- A. Preparation and painting of interior lined dock striping as shown on the drawings. Striping to occur before application of Seal Hard as specified elsewhere.

- B. The dock striping shall occur before the application of Seal Hard as specified in Section 03300- Cast-in-Place Concrete.
- C. Do not apply coating when the temperature of concrete surface to be painted and the surrounding air temperatures are above or below the manufactures' printed instructions.
- D. Preferred Vendors: (for suggestion only, not required to be utilized)
 - Price Industries
 - Joe Price, President
 - 4891 Campbell's Run Road
 - Pittsburgh, PA 15205
 - Phone: 412-276-2600
 - Fax: 412-276-0300
 - Email: jprice@priceindustries.us
- E. Acceptable painted stripe materials:
 - 1. Base Coat: ARMOSEAL 33 Epoxy Primer (8.0 dry mils)
 - 2. Top Coat: ARMORSEAL 1000 HS Safety Yellow (8.0 Dry Mil)
- F. Utilize shot blast equipment equal to, EDCO BE-7 and Vac 100 Shot Blast System with #280 Shot blast medium.
- G. Degrease floor if necessary with appropriate cleaner. Assure that all areas are free of moisture before proceeding.
- H. Layout striping with white chalk lines to outside edge of striping. Lines shall be laid for each edge of striping line. Mask-off both sides of stripe using duct tape, to create a 4" wide stripe. Assure that all area to be striped has been shot blasted. Inspect the edges of duct tape to assure it is fully adhered to the concrete substrate to avoid coating from bleeding under tape. At corners, overlap take to create 90 degree turns.
- I. Shot blast 4" wide stripe along the layout to roughen concrete surface and removing approximately 1/16" in depth of concrete.
 - 1. Take appropriate measures to control the amount of material to be removed.
 - 2. Assure that the shot blast area remains true and parallel to the layout.
 - 3. Assure that all grease, oil and bond inhibitors have been removed by shot blasting.
- J. Power vacuum areas to receive specified coating.
- K. Verify pot life of product before mixing. Mix coating product as directed by manufacturer and only of sufficient quantity as can be applied in the allotted time.
- L. Mixing and Application (when using Glaze Shield)
 - 1. When the ambient temperature is above 85°F, mix the product as per manufactures instructions and add 1 to 1/5 pints of xylene and mix for 1 minute with slow speed drill.
- M. Once the product is properly mixed, pour coating onto the floor in a straight line parallel to the direction of the strip of sufficient quantity that when brushed will extend edge to edge.
- N. Remove duct tape before final cure, taking care not to rake tape over painted stripe, and avoiding smearing onto adjacent concrete surfaces. Properly dispose of.
- O. Inspect painted stripe and reapply coating where thin after product has cured.

3.8 CONCRETE SEALERS AND HARDNERS

- A. Provide sealer and hardeners at following slab locations (No substitutes allowed):
 - 1. Office Interior flat work at Office slabs: Exposed concrete areas.
 - a. Curing Agent - L&M Cure

- b. Floor Sealer & Hardener – L&M FGS Hardener Plus, 2-coats
 - 2. Office and Shop Interior flat work with Floor Finishes: Where floor finish materials, i.e. LVT, carpet, ceramic tile and etc., are scheduled to be installed on top of slab.
 - a. Cure and Seal - “L&M Dress and Seal #30”. Contractor shall take measures to prevent the product from being deposited onto adjacent concrete slabs scheduled to receive Seal Hard coatings.
 - 3. Dock Interior flat work: Exposed concrete areas
 - a. Curing Agent - L&M Cure
 - b. Floor Sealer and Hardener - L&M Seal Hard. Product to be applied after saw, contraction and/or expansion joints on dock slab have been filled and after painted dock stripping has been applied
 - 4. Shop Interior flat work at Core: Janitor, Storage, Parts Room, Etc.
 - a. Curing Agent - L&M Cure
 - b. Floor Sealer & Hardener – L&M FGS Hardener Plus, 2-coats
 - 5. Shop Interior Service Bays: i.e. tractor, trailer, forklift, etc.
 - a. Floor Sealer & Hardener – L&M Seal Hard, 1-coat, allow to dry
 - b. Oil & water repellent – L&M Petrotex, 1-coat
 - 6. Shop Interior Washbays:
 - a. Curing Agent - L&M Cure
 - b. Floor Sealer & Hardener - L&M Aquapel
 - 7. Fuel Island Exterior Concrete:
 - a. Curing agent – L&M Cure
 - 8. Fuel Island Interior Lube Shed:
 - a. Floor Sealer & Hardener – L&M Seal Hard, 1-coat, allow to dry
 - b. Oil & water repellent – L&M Petrotex, 1-coat
 - 9. All exterior concrete: Includes sidewalks, ramps, driveways, pavement, aprons, dolly pads, curbs, etc.
 - a. Curing Agent - L&M Cure W-2, with white pigment
- B. All sealers and hardeners shall be uniformly applied as per manufacturer's recommendation and at coverage rates & number of coats as recommended by manufacturer. Concrete shall receive powered machine-troweled smooth surface, burnished to gloss finish. Waxed based curing agents are not allowed.
- C. Product Ordering: When placing orders for the L&M Products for use on this project, the Contractor or his sub-contractor shall notify the following person when making orders:
- L&M Construction Chemicals
 A Product Brand of LATICRETE International
 #1 LATICRETE Park North
 Bethany, CT 06524-3423 USA
 Phone 800-243-4788 ext 235
 Fax 203-393-1684
- D. As part of the close out documents and part of this scope of work, the Contractor is to furnish the Owner with copies of all L&M Construction Chemicals, Inc. invoices showing the total amount of each type of L&M product used on this project.

SECTION 4 - MASONRY

NONE IDENTIFIED

SECTION 5 - METAL

5.1 LIGHT GAUGE METAL FRAMING

- A. Provide all material, labor, and equipment necessary to complete the light gauge metal framing as shown on the drawings.
- B. All materials to comply with AISI, AWSI & ASTM Standards.

- C. Design all vertical members and connections to withstand a wind pressure as required by building code or local jurisdiction and for additional implied loads as shown on the structural drawings.
- D. Steel studs and joists to be standard “C” shaped with all studs and joists 16 gauge and heavier to be welded.
- E. Tracks, runners and bridging shall be of the same type, grade and gauge as studs.
- F. Interior steel studs and furring to be 1-5/8”, 2-1/2”, 3-5/8”, 6”, or 8”, min. 22 gauge galvanized or as noted on plans.
- G. Exterior steel studs to be 2-1/2”, 3-5/8”, or 6”, min. 20 gauge, G60 galvanized, unless otherwise noted on plans or as required by code.

5.2 METAL FABRICATIONS

- A. Provide all labor, materials and equipment necessary to complete all metal fabrications as shown on the drawings.
- B. All material and labor practices to comply with ASTM standards.
- C. Provide shop drawings for engineer review prior to ordering.
- D. Metal fabrications to be shop primed.
- E. Erection of materials to comply with all local, state, and OSHA requirements.
- F. Project Contractor to supply special tests and inspections, if required.
- G. Provide metal fabrications as indicated to include below, but not limited the following list:
 1. 6” pipe bollards – Schedule 40 pipe, no exceptions
 2. Steel stairs, railings & landings as required by local design codes, shall be galvanized.
 3. Exterior ramp railings as required
 4. Interior railings – 1 ¼” round pipe
 5. Miscellaneous anchor plates – as required
 6. 12” steel C-Channels at edge of dock – C12x20.7, see drawings for required lengths
 7. Broom and shovel hangers
 8. Miscellaneous fastening devices
 9. Ladder at roof hatch – C3x4.1 primed steel side rails with 1-1/4” steel safety treads at 12” on-center
 10. Check writing stands – 1” x 1” x 1/8” angles
 11. Wall plates – 3/16” metal plate fabricated between dock door jambs

SECTION 6 - CARPENTRY

6.1 ROUGH CARPENTRY

- A. Provide all labor, material and equipment necessary to complete all rough carpentry as shown on the drawings.
- B. All materials to comply with AWPA, APA, and NFPA Standards for wood construction.
- C. Wood blocking in contact with exterior surfaces shall have a waterborne preservative treatment.
- D. Interior wall blocking to be fire retardant and installed where shown on the plans and as noted on supplier’s installation information.
- E. Provide continuous 4’ or 8’ high plywood wainscot as noted in drawings, with 1/2” fire-treated CDX plywood, 2 x 6 fire-treated wood base, wood transition edge cap, painted to match wall. Install inside telco rooms, inside sprinkler rooms and other areas as noted in drawings.

- F. End wall of dock area shall have 8' high plywood facing as noted in drawings, with 3/4" fire-treated CDX plywood, fastened to 3-5/8"x 25 ga metal studs @ 24" on-center and secured to end wall inset girts. At base of wall install 6"x 6" fire-treated wood bumper, anchor to floor with 5/8" expansion anchors @ 48" on-center or as required by local codes.

6.2 ARCHITECTURAL WOODWORK

- A. Provide all material, labor, and equipment necessary to furnish the architectural woodwork as shown on drawings.
- B. All materials to comply with AWPA, APA, & NFPA standards for wood.
- C. Hardware
 - 1. Use drawers and door hardware suitable and of adequate load bearing capacities for the intended use.
 - 2. Provide the following hardware, but not necessarily limited to items listed below:
 - a. Drawer Glides – equal to “Knap & Vogt” # 8417, full extension, self closing ball bearing glide.
 - b. Concealed Hinges – equal to “Blum” Compact 33 hinge series designed to open 120 degrees.
 - c. Supports for built-in shelving, “Knap & Vogt”, #346, anochrome shelf support, 4 supports per shelf.
 - d. Wire pulls – equal to “Epc” 4” clear anodized aluminum.
 - e. Recessed Standard – equal to “Knap & Vogt”, 5/8” wide x 3/16” high, 17ga. #255AL of required lengths. Provide #256 shelf support, 4 per shelf.
 - f. Sliding Glass Panels – equal to “Epc” #38AS14 extruded aluminum lower track and #48A14 upper guide for 1/4” sliding glass.
 - g. Closet Rod – equal to “Knap & Vogt” #660 SS Stainless rods with #734 CHR end support flanges.
- D. Storage Room shelving; where detailed, provide shelf standards, shelf brackets and laminated shelving.
 - 1. Shelf standards – one vertical double slotted standard @ 32” centers as required to fit shelf area, equal to Granger 72” long, item #1WDR6, white. Standard to be mounted to surface of drywall at metal stud locations.
 - 2. Shelf brackets – provide 4 shelf brackets per vertical standard, equal to Granger 16 deep, item # 1WDT4, white.
 - 3. Shelving – provide laminated shelving as detailed in drawings.

6.3 SOLID SURFACE FABRICATIONS

- A. Provide all material, labor, and equipment necessary to furnish the solid surface fabrications as shown on drawings.
- B. Manufacturer Warranty: Provide manufacturer’s standard warranty for material only for period of 10 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Architect and at no expense to Owner.
- C. Solid surface material to be Corian by DuPont. See Tab 9 for color selections.
- D. Window Sills: 1/2" thick solid surfacing material, adhesively joined with inconspicuous seams, with eased edge details, or as indicated on Drawings. Minimize joints.
- E. Countertops: 3/4" thick solid surfacing material, adhesively joined with inconspicuous seams, with eased edge details, or as indicated on drawings. Minimize joints.
- F. Counter Support Frame: Ensure moisture resistant cores for counter tops in wet areas having sinks or lavatories are 3/4" thick exterior grade plywood with waterproof adhesive, Fir or Poplar plywood, veneer core only. Plywood shall fully support countertop.
- G. Fabrication:
 - 1. Fabricate components in shop to greatest extent practical to sizes and shapes indicated, in accordance with approved Shop Drawings and solid polymer manufacturer requirements. Form joints between

- components using manufacturer's standard joint adhesive without conspicuous joints. Provide factory cutouts for plumbing fittings and bath accessories as indicated on Drawings.
2. Where indicated, thermoform corners and edges or other objects to shapes and sizes indicated on Drawings, prior to seaming and joining. Cut components larger than finished dimensions and sand edges to remove nicks and scratches. Heat entire component uniformly prior to forming.
 3. Ensure no blistering, whitening and cracking of components during forming.
 4. Fabricate backsplashes from solid surfacing material with optional radius cove where counter and backsplashes meet as indicated on Drawings. Backsplashes for most colors may be fabricated by traditional means discussed in K-25294 *Backsplashes*.
 5. Fabricate joints between components using manufacturer's standard joint adhesive. Ensure joints are inconspicuous in appearance and without voids. Attach 50 mm (2") wide reinforcing strip of solid polymer material under each joint. Reinforcing strip of solid polymer material is not required when using DuPont™ Joint Adhesive 2.0.
 6. Provide holes and cutouts for plumbing and bath accessories as indicated on Drawings.
 7. Rout and finish component edges to a smooth, uniform finish. Rout cutouts, then sand edges smooth. Repair or reject defective or inaccurate work.
 8. Finish: Ensure surfaces have uniform finish:
 - a. Matte, with a 60° gloss rating of 5 - 20.
 9. Fabrication Tolerances:
 - a. Variation in Component Size: +/-1/8".
 - b. Location of Openings: +/-1/8" from indicated location.
- A. Install components plumb, level, rigid, scribed to adjacent finishes in accordance with reviewed Shop Drawings and Product installation details.
 - B. Fabricate field joints using manufacturer's recommended adhesive, with joints being inconspicuous in finished work. Exposed joints/seams are not permitted. Keep components and hands clean when making joints. Reinforce field joints as specified herein. Cut and finish component edges with clean, sharp returns.
 - C. Route radii and contours to template. Anchor securely to base component or other supports. Align adjacent components and form seams to comply with manufacturer's written recommendations using adhesive in color to match work. Carefully dress joints smooth, remove surface scratches and clean entire surface.
 - D. Install countertops with no more than 1/8" sag, bow or other variation from a straight line.
 - E. Adhere topmount sinks/bowls to countertops using manufacturer recommended adhesives, clips, brackets, and color-coordinated silicone sealant.
 - F. Seal between wall and components with joint sealant.
 - G. Provide backsplashes and endsplashes as indicated on Drawings. Adhere to countertops using a standard color-coordinated silicone sealant. Adhere applied sidesplashes to countertops using a standard color-matched silicone sealant. Provide coved backsplashes and sidesplashes at walls and adjacent millwork. Fabricate radius cove at intersection of counters with backsplashes to dimensions shown on reviewed Shop Drawings. Adhere to countertops using manufacturer's standard color-coordinated joint adhesive.
 - H. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Ensure components are clean on date of Substantial Completion of the Work.
 - I. Coordinate connections of plumbing fixtures with plumbing trade.
 - J. Non-Conforming Work: Replace damaged work which cannot be satisfactorily repaired, restored or cleaned, to satisfaction of Architect at no cost to Owner

- K. Clean surfaces in accordance with manufacturer's "Care and Maintenance Instructions".

SECTION 7 - THERMAL & MOISTURE PROTECTION

7.1 BUILDING INSULATION

- A. Location of the faced insulations and air/vapor barriers/retarders to be determined by the Developer's Architect of Record according to the facility location, local climate, and governing codes. All air/vapor barriers/retarders shall be properly detailed to provide continuous protection.
- B. Provide all material, labor and adhesives necessary to complete all building insulation as shown on the drawings.
- C. Refer to Section 13.1, Pre-engineered Metal Building for insulation requirements at roof and walls of metal building.
- D. All materials supplied herein shall comply with ASTM and UL Standards.
- E. Perimeter foundation insulation to extruded polystyrene board type IV, 1.6 PCF minimum density, 3" thick and installed with adhesives as per manufacturer's recommendations (R-Value = 5.0 per inch). Provide at office, dock, shop & Lube shed.
- F. Continuous insulation at exterior walls shall be foil-faced closed cell polyisocyanurate rigid board, and achieve a manufacturer certified minimum LTTR value (ASTM C1289) of 5.7 per inch. Adhere insulation to the concrete wall substrate and butt joints tightly together. Insulation shall be factory laminated with foil facing and seams taped to provide a vapor/air barrier/retarder by Architect of Record to comply with dew point location. All penetrations, terminations, joints, etc. shall be properly detailed. See wall locations as noted in proto-type drawings.
- G. Un-faced and faced batt insulation shall be fiberglass type in width, thickness, and length as shown in the drawings, (R-Value = 3.25 per inch).
- H. Provide foil-scrim-kraft (FSK) fire-rated foil-faced R-13 or R-19, pre-cut insulation batts (flame spread = 25 and smoke developed = 50), at wall locations as noted in proto-type drawings.
- I. Sound Attenuation. Provide un-faced GreenGuard Gold Certified, Sustainable Insulation, NoiseReducer Sound Attenuation and Acoustical Ceiling Batts as manufactured by CertainTeed Saint-Gobain, Valley Forge, PA. Telephone Number: 800-233-8990, or approved equal. Insulation shall be pre-cut batts with Flame Spread 25, Smoke Development 50;
 - a. 3½", R-13 in partition walls, Noise Reduction Coefficient 1.00, Sound Transmission Class 45.
 - b. 6¼", R-19 above acoustical ceilings, Noise Reduction Coefficient 0.95, Sound Transmission Class 57, as noted in proto-type drawings, i.e. typical above ceiling grid of entire office area, entire pod (s) area, entire shop core area.
- J. Provide products of one of the following manufacturers or approved equal:
 - a. Certain-Teed Products Corp.; Valley Forge, PA.
 - b. Owens-Corning Fiberglass Corp.; Toledo, OH
- K. Provide all necessary fasteners and adhesives for proper material installation.

7.2 EXTERIOR INSULATION AND FINISH SYSTEM (EIFS) – NOT USED

7.3 STANDING SEAM ROOF, FLASHING AND TRIM SHEETMETAL

- A. Provide all labor, materials, and equipment necessary to complete all flashing, sheet metal work and architectural metal roof as shown and as not shown on the drawings.
- B. All materials and labor to comply with ASTM and AISI Standards.

- C. Fabricate and install 24-gauge pre-finished sheet metal flashing where indicated on the drawings.
 - 1. High/low roof flashings
 - 2. Parapet Coping
- D. Furnish and install architectural metal roof as indicated in the drawings
 - 1. Roofing materials shall be 24 gauge, pre-finished Kynar 500 coating, roof panels with snap on battens (2"x1 3/4") @ 16" o.c. Supply roof decking and underlayment protection as required by manufacturer.
 - 2. Products shall be equal to Berridge Manufacturing.

7.4 SEALANTS AND CAULKING

- A. Provide all labor material, and equipment necessary to complete the installation of joint fillers or sealants material at all saw joints, formed joints and expansion joints where shown and not shown on drawings.
- B. All materials and labor practices to comply with ASTM Standards.
- C. Five (5) year warranty on ALL exterior joint sealants (pavement).
- D. Provide joint sealants, joint fillers and other related materials that are compatible with one another and with joint substitutes under service and application conditions in accordance with the manufacturer's installation instructions. Joint filler and sealants types shall be provided at the following locations:
 - 1. Joint filler – All interior saw and construction joints shall be filled full depth with semi rigid epoxy equal to Versaflex SL-75, color as selected by FXF. Once joint filler has fully cured, the overfilled latten material shall be struck flush with surface of concrete. All joints shall be prepped and cleaned as required by manufacturer before installation of joint filler. All cold joints shall be sawed prior to application in order to provide a clean joint in which to install the joint filler.
 - 2. Joint sealer – All exterior joints expansion and saw joints shall be sealed with polyurethane self-leveling sealant, color as selected by FXF. Provide all necessary primers, backer rods and other material as required. All joints to be cleaned of loose materials and foreign matter which might impair adhesive of sealant. Follow manufacturer's explicit recommendations for installation of their product.

7.5 MEMBRANE ROOFING SYSTEM – NOT USED

SECTION 8 - DOORS & WINDOWS

8.1 HOLLOW METAL DOORS & FRAMES

- A. Provide all material and equipment necessary to furnish the hollow metal doors and frames as shown on the drawings.
- B. All materials to comply with ASTM and ANSI Standards.
- C. Provide shop drawings for architects review prior to ordering.
- D. Doors and frames to be factory primed.
- E. Corrosion Protection: At exterior hollow metal frames or where grouting is required, provide a bituminous coating or automotive undercoating to fully coat the backside of the frame before installation. Coating must remain concealed once installed and not interfere with hardware or frame preparation.
- F. Hollow metal door and window frames to be fully welded type with welds ground smooth and prepped for priming and painting. Provide hollow metal doors with seamless construction, having no visible seams on faces or vertical edges, of sizes and designs as indicated in drawings. Prep for and provide all necessary hardware reinforcement, cut outs, tapping, and door anchors. Door undercuts shall be coordinated with threshold requirements in order to provide proper weather seal. Provide galvanized doors and frames at all exterior openings, and where scheduled.

- G. Under no circumstances shall hollow metal door, doors and/or window frames as supplied or manufactured by the metal building manufacturer be allowed unless specifications for the manufacturing of the frames and doors can be fully met.
- H. Where applicable at all passage doors located in wet locations at Shop i.e. tractor and trailer wash bays and wash equipment room each passage door shall be field prepped with 2 part epoxy primer and enamel top coat. Both faces and all sides shall be finished.
- I. Doors to be SDI Grade II or III as applicable with 24 gauge louvers where indicated. Exterior doors to be insulated with a foam core, with glass lights where indicated. Doors and frames to be fire-rated as noted on the door schedule with UL or FM Labels.
- J. Storm Shelter Doors: Provide Steelcraft PW14 Paladin series doors and FP14 series frames at the perimeter of a Storm Shelter to meet current FEMA 361/320 and ICC-500 requirements. Paladin narrow glass lights shall be provided if glazing is scheduled. Door, glass lights, and frame shall be tested for FEMA compliance and have affixed label.
- K. Door and frame gauges will be provided as follows:
 - 1. Exterior frames 16 gauge
 - 2. Exterior doors 16 gauge
 - 3. Interior frames 16 gauge
 - 4. Interior doors 16 gauge
- L. Approved manufacturers:
 - 1. Ceco
 - 2. Fenestra
 - 3. Republic
 - 4. Steelcraft

8.2 WOOD DOORS – NOT USED

8.3 OVERHEAD COILING SHEET DOORS

- A. Provide all labor, material and equipment necessary to complete the overhead coiling sheet doors as shown on drawings.
- B. If Dock heat provided, doors shall be OIRD-2.
- C. Coiling doors shall be 9' x 10' steel curtain door as manufactured by or approved equal to:

Series 201HD (Series 203 Hurricane Rated)

ASTA Door Corporation

4255 McEver Industrial Drive
 P.O. Box 420
 Acworth, GA 30101
 Phone: 770-974-2600, ext 228
 Fax: 770-974-1455
 Contact: Jimmy Miller
 Email: jmiller@astadoor.com

Series 2500 (Series 5000 Hurricane Rated)

DBCI

4645 Timber Ridge Road
 Douglasville, GA 30135
 Phone: 469-400-7593
 Contact: Jim Stork
 Email: jim.stork@dbci.com

Series 2500 (Series 3400 Hurricane Rated)

Janus International

134 Janus International Blvd.
Temple, GA 30179
Contact: Matt Ronza
Email: matt_ronza@janusintl.com
Phone: 404-596-2001

Series 780 (Series 790 Hurricane Rated)

Overhead Door Corporation

2501 S. State Hwy 121; Business Suite 200
Lewisville, TX 75067
Contact: Richard Schutte
Cell: 469.678.4575
Email: richard_schutte@overhaddoor.com

Series Duracoil LFF (Series FF Hurricane Rated)

Raynor Worldwide

1101 East River Rd.
P.O. Box 448
Dixon, IL 61021-0448
Contact: Charles Ziegler
Cell: 469.556.1683
Email: cziegler@raynor.com

- D. All overhead coiling sheet doors to be operated by reduced chain hoist.
- E. All overhead coiling slat doors located at dock shall have the chain hoist mechanism located opposite side of the dock check writing stand (s). Chain hoists to be coordinated for hand of operation with plans and field conditions. Contact FFX Project Manager prior to ordering of doors for any clarifications.
- F. Overhead sheet coiling doors shall be provided with: 26 ga galvanized curtain, baked epoxy primer and polyester top coat, 12 ga guides x 3.5" deep, dual 8 ga galvanized steel slide bolt locks, bottom bar with weatherseal, 16 ga galvanized steel drums with 26 ga galvanized steel sheet cover, support brackets with 3/16" structural steel angles and 1/4" steel diagonal braces.
- G. Where overhead coiling sheet doors are required to withstand hurricane force winds, doors shall be furnished as noted above, and approved by local code authorities. Doors shall be wind load certified and in compliance with design, and constructed to meet or exceed local code or authority having jurisdiction.

8.4 OVERHEAD INSULATED ROLLING DOORS

- A. Provide heavy duty overhead insulated rolling doors, steel slated and upward-acting, dimensions and arrangements as shown on drawings, and including the following requirements as manufactured by:

Series 624

ASTA Door Corporation

4255 McEver Industrial Drive
P.O. Box 420
Acworth, GA 30101
Phone: 770-974-2600, ext 228
Fax: 770-974-1455
Contact: Jimmy Miller
Email: jmiller@astadoor.com

Series 625

Overhead Door Corporation

2501 S. State Hwy 121; Business Suite 200
Lewisville, TX 75067
Contact: Richard Schutte
Cell: 469.678.4575
Email: richard_schutte@overheaddoor.com

Series Duracoil IF
Raynor Worldwide
1101 East River Rd.
P.O. Box 448
Dixon, IL 61021-0448
Contact: Charles Ziegler
Cell: 469.556.1683
Email: cziegler@raynor.com

B. General Requirements

1. Doors shall be constructed from interlocking, 24 ga front and 24 gauge back, hot dipped galvanized steel slats finished with baked epoxy primer coat and baked polyester finish coat, on both interior and exterior faces.
2. Slats to be filled with foamed-in-place polyurethane insulation with maximum flame spread and smoke developed indexes of 75 and 450 respectively, per ASTM E84 or UL 723.
3. Doors to have a minimum rated 7.2 R-value.
4. Profile: slats to be flat, insulated, 3/4" wide x 3 inches high.
5. Hoods: 24 ga galvanized steel with baked epoxy primer, baked polyester top coat, enclosed coil, 8" PVC baffle riveted to inside hood.
6. Doors shall have double angle bottom bars, three piece structural steel guides, clip-on guide seal, header seal to be aluminum retainer with 6" brush seal.
7. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components. Secondary components shall be included in the warranty.
8. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
9. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.
10. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.
11. Where overhead insulated rolling doors are required to withstand hurricane force winds, doors shall be furnished as noted above, and approved by local code authorities. Doors shall be wind load certified and in compliance with design, and constructed to meet or exceed local code or authority having jurisdiction.
 - a. OIRD - 1– Provide the General Requirements listed above and the following additional requirements:
 1. Provide insulated vision lites, 10" x 1" uniformly spaced horizontally across door face.
 2. Provide LiftMaster H103L5, jackshaft style, 1-HP with solenoid break, 3-phase, heavy duty motor operator, emergency manual chain hoist, 3 button NEMA-1 control buttons. Field verify available electrical voltage before ordering motors. Motor operators at Wash Bay doors shall be provided with weatherproof enclosures.
 3. Provide UL325-2010 monitored entrapment protection devices at each motor operated door. Provide two (2) sets of photo-sensors; locate one-set-high and one-set-low to meet UL325-2010 at each door opening. Provide continuous pressure sensitive sensor edge along bottom each door to stop or reverse downward travel when contacted with an obstruction. Bottom Sensing Edge: Miller Edge Wireless Bottom Sensing Edge (Black / Yellow Strap), Air Wave Switch & Receiver (no coil cord needed).
 4. At exterior side of door header of each coiling door provide and install full length of door opening a "Z" shaped lintel brush seal. Brushes shall be minimum of 1" longer than opening

of void between edge of door header to face of door slats when coiling door is in fully closed position.

5. Operator shall be warranted by manufacturer to installer for a period of two (2) years from date of sale against defects in materials or workmanship. Defective part(s) shall be repaired or replaced at no charge, at manufacturer's option.
- b. OIRD - 2– Provide the General Requirements listed above and the following additional requirements:
1. OIRD-2 doors shall only be provided at Dock when heat is included in project.
 - a. Doors shall be operated by reduced chain hoist.
 - b. Doors located at dock shall have the chain hoist mechanism located opposite side of the check writing stand(s). Chain hoists to be coordinated for hand of operation with plans and field conditions. Contact FFX Project Manager prior to ordering of doors for any clarifications.
 2. If door is located at Secure Storage provide the following additional items:
 - a. Provide LiftMaster H-series, jackshaft style, 1/2-HP with solenoid break, 3-phase, heavy-duty motor operator, emergency manual chain hoist, 3 button NEMA-1 control buttons. Field verify available electrical voltage before ordering motors.
 - b. Provide UL325-2010 monitored entrapment protection devices at each motor operated door. Provide two (2) sets of photo-sensors; locate one-set-high and one-set-low to meet UL325-2010 at each door opening. Provide continuous pressure sensitive sensor edge along bottom each door to stop or reverse downward travel when contacted with an obstruction. Bottom Sensing Edge: Miller Edge Wireless Bottom Sensing Edge (Black / Yellow Strap), Air Wave Switch & Receiver (no coil cord needed).
 - c. At exterior side of door header of each coiling door provide and install full length of door opening a “Z” shaped lintel brush seal. Brushes shall be minimum of 1” longer than opening of void between edge of door header to face of door slats when coiling door is in fully closed position.
 - d. Operator shall be warranted by manufacturer to installer for a period of two (2) years from date of sale against defects in materials or workmanship. Defective part(s) shall be repaired or replaced at no charge, at manufacturer's option.
 3. Wind locks per design wind load requirements: door assembly designed to withstand a minimum of 20 psf or 90 mph in accordance with ASTM E330 using a factor of safety of 1.0 or as required to meet or exceed local code or authority having jurisdiction.
- c. OIRD - 3– Provide the General Requirements listed above and the following additional requirements:
1. Provide LiftMaster H-series, jackshaft style, 1/2-HP with solenoid break, 3-phase, heavy-duty motor operator, emergency manual chain hoist, 3 button NEMA-1 control buttons. Field verify available electrical voltage before ordering motors.
 2. Provide UL325-2010 monitored entrapment protection devices at each motor operated door. Provide two (2) sets of photo-sensors; locate one-set-high and one-set-low to meet UL325-2010 at each door opening. Provide continuous pressure sensitive sensor edge along bottom each door to stop or reverse downward travel when contacted with an obstruction. Bottom Sensing Edge: Miller Edge Wireless Bottom Sensing Edge (Black / Yellow Strap), Air Wave Switch & Receiver (no coil cord needed).
 3. At exterior side of door header of each coiling door provide and install full length of door opening a “Z” shaped lintel brush seal. Brushes shall be minimum of 1” longer than opening of void between edge of door header to face of door slats when coiling door is in fully closed position.
 4. Operator shall be warranted by manufacturer to installer for a period of two (2) years from date of sale against defects in materials or workmanship. Defective part(s) shall be repaired or replaced at no charge, at manufacturer's option.

- C. Fuel Island Storage Shed: Provide heavy duty insulated coiling steel slatted upward-acting doors, with motor operator, of dimensions and arrangements as specified on drawings.

8.5 ALUMINUM ENTRANCES AND STORE FRONTS

- A. Provide all material, labor and equipment necessary to complete the aluminum entrances and store fronts as shown on the drawings.
- B. All materials to comply with ASTM and AAMA Standards.
- C. Provide shop drawings for architects review prior to ordering.
- D. Framing members to be extruded aluminum members (alloy and temper as recommended by the manufacturer) designed with a 35 psf wind load and thermal-break construction.
- E. All framing members to receive carbon steel reinforcement fasteners, flashings (26 gauge stainless steel), brackets, weather-stripping, glazing materials and masonry/concrete inserts as per manufacturer's recommendations.
- F. Framing Finish: Refer to Tab 9, Finish Schedule.
- G. Frame and door frame size to be 3 1/2" medium stile.
- H. Install units plumb and level, true to line; provide support and anchors as necessary.
- I. Set sill members in a bed of sealant and seal all joints between aluminum frames and adjoining materials to provide a weather tight seal.
- J. Approved aluminum entrances and store front manufacturers:
 - 1. Kawneer
 - 2. EFCO
 - 3. U.S. Aluminum
 - 4. Tubelite Inc.

8.6 ALUMINUM WINDOWS

- A. Aluminum window and glazing systems for storm shelters shall be designed to FEMA 361 and ICC 500 requirements, for the conditions specified under section 11.9 Storm Shelters, and include UL labels stating such. Insulguard StormDefend TTH600 window system shall be utilized, or other tested system, approved by FXF.
- B. Provide all material, labor, and equipment necessary to complete the aluminum windows as shown on the drawings.
- C. All materials to comply with ASTM or AAMA Standards.
- D. Provide shop drawings for architects review prior to ordering.
- E. Framing members to be extruded aluminum members (alloy and temper as recommended by the manufacturer) designed with a 35 psf wind load, with thermal-break construction.
- F. All framing members to receive carbon steel reinforcement, fasteners, flashings (26 gauge stainless steel), brackets, weather-stripping, glazing materials and masonry/concrete inserts as per manufacturer's recommendation.
- G. Framing finish; Refer to Tab 9, Finish Schedule.
- H. Frame size to be 3 1/2" min. depth.
- I. Install units plumb and level, true to line; provide support and anchors as necessary.

- J. Set sill members in a bed of sealant and seal all joints between aluminum frames and adjoining materials to provide a weather tight seal.
- K. Approved aluminum windows manufacturers:
 1. CMI
 2. EFCO
 3. U.S. Aluminum
 4. Kawneer
 5. Tubecraft

8.7 FINISH HARDWARE

- A. Provide all material and equipment necessary to furnish hardware as shown on the drawings and door finish schedule.
- B. All materials to comply with UL, BMHA ADA, and NFPA Standards.
- C. Hardware to be in compliance with federal, state and local building code requirements.
- D. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80, No. 101 and local building code requirements. Provide only hardware, which has been tested and listed, by UL, FM or Warnock Hersey for types and sizes of doors required and complies with requirements of door and door frame labels.
- E. Hardware Schedule: Submit a hardware schedule prior to ordering. Hardware schedule shall be in a vertical format (horizontal format not acceptable), organized into sets, including the information below. Designations for door numbers and hardware sets in the schedule shall match those used in the Construction Documents.
 1. Hardware Schedule shall be coordinated with doors, frames, and related work to ensure proper size, thickness, hand function, and finish of door hardware. Provide index at end of submittal listing door and-specified hardware. In addition, indicate page on submittal where door is found.
 2. Catalog cuts of each type of exposed hardware unit, highlighted in color to indicate compliance with the Hardware Schedule.
 - a. Type, style, function, size, and send finish of each hardware item.
 - b. Name and manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
 - e. Mounting locations for hardware.
 - f. Door and frame sizes and materials.
 - g. Deviations from Specifications shall be noted in cover letter.
- F. Hardware to be heavy duty grade type with a US26D aluminum finish unless otherwise noted.
- G. Hardware for Overhead Coiling Sheet Doors and Overhead Insulated Rolling Doors to be furnished within their Sections.
- H. Coordinate hardware prep and installation with other Sections included in the Project Manual. Non-functioning hardware will not be acceptable and shall be corrected at the Developer’s expense, which includes electrical and mechanical functions.
- I. Electrical System Roughing-In: Coordinate with Section 16.7 for electric components prep in doors and frames. Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
- J. Door undercuts shall be coordinated with threshold requirements in order to provide proper weather seal.
- K. Coordinate and provide Owner with a keying schedule; refer to Keying Section.

- L. Approved finish hardware products and manufacturers:
5. Hinges: Where hinges are specified, unless otherwise noted, they shall be of the types and sizes as follows: (Numbers are taken from Ives, Hager, and Stanley).
 - a) Height: Doors up to 36" wide: 4-1/2". Doors over 36" wide: 5".
 - b) Width: sufficient to clear all trim. Furnish one pair of hinges for all doors up to 5'-0" high. Furnish one additional hinge for every additional 2-1/2 feet or fraction thereof.
 - c) Finish: Hinges shall be steel based, exterior doors shall have stainless steel hinges.
 - d) Furnish non-removable pins (NRP) at all exterior out-swing doors and interior key lock doors with reverse bevels.
 - e) Hinges shall be heavy weight ball bearing.
 - f) Model Numbers: Exterior: Ives 5BB1HW, Hager BB1191, or Stanley FBB199. Interior: Ives 5BB1HW, Hager BB1168, or Stanley FBB168.
 - g) Where aluminum continuous geared hinges are specified, provide Ives 224XY, Hager 780-224HD, or Stanley 662HD.
 6. Locks or Latches
 - a) Where locks or latches are shown, unless otherwise noted they shall be Schlage ND series with SPA trim, Corbin Russwin CL3300 Series with PZD trim, or Sargent 11 line with BP trim.
 - b) Provide milled or knurled tactile warning levers at hazardous locations.
 - c) Locksets shall have a published minimum 7-year warranty.
 - d) Provide latch/lock guards at all exterior doors.
 7. Deadlocks
 - a) Where deadlocks are shown, unless otherwise noted, they shall be Schlage B660P, Corbin Russwin DL3013, or Sargent 485.
 8. Electric Strikes
 - a) Heavy duty, electric strikes conforming to ANSI/BHMA A156.31, Grade 1, UL listed for both Burglary Resistance and for use on fire rated door assemblies. Strikes tested for a minimum 1 million operating cycles. Provide strikes with 12 or 24 VDC capability and supplied standard as fail-secure unless otherwise specified.
 - b) For cylindrical locks provide Von Duprin 6211 or equal. For panic devices provide Von Duprin 6300 or equal.
 9. Exit Devices
 - a) Push Pad Type: Where push pad exit devices are scheduled, unless otherwise noted, they shall have a manufacturer's published 3-year warranty, equal to Von Duprin 99 Series. Where operating trim is required, use trim equal to Von Duprin 99L x 17. Where exit devices are used on fire rated doors they shall be "UL" listed as fire exit device.
 - b) Provide cylinders by lock manufacturer where cylinders are required with exit devices.
 - c) Except on fire rated doors, provide exit devices with cylinder dogging device to hold the pushbar and latch in a retracted position.
 - d) Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
 - e) Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy-duty escutcheon trim with threaded studs for thru-bolts. Provide free-wheeling, vandal resistant type trim.
 - f) Storm Shelter Doors: Where push pad exit devices are scheduled at the perimeter of a storm shelter, provide Von Duprin WS99 series to meet current FEMA 361/320 and ICC-500 requirements. Where operating trim is required, use trim equal to Von Duprin 99L x 17.
 10. Push Plates
 - a) Where push plates are shown, unless otherwise noted, they shall be Ives 8200, 8x16, Hager 305, 8x16 or Rockwood 70F, 8x16 stile permitting. Undersize plate width accordingly with door stile.
 11. Pull Plates
 - a) Where pull plates are shown, unless otherwise noted, they shall be Ives 8303-8, 4x16, Hager 34G, 4x16, 8" or Rockwood 110 x 70C, 4x16.
 12. Door Closers
 - a) Where door closers are shown, unless otherwise noted, they shall be LCN 4040XP, Norton 7500 BF and PR-7500 BF, or Rixson PH2020 and HDBA PH2020.
 - b) Mount closers out of corridors and public areas.

- c) Closer cylinders, arms, adapter plates, and metal covers shall have a powder coating finish which has been certified to exceed 100 hours salt spray testing as described in ANSI Standard A156.4 and ASTM B117.
 - d) Provide brackets or plates required for proper installation of door closers.
13. Kick Plates
- a) Where kick plates are shown, unless otherwise noted, they shall be Ives 8400 series, Hager 1905 or Rockwood K1050. On single doors 8" x 2" less door width and on pairs of doors 8" x 1" less door width. Plates shall be beveled on all 4 edges with countersunk screws.
14. Flush bolts
- a) Shall be Ives FB458, Hager 282D, or Rockwood 555 and 12" rod length on 7' doors. Provide longer bolts for doors over 7' tall.
15. Dust Proof Strike
- a) Shall be Ives DP1/DP2, Hager 280X, or Rockwood 570.
11. Astragal
- a) Shall be Zero 43SP, Pemko 3572SPND, or NGP 1390SP. Galvanized thru bolts shall be provided.
16. Door Stops
- a) Where door stops are shown, unless otherwise noted, they shall be Ives FS444, Hager 267F or Rockwood 471 on exterior doors.
 - b) On interior doors use wall stops Ives WS402CCV, Hager 234W, Rockwood 403 as required.
 - c) On interior doors where wall stops are not practical, use Glynn-Johnson 90 Series, Hager 7000 series, or Sargent 590 series heavy duty surface mount overhead stops.
17. Thresholds and Weather-stripping
- a) Where thresholds are shown, unless otherwise noted, they shall be Zero 65A, NGP 896N, or Pemko 2005AT sized equal to door opening width.
 - b) Where weather-stripping and seals are shown, unless otherwise noted, they shall be Zero 488S, NGP 2525, or Pemko S88, sized equal to door opening height x 2 plus door opening width. Color shall be Black.
 - c) Where automatic door bottoms are shown, unless otherwise noted, they shall be Zero 361AA, Pemko 4301_RL, or NGP 420N.
 - d) Where sweeps are shown, unless otherwise noted, they shall be Zero 31A, Pemko 315SSN, or NGP 130NSS.
18. Silencers
- a) Provide silencers Ives SR64 or Hager 307D on all doors that are not weather-stripped. Three (3) each on single doors and two (2) each on pairs of doors.
19. ADA Door Controls
- a) Provide all accessories necessary for a complete, code compliant, and functional system. Provide system components from a single manufacturer.
 - b) ADA Push Button/Activator – Provide standard 4-3/4"x4-3/4" and 1-1/2"x4-3/4" actuators per locations on drawings. Actuators shall be recessed in wall, bollard, or aluminum storefront system.
 - c) ADA Bollard Post – Black powder coated steel or clear anodized aluminum.
 - d) Door Operator – LCN 9500 Senior Swing Series or approved equal.
20. Foot Operator
- a) Provide anodized aluminum StepNpull foot operated door opener in matte black finish at all restroom doors with push/pull plate hardware. Provide all accessories for a complete and secure installation.

8.8 FINISHES

- Exterior Hinges - 630
- Interior Hinges – 652
- Aluminum Continuous Geared Hinges – Clear Anodized
- Locks, Latches and Deadlocks – 626 or 630
- Exit Devices – 626
- Push and Pull Plates - 630
- Door Closers - 689
- Kick Plates - 630
- Stops - 626, 630
- Flushbolts – 626

- Dust Proof Strike – 626
- Door Stops – 626 or 630

8.9 HARDWARE SCHEDULE

A. Provide hardware as specified in sets according to the following schedule as shown below. Some or all sets may/or may not be used as shown.

HARDWARE SET: 01 - AL ENTRANCE (CD PANIC, AUTO OP)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-17	626	VON
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURF. AUTO OPERATOR	9542 MS AS REQ (120/240 VAC)	ANCLR	LCN
1	EA	BOLLARD POST	8310-866	AL	LCN
1	EA	BOLLARD ACTUATOR	8310-3853TWB	AL	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	FLOOR STOP	FS444	626	IVE
1	EA	WEATHER STRIPPING	PROVIDED BY DOOR AND FRAME MANUFACTURER		
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. PANIC MAY BE DOGGED (MADE PUSH/PULL) VIA KEY. DOOR AUTO OPENS WHEN DOOR IS DOGGED. ALWAYS FREE EGRESS.

HARDWARE SET: 02 - AL ENTRY INT (CR, PANIC ELEC STRIKE, AUTO OP)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-17	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURF. AUTO OPERATOR	9542 MS AS REQ (120/240 VAC)	ANCLR	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	ACTUATOR, JAMB MOUNT	8310-818T	630	LCN
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1		DESK MOUNT BUZZER	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ OR BUZZER. OUTSIDE ACTUATOR ONLY OPERABLE AFTER BUZZ IN FROM DESK OR AFTER VALID CARD READ, INSIDE ACTUATOR ALWAYS OPERABLE. ALWAYS FREE EGRESS.

HARDWARE SET: 03 - CONFERENCE/CBE/WORKROOM/DISPATCH TO GEN OFFICE (PASSAGE SET)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PASSAGE SET	ND10S SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP H	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 03A - BREAK RM TO HALL, HALL TO GEN OFFICE - STORM (PASSAGE SET)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	PANIC HARDWARE	WS-9957-L-BE-17-299F	626	VON
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	FIRE/LIFE WALL MAG	SEM7850	689	LCN
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 04 - OFFICE (OFFICE LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50RD SPA	626	SCH
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 05 - POD SECURE STOR/DOCK TO PODOFFICE/TELCO/SHOP PARTS ROOM/POD BREAK ROOM TO SECURE STORAGE (CR)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	ND80RD SPA	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP CUSH (ADD HOLD OPEN ARM AT PARTS ROOM)	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

HARDWARE SET: 06 - DISPATCH TO BREAKROOM (CR, ELEC STRIKE)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	ND80RD SPA	626	SCH
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

HARDWARE SET: 07 - JANITOR/SHOP JANITOR/STORAGE (STOREROOM)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	ND80RD SPA	626	SCH
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 08 - POD ENTRY FROM DOCK/OFFICE TO DOCK/BREAKROOM TO EXT OR DOCK (CR, PANIC, ELEC STRIKE)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-17	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	RAIN DRIP	142AA (AT EXTERIOR DOORS ONLY)	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANICS MAY BE DOGGED (MADE PUSH/PULL) VIA KEY. ALWAYS FREE EGRESS.

HARDWARE SET: 08A - BREAKROOM TO EXT - STORM (CR. QEL PANIC.)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC PANIC HARDWARE	RX-QEL-WS-9957-TL-377T-299F-CON 24 VDC	626	VON
1	EA	ROD AND LATCH GUARD	WS-LGO-3-	630	VON
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	RAIN DRIP	142AA (AT EXTERIOR DOORS ONLY)	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1		CARD READER	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. PANICS MAY BE DOGGED (MADE PUSH/PULL) VIA KEY. ALWAYS FREE EGRESS.

HARDWARE SET: 09 - RESTROOM (PUSH/PULL)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 10 - SGL USE RESTROOM (PRIVACY)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PRIVACY LOCK	ND40S SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 11 - DOCK TO EXT/ SPRINKLER TO EXT/SHOP TO EXT/SHOP LUBE EQUIPMENT TO EXT/SHOP WASH TO EXT/SHOP SPRINKLER TO SHOP PARTS (NL PANIC)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-17	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	GASKETING	429AA-S	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	65A-223	A	ZER

HARDWARE SET: 12 - RETROFIT SECURE STORAGE (CR, MAG LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB358	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2	626	IVE
1	EA	CLASSROOM LOCK	ND70RD SPA	626	SCH
1	EA	MAGNETIC LOCK	M450P 12/24 VDC ACTIVE LEAF	628	SCE
2	EA	SURFACE CLOSER	4040XP SHCUSH	689	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	DOOR BOTTOM	355AA	AA	ZER
1	EA	ASTRAGAL	383AA	AA	ZER
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1	EA	PUSH BUTTON	621ALEX DA 12/24 VDC	626	SCE
1		CARD READER	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

HARDWARE SET: 13 - BREAKROOM TO MEETING (STOREROOM LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	ND80RD SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 13-A - BREAKROOM TO MEETING - STORM (STOREROOM LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	MULT PT STOREROOM	LM9380R 17A	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 14 - SECURE STORAGE W/PANIC (CR, QEL PANIC)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
6	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	630	IVE
2	EA	MANUAL FLUSH BOLT	FB358	626	IVE
1	EA	DUST PROOF STRIKE	DP1/DP2	626	IVE
1	EA	ELEC PANIC HARDWARE	RX-QEL-9975-L-NL-17 24 VDC	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
2	EA	SURFACE CLOSER	4040XP SHCUSH	689	LCN
2	EA	ARMOR PLATE	8400 34" X 1" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	DOOR BOTTOM	355AA	AA	ZER
1	EA	ASTRAGAL	383AA	AA	ZER
1	EA	ELEC POWER TRANSFER	EPT10	628	VON
1		CARD READER	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.

HARDWARE SET: 15 - MEETING ROOM TO OFFICE/BREAKROOM TO DRIVER CHECK-IN/DRIVE CHECK IN TO GEN OFFICE (CR PANIC)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5 NRP	652	IVE
1	EA	PANIC HARDWARE	CD-99-L-NL-17	626	VON
1	EA	MORTISE CYLINDER	26-091 XQ11-948	626	SCH
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	ELECTRIC STRIKE	6300 FSE 12/24 VAC/VDC	630	VON
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		

HARDWARE SET: 16 - ELEC ROOM TO EXT/MEETING RM TO EXT(EXIT ONLY PANIC)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	99-EO	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET: 16A - ELEC ROOM TO EXT/MEETING RM TO EXT (EXIT ONLY PANIC) - STORM

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY	628	IVE
1	EA	PANIC HARDWARE	WS9957-EO	626	VON
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET: 17 - ELEC ROOM TO SECURE STORAGE (NL PANIC)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	FIRE EXIT HARDWARE	99-L-NL-F-17-KN	626	VON
1	EA	RIM CYLINDER	20-057	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER

HARDWARE SET: 18 - SHOP LUBE EQUIP TO SERVICE BAY (STOREROOM)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	STOREROOM LOCK	ND80RD SPA	626	SCH
1	EA	SURFACE CLOSER	4040XP SHCUSH	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 19 - SHOP BREAK/SHOP CBE/SHOP OFFICE/LUBE EQUIP TO WASH (OFFICE LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	ENTRANCE/OFFICE LOCK	ND50RD SPA	626	SCH
1	EA	OH STOP	90S (WHERE WALL STOP NOT FEASIBLE)	630	GLY
1	EA	SURFACE CLOSER	4040XP H	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET: 19A - SHOP CBE/SHOP OFFICE - STORM (OFFICE LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	MULT PT OFFICE LOCK	LM9350R 17A	626	SCH
1	EA	SURFACE CLOSER	4040XP H	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET: 20 - SHOP RESTROOM (PUSH/PULL)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP	39A	A	ZER
1	EA	THRESHOLD	655A-223	A	ZER

HARDWARE SET: 21 - OFFICE RESTROOM (ADA PUSH/PULL)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	PUSH PLATE	8200 8" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURF. AUTO OPERATOR	4631 WMS 120 VAC	MTLPC	LCN
2	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE SET: 22 - BREAKROOM TO HALL (CR. AUTO OPERATOR)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	DUMMY PUSH BAR	330	626	VON
1	EA	DELAYED EGRESS MAG	M490DEP 12/24 VDC	628	SCE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURF. AUTO OPERATOR	4642 WMS 120 VAC	MTLPC	LCN
1	EA	ACTUATOR, WALL MOUNT	8310-853T	630	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS401/402CCV	626	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		
1		CARD READER	BY ACCESS CONTROL PROVIDER		

OPERATION: PULL SIDE - DOOR NORMALLY CLOSED AND LOCKED, APPROACHING DOOR UNLOCKS IT. PUSHING ACTUATOR OPENS DOOR. PUSH SIDE - VALID CARD READ TEMPORARILY DISABLES DELAYED EGRESS DEVICE, ALLOWING EGRESS, AND OPENING DOOR. WITHOUT VALID CARD READ ALARM WILL SOUND WHEN PUSH PAD IS DEPRESSED, THE DEVICE WILL PREVENT EGRESS FOR 15 SECONDS OR LESS. DEVICE WILL DISARM IMMEDIATELY UPON FIRE ALARM.

HARDWARE SET: 23 – HALL TO BREAKROOM - STORM (PASSAGE LOCK)

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	630	IVE
1	EA	MULT PT PASSAGE	LM9310R 17A	626	SCH
1	EA	SURFACE CLOSER	4040XP RW/PA	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

8.10 KEYING & CYLINDERS

A. Facility locks to be keyed as follows:

1. New buildings: Provide new grand master key system. Provide interchangeable core cylinders and locks with Patented open keyway. Schlage Everest 29 R or equivalent.
2. Existing buildings: Verify existing key system. Provide interchangeable core cylinders and locks. Key to existing key system unless otherwise noted by Owner or Architect.
3. Provide three (3) Grand Master keys that open all locks in all buildings. Grand master key to be marked, "GMK Do not duplicate".
4. Provide three (3) Building Master Keys for the Terminal Building (Office and Dock) that open all locks within that building. Master key to be marked, "TMK Do not duplicate".
5. Provide three (3) Building Master Keys for the Shop Building that open all locks. Master key to be marked, "SMK Do not duplicate".
6. Exterior Office Building doors (excluding doors to Dock area) to be keyed alike.

7. Exterior Dock Doors to be keyed alike.
8. Exterior Shop Doors to be keyed alike.
9. Exterior Storage Building doors to be keyed alike.
10. Janitor Closets to be keyed alike.
11. Provide separate keying for all other locks.
12. Provide separate keying for all other locks.

8.11 GLASS & GLAZING

- A. Provide all material, labor and equipment necessary to complete the glass and glazing as shown on the plans.
- B. All material to comply with ASTM, ANSI and IGCC Standards.
- C. Glazing system to be capable of withstanding normal thermal movement and impact loading without failure.
- D. Interior glass shall be a minimum of 1/4" thick and shall be clear unless otherwise noted.
- E. Exterior insulated windows – shall be 1" insulated; outboard – ¼" solar gray tinted with light transmission of 47%. Inboard – ¼" clear with 1/2" black spacers. Shading coefficient of .57.
- F. Tempered glass to be provided as per local, state, and government regulations.
- G. All glazing to be set in glazing blocks, spacers, and gaskets to provide for proper installation and weather tightness.
- H. Glass types to be provided as follows:

1. Exterior windows	1" insulated glass (1/2" minimum air space)
2. Exterior doors	1/4" tempered insulated glass
3. Interior windows	1/4" float glass
4. Interior doors	1/4" tempered glass
5. Special interior windows/openings	1/4" wire glass
- I. Approved glass manufacturers:
 1. Viracon
 2. PPG
 3. HPG

SECTION 9 - FINISHES

9.1 GYPSUM DRYWALL SYSTEM

- A. Provide all material, labor, and equipment necessary to complete the gypsum drywall system as shown on the drawings, and room finish schedule.
- B. All materials to comply with ASTM Standards.
- C. Interior gypsum drywall on all walls and ceilings to be 5/8" fire code and 5/8" moisture resistant where noted on the plans.
- D. Exterior gypsum sheeting to be 5/8" thick water resistant.
- E. All corner beads, edge trims, control joints, flex corner beads, fasteners, and adhesives to be provided as per manufacturer's recommendations.
- F. Exposed finished drywall to receive joint tape and a three (3) coat joint compound finish system with a smooth sanded finish.

- G. Provide Level 4 finish as presented by the Association of the Wall and Ceiling Industries – International (AWCI).
- H. Provide Green Glue noiseproofing compound by Saint-Gobain between 2 layers of drywall at each office wall (except exterior) and as noted on the drawings. Install per manufacturer instructions.

9.2 CERAMIC TILE

- A. Provide all material, labor and equipment necessary to complete the ceramic tile as shown on the drawings, and room finish schedule.
- B. All materials to comply TLA and ANSI Standards.
- C. Tile to be installed using thin-set mortar; butt and fit all tile tight to openings.
- D. Grout all ceramic tiles using manufacturer’s recommended materials; install color grout at all ceramic tile joints.
- E. Provide bull-nosed, coved and other special tile where required.
- F. Materials to be selected by the Owner from manufacturer’s standard grade tile charts.
- G. Standard tile sizes to be provided as follows:
 - 1. Ceramic floor 2” x 2”
 - 2. Ceramic base 2” x 2” x 4” tall cove base
 - 3. Ceramic walls 2” x 2”
 - 4. Ceramic bullnose 2” x 2”
- H. Refer to the attached Room Finish and color schedule for ceramic tile.
- I. Clean all tile surfaces upon completion of work removing all residual grout from surface of tiles and leaving the tile surfaces polished. Apply (1) coat of sealer at all ceramic tile floors and grout with product as recommended and approved by tile manufacturer.
- J. Provide upon completion a maintenance stock of each ceramic tile used equal to 2% of the total amount installed. Material shall be from the same lot and dye number of the product installed.
- K. Approved tile manufacturers:
 - 1. American Olean
 - 2. Dal-Tile
 - 3. U.S. Ceramic Tile
- L. At Shop restrooms only, cove base shall be utilized with aluminum Schluter Schiene termination bar. See prototype drawings for detail.

9.3 ACOUSTICAL CEILINGS

- A. Provide all material, labor and equipment necessary to complete the acoustical ceilings as shown on the drawings, and room finish schedule.
- B. All materials to comply with ASTM, USDA and UL Standards.
- C. Grid system to be standard 15/16” exposed tees; white finish and all necessary suspension accessories to provide a complete system, by Armstrong World Industries, Prelude XL HRC.
- D. Grid system to be installed where indicated on the drawings.

- E. Tiles shall be Ultima 1914HRC or 1911HRC Mineral Fissured (white) 24" x 48" x 3/4" or 24" x 24" x 3/4" tegular edge (revealed edge), humidity resistant, anti-sag, anti-microbial, manufactured by Armstrong World Industries Inc.
 - 1. NRC – 0.75 min.
 - 2. CAC – 40 min.
 - 3. Class – A
 - 4. Light Reflectance - .88 min.
- F. Coordinate the grid layout in each space with other trades.
- G. Space hangers no more than 4'-0" o.c. In project locations subject to seismic activity or as required by code and/or local jurisdiction, provide extra hangers as required.
- H. Install tile hold down clips in all vestibules and within a 20-foot radius of doors to the exterior.
- I. Upon completion, provide a maintenance stock of ceiling panels equal to 5% of materials used. Material shall be from the same lot and dye number of the product installed.
- J. Acceptable acoustical ceiling manufacturer's list to include:
 - 1. Certainteed
 - 2. Armstrong
 - 3. USG Interiors
 - 4. Rockfon (Chicago Metallic)

9.4 RESILIENT FLOORING AND BASE

- A. Provide all material, labor and equipment necessary to furnish the resilient tile flooring and base as shown on the drawings and room finish schedule.
- B. All materials to comply with ASTM Standards.
- C. Refer to Room Finish and Color Schedule for Vinyl base at end of specification.
- D. Reducer strips to be 1" x .08 gauge, type 2 vinyl, color to match vinyl tile floor.
- E. Floors and base to be set in a water and alkali resistant adhesive as recommended by the floor tile manufacturer.
- F. Provide all testing necessary to comply with manufacturer's installation instructions. If testing results do not meet manufacturer requirements, Developer must mitigate those issues as necessary to comply and achieve acceptable results.
- G. Leveling and patching compound to be latex type as recommended by the floor tile manufacturer.
- H. Upon completion, provide a maintenance stock of each floor tile and wall base used equal to 2% of the amount installed. Material shall be from the same lot and dye number of the product installed.
- I. After flooring installed, provide initial cleaning as per manufacturer's instructions. All trades shall be restricted from accessing floors after cleaning operations begin. Coordinate work with FXF Project Manager.
- J. **LUXURY VINYL TILE (LVT)**
 - A. Provide resilient flooring and accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper installation, meeting the following minimum requirements.
 - 1. Product Type: Shaw Contract LVT, 0515V Surface, 15500 Pitch
 - 2. Construction: Heavy Commercial Luxury Vinyl Tile
 - 3. Class / ASTM F1700: Class III, Type B

4. Finish: ExoGuard™
5. U.S./Metric Nominal Dimensions: 18 in w x 36 in / 45.5 cm w x 91.5 cm
6. Actual Dimensions: 18 in w x 36 in / 45.72 cm w x 91.44 cm
7. Wear Layer Thickness: 20 mil (0.02 in) 0.51 mm
8. Overall Thickness: 0.098 in / 2.5 mm
9. Edge Profile: Squared Edge
10. Installation: Direct Glue / Manufacturer Recommended Adhesive
11. Installation Pattern: Ashlar Pattern
12. Static Load ASTM F970
13. Residual Indentation ASTM F1914
14. Resistance to Heat ASTM F1514
15. Resistance to Light ASTM F1515
16. Resistance to Chemicals ASTM F925
17. Smoke Density ASTM E662, Flaming Mode
18. Radiant Panel ASTM E648
19. Coefficient of Friction ASTM D2047, Slip Resistance greater than or equal to 0.5
20. 15 Year Commercial Limited Warranty

B. Shaw Contract:
 Michelle Swain
 Cell: 501.733.6568
 Email: michelle.swain.contract@shawinc.com

9.5 RESILIENT BASE – NOT USED

9.6 PAINTING

- A. Provide all material, labor and equipment necessary to furnish the painting as shown on the drawings.
- B. All materials to comply with ASTM, PDCA, and ASA Standards.
- C. Provide paint colors as listed in Room Finish and Color Schedule of this specification.
- D. Prior to surface preparation and painting, completely mask, remove, or otherwise adequately protect hardware, accessories, machined surfaces, plates, lights and similar items in contact with painted surfaces, but not schedule to receive paint.
- E. Prime all exposed nails and other materials to be painted with emulsion paints. Before and during application, sand and dust to remove visible defects from a distance of five feet.
- F. Provide 2 part epoxy primer with enamel top coat at all passage doors located in wet location at Shop i.e. tractor and trailer wash bays and wash equipment room.
- G. Seal tops, bottoms, and hardware mortises of wood doors.
- H. Thoroughly clean all surfaces before applying finishes.
- I. Do not paint over code required labels.
- J. Putty all nail holes, cracks, or defective holes in exposed woodwork; color of putty to match finish.
- K. Provide the paint systems for the various substrates; as noted on the Room Finish Schedule at the end of this specification.
- L. Apply paint, enamel, stain and varnish with suitable brushes, rollers or spraying equipment.
 1. Rate of application shall not exceed that as recommended by product manufacturer for the surface involved.
 2. Keep brushes, rollers and spraying equipment free from contaminates and suitable for the finish required.

3. Apply stain by brush.
- M. Provide no visible brush or roller strokes or marks. Hollow metal doors and frames shall be sprayed.
- N. Paint inside of ductwork flat black for entire area visible through ceiling openings.
- O. Clean window glass and other paint spattered surfaces.
- P. Upon completion of the project, provide FFX with partially used containers of paint and stain. Each container must contain no less than ¾ volume of product from its original container.
- Q. Acceptable brands of paints, stain, varnish, sealers and coatings are as follows:
 1. Sherwin Williams Co.
 2. Benjamin Moore Co.
 3. DeVoe Paint
 4. Pittsburgh Paints
- R. Provide the following paint types. Cross match as required between approved paint manufacturers.

Exterior

2. Ferrous metal:
 - a) Primer: one coat, B66-310 Series – PRO Industrial Pro-Cryl Universal Primer.
 - b) Finish: two coats, Semi-gloss: B66 – 200 Series – DTM Acrylic, color as selected.
3. Galvanized metal:
 - a) Primer: one coat: B66W1 Series – DTM Acrylic Primer, color - white.
 - b) Finish: two coats, Semi-gloss B66 – 200 Series – DTM Acrylic, color as selected.
4. Wood:
 - a) Primer: one coat: B42W41 Series – A-100 Exterior Latex Wood Primer, color - white.
 - b) Finish: two coats: Semi-gloss, B66 – 200 Series – DTM Acrylic Semi-gloss, color as selected.
5. Masonry / Concrete Pre-cast or Tilt-up:
 - a) Primer: one coat: B24W300 Series – Loxon Exterior Acrylic Masonry Primer for surfaces with ph greater than 9, color - white.
 - b) Texture: A44W800 Series – UltraCrete Waterborne Texture Coating Fine.
 - c) Finish: two coats: A5 - 100 Series – SherLastic Elastomeric Coating, color as selected.

Interior

1. Concrete Block (CMU):
 - a) Primer: one coat: B25W25 Series – PrepRite Block Filler, color - white.
 - b) Finish: two coats: Semi-gloss B31W2200 Series – ProMar 200 Interior Latex, color as selected.
2. Drywall (GWB):
 - a) Primer: one coat: B28W200 Series – PrepRite 200 Interior Latex Wall Primer, color - white.
 - b) Finish: two coats: Satin, B20W2200 Series – ProMar 200 Interior Latex, color as selected. Final coat of finish paint shall be applied with a nap roller in order to create a light surface texture.
3. Ferrous metal:
 - a) Primer: one coat, B66-310 Series – PRO Industrial Pro-Cryl Universal Primer.
 - b) Finish: two coats, Semi-gloss: B66 – 200 Series – DTM Acrylic, color as selected.
4. Galvanized metal:
 - a) Primer: one coat: B66W1 Series – DTM Acrylic Primer, color - white.
 - b) Finish: two coats, Semi-gloss B66 – 200 Series – DTM Acrylic, color as selected.
6. Wood (painted):
 - a) Primer: one coat: B28W101 Series – Prep-Rite Classic Interior Latex Primer, color - white.
 - b) Finish: two coats: Semi-gloss, B66 – 200 Series – DTM Acrylic Semi-gloss, color as selected.
7. Wood (stained):
 - a) Primer/Sealer: one coat: B26V43 Series – Wood Classic Fast Dry Sanding Sealer, clear.
 - b) Stain: Transparent A49 – 200 Series – Wood Classic Interior Oil Stain, color as selected.
 - c) Finish: two coats: A68 Series – Wood Classics Waterborne Poly Varnish, clear.
- S. Refer to Room Finish Schedule, Tab 9 for color selections.

9.7 LINEAR METAL CEILING SYSTEM

- A. Provide slatted linear metal ceiling system at office areas and other locations as shown on drawings. Slats shall be flush-faced without exposed fasteners, 6" wide x 3/4" deep, roll-formed, 0.025" thick aluminum with square interlocking, integral reveal closure edges, factory finished.
- B. Install non-perforated slats at exterior building locations except for one full length perforated panel at each end of entrance canopy. Verify warranty of system with manufacturer for percentage of perforated/non-perforated panels.
- C. Carriers and panels shall be designed to withstand positive/negative wind loads as required to meet local codes and wind load conditions.
- D. Provide "Luxalon" 150F linear metal ceiling system, as manufactured by Hunter Douglas Architectural Products, Inc., 5015 Oakbrook Parkway, Suite 100, Norcross, Georgia 30093. Phone (800) 366-4327.

9.8 CARPETING

- A. Provide carpeting and carpet accessories where shown on the Drawings, as specified herein, and as needed for a complete and proper carpet installation, meeting the following minimum requirements.
 - 1. Product Type: Shaw Contract Carpet Tiles, 5T267 Assembly Support Tile, System 67505
 - 2. Construction: Multi-Level Pattern Loop
 - 3. Gauge: 1/12 inch (47.20 rows per 10 cm)
 - 4. Stiches Per Inch: 9 (34 per 10 cm)
 - 5. Finished Pile Thickness: 0.095 inch (2.41 mm)
 - 6. Dye Method: 100% Solution Dyed
 - 7. Backing Material: Synthetic Ecoworx Tile.
 - 8. Fiber Type: Eco Solution Q Nylon
 - 9. Face Weight: 20.0 oz per (678.1 gms/sqm)
 - 10. Size: 12" x 48" (30.5 cm x 121.9 cm)
 - 11. Installation Method: Ashlar Pattern with long direction of tile to match long direction of room.
 - 12. Soil Release Technology: SSP Shaw Soil Protection
 - 13. Foot Traffic Recommendation TARR: Severe
 - 14. Static: AATCC-134 Under 3.5 KV
 - 15. Flammability: ASTM 648 Class 1 (Glue Down)
 - 16. Smoke Density: ASTM E662 Less than 450
 - 17. Warranties: Lifetime Commercial Limited Carpet Tile Warranty.
- B. Shaw Contract:
Michelle Swain
Cell: 501.733.6568
Email: michelle.swain.contract@shawinc.com

SECTION 10 - SPECIALTIES

10.1 TOILET PARTITIONS

- A. Provide all material and equipment necessary to furnish the toilet and urinal partitions as shown on the drawings, and to provide a complete and functioning system.
- B. All materials to comply with ASTM, ADA Standards. All fasteners shall be non-ferrous metal.
- C. Provide shop drawings for FXF review and color selection prior to ordering.
- D. High Density Polyethylene (HDPE) toilet partitions and urinal screens shall be floor supported with top metal overhead braces mounted in the dimensions and arrangement shown or not shown in the drawings each in full compliance with ADA. Color: Refer to Tab 9, General Room Finish and Color Schedule.

- E. Pilasters, panels, screens and doors shall be constructed from 1” thick High Density Polyethylene (HDPE). Pilaster shoes shall be 304 stainless steel, no. 4 finish.
- F. Toilet partitions and urinal screens shall be securely fastened to the wall and pilasters with continuous heavy duty aluminum, stirrup double eared, brackets. Doors shall be secured with a continuous stainless steel cam action piano hinge.
- G. Doors shall be a minimum 24 inch width, and a minimum 36 inch width at ADA accessible compartments. Door/panel heights shall be 66 inches.
- H. Toilet compartments shall be 12 inches above finished floor.
- I. Urinal screens shall be 12 inches above the finished floor, 24-30 inches wide and 66 inches high. Posts shall be 1-3/4 inch square aluminum tubes and be 82 inches high.
- J. Provide concealed 2X solid fire retardant treated wood blocking securely anchored to metal wall framing for proper anchoring of partitions. Blocking is in addition to plywood.
- K. Hardware and accessories to be non-ferrous and have a brushed chromium finish.
- L. Latches, coat hook, bumper, and wall stop to be furnished for each door.
- M. Provide and install mill-finish aluminum offset privacy strip on latch side of each toilet partition door.
- N. Acceptable toilet partition manufacturer’s list, or approved equal:
 1. General Partitions Manufacturing Corp.
 2. Accurate Partitions Corp, an ASI Group Company
 3. Scranton Products
 4. Bradley Corporation

10.2 BUILDING ACCESSORIES

- A. Provide all material and equipment necessary and where shown in the drawings.
- B. Flagpole – 35’ exposed length aluminum pole. Pole shall be designed to withstand 90 mph of winds with 5’ x 8’ flag. Flagpole assembly to include gold anodized spun aluminum ball, cast aluminum revolving ball bearding truck, two (2) swivel snaps, one (1) set of halyards, aluminum flashing collar, foundation sleeve and plate and ground spike. Lessee will furnish the flag.
- C. Window Blinds – Provide and install 1” metal mini blinds on all windows and interior doors and/or sidelights located at all rooms serving as offices and conference rooms. Blinds shall be “equal to” Model CD80 1”x .008” mini aluminum blinds as manufactured by Hunter Douglas. Provide colors as required to match aluminum window frames.
- D. Flexible Bollards – Install four units at each fire hydrant located in yard pavement areas and at other locations as noted in proto-type drawings. Provide BollardFlex System, impact resistant flexible bollards with 360 degree flexibility, Model BF-52C, 52”high x7”diameter polyethylene, red bollard with yellow reflective tape, 7ga steel base plate with torsion spring and concrete/asphalt fasteners, as manufactured by Innoplast, 10120 Gottschaulk Parkway, Chagrin Falls, OH 44023, 800.516.9287, or approved equal.
- E. Pipe Bollard Sleeves – At each pipe bollard installed and/or existing, provide standard duty, polyethylene thermoplastic (LDPE) tubes having ultra-violet resistance and anti-static properties, nominal thickness 0.250 inches “equal to” as those manufactured by IDEAL SHIELD, 2525 Clark Street, Detroit, Michigan 48209-1355, Telephone: (877) 325-0769. Color shall be OSHA yellow at all pipe bollard locations except at bollards locations on the dock where fire extinguishers are located at main frames, at these locations provide red bollard sleeves at each pipe bollard right and left of main frame, verify locations of fire extinguishers. Provide sleeve covers sized for pipe diameters and bollard lengths.
 Contact: Antonio Rivera

- F. Air Compressor:
1. At Shop Maintenance Facility provide and install air compressor as specified in the proto-type drawings. Include manufacturer's standard startup of air compressor.
 2. At Shop Fuel Island provide and install air compressor as specified in the proto-type drawings. Include manufacturer's standard startup of air compressor.
- G. Hot Water Pressure Washer: At Shop Maintenance Facility provide and install hot water pressure washer with stand as specified in the proto-type drawings.
- H. Ice machine(s): At each and every Break Room (Office, Dock Pods and Shop) provide and install the number of Ice machines/Dispenser as shown in the proto-type drawings. Each of the required ice machines shall be furnished complete with the proper sized machine stand and water filter assembly as listed. When determining the number of ice machines required for this project, refer to the following table and proto-type drawings.
1. **Office Building Break Rooms:**
Scotsman N0622A-1A Nugget Machine
ID200B-1A – Scots Counter Dispenser, 200 lb. Capacity
IOBDMS30 – Machine Stand
KBT43 – Bin Top
KWGFID – Water Filler
KVS – Bin Control
Filter – ICE125S 5616004
 2. **Dock Break Room Pod(s):**
Scotsman N0622A-1A Nugget Machine
ID200B-1A – Scots Counter Dispenser, 200 lb. Capacity
IOBDMS30 – Machine Stand
KBT43 – Bin Top
KWGFID – Water Filler
KVS – Bin Control
Filter – ICE125S 5616004
 3. **Shop Maintenance Facility Break Room:**
Scotsman N0422A-1A Scotsman Nugget
ID200B-1A – Scots Counter Dispenser, 200 lb. Capacity
IOBDMS30 – Machine Stand
KBT43 – Bin Top
KWGFID – Water Filler
KVS – Bin Control
Filter – ICE125S 5616004
 4. **Office/Pods/Shop Breakroom (All ice machines shall be the following if project is LEED Certified):**
Scotsman N0922A-32 Scotsman Nugget
ID200B-1A – Scots Counter Dispenser, 200 lb. Capacity
IOBDMS30 – Machine Stand
KBT43 – Bin Top
KWGFID – Water Filler
KVS – Bin Control
Filter – ICE125S 5616004
 5. Water Filtration System: Water Filtration unit and one filter required for each ice machine provided.
 6. Replacement Filter: One Water Filter Cartridge per Unit.
 7. Water Filler: Field installed on Dispenser Unit.

8. Provide 115 volt, 20 amp single phase breaker, minimum. If project is LEED Certified, provide 208 volt, 15 amp single phase breaker, minimum. Verify all electrical and breaker requirements with manufacturer, install accordingly and coordinate with electrical.
 9. Provide 3/8" diameter water connector. Verify all water line requirements with manufacturer, install accordingly and coordinate with plumbing.
 10. FXF currently has pricing established with North Little Rock Winsupply, PO Box 490, North Little Rock, AR 72115, phone 501-758-8830. Verify exact costs with vendor before submitting bid. General contractor shall not be bound to purchase this equipment from the listed vendor and is allowed to pursue competitive bids from other suppliers.
- I. Mail Box: Outside site perimeter security fencing as located on site plan, provide and install black polymer mail box, 50"x11.5"x21.77", Gentry Model by Rubbermaid, with rear retrieval, post sleeve, newspaper holder. Install unit over 4x4 treated wood post set in concrete footing. Install as per US Postal Service standards.
 - J. Pipe Picket Railing: Provide heavy duty, non-welded, concealed mechanical fasteners and joints, aluminum pipe railing system for handrails, steps, ramps and patios in picket configuration as shown on drawings. Install Series 550 pipe picket railing system with 1.5" diameter Schedule 40 rails and posts formed from extruded 6063-T6 aluminum, 3/4" diameter pickets formed from extruded 6063-T5 aluminum, stainless steel or aluminum fasteners, post spacing not to exceed 4'-0" on-center, satin anodized aluminum finish, as manufactured by Superior Aluminum Products, Russia, OH 937-526-4065, or approved equal. Railing design shall meet ADA and all local code requirements as well as uniform and concentrated loading requirements.
 - K. Skylight Fall Protection Screens: Provide hot dipped galvanized welded wire mesh skylight screens for fall protection at each skylight roof panel location. Skylight screens shall be Model TSSR Fallguard with S5 clamps, as manufactured by Plasteco, Inc., Houston, TX, 800-231-6117, or approved equal. Verify exact quantities and roof panel profile with pre-engineered metal building manufacturer. Penetrations through standing seam metal roof panel or ribs are not allowed. Secure fall protection screen to unistrut channels supported by non-penetrating metal roof clips. Refer to drawings for more information.
 - L. SlowStop Rebounding Steel Pipe Bollards and Guardrail System where indicated on the drawings:
 1. Provide SlowStop bollards and guard rail system as manufactured by Impact Recovery Systems, 4955 Stout Drive, San Antonio, TX 78219.

PRICING/ CONTACT INFO: Marko Vojcanin, Director of Corporate Accounts, 813-774-2161, mvojcanin@impactrecovery.com or Jason Schneider, Corporate Account Manager, 210-947-7950, jschneider@impactrecovery.com . Provide facility location at time of pricing inquiry, including quantities. You will be provided Fed Ex Freight negotiated pricing. Must provide Impact Recovery Systems Order Acknowledgment document if requested by the FXF Project Manager of Facility Advisor on site. Any contractor, or their hired sub- contractor, must be previously trained by Impact Recovery Systems. If given ample notice, the training can take place on site before work commences. The work is not considered complete until FXF signs off on the installation. You will be required to come back to complete any work that is not considered complete.

- a. Bollards shall be 5" diameter x 42" tall (Product # SS5Y-42) Stopping Power: 14,000 joules/ 10,326 ft-lb. Energy Absorption (no damage rating) of 7,000 Joules/ 5,163 ft./lb. Bollards shall give way (absorb energy) approximately 20 degrees when impacted. Meets IBC 1607.8.3 requirements to resist 6,000 pounds of force @ 27" height. Provide posts, anchors, adapter & base and all components necessary for complete installation – color to be yellow.
 - b. Guardrail system to be SlowStop 4" Modular FlexRail Guardrail system (product #SS4Y-GRS-2) and shall include 4" x 42" tall SlowStop bollards, polycarbonate guardrail and end caps (product #SS4Y-GRE). The break strength of the system shall be 24,780 ft-lbs with a deflection of 28". Provide 4" posts, polycarbonate guardrail, anchors, adapter & bases and all components necessary for complete installation – color to be yellow.
 - c. MODS protection is specified on the drawings and in section 16.6.
- M. Office Breakroom Refrigerator: Shall be manufactured by TRUE Manufacturing Co., Inc. 2001 East Terra Lane, O'Fallon MO 63366-4434, 800.325.6152, Model GDM-47-HC-LD. Provide refrigerator and install

where shown on the proto-type drawings. Provide electrical outlet as necessary per manufacturer's specifications.

- N. Pallet Racking System: FXF to provide a Husky Rack and Wire Invincible Rack system at the end bay dock wall, see drawings for location. Developer to install and securely fasten racking system to concrete slab with expansion anchors. Developer to provide appropriate expansion anchors for field conditions.

10.3 FIRE EXTINGUISHERS AND CABINETS

- A. Provide portable fire extinguishers throughout the facility as required, unless additional coverage is required by local governing authority.
- B. Provide portable fire extinguishers as follows:
 - 1. Dock Area:
 - a) Provide one 10# extinguisher within 50 feet of any given point.
 - 2. Office Area:
 - a) Provide one 10# extinguisher within 75 feet of any given point or where shown on drawings.
 - 3. Pod Area:
 - a) Provide one 10# extinguisher within 75 feet of any given point or where shown on drawings.
 - 4. Vehicle Maintenance Area: (where applicable)
 - a) Provide one 10# extinguisher within 25 feet of any given point.
 - 5. Fuel Facility:
 - a) Provide one 20# fire extinguisher per fueling lane.
- C. Fire Extinguishers: Provide extinguishers classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated.
 - 1. 10# Type: Multipurpose dry chemical UL rated 4A-80BC equal to J.L. Industries, Inc. Cosmic 10E.
 - 2. 20# Type: Multipurpose dry chemical UL rated 6A-120BC equal to J.L. Industries, Inc. Cosmic 20E.
- D. Extinguishers installed on wall mounted brackets are acceptable in the following areas:
 - 1. Dock Area
 - 2. Vehicle Maintenance Area
- E. Provide fire extinguisher cabinets classified and labeled by Underwriters Laboratories Inc. for the purpose specified and indicated in the following area:
 - 1. Semi-Recessed Mounted: Office & Pod Areas equal to J.L. Industries, Inc. Academy Series, aluminum, 4" rolled trim with ADA pull, laminated safety glass, clear anodized finish, Model 1022V18ADAC. Location of cabinet may be or may not be indicated on drawings.
 - 2. Surface Mounted: Fueling Lanes equal to J.L. Industries, Inc. Academy Series, aluminum, full laminated safety glass, clear anodized finish, Model 2023F18. Location of cabinet may be or may not be indicated on drawings.
- F. Placement: High Visibility area; top of extinguisher not to exceed 42" inches above floor.
- G. Signage: Provide "FIRE EXTINGUISHER" signage for all extinguishers equal to J.L. Industries, Inc. #DRFA, decal 3.5"x11.75", vertical, red and white.
- H. Operation and Maintenance: Extinguishers shall be inspected/tagged upon installation to meet local fire code.

10.4 FEDEX FREIGHT SIGNAGE

- A. All FedEx Freight signage shall be supplied and installed by Developer/General Contractor. The General Contractors electrical sub-contractor will provide and connect service as required for the location identified on the drawings.
- B. Exterior Signage:

1. Type 1 - Exterior base mounted sign, rectangular monument @ main entry drive, **Purple & Orange** colored letters, shall be design FX-D402F as per the FedEx Comprehensive World Sign Manual, Size 60" x 140", internally LED illuminated.
 2. Type 2 - Exterior building mounted sign, outline **Purple & Orange** colored channel letters, shall be design FX-E501F as per the Comprehensive World Sign Manual, Size 56" x 122" internally LED illuminated.
 3. Type 3 - Exterior building mounted sign, rectangular **Purple & Orange** colored letters, shall be design FX-E122F as per the Comprehensive World Sign Manual, Size 42" x 98", internally LED illuminated.
- C. The exterior signage shall be supplied by a pre-approved sign vendor as listed below. No other vendor will be allowed unless pre-approved in writing from FedEx Freight, Inc., prior to bidding.
- D. Interior Signage:
1. Provide and install etched clear acrylic signage at the reception desk as detailed in the prototype drawings.
- E. Approved Signage manufacturer:
- Velocity, Inc.
Dallas Hunsucker
530 Vaiden Dr.
Hernando, MS 38632
Phone: 662-449-4026 ext 34
Cell: 662-782-8988
Fax: 662-449-4029
dhunsucker@velocityid.com
- F. Shop drawings of the proposed signage shall be submitted to FXF prior to acceptance of order and manufacturing of sign. Approval by FXF is mandatory.
- G. Permitting: Developer/General Contractor shall be responsible for obtaining all necessary permits and/or variances as may be associated with the installation & operation of all signage. All illuminated signs for projects in Canada shall be certified by Canadian Underwriter's Laboratory (CUL) before shipping product to site.

10.5 TOILET ACCESSORIES

- A. Provide all material and equipment necessary to furnish the toilet accessories as shown on the drawings.
- B. All materials to comply with ADA and ASTM Standards.
- C. Submit shop drawings for architects review prior to ordering.
- D. Accessories to be fabricated of stainless steel (type 302 or 304) with a satin finish.
- E. Theft proof screws are to be provided for installation and grab bars shall be capable of supporting a minimum dead load of 300 pounds.
- F. Provide the following toilet accessories within each designated area where and in quantities as shown in the proto-type drawings:
 1. Men's Restroom:
 - Surface mounted mirror (ADA tilted) 18" x 30" per handicapped lavatory
 - Surface mounted mirror (fixed) 18" x 30" per standard lavatory
 - Surface mounted mirror (fixed) 60" x 24" per hand wash station
 - ADA grab bars (per ANSI Code) per handicapped water closet
 2. Women's Restroom:
 - Surface mounted mirror (ADA tilted) 18" x 30" per handicapped lavatory
 - Surface mounted mirror (fixed) 18" x 30" per standard lavatory
 - ADA grab bars (per ANSI Code) per handicapped water closet
 - 1 - 6" wide x 18" long, 18 ga. Stainless steel shelf / handicapped toilet

3. Janitor Closet:
 - 1 - Utility shelf (mop-broom holder (3) with rag hooks)
- G. Acceptable toilet accessory manufactures:
 2. Bobrick Washroom Equipment
 3. American Specialties, Inc.
 4. Columbia Products
 5. Tubular Specialties Manufacturing
- H. Provide fire-treated wood blocking in walls for proper mounting of accessories. Verify proper ADA mounting heights for all toilet room accessories before proceeding with installation.
- I. FXF will furnish toilet room accessories and installation shall be by contractor/developer:
 1. Paper Towel dispensers located in Toilet Rooms adjacent to lavatories and/or multi-station hand-wash units, in Break Rooms near sink areas & in Janitor Closets.
 - a. Shall be Georgia Pacific Pacific Blue Ultra Automated Touchless Dispenser #59590.
 2. Soap Dispensers located in Toilet Rooms adjacent to lavatories and/or multi-station hand-wash units, in Break Rooms near sink areas & in Janitor Closets.
 - a. Shall be Gojo Industries Inc. LTX-12 Touch-Free Foam Dispenser #191904, and Gojo Industries Inc. Pro TDX 5000 Dispenser #7500-01.
 3. Feminine hygiene product dispensers; one unit located in each Women's Toilet area.
 - a. Shall be Hospeco Dual Dispenser DI-25.
 4. Feminine sanitary napkin disposal receptacles, stainless steel; one unit located in each Women's single toilet fixture room and one unit located in each Women's individual toilet room stalls.
 - a. Shall be Tough Guy Receptacle #1ECK9.
 5. Toilet paper dispensers; one unit located in each single toilet fixture room and one unit located in each individual toilet room stalls.
 - a. Shall be Georgia Pacific Corporation Compact Tissue Dispenser #GPC56744A.

10.6 SAFETY RAILING SYSTEM

- A. Provide and install permanent bolt-on railing system(s) for safety egress and ingress through roof type access hatches and for protection of roof opening(s) while roof hatch is in use. Railing system must meet OSHA Standards #1910.23 and #1910.27.
- B. Furnish and install railing system on all roof hatches, matching proper model with specified roof hatch. Contact manufacturer for proper model selection, if necessary.
- C. Performance Characteristics:
 1. Railing system shall be designed to withstand a 200 pounds test load.
 2. Railing system shall consist of a top rail, mid rail and chain or swinging gate, with the hatch curb acting as the toe plate. All parts must be galvanized.
 3. Railing system shall extend to a height of at least 42" from the finished roof deck, and shall be designed to attach to the roof curb.
 4. Project label shall include easy reading "NO HOISTING" warning along with manufacture's identification and patent label.

10.7 METAL LOCKERS

- A. Where indicated in drawings, specifically at Shop Maintenance Facility, provide metal lockers and benches equaling number as shown in drawings.
- B. Single Tier Ventilated Locker(s): Size shall be 12" wide x 18" deep x 72" high, Model 5042HDDP, shipped "knocked down", high grade Class 1 cold rolled steel materials, baked enamel Dove Gray (DD) finish from standard colors.
 1. Locker minimum standards each unit:
 - a. Body – 16 gauge steel, flanged to give double thickness at back vertical corners.
 - b. Door Frame – 16 gauge steel channels.
 - c. Door – One-piece, 14 gauge steel.

- d. Locking device – quiet-locking device engaged at three points.
 - e. Handle - Tamper Guard type with slim profile and padlock loop.
 - f. Hooks – one double prong ceiling hook and three single prong wall hooks.
 - g. Shelf – one 16 gauge shelf approximately 9” below top.
 - h. Number Plates – aluminum plates with etched numbers.
 - i. Base – 12 gauge, 4” high, z-type base with toe space, baked enamel Vulcan Black (9005-KK) finish.
- C. Locker Bench(s): Provide 9.5” wide anodized aluminum locker bench(s) with aluminum pedestals. Install in fixed position to concrete slab. Refer to drawings for length requirements.
- D. Provide metal lockers with all necessary options and accessories including, but not limited to the following: sloped top closures, fillers used to fill space between locker and wall to give wall-to-wall locker appearance and furnishing and installation of anchoring devices as required to prevent overturning.
- E. Lockers and benches shall be as manufactured by Lyon Metal Products, P.O. Box 671, Aurora, IL 60507-0671, 800-433-8488.
- F. Approved equal: Hallowell, P.O. Box 1267, Apopka, FL 32703, Heavy-Duty Ventilated KD Lockers, U1288-1HDV, Gray, 866-566-0500.

10.8 FABRIC STORM PANEL – NOT USED

SECTION 11 - EQUIPMENT

11.1 DOCK LEVELERS/BUMPERS

- A. Owner to obtain levelers and bumpers from LESSEE vendor, at LESSEE National Account pricing.
- B. Provide where indicated on drawings the following type of levelers where indicated on drawings
1. Edge of Dock Leveler - 20,000 lb capacity (heavy duty type, DLM, Edge of Dock Model, DL-72, with 18” bolt-on laminated bumper stack with plate, mounting bracket and bolts, Model #DBBS-3527 Bumper Assembly, as manufactured by DLM. Both products installed with continuous field welds.
 2. Pit mounted dock leveler – DM-6630-16, 30,000 lb capacity with two (2) laminated bumpers Model #VB420-11F, 4-1/2” wide x 10-3/8” long x 19-1/2” tall. Provide laminated heavy duty molded rubber dock bumpers 19-1/2” tall in lieu of 10” tall standard unit with structural angle end plates. Provide Allied Solutions draft pad and cup seal.
- C. Ramp and lip construction of 50,000 P.S.I. Tensile yield four way safety tread plate.
- D. Approved dock leveler and bumper manufacturers:
DLM
Hwy 270 East
Malvern, AR 72104
Contact person: Anne Brown
Phone: 501-332-5495 ext 7901
Email: annebrown@loadingdocksystems.com
- E. There shall be no sharp edges on the bumpers.

11.2 DOCK LADDERS/GRAB BARS (NOT USED)

11.3 DOCK SHELTERS – NOT USED

11.4 AXLE SCALE

- A. Developer/General Contractor shall provide, where indicated in drawings: concrete scale pit, axle scale, displays, underground conduits, power and associated hardware in order to provide a fully operational system.

B. Approved vendor(s):

Avery Weigh-Tronix
11109 Moss Drive
Carmel, IN 46033
Attn: Joe Stark
Phone: 513-225-6709
email: jstark@awtx-itw.com

C. Scale shall be:

1. Weigh-Tronix Model BMS-HD-1010 BridgeMont Scale. Scale shall have capacity of 70,000#, with dual tandem axle rating of 60,000#. Scale deck shall have integral manhole for access to scale pit and for servicing of scale.

D. Digital Indicator: 1” LED display, 20 A current Loop or RS485 interfaces, Weigh-Tronix Model ZM405. Mount unit on 4” dia. steel pole, position below remote display.

E. Remote Display: 6” Adjustable High Intensity, 6 digits LED display, Weigh-Tronix Model XR6500. Unit shall be enclosed in water resistant NEMA rated metal enclosure. Unit shall be mounted to 4” dia. steel pole embedded into concrete at location shown on drawings.

F. Accessories: Material shall include but not necessarily limited to mounting brackets, interface cables with length as required and verify with site plan, 4” diameter steel mounting pole, all associated electrical work including conduits and conductors from electrical panel to indicator, 1 ½” conduit from indicator to scale pit for interface cable, and any and all associated hardware.

G. Installation: Provide within lease cost, cost for construction of associated concrete scale pit, associated conduit and electrical work furnishing and installation of 4” mounting post, cost of scale and components including tax and shipping cost, labor to unload scale at job site, labor and equipment to install anchor bolts and weigh-bar pin stands, labor and equipment to install scale check, wiring and hook-up of the scale instrument and scoreboard display calibration and testing of scale system and instructional training to the lessee personal.

11.5 GROUND-TO-DOCK LOADING RAMP – NOT USED

11.6 WASTEWATER TREATMENT SYSTEM – NOT USED

11.7 PORTABLE SNOW SCRAPER – NOT USED

11.8 MODULAR STORM SHELTER – NOT USED

11.9 STORM SHELTER

A. Where indicated on the Site Development plan provide storm shelter(s) of the size and location indicated.

B. Developer to provide storm shelter equal to the following:

1. Design Standards; ICC 500-2014 ICC/NSSA Standard for the Design and Construction of Storm Shelters and FEMA 361, 4th Edition – April 2021 – Design and Construction Guidance for Community Safe Rooms, or the most current version applicable.
2. Design Criteria (Minimum requirements are listed below. Site, Regional, Local Jurisdiction, etc. could require more stringent standards and should be adhered to.);
Community Tornado Shelter
Occupancy = Group A-3
Design Wind Speed = 250 mph
Wind Importance Factor = 1.0

Wind Exposure Category = C
Internal Pressure Coefficient = 0.55
Topographic Factor = 1.0
Directionality Factor = 1.0
Roof Live Load = 100 psf

3. Door and window assemblies shall be impact tested and UL labeled stating they meet the FEMA 361 and ICC 500 design criteria listed above and required by those codes and regulations.

SECTION 12 – FURNISHINGS – Not Used

SECTION 13 - SPECIAL CONSTRUCTION

13.1 PRE-ENGINEERED METAL BUILDING

- A. Provide all material, labor and equipment necessary to complete the pre-engineered metal building as described in the proto-type documents. Approved and or acceptable pre-engineered building manufacturers are as listed below:
 1. Varco Pruden
Contact: Richard Lewis, Corporate Accounts Manager
817-442-8787 (office)
817-247-4087 (cell)
Email: rlewis@vp.com
 2. CECO
Contact: Tom Deberry
931-260-8307 (cell)
931-528-7275 (fax)
Email: tom.deberry@cecobuildings.net
 3. American Buildings
Contact: Bob Barry - National Accounts Sales Manager
315-427-7781 (cell)
315-622-4440 (office)
Email: Bob.Barry@nucor.com
 4. Butler Manufacturing
Contact: John C. Shaub Jr. – Sr. Global Corporate Accounts Manager
330-414-2048 (cell)
Email: jcshaub@butlermfg.com
 5. Other manufacturers as approved in writing from FedEx Freight, Inc., Facility Planning & Design Department will be considered prior to receipt of bids. In order to be considered the submitting metal building manufacturer must have obtained International Accreditation Service, Inc. (IAS) accreditation under the Inspections Programs for Manufacturers of Metal Building Systems (AC472) and must be current at the time of submission for approval and must be in good standing within the past 6 months. Letter of Certification must be provided indicating proof of current accreditation. Refer to Item J.2 for roof warranty requirements.
- B. All materials to comply with State and Local codes.
- C. PEMB shop drawings shall be submitted for review & approval to Developer’s Project Manager, General Contractor, and consulting Structural Engineers. FFX Construction Project Manager shall also receive PEMB shop drawings for review only prior to ordering fabrication of metal building structural components. All comments must be addressed & resubmitted. Only shop drawings stamped “Approved” by the Developer’s Project Manager and “Reviewed” by FFX shall be returned to PEMB manufacturer for fabrication of

building(s). PEMB shall not be ordered for fabrication until shop drawings have been fully approved by the developer and reviewed by FXF.

- D. The building size will be as shown on plan with an eave height (top of main frame) as indicated on plans.
- E. Structural steel frames to be spaced and be clear span as noted on the plans. PEMB frames and roof members shall be independent structural systems and shall not be attached to tilt-wall or pre-cast concrete wall panels so as to transfer structural loads in order to omit clear span frame conditions.
- F. The design loads for the structural system will be as required by locally approved building codes.
- G. Building Color: Refer to Tab 9, General Room Finish and Color Schedule. Custom colors required when matching colors of existing structures.
- H. Provide Auxiliary Roof Loading of:
 - 1. Collateral Load = 5 P.S.F. min or greater to meet loadings below
 - 2. Radio Frequency Infrared (RFID) Antennas = 45 lbs/each, assume 4 units per bay
 - 3. Review electrical drawings for conduit runs which may add to collateral load
 - 4. Review sprinkler drawings for piping runs which may add to collateral load
 - 5. Provide Dimensioner Equipment point load of 880 pounds per unit on each main frame
 - 6. Heated Areas with Infrared Tube Heaters: Provide tubing at 2.8 lbs/lf, burners at 21.0 lbs/ea, vacuum pumps at 110.0 lbs/ea; consult tube heating manufacturer for locations
- I. Within the office/pods/shop-core (all areas with a suspended ceiling within the Shop) building areas of the project, provide straight columns with inset wall girts. Tapered columns w/ inset wall girts shall be utilized within the other areas of the shop and dock.
- J. Roof panels to be minimum of 24 gauge, standing seam design with seam lines at 24" O.C., with floating roof clips, a "galvalume" roof finish and low profile continuous ridge cap. All roof panels to extend 6" beyond the sidewall eave trim.
 - 1. The roof system shall have a UL-90 uplifting rating.
 - 2. Metal building manufacturer shall provide a 15-year metal building manufacturer's No-Dollar-Limit, Weathertightness Warranty to include all labor & materials for the roof system and PrisMax SL skylights. Roof system shall be inspected by a qualified PEMB Field Construction Technical representative & documented certification shall be issued to Developer, General Contractor and FXF Project Manager, also to be provided in closeout documents. Any PEMB manufacturer not able to provide the 15-year roof warranty as stated above, shall be considered unqualified for this work & proposals shall not be accepted.
- K. Dock exterior wall panels, flashings, trim and corners to be a minimum 26 gauge, 80 KSI minimum yield steel, architectural panel. Panels shall be painted with KYNAR 500 Finish using standard manufacturer's color choices. Additions to existing buildings shall have custom colors to match existing finishes.
- L. Provide 10'-0" wide canopy overhang full length, each side of Dock building and Vehicle Maintenance Bay. Canopy shall have 24-gauge prefinished color gutter system with prefinished color downspouts, on each side of dock, connected to below grade storm water drainage system. Provide prefinished metal straps as required to secure downspouts to metal building wall panels, metal wall plate & concrete stem wall. Canopy roof shall be uninsulated beyond dock exterior walls.
- M. Provide 15'-0" wide canopy overhang with solid & perforated metal soffit panels and boxed support beams shall be provided the full length, each side of Shop building. Canopy shall have 24-gauge prefinished color gutter system with prefinished color downspouts on each side of dock, connected to below grade storm water drainage system. Provide prefinished metal straps as required to secure downspouts to metal building wall panels. Canopy roof shall be uninsulated beyond dock exterior walls.
- N. Provide 12-gauge door posts at all exterior & interior coiling doors. At dock, door posts shall extend continuous from dock slab to dock roof structure with 3/16" steel plate welded to door jambs from dock slab to top of door header.

- O. All closures, screws, bolts, caulking, roof jacks, trim and framed openings will be provided according to standard manufacturer's prices.
- P. Building Insulation shall meet requirements set forth by the most recent International Energy Conservation Code (IECC), per the local climate zone, and as required by the local authority having jurisdiction. Developer shall meet requirements of the IECC and determine the appropriate vapor/air barriers and facing locations. Insulation facing shall be white polypropylene/scrim/polyester (VR-R) and not exceed a perm rating of .01. Alternative compliance methods can be utilized to meet or exceed required insulative values, but only if approved by FXF Project Manager, and supported by third party certified testing.
1. Office and Pods:
 - a. Wall Insulation: Effective insulative values of wall sections shall be obtained per a Mass Wall system. Reference wall and partition types. Not included in PEMB scope of work.
 - b. Roof Insulation: Effective insulative values of roof sections shall be obtained per a double layer batt insulation system with liner. The system shall be a minimum of R-19 + R-30 faced/unfaced insulation for an effective value of R-34 (U-0.029). Thermal blocks shall be utilized.
 2. Dock:
 - a. Heated:
 - i. Wall Insulation: Effective insulative values of wall sections shall be obtained per a single layer batt insulation system with liner. Reference wall and partition types. The system shall be a minimum of R-30 faced batt insulation in cavity with thermal break strip on purlins for an effective value of U-0.052.
 - ii. Roof Insulation: Effective insulative values of roof sections shall be obtained per a double layer batt insulation system with liner. The system shall be a minimum of R-19 + R-30 faced/unfaced batt insulation for an effective value of R-34 (U-0.029). Thermal blocks shall be utilized.
 - b. Un-heated:
 - i. Wall Insulation: No insulation necessary at unheated Dock unless walls are shared with a conditioned space. If walls are shared between conditioned/non-conditioned space, wall insulation must meet the requirements of the conditioned space.
 - ii. Roof Insulation: Effective insulative values of roof sections shall be obtained by a single layer batt insulation system. The system shall be a minimum of R-13 faced batt insulation.
 3. Shop and Vehicle Maintenance Bay:
 - a. Wall Insulation: Effective insulative values of wall sections shall be obtained per a single layer batt insulation system with liner. Reference wall and partition types. The system shall be a minimum of R-30 faced batt insulation in cavity with thermal break strip on purlins for an effective value of U-0.052.
 - b. Roof Insulation: Effective insulative values of roof sections shall be obtained per a double layer batt insulation system with liner. The system shall be a minimum of R-19 + R-30 faced/unfaced batt insulation for an effective value of R-34 (U-0.029). Thermal blocks shall be utilized.
- Q. Ceiling Fall Protection and Insulation Support System shall be furnished by the PEMB manufacturer and installed in accordance with manufacturer's written instructions.
1. Install system at all areas where uncompressed roof insulation is indicated, whether concealed or exposed.
 2. The system shall meet all OSHA, UL, and other required standards for each application and condition.

3. The system shall be continuous to the greatest extent possible with minimum required overlaps and all seams shall be taped. Seam tape shall be equal to the perm rating of the liner to facilitate a continuous vapor barrier. Provide a continuous vapor barrier connection from wall to roof. The vapor barrier shall be located per local climate zones.
 4. Connect the system to the PEMB building structure with manufacturer approved fasteners per the manufacturers written instructions.
 5. Where the insulation system has inherent Fall Protection built in, additional Fall Protection is not necessary.
- R. Expandable end walls shall be provided at Dock and/or Shop locations where indicated on site plan or other drawings.

13.2 FUEL AND PATIO CANOPY

- A. Engineered canopy system shall be pre-engineered and prefabricated using only the highest quality materials available. Recycled or salvaged steel, decking and fascia are not acceptable.
- B. Provide canopy system of the dimensions and configurations as shown in the proto-type drawings. The canopy system shall be fully designed, engineered and fabricated by canopy manufacturer. Engineering shall include footings, anchor bolts and sealed drawings. Design, fabricate, and erect the canopy system to withstand loads from winds, gravity, and structural movement, and resist in-service use without failure. Design Loads: Basic design loads to be withstood are indicated below: (These are minimum requirements)
1. Governing Building Code: As required by local jurisdiction
 2. Roof Dead: Self weight
 3. Live Load: Per building code
 4. Snow Drift: Per building code
 5. Seismic: As required by local code
 6. Basic Wind Loads: Per A.S.C.E. 7-95 or as specified
 7. Uplift: Per A.S.C.E. 7-95 or as specified
 8. Clearance 16'-0" minimum
 9. Canopy shall be designed, engineered and fabricated to allow for the installation of a lubrication hose reel assembly as shown in the drawings.
- All above listed design loads are suggested minimums; actual design criteria shall be adjusted to match local codes or authority having jurisdiction.
- C. The canopy manufacturer shall furnish a complete set of canopy drawings including design calculations. Drawings and calculations shall be sealed by a Registered Professional Engineer licensed in the state where the canopy is to be installed.
- D. Engineered canopy system shall have a complete perimeter guttering system designed to drain back to a centralized gutter that carries roof water to the columns for collection and disbursement via an internal downspout.
- E. System shall include the furnishing and installation of LED light fixtures as located and scheduled on drawings.
- F. The engineered canopy system described herein and depicted on the drawings is designed around:
1. **Arning Canopy Systems, Inc.**
P.O. Box F
Cassville, Missouri, 65625
Phone: 800-732-5074
Tel (Direct): 417-847-3131
Contact: Gavin Chapman
Email: gchapman@arningco.com

OR

2. McGee Corporation

12701 East Independence Blvd.
Matthews, NC 28106
Phone: 704-882-1500

3. Canopy systems of equal performance and quality will be reviewed for approval by the FedEx Freight.
- G. Provide the following metals as required:
1. Columns: ASTM A 500, Grade B, with a minimum yield stress of 46,000 psi. Provide ¾" electrical conduits with seal-off internally mounted inside of each column. Seal-off shall be visible through 4"x6" hand hole located 48" above finish drive. Provide 14-gauge collector boxes at each column to collect drain water from the guttering system. Each collector box will be a minimum of 17" square and 4 3/4" in depth.
 2. Wide Flange Beams, Angles and Plate: ASTM A36 hot rolled shapes, Grade 50. No cold rolled shapes are acceptable. All framing members shall be shop-fabricated for bolt assembly.
 3. Structural Bolts: ASTM A F1554 GR 55 structural steel with minimum yield strength of 55,000 ksi.
 4. Deck Panels: 20 gauge galvalume steel panels rolled into a standing seam profile. ASTM A446 with yield stress of 50,000 psi. Panels shall have an embossed texture with the finish side coated of white polyester paint baked on over an epoxy primer. Color at Office patio canopy shall match fascia.
 5. Gutters: .032 aluminum with embossed texture, 7-1/2" wide x 5" deep, paint specification to match deck material.
 6. Fascia / Framing: Fascia to be 18 gauge, Galvanized Steel Grade-D or Aluminum Composite Material, color as selected by FFX Project Manager (provide color samples). Fascia to be a minimum of 36". Fascia at Office patio canopy shall be aluminum composite material (ACM), and a minimum 14" tall.
 7. Drain Leader and Downspout: Water shall be drained from the bottom of gutter into collector box connected to 4" schedule 40 PVC downspout mounted inside column with stub out. Interior downspout at Office patio canopy shall be connected to storm sewer beneath patio slab.
- H. Rigid Frames: Crossbeams and purlins shall be factory welded, shop primed, wide flange shapes with structural attaching plates and or splice members to suit project conditions. All attachments shall be factory drilled for field bolted connections. Field welding and fabrication is unacceptable.
- I. Erect framing true to line, plumb, level, rigid and secure. Level base plates to true even plane with bearing to supporting structures, set with double-nutted anchor bolts. Anchor bolts to be a minimum of 1 1/4" in diameter, 30" long with a 5" hook or as required by design.
- J. Contractor to use non-shrinking grout under base plate to obtain uniform bearing and maintain level baseline elevation. Moist-cure grout for 7 days after placement.
- K. Fasten roof deck panels to purlins with galvanized steel clip fasteners. Secure each panel with a stitch screw between each purlin. Avoid panel creep or application not true to line. Protect factory finishes from damage. Field cutting of panels by torch is not permitted.
- L. Install gutters, downspouts and other accessories with positive anchorage to structure and weather tight mounting. Use only high quality sealant designed for outdoor use on sheet metal.
- M. Install fascia sections, trim and related accessories per manufactures specifications for the style of fascia used on this project.
- N. Install screw fasteners with power tools having controlled torque as to not strip screw threads and or damage fascia material.

13.3 UST FUELING SYSTEM – NOT USED

13.4 AST FUELING SYSTEM

- A. Work included in this Section shall consist of furnishing all materials, supplies, equipment, tools, transportation and facilities and performing all labor and services necessary for an Aboveground Storage Tank

(AST) type fueling system as designated on site development drawings. Contractor shall provide for a complete and fully functional and operational fueling system.

1. AST(s) shall be UL 2085 fire rated for 2-hours, double walled, above ground fuel product piping and supplied by fuel tank vendor to meet all other requirements of this specification.
 2. Contractor shall send Specifications and Drawings to Fuel Vendor for full review upon receipt of this bid package.
- B. The responsible Developer and/or their bidding General Contractor shall receive pricing from Fuel Vendor which will include the cost of the AST fueling system as manufactured, fuel canopy(s), lube storage shed including equipment as scheduled on drawings, Veeder Root TLS 450 Plus fuel monitoring system, Veeder Root Alarm & Acknowledgement switch, fuel inventory control unit (ICU), lubrication system at fuel island and any applicable sales tax, delivery charges, installation and startup costs. Costs for the construction of concrete pads, bollard protection, associated electrical line voltages, conduits and other work as outlined below shall be part of this work.
- C. Use adequate numbers of skilled workman who are thoroughly trained and experienced in the necessary craft and who are completely familiar with the specified requirements and methods needed for proper performance of the work. Work shall be done in compliance with:
1. National Fire Protection Association
 2. Current Federal, State and local codes and ordinances.
 3. Environmental Protection Agency
- D. Contractor shall submit shop drawings of each piece of equipment being incorporated into the fueling system. Drawings shall include all critical dimension, fittings, pumps, dispensers, monitoring system including probe valves, caps and all other accessories required. Provide calibration charts of fuel storage tank provided.
- E. Scope of work shall also include furnishing, installation and startup of Fuel Management System also known as Island Control Unit (ICU).
- F. Submersible Pump
- a. For a fuel tank tied to a single master dispenser, provide Red Jacket model P150U1 RJ2, 1 1/2 hp submersible pump with relay control boxes. Provide one (1) pump per tank provided.
 - b. For a fuel tank tied to a two (or more) master dispensers, provide Red Jacket model P200U1-3 RJ2, 2 hp submersible pump with relay control boxes. Provide one (1) pump per tank provided.
- G. Fuel Dispenser
- a. Master Dispenser - Each master dispenser noted on drawings to receive the following:
 1. (1) GasBoy 9850KX DZ .
 - a. Stainless steel panels, part number Z-AT0-ISSA00
 - b. Satellite Piping, part number Z-AT0-HSPS00
 - c. PCA, Pulse Output, Z-AT0-APULID
 2. (1) Franklin Fueling Model 662 double poppet shear valve anchored at grade.
 3. Spin on filters: (2) Cim-Tec Filter Part No. 70020, Model 800-30 and dual adaptor Part #50011, Model #820.
 4. (1) 1" x 8' fuel delivery hose with 1" hose swivel
 5. (1) Catlow Cam Twist Magnetic Breakaway
 6. (1) Husky 1" high flow fuel nozzle.
 7. Pomeco 100 Counterweight Hose Retractor or Equivalent
 8. Bravo Above Ground Dispenser Containment A6670-3
 - b. Satellite Dispenser - Each satellite dispenser noted on drawings to receive:
 1. (1) GasBoy 9216K-Z
 - a. Stainless steel panels, part number Z-AT0-ISSA00
 2. (1) Franklin Fueling Model 662 double poppet shear valve anchored at grade
 3. (1) 1" x 8' fuel delivery hose with 1" hose swivel
 4. (1) Catlow Cam Twist Magnetic Breakaway

5. (1) Husky 1” high flow fuel nozzle.
 6. Pomeco 100 Counterweight Hose Retractor or Equivalent
 7. Bravo Above Ground Dispenser Containment A6670-3
- c. Fuel Dispenser Wiring
1. Off/On switch for each Master to control flow of fuel to Master and Satellite solenoids.
- H. Island Control Unit (ICU): Contractor and/or its sub-contractor shall be required to furnish and install ICU as specified below and as outlined in proto-type drawings. Verify number of ICU units required via proto-type drawings.
1. Gilbarco Gasboy Islander PRIME (with Payment Processing sever) Mechanical Pumps – 4 hose

<u>Part #</u>	<u>Description</u>
a. FL-4MH0IP-00	4 Mechanical Hoses
a. Z-FL0-ASW391	Annual Software Support - 1 Year
a. Z-FL0-MCR007	Insert Mag Card Reader
 2. ICU unit shall be purchased from the following company;

Gilbarco Gasboy
 Scott Fischer, Commercial Account Manager
 Mobile : 336-455-3543
 Email : scott.fischer@gilbarco.com
 Website: www.gasboy.com
 3. After ICU Assembly installed with power and wiring, Contractor shall notify FedEx Services Procurement and coordinate on the startup date and time.

Justin Hudson/FedEx Services
 Office: 870-704-5206
 Mobile: 870-365-8677
justin.hudson@fedex.com
- I. Electronic Monitoring System
1. Electronic monitoring shall be provided to monitor the aboveground storage tank and associated product piping.
 2. System shall be Veeder Root TLS--450PLUS Console part number 860091-301, TLS-450PLUS Application Software part number 333545-001, Universal Sensor Module (USM) Interface for Probes, Sensors, and DPLLD part number 332812-001, Universal Input/Output Interface Module (UIOM) for Relay Control and Input part number 332813-001 Provide the following operational specifications:
 - a. In-tank leak detection.
 1. In-tank probes based on magnetostrictive principle for liquid measurement and in-tank leak detection.
 - b. Interstitial Leak Detection (double wall)
 1. Dry monitoring system shall be able to perform automatic, continuous leak sensing of the dry interstitial space.
 2. System shall leave ability to sense the presence of hydrocarbons and/or fluid.
 - c. Electronic Product line leak detection
 1. Provide a single detector for each line to be monitored.
 2. System shall be able to perform automatically and on demand a 3.0, 0.2, and 0.1 gph line test.
 3. System shall be capable of performing a test on the piping between the submersible pump and the line leak detector check valve.
 - d. Product Inventory Control (Tank Gauging)
 1. The management system shall collect product height and temperature data from up to eight magnetostrictive level sensors and compute gross/net gallons.

2. System shall generate an inventory increase report when a delivery of a product has taken place. Report shall include time and date of delivery, stating volume in tank, ending volume in tank and inventory increase amount.
- J. Fuel Vendor to provide a functional lubrication system within lube storage shed and product lines to lubrication hose reels at the fuel canopies meeting the following criteria:
1. Air Compressor. Provide and install as part of this contract a 5 hp air compressor located within the Lube Shed. Electrical sub-contractor to size circuit as required. The air compressor shall be installed using vibration isolators. Refer to lube shed equipment schedule & drawings.
 2. Provide and install one (1), 500-gallon double wall AST oil tank within the Lube Shed. Primary tank shall be constructed of minimum 10-gauge steel and the secondary shall be constructed of 12-gauge steel and approved for use in the seismic zone of its intended use. Tank shall be provided with: 4" primary vent, 4" secondary emergency vent fitting, two-2" fittings, a Krueger Interstitial Leak Gauge, and liquid level gauge, Black Knight Model, as manufactured by BJ Enterprises, Waynesboro, VA, 800-457-0749. The secondary shell shall be fitted with ½" fitting through outer shell with button right glass for viewing of interstitial space. Exterior of tank shall be primed and provided with finish coat.
 3. Fuel Facility hose reel order of placement, verify with reel schedule in drawings:
 - a) Air
 - b) Antifreeze
 - c) Washer Fluid
 - d) Oil
- K. Contractor shall include and provide for off-loading and placement of tank(s) and off-loading and secure storage all of products & materials as delivered within this specification. In preparation for the fueling system, Contractor shall provide:
1. Concrete pads:
 - a. Fuel Tank Pad - (per 20,000 gallon AST system) 4000 psi, 8" concrete pad reinforced with 2 layers #4 rebar @ 24" centers each way, as detailed on the drawings. Verify exact pad size required by fuel tank supplier & structural engineer.
 - b. Fuel Tank Pad - (per 12,000 gallon AST system) 4000 psi, 8" concrete pad reinforced with 1 layers #4 rebar @ 24" centers each way, as detailed on the drawings. Verify exact pad size required by fuel tank supplier & structural engineer.
 - c. Tractor Fueling Pad - 4000 psi, 8" thick concrete pad reinforced with 1 layer #4's @ 24" centers each way. Provide layout as shown in the drawing. Verify pad requirements with structural engineer.
 - d. 6" x 7' schedule 40 concrete filled pipe bollards as shown on drawings embedded 3' in concrete around tank pad and spaced no more than 4'-0" on centers with PVC protective covers.
 - e. Canopy Footers – (for each canopy as shown) 4000 psi, concrete footers 5' x 5' x 5' with #4 rebar on 12" centers in all directions (or engineered equivalent) including placement of (4) 1.25" anchor bolts per footing or as engineered. Footer engineer stamped drawings to be provided to Contractor by Canopy Manufacturer.
 - f. Contractor to provide crane to off-load fuel system on pre-determined date and time. Drawings will be provided by Contractor showing exact off-load location and placement for fuel system(s) to FFXF Project Manager.
- L. Contractor to provide:
1. Per AST system- Underground conduits – 1 conduit for high voltage electrical service to AST and ICU, 1 conduit for future use, 2 conduits for data wire per AST, 1 conduit to canopy column, and 1 conduit from lube shed to Veeder Root console for alarm per AST Fueling drawings. Conduits shall have calibrated pull tapes and be placed to provide connection to the electrical junction box provided at the front of the AST and at the ICU location. Reference KEYED NOTES located on AST FUELING drawings for exact sizes and locations. High voltage wiring from lube shed to fuel island and Veeder Root wiring to be completed by Fuel Vendor. ICU data wiring to be completed by Contractor. All conduits and accessories shall be metallic and explosion proof materials.
 2. Provide electrical service to sub panel on lube shed provided by Contractor. Circuits for the fuel island will be provided by Contractor and are listed in KEYED NOTES of AST Fueling drawings. Contractor shall provide emergency shut-off switch placed 20' to 100' from the dispenser that interrupts all power – through the use of relays or alternative means to fueling locations as required by NFPA, NEC & local

Fire Marshall. NOTE: 1. Most jurisdictions use the 20'-100' E-stop setback, but local code may require a different E-stop location. Please refer to permit for setback of E-stop.

M. Testing

1. It shall be the installing Contractor's responsibility to provide and meet any and all testing, inspection and installation requirements as set forth by Federal, State and local jurisdiction.
2. The installing Contractor shall provide, notify and file all notification/registration forms as required by Federal, State and local jurisdiction. Copies of all such forms shall be delivered to Lessee.
3. The installing Contractor shall complete and distribute Manufacturer's Installation Check List. Copies of all such forms shall be delivered to Lessee.
4. A hydrostatic test of all containment sumps, a tank primary and secondary tightness test, a product line secondary and primary tightness test, a certified functionality test of the emergency stop, certification of overfill shutoff at 93%, and a test of all monitoring equipment including but not limited to the line leak detector, all sensors, and tank gauge shall be performed before final acceptance by Owner and Lessee. Testing shall be done by independent, third party testing company and not be by electronic monitoring system. All testing records shall be delivered to Lessee.
5. The installing Contractor shall provide "on site" training of Lessee personnel on the proper use and operation of all equipment installed, including electronic monitoring system

13.5 FUEL ISLAND LUBRICATION SYSTEM

A. LUBRICATION EQUIPMENT BY DEVELOPER/CONTRACTOR

1. All lube equipment shall be Graco products. Lessee has the option of selecting alternate equipment.
2. All pumps shall be supplied with air control assembly consisting of air gauge, regulator and air shut off valves.
3. Provide all mounting brackets, connecting hoses, connectors, swivels and ball stops as required for a complete and operational system. Scheduled or not scheduled.
4. Provide all necessary connections, reducers, swivels and accessories as required.
5. Provide all necessary shut-off valves to supply lines, pumps and hose reels.
6. Furnish and install 500 gallon new oil tank as specified.
7. Furnish and install air compressor as scheduled on plans, including connection of 2" air delivery line to compressor.

B. LUBE SYSTEM PIPING REQUIREMENTS

1. Motor Oil

Lengths	Seamless Steel Tubing	Iron Pipe
0-200'	5/8" OD Tubing, w/.049 Wall Thickness	3/4" Schedule 80 w/ 300 psi malleable fittings
Over 200'	1" OD Tubing, w/ .049 Wall Thickness	1" Schedule 80 w/ 300 psi malleable fittings

2. Windshield Washer Fluids and Antifreeze

Length	Seamless Steel Tubing or Copper	Iron Pipe
0-200'	1/2" OD Tubing, w/ .028 Wall Thickness	1/2" Schedule 40
Over 200'	3/4" OD Tubing, w/ .028 Wall Thickness	3/4" Schedule 40

3. Air Lines

Air Line Loop	SCHD 40 Black Pipe
Air Drops	SCHD 40 Black Pipe
Air Drops @ Lube Pump	SCHD 40 Black Pipe

4. Install pump pressure relief valves to prevent damage to system due to thermal expansion of fluids.
5. Air and fluid shut off valves should be used throughout the system for ease of service.
6. Air shut off valves should be placed within 3ft. of pumps.

7. Fluid shut off valves should be placed within 3 ft. of hose reels.
8. Adequate bracing of product piping must be provided to prevent pipe from moving hammering or swaying. Verify with FFXF Project Manager if bracing is adequate.
9. Product Lines serving the detached fuel facility shall span overhead between the shop and fuel canopy. Provide adequate support and means for lines to expand.
10. Lubrication vendor shall provide & install all electric power cord reels as scheduled and/or as indicated on proto-type drawings. Coordinate electrical services with electrical contractor as required to properly operate reel.

C. LUBRICATION PRODUCTS (Provide quantities as required, refer to construction documents)

1. Windshield Washer System

716 Diaphragm pump	241906
Wall mount bracket	224835
Filter Regulator & Gauge	110147
XD Series 20 Hose Reel 1/2"x50'	HSL65B
Bib	180685
Reducer	150287
Shut off valve & pump	108537
Reel inlet hose	218549
55 Gallon suction tube	236054
Fluid Hoses	109105
1/2" shut-off valve & reel	108458
3/4" Runaway valve	224040
Thermal Relief Kit	113497
Wash fluid metal label	Match Others
2. Anti-freeze System

1050 Diaphragm pump	647016
55 Gallon suction tube	236054
Wall mounted bracket	246637
1/2" Regulator	244844
XD Series 20 Hose Reel 3/8"x65'	HSL56B
Reel inlet hose	218549
Dispense valve for A/F	180685
Reducer	150287
1" Shut off valve	110314
Air shut off/bleed valve	110225
1/2" Shut off valve	108458
3/4" Runaway valve	224040
Thermal relief kit	238428
Anti-freeze metal label	218677
3. Oil System

5:1 Fireball stub pump	203876
6' air and fluid hose kit	222063
Wall mount bracket	203987
Low level cutoff	203688
55 Gallon suction tube	236054
3/8" Air regulator w/gauge	109075
XD Series 20 Hose Reel 1/2"x50'	HSM65B
Reel inlet hose	218549
3/4" Runaway valve	224040
SDP5 Dispense Meter (Quart)	255200
1/2" Shut off valve	108458
Thermal relief kit	237893
3/4" shut off valve	108537
Air shut off/bleed valve	110225
Motor Oil metal label	218670
4. Air Reel System

XD Series 20 Hose Reel 3/8"x65'	HSL56B
Reel inlet hose	218549
3/8" air coupler	110198
Nipple	169971
Air metal label	218675
5. Air System for Lube Pump	
3/4" Air filter	106150
3/4" Air lubricator	214849

D. SUPPORT STANDS – HOSE REELS

1. Suspended hose reel stands similar as shown on drawings.
2. Verify quantity, location & order of placement as noted in construction documents.
3. Coordinate locations with FFX Project Manager prior to installation.

E. HOSE REEL LOCATIONS AND FLUIDS REQUIRED

1. Fuel Bay - (order of placement, see drawings)
 - Air
 - Antifreeze
 - Washer Fluid
 - Oil

F. NEW OIL AST TANK

1. Lubrication jobber to provide and install one (1), 500 gallon double wall AST oil tank within the Lube Shed Storage Room where shown on drawings.
2. Primary tanks shall be constructed of minimum 10-gauge steel and the secondary shall be constructed of 12-gauge steel and approved for use in the seismic zone of its intended use.
3. Tanks shall be fitted with; 4" primary vent, 4" secondary emergency vent fitting and two-2" fittings.
4. The secondary shell shall be fitted with ½" fitting through outer shell with button right glass for viewing of interstitial space.
5. Exterior of tank shall be primed and provided with finish coat.
6. Provide and install a 2" Krueger Interstitial Leak Gauge in the tank secondary
7. Provide and install liquid level gauge at each new and used oil AST tank, Black Knight Model, as manufactured by BJ Enterprises, Waynesboro, VA, 800-457-0749.

13.6 SHOP LUBRICATION SYSTEM

A. RELATED SHOP EQUIPMENT

1. Air Compressor @ Shop Maintenance Facility: Refer to Section 10.2 of this Project Manual for specification relating to the air compressor. The air compressor is an integral part of the lubrication system located within the Shop Facility. Note: this is a separate requirement from the air compressor required at Fuel Facility Lube Shed.
2. Truck Wash Equipment. Furnish and install equipment as specified in Section 10.2 and as shown elsewhere in the drawings. Provide and install ducted flue from unit up through roof, water, electric and gas connections. Run water lines to wash bay carousel using high pressure Schedule 80 steel pipe.

B. LUBRICATION EQUIPMENT BY DEVELOPER/CONTRACTOR

1. All lube equipment shall be Graco products. All electric reel equipment shall be CoxReels products. Lessee has the option of selecting alternate equipment.
2. All pumps shall be supplied with air control assembly consisting of air gauge, regulator and air shut off valves.
3. Provide all mounting brackets, connecting hoses, connectors, swivels and ball stops as required for a complete and operational system. Scheduled or not scheduled.
4. Provide all necessary connections, reducers, swivels and accessories as required.
5. Provide all necessary shut-off valves to supply lines, pumps and hose reels.
6. Furnish and install 500 gallon new and used oil tanks as specified.
7. Furnish and install air compressor including connection of 2" air delivery line to compressor.

C. LUBE SYSTEM PIPING REQUIREMENTS

1. Motor Oil, Gear Oil & ATF

Lengths	Seamless Steel Tubing	Iron Pipe
0-200'	5/8" OD Tubing, w/.049 Wall Thickness	3/4" Schedule 80 w/ 300 psi malleable fittings
Over 200'	1" OD Tubing, w/ .049 Wall Thickness	1" Schedule 80 w/ 300 psi malleable fittings

2. Grease

Lengths	Seamless Steel Tubing	Iron Pipe
0-200'	5/8" OD Tubing, w/ .120 Wall Thickness	3/4" Schedule 160 w/ 3000 psi forged steel fittings
Over 200'	3/4" OD Tubing, w/ .120 Wall Thickness	1" Schedule 160 w/ 300 psi forged steel fittings

When installing grease piping, minimize number of elbows to reduce pressure drop. Utilize radius bends in preference to elbow where installation permits.

3. Windshield Washer Fluids and Antifreeze

Length	Seamless Steel Tubing or Copper	Iron Pipe
0-200'	1/2" OD Tubing, w/ .028 Wall Thickness	1/2" Schedule 40
Over 200'	3/4" OD Tubing, w/ .028 Wall Thickness	3/4" Schedule 40

4. Air Lines

Air Line Loop	SCHD 40 Black Pipe
Air Drops	SCHD 40 Black Pipe
Air Drops @ Lube Pump	SCHD 40 Black Pipe

5. Install pump pressure relief valves to prevent damage to system due to thermal expansion of fluids.
6. Air and fluid shut off valves should be used throughout the system for ease of service.
7. Air shut off valves should be placed within 3ft. of pumps.
8. Fluid shut off valves should be placed within 3 ft. of hose reels.
9. Adequate bracing of product piping must be provided to prevent pipe from moving hammering or swaying. Verify with FXF Project Manager if bracing is adequate.
10. Product Lines serving the detached fuel facility shall span overhead between the shop and fuel canopy. Provide adequate support and means for lines to expand.
11. Lubrication vendor shall provide & install all electric power cord reels as scheduled and/or as indicated on proto-type drawings. Coordinate electrical services with electrical contractor as required to properly operate reel.

D. LUBRICATION PRODUCTS (Provide quantities as required, refer to construction documents)

1. Windshield Washer System

716 Diaphragm pump	241906
Wall mount bracket	224835
Filter Regulator & Gauge	110147
XD Series 20 Hose Reel 1/2"x50'	HSL65B
Bib	180685
Reducer	150287
Shut off valve & pump	108537
Reel inlet hose	218549
55 Gallon suction tube	236054
Fluid Hoses	109105
1/2" shut-off valve & reel	108458
3/4" Runaway valve	224040
Thermal Relief Kit	113497

	Wash fluid metal label	Match Others
2.	Anti-freeze System	
	1050 Diaphragm pump	647016
	55 Gallon suction tube	236054
	Wall mounted bracket	246637
	1/2" Regulator	244844
	XD Series 20 Hose Reel 3/8"x65'	HSL56B
	Reel inlet hose	218549
	Dispense valve for A/F	180685
	Reducer	150287
	1" Shut off valve	110314
	Air shut off/bleed valve	110225
	1/2" Shut off valve	108458
	3/4" Runaway valve	224040
	Thermal relief kit	238428
	Anti-freeze metal label	218677
3.	Oil System	
	5:1 Fireball stub pump	203876
	6' air and fluid hose kit	222063
	Wall mount bracket	203987
	Low level cutoff	203688
	55 Gallon suction tube	236054
	3/8" Air regulator w/gauge	109075
	XD Series 20 Hose Reel 1/2"x50'	HSM65B
	Reel inlet hose	218549
	3/4" Runaway valve	224040
	SDP5 Dispense Meter (Quart)	255200
	1/2" Shut off valve	108458
	Thermal relief kit	237893
	3/4" shut off valve	108537
	Air shut off/bleed valve	110225
	Motor Oil metal label	218670
4.	Grease System	
	50:1 Fireball Pump (400lb drum)	225016
	XD Series 20 Hose Reel 3/8"x50'	HSH55B
	Reel inlet hose	218550
	HP Control handle with swivel & 30" Whip Hose	224872
	3/8" Air regulator w/ gauge	109075
	High pressure shut off valve	202869
	Air shut off/bleed valve	110225
	3/4" Runaway valve	224040
	Drum elevator	241663
	Grease metal label	218671
5.	Air Reel System	
	XD Series 20 Hose Reel 3/8"x65'	HSL56B
	Reel inlet hose	218549
	3/8" air coupler	110198
	Nipple	169971
	Air metal label	218675
6.	Transmission Fluid	
	5:1 Fireball stub pump	203876
	6' air and fluid hose kit	222063
	Wall mount bracket	203987
	Low level cutoff	203688
	XD Series 20 Hose Reel 1/2"x50'	HSM65B
	55 Gallon suction tube	236054

	Air regulator w/ gauge	109075
	Inlet hose kit	218549
	3/4" Runaway valve	224040
	SDM5 dispense valve	255348
	1/2" Air shut off/ bleed valve	110225
	1/2" shut off valve at reel	108458
	Thermal relief valve	237893
	3/4" fluid shut off valve	108537
	1/2" air shut off valve	110225
	Transmission metal label	218673
7.	Rear End-Gear Oil System	
	5:1 Fireball stub pump	203876
	6' air and fluid hose kit	222063
	Wall mount bracket	203987
	Low level cutoff	203688
	55 Gallon suction tube	236054
	3/8" Air regulator w/gauge	109075
	XD Series 20 Hose Reel 1/2"x50'	HSM65B
	Reel inlet hose	218549
	3/4" Runaway valve	224040
	SDM5 dispense valve	255348
	Gear lube label	218672
	1/2" Shut off valve	108458
	Thermal relief kit	237893
	3/4" shut off valve	108537
	1/2" Air shut off/bleed valve	110225
8.	Hydraulic Fluid	
	5:1 Fireball stub pump	203876
	6' air and fluid hose kit	222063
	Wall mount bracket	203987
	Low level cutoff	203688
	XD Series 20 Hose Reel 1/2"x50'	HSM65B
	55 Gallon suction tube	236054
	Air regulator w/ gauge	109075
	Inlet hose kit	218549
	3/4" Runaway valve	224040
	SDM5 dispense valve	255348
	1/2" Air shut off/ bleed valve	110225
	1/2" shut off valve at reel	108458
	Thermal relief valve	237893
	3/4" fluid shut off valve	108537
	1/2" air shut off valve	110225
	Transmission metal label	218673
9.	Air System for Lube Pump	
	3/4" Air filter	106150
	3/4" Air lubricator	214849
10.	Air Drop Service, coordinate with FDXFR Project Manager, each air drop where indicated on LUBE plans shall have:	
	1/2" Filter-regulator-lubricator	217072
	1/2" air coupler	110199
	1/2" air fitting	110196
	3/4" air coupler	110200
11.	Electrical Power Cord Reel, by CoxReels, shall have:	
	PC Series, 75', quad plug head	PC19-7512-B

E. SUPPORT STANDS – HOSE REELS

1. Suspended hose reel stands similar as shown on drawings.

2. Verify quantity, location & order of placement as noted in construction documents.
3. Coordinate locations with FFX Project Manager prior to installation.

F. HOSE REEL LOCATIONS AND FLUIDS REQUIRED

1. Tractor/Trailer Service Bay – (order of placement, see drawings)
 - Air
 - Antifreeze
 - Washer Fluid
 - Engine Oil
 - Grease
 - Gear Oil – Differential 70W
 - Gear Oil - Transmission 50W
 - Electrical Power Cord
2. Fork Lift Bay, shares reels at Tractor/Trailer Service Bay - (order of placement, see drawings)
 - Automatic Transmission Fluid
 - Hydraulic Fluid
 - Electrical Power Cord

G. OIL RECOVERY SYSTEM

1. Where shown on the proto-type Shop Lubrication Plan, FedEx Freight to provide and install Series 800 Oil Changer as manufactured by ESCO Commercial Truck, Inc., 48553 West Road, Wixom, MI 48393, phone 248-624-7992. General Contractor shall provide and install all oil recovery piping, runs, drops, shut-off and check valves and compatible quick disconnect devices as required for a complete and operational system.

H. NEW AND USED OIL AST TANKS

1. Lubrication jobber to provide and install two (2)-500 gallon double wall AST oil tanks within the Shop Facility Storage Room where shown on the drawings.
2. Primary tanks shall be constructed of minimum 10-gauge steel and the secondary shall be constructed of 12-gauge steel and approved for use in the seismic zone of its intended use.
3. Tanks shall be fitted with; 4” primary vent, 4” secondary emergency vent fitting and two-2” fittings.
4. The secondary shell shall be fitted with ½” fitting through outer shell with button right glass for viewing of interstitial space.
5. Exterior of tank shall be primed and provided with finish coat.
6. Provide and install a 2” Krueger Interstitial Leak Gauge in tank secondary.
7. Provide and install liquid level gauge at each new and used oil AST tank, Black Knight Model, as manufactured by BJ Enterprises, Waynesboro, VA, 800-457-0749.

SECTION 14 – CONVEYING SYSTEMS

14.1 HYDRAULIC PASSENGER ELEVATOR – NOT USED

14.2 PNEUMATIC TUBE SYSTEM – NOT USED

SECTION 15 – MECHANICAL

15.1 PLUMBING

- A. The plumbing system shall be designed by a Professional Engineer; this includes the responsibility to provide all drawings (conforming to all local, state and federal codes) prepared under their direct supervision, receiving their signed stamp of state registration for professional engineers.
- B. Provide all material, labor and equipment necessary to complete the plumbing as shown on the drawings.
- C. All materials to comply with ASA, ASME, UL and MSVF Standards.
- D. Submit shop drawings for review prior to ordering.

- E. All state and local inspection fees and permits to be included.
- F. Plumbing fixtures and trim to be provided in accordance with the (ADA) American Disability Act where applicable.
- G. All water closets and urinals to have flush valve operations. Each valve is to be served by minimum 1" waterline. Domestic service to building shall be a minimum of 2" waterline.
- H. Soil, waste, storm, or vent piping to be service weight cast iron, schedule 40 galvanized steel or PVC schedule 40 as per code and sizing requirements.
- I. Water supply piping inside building to be type L hard copper above ground and type K soft copper below ground as per code and sizing requirements.
- J. Pipe insulation to be provided on all above grade hot and cold piping, which is concealed or exposed.
- K. All clean-outs, pipe, valves, pipe supports, testing, fittings, trim and all other necessary materials to provide a complete system shall be included.
- L. Provide approved chromium plated one piece or split hinge type metal escutcheon plates for piping passing through floors, walls and ceilings in exposed areas. Securely anchor plates with set screws or other approved means.
- M. Waste water lines to connect to sanitary sewer lines.
- N. All disturbed soil to be replaced and compacted to 100% of maximum proctor density.
- O. Color of fixtures to be white unless otherwise noted.
- P. Approved plumbing fixture manufacturers:
 - 1. Chicago
 - 2. Elkay
 - 3. Crane
 - 4. Moen
 - 5. Kohler
 - 6. Delta
 - 7. American Standard
 - 8. Gerber
 - 9. Bradley
- Q. All underground water lines to be installed with colored plastic detection tape for future location of service lines. Tape shall have printed warning text, stainless steel wires laminated between two layers of rot resistant polyethylene, as manufactured by Wavelay.
- R. Overhead or underslab water and sewer lines are not permitted on the Dock.

15.2 HEATING/VENTILATING & AIR CONDITIONING

- A. The design engineer shall be responsible for preparing construction drawings and sizing the capacity of all HVAC equipment based on geographic location of the facility, its orientation, applicable codes and design criteria given in these specifications or the drawings. A licensed engineer shall stamp final plans.
- B. Heating shall be based on using natural gas as a fuel source. Should Developer choose to use electricity as a fuel source, he shall perform a Net Present value (NPV) economic analysis, which besides including all of the capital costs, shall also include the operating costs. The interest rate and number of years to be used for discounting the operating costs shall be obtained from FedEx Freight, Inc. (Lessee) prior to submitting a bid.

- C. Provide all material, labor and equipment necessary to complete the HVAC as shown on final construction drawings. HVAC systems to be Tested, Adjusted and Balanced by a NEBB or AABC Certified Contractor.
- D. All materials to comply with ASTM, UL, ANSI Standards.
- E. Submit shop drawings for review prior to ordering of equipment.
- F. All inspection fees and permits to be included.
- G. Design of heating and air conditioning system to be based upon the design temperature criteria as follows:
 - Office Building:
 - 1. All occupied interior spaces shall be heated and cooled except as noted, the Telco Room shall be on a separate cooling system as specified elsewhere in this manual. Secure Freight Room shall be heated only as specified elsewhere in this manual.
 - 2. Maintain a 70 degree F temperature from -15 degree (below) to 90 degree (above) F.
 - Dock Area:
 - 1. **Unconditioned** - The dock area shall be considered an unconditioned space. If local code jurisdiction requires dock area to be heated, then Developer shall provide low intensity infrared gas supplied heating system with make-up air supply as required to provide a complete and functional dock heating system. Coordinate with all other disciplines as required to insure building is properly insulated to meet all codes.
 - 2. Provide electric industrial grade non-oscillating air circulator fans where shown on the proto-type plans and as specified elsewhere in this manual.
 - 3. Provide exhaust fans and fresh air intake louvers within new and existing (if applicable) dock space as required by local codes considering on-dock use of propane fueled or electric forklifts with separate battery exhaust fans on roof, and that all dock doors will be 100% occupied with trailers or closed dock doors. Provide exhaust fans of sufficient size and quantity in order to provide a minimum of 2 air changes every 1 hour or additional air flow above this level as required by local codes, including fresh air intake louvers. Interlock exhaust fans with louvers for thermostatically controlled system.
 - Shop Facility:
 - 1. Shop Support facilities i.e., Office areas, break rooms, restrooms and enclosed parts area shall be heated and cooled, maintaining a 70-degree F temperature from -15 degree (below) to 90 degree (above) F.
 - 2. Tractor service, trailer service, fork lift service, wash bay and storage rooms shall be provided with low intensity infrared heat system. Interior design heating criteria shall be 60 degree F inside at -15 degree F outside. Provide thermostatically controlled sensors to manage heat output. Heating system shall be designed to meet all Local & Energy codes for a complete and functional heating system. Coordinate with all other disciplines as required to insure building is properly insulated to meet all codes. Provide Roberts Gordon Compact BH unitary infrared tube heating system with programmable thermostats, or approved equal. Contact: Gus Andros, Midwest Environmental, 1001 Nicholas Blvd, Suite L, Elk Grove Village, IL 6007; Phone 847-290-8888, Fax 847-290-8880; email: gandros@midwest-environmental.com
 - 3. Provide exhaust system to provide 2 air changes every 1 hour or as required by code or authority having jurisdiction.
- H. High efficiency natural gas units forced air supply and return system with rooftop equipment to be provided for the following areas: Office Building, Dock Rest Room and Break Room Pod and within the Shop Support, i.e. office, parts, break and rest room facilities.
- I. All HVAC units shall be furnished with a minimum **16.0 SEER** rating or **14.00 EER** rating.
- J. At Shop Facility provide low intensity infra-red tube heaters within the tractor, trailer, forklift service bays, wash bays Storage Bays and any space having exterior overhead doors.

- K. Forced air unit heaters with spark ignition to be installed at the following locations: Shop Parts Room when not located in Shop Core Area, and other areas as indicated on drawings. Units shall be sized to maintain space where located at constant 60 degree F minimum temperature setting with thermostat control. These areas shall not be conditioned with heated air from main ducted supply-air runs.
- L. Telco Room shall have its own independent cooling system for conditioning of its area. See Section 15.4 of this manual.
- M. All remotely located thermostats shall have locking covers unless the thermostat is located on the mechanical unit itself.
- N. Units to have smoke detectors, thermostat, and roof curb as required.
- O. Exhaust fans and duct work to be installed in all toilet areas sized for the proper number of air changes as required by code.
- P. All required above ceiling return air runs shall be installed using sheet metal ductwork; space above ceiling shall not to be used as a return air plenum.
- Q. Ductwork above ceilings to be galvanized sheet metal (insulated as required) and flexible duct where applicable. Flex-duct lengths shall not exceed 10 feet.
- R. Install all registers, grilles, diffusers, access doors, fan connections, fans, dampers, louvers, control devices, condensing units, hoods, chimneys (Class B), fire dampers, and hangers to provide a complete HVAC system.
- S. All exposed gas line piping shall be painted to prevent rust. See painting specification. Treated wood supports on metal panel roof system are not allowed.

15.3 COMPUTER ROOM A/C UNIT (CRAC) – NOT USED

15.4 DUCTLESS SPLIT-SYSTEM UNIT

- A. At Telco Room in Office, Shop, and elsewhere indicated in the drawing provide a ductless split-system A/C unit assuming a total dissipation of 6000 watts (20,478.0 btu/hr) for voice and data networking equipment plus 1,466 watts (5,004 btu/hr) for RFID cabinet = total 7,466 watts (25,482 btu/hr). Room requires a stable ambient temperature of 72 degrees Fahrenheit. Temperature Control of this room shall be by dedicated thermostat and be independent of the main building HVAC system.
- B. The performance requirements as specified herein for the Telco room shall be provided and installed in duplicate by (2) separate independently operating units that will maintain the specified temperature control of this room in the event one unit should fail. The units are to be provided with the thermostatic controls that will automatically operate each of the units as needed, one at a time, while alternating the run time between the two units equally on regularly set intervals. The controls need to be able to indicate an alarm if one unit malfunctions or fails to operate, while allowing the other unit to continue to function.

15.5 ELECTRIC UNIT HEATERS

- A. At Secure Storage, Pod Storage, Shop Parts Storage at Core, all Sprinkler Rooms and other areas as indicated on drawings: Provide Trane Model UHEC, Electric Unit Heater, 3 to 50 KW, vertical wall mounted, field verify 3-phase or 1-phase voltage operation, wall-mounted thermostat, wall-mounted power disconnect switch
- B. At Vehicle Maintenance Bay Toilet Room and other areas as indicated on drawings: Provide Trane Model UHAA, Electric Unit Heater, 1.5 to 4.8 KW, vertical wall mounted, field verify 1-phase voltage operation, built-in thermostat, built-in power disconnect switch.

15.6 FIRE PROTECTION SYSTEM

- A. Design and install a complete and fully operational automatic fire sprinkler system in accordance with NFPA 13 Standard for the Installation of Sprinkler Systems unless more stringent requirement is required by local authority having jurisdiction.

- B. Fire service water mains shall be provided for distribution to private fire hydrants and fire suppression systems as required by local, state and federal jurisdiction and in accordance with this specification.
- C. Provide a free standing Fire Department Connect (FDC) as required by local jurisdiction including any meter vaults as required.
- D. System Type
 - 1. Wet system shall be provided in the heated office area.
 - 2. Dry pipe system shall be provided in the dock area, pod areas (where applicable), service maintenance bays (where applicable) and shop maintenance facility (where applicable).
- E. The discharge area for each system shall be the hydraulically most remote area as defined in NFPA 13. A minimum 10 psi cushion or safety margin between the available water supply residual pressure and the calculated system demand pressure of the hydraulically most remote system shall be incorporated into all hydraulic calculations. The hydraulic calculations shall also account for any proposed future additions as shown on the drawings and shall be included in the calculations.
- F. Provide design/shop drawings prepared by state licensed professional engineer of NICET Level 3 sprinkler designer with minimum 5 year experienced.
- G. Sprinkler heads and associated branch piping shall be located 12” off the centerline of each coiling door at the dock facility.
- H. Any sprinkler piping being supported from roof purlins shall be attached to the purlin web by use of side mounted beam brackets. Use of flange brackets on purlin flanges will not be allowed. Piping suspended from beam shaped structural members will be allowed to be supported from appropriate designed clamp type brackets.
- I. Provide and install the following alarm and supervisory switches of which each shall be connected to the building fire alarm control panel by the alarm contractor.
 - 1. Tamper Supervisory switches on all valves controlling water to fire sprinklers.
 - 2. Water flow Switches; each wet-pipe sprinkler system shall be provided with a vane-type water flow device. Each dry-pipe system shall be provided with a pressure-type water flow switch.
- J. Drain pipes and valves shall be installed on each system to allow drainage. Each system shall drain to the maximum extent possible through the main drain valve. For dry systems branch lines shall be pitched at least ½ inch per 10 feet and mains shall pitch at least ¼ inch per 10 feet.
- K. At all Drain Inspection Pipes and drip drums located in unheated spaces provide and install heat tape to piping.
- L. Provide permanent water supply and stand pipes as required by authority having jurisdiction. Provide fire hydrants as required by authority having jurisdiction. Provide fire hose connection as required by authority having jurisdiction. Located as required.
- M. Provide fire pump if necessary and as required by design.
- N. System shall be designed, sized and constructed to allow for any proposed building expansions as indicated on the drawings. Hydraulic calculations shall include such future proposed additions.
- O. All above ground fire sprinkler system shall be tested in accordance with NFPA Standard 13. All piping shall be hydrostatically tested for a period of two (2) hours at not less than 200 PSI pressure. If any leaks appear, lines shall be drained, leaks repaired and test repeated. After completion of tests, make all necessary corrections necessary to secure acceptance by fire marshal and/or any other authority having jurisdiction.
- P. System shall be designed and constructed accessible, unobstructed and free of damage from Tenants business operations. All sprinkler mains shall be installed along the center line of the dock area, no exceptions unless as authorized in writing by FXF.

- Q. Sprinkler Piping
1. Steel piping (below grade): ASTM A53 with ASME polyethylene jacket or double layer, half-wrapped polyethylene tape.
 2. Steel piping (above grade)
 - b. Wet system - black steel schedule 40 for overhead piping 2 ½" or smaller w/ screwed fittings. 3" or larger, schedule 10.
 - c. Dry system - provide schedule 40, throughout at mains and branch lines.
 3. Fittings-Roll grooving of schedule 40 and schedule 10 is acceptable on piping 3 inches or larger. Note: No threadable thin wall piping shall be allowed.
- R. Sprinkler Heads
1. Pendant: brass finish
 2. Upright: brass finish
 3. Sprinkler heads in finished areas shall be semi-recessed, chrome finish. All heads shall be centered in ceiling tiles throughout all finished office, pod & shop areas.
- S. Flow test: Establish system design based on water flow test conducted by municipal water utility or fire department at the effective point of city connection. Flow test must have been performed within the previous 6 months. Include copy of flow test indicating static pressure, residual pressure and psi with gpm flowing.
- T. Testing of system: The entire fire suppression system shall be subject to inspection and acceptance by authorities having jurisdiction to determine if system(s) are in accordance with federal, state and local codes.
1. All underground piping shall be hydrostatically tested at not less than 200 psi or 50 psi in excess of the maximum working pressure of the system (whichever is greater) for not less than two (2) hours in accordance with NFPA 24. Before testing the trench shall be backfilled between joints. All joints shall be left exposed during the test.
 2. Each fire hydrant shall be fully opened and closed under full pressure.
 3. All interior system piping shall be hydrostatically tested at not least than 200 psi or 50 psi in excess of the maximum working pressure of the system for not least than two (2) hours.
 4. Dry-Pipe System; an air pressure leakage test at 65 psi shall be conducted for 24 hours. There shall be no drop in pressure in excess of 1.5 psi for the 24 hours. This air pressure test is in addition to the required hydrostatic test. Each dry-pipe valve shall be trip-tested by reducing normal air pressure through opening the Inspector's Test Connection. Systems equipped with quick opening devices shall be first tested without operation of the quick opening device and then tested again with the device in operation.
 5. All test results shall be witnessed and recorded. Test results shall be included in the number of seconds elapsed between the time the test valve is opened and tripping of the dry-pipe valve; trip-point air pressure of the dry-pipe valve; water pressure prior to valve tripping; and the number of seconds elapsed between the ITC valve is opened and the water reaches the ITC orifice.
 6. All field test performed by the Contractor shall be conducted in the presence of the design engineer, the authorities having jurisdiction, the building owner and FedEx Freight, Inc., Project Manager. Contractor to provide written notification to all persons concerned two (2) weeks in advance of the tests.

15.7 ICE MELT SYSTEM – NOT USED

SECTION 16 - ELECTRICAL

16.1 ELECTRICAL

- A. The electrical system shall be designed by an Electrical Engineer; this includes the responsibility to provide all drawings (conforming to all local, state and federal codes) prepared under their direct supervision, receiving their signed stamp of state registration for professional engineers.
- B. Provide all material, labor, and equipment necessary for all electrical work associated with general service, power distribution, contractor supplied equipment and equipment supplied by others.
- C. All materials to comply with UL, NEMA, ASTM, OSHA, IEEE, NEC and local codes and ordinances.
- D. Submit shop drawings for review prior to ordering.

- E. All state and local inspection fees and permits to be included.
- F. Electric Service shall consist of an underground circuit from the utility company to a pad mounted transformer and underground service into the building main distribution panel. Under no circumstance shall the transformer be located in the front of the office building.
 - 1. Building service shall be 277/480V, 3 phase, 4 wire, 60 hertz and shall be provided at main disconnect. Developer shall verify that specified service is available, and/or provide necessary transformers as required. Service entrance shall be protected from power surges by use of Surge Protection Device(s) (SPD) as specified in Section 16.2 of this Project Manual.
 - 2. Developer shall provide all necessary step-down transformers to provide for 120/208V operation where required. All 120/208V panels installed shall be protected from power surges by use of Surge Protection Device(s) (SPD) as specified in Section 16.2 of this Project Manual.
 - 3. Open 30 amp breaker shall be provided for each SPD location.
 - 4. Provide single point grounding system as specified in Section 16.3 of this Project Manual.
- G. Provide temporary power and lighting as required by the project Contractor; cost of power to be paid by the Contractor.
- H. All wire to be copper and enclosed in conduit; conduit installed underground to be in rigid steel or schedule 40 P.V.C. Rigid conduit fittings shall be ANSI/NEMA FB 1 all steel fittings and plastic insulating bushings with PVC coated rigid steel elbows. PVC fittings shall be NEMA TC 3 preformed fittings and accessories.
- I. All bus bars, in all switchboards, distribution panels, and panel boards shall be copper.
- J. All switchgear shall be fully rated.
- K. All circuits within the building areas shall be run in thin-walled electrical metallic tubing (EMT) conduit and shall be installed overhead. EMT fittings shall be ANSI/NEMA FB 1 steel compression type with insulated throat. Under no circumstances, unless approved in writing in advance by FXXF, will conduits be allowed to be installed in or under interior concrete slabs.
 - a. Use of the following is prohibited:
 - i. EMT crimp-on, tap-on, or indenter type fittings.
 - ii. EMT set-screw fittings.
 - iii. Spray (aerosol) PVC cement.
 - iv. All-thread nipples.
 - v. Wooden plugs inserted in concrete or masonry units as bases for fastening conduits, tubing, boxes, cabinets, or other equipment.
 - vi. Installation of conduit or tubing which has been crushed or deformed.
 - vii. Torches for bending PVC conduit.
- L. Conduit Requirements:
 - a. Minimum 3/4 inch diameter.
 - b. Underground Installations: Use schedule 40 PVC rigid conduit with PVC coated rigid steel elbows.
 - c. Outdoor Locations, Above Grade: Use rigid steel and liquid tight flexible metal. Use 18 inch maximum length of flexible metal unless otherwise approved.
 - d. In Slab, Above Grade: Use galvanized rigid steel conduit and schedule 40 non-metallic conduit as noted on plans.
 - e. Wet and Damp Locations: Use galvanized rigid steel conduit and liquid-tight flexible metal conduit. Use 18 inch maximum length of flexible metal unless otherwise approved.
 - f. Dry Locations Concealed and Exposed: Use galvanized rigid steel conduit for panel feeders, transformers, and for integral horsepower motors, and galvanized electrical metallic tubing for branch circuits and for fractional horsepower motors, unless otherwise noted. Use flexible metal (liquid-tight flexible metal in areas subject to moisture) for connections to motors and transformers, maximum length of 18 inches unless otherwise approved.

- M. New main service entrance panel to be located where noted on the drawings. Provide a minimum of 20% spare space in main power distribution panel for future use. (120/208 - 3 phase).
- N. Panel boards to be installed as required; coordinate switching and final location with Contractor. Each panel shall be designed to allow for 20% spare, unused circuit spaces. Electrical panel boards and/or IT panel boards are not allowed to be located in the middle of the dock slab.
- O. Coordinate switching of electrical power feeds, and interior fixture moving with LESSEE.
- P. Light fixtures for interior and exterior lighting shall be provided as per light fixture schedule and plans. All fixtures, ballasts and lamps shall be fully warranted for material and labor replacement by contractor for one year from date FedEx Freight takes possession of building(s).
- Q. Interior Office, Pods, Shop Core and other finished areas shall have receptacles, switches and wall plates installed, manufactured from Lexan; plastic or vinyl products are not acceptable. Install as per electrical & building codes. See Tab 9, Finish Schedule, and General Notes for color selection.
- R. Storage and dock area outlets to be duplex steel box with metal cover located between each coiling overhead door as shown on drawings.
- S. Toilets, wet areas, and exterior outlets (truck heater plugs) to be ground fault duplex type (G.I.F.); one per toilet, 4 each on the exterior, and as per code requirements in the wet area.
- T. Install boxes and conduit for telephone system and computer system at locations per plans.
- U. Provide two (2) 1-1/2" diameter Schedule 40 PVC conduits, run each underground with calibrated pull tape to pull box, from Office Electrical and Office Telco Room to main yard entry island area for future use as may be required by FXF. Electrical wiring or control cables not required.
- V. Lighting switches shall be provided in all areas to control lighting fixtures. Locate switches in all Office spaces adjacent to doors or egress openings in walls. Rooms with multiple entry/exit locations shall require 3-way or 4-way switching. Coordinate all switch locations with FXF Project Manager.
- W. All low voltage cables shall be run in separate conduits and in separate pull-boxes from all electrical power circuits. Installing both low voltage cables and power together in a common conduit or divided pull-box is unacceptable.
- X. Provide all conduit, boxes, plates, wiring fuses, disconnect switches, wiring devices, metering, panel boards, fixtures, connection devices, and miscellaneous electrical components to furnish a complete system. Wiring devices shall match the amperage of circuit being served. Coordinate all electrical signage requirements.
- Y. Flush mounted multi-service floor boxes shall include two duplex receptacles and one data duplex outlet: Walker RFB4-CI-1 (box) with (2) #CIHT-D (receptacle brackets), #CILT-4TKO (Data/Telecom Bracket), and #FPBTCBK (coverplate).
- Z. Furnish two (2) bound copies of manufacturer's cleaning and maintenance procedure and shop drawings to the Owner upon completion.
- AA. Verify size and voltage of main service panel with all other applicable Contractors.
- BB. Where a shop maintenance facility is included within scope of work provide service for:
 - 1. Power Cord Reels, coordinate requirements with Lubrication Vendor.
- CC. Where block heaters and/or lift gate charging stations are required, each device shall be installed so as to plug into a single receptacle with a dedicated breaker which is not shared with any other device.

16.2 SURGE PROTECTIVE DEVICES (SPD)

- A. Surge Protection Device(s) (SPD) shall be installed at each building's configured main service disconnect (service entrance), generator, automatic transfer switch (ATS), switchgear/switchboard (main distribution panel - MDP) and sub panel (branch/ distribution) locations as indicated on drawings. The SPD shall be located immediately adjacent to the main disconnects at Automatic Transfer Switch (ATS), switchboard and branch panel locations. SPD equipment shall not be an integrated component or system contained inside or within the switchgear or panel board(s). Any SPDs not meeting the specified performance criteria outlined in this specification are unacceptable.
- B. All SPD's must be provided by the same SPD manufacturer.

It is the sole responsibility of the Contractor to ensure that all submittals represent products that meet or exceed specifications included herein. Alltec LLC is the preferred SPD vendor for all surge protection products described herein or approved equal. Alltec's contact information follows:

Alltec LLC
64 Catalyst Drive
Canton, NC 28716, USA
Office Direct: +1.828.646.9290
FAX: +1.828.412.4270
Email: fedex@alltecglobal.com

Ron Wenzel – President/CEO
Tel: 828-646-9290 x 3017
Mobile: 704-661-9245
Email: r.wenzel@alltecglobal.com

- C. Approved Equal Products: Any alternate manufacturer(s) must be submitted and approved 10 days prior to bid date. Alternate vendor's substitute SPD equipment performance and warranty parameters must be indistinguishable from those of the original specified. Any product substituted for the originally specified SPD model must be verified by an independent testing facility as being an exact equal to its counterpart.
- D. Maintenance Restrictions: SPD equipment shall be maintenance free devices that do not require scheduled preventive maintenance or replacement parts. SPDs requiring functional testing, specialized test equipment, or special training to monitor their operational status are not acceptable. Surge protection devices are considered non-repairable items and shall be fully replaced upon expiration.
- E. The SPD shall be listed by UL, or other National Recognized Test Laboratory (NRTL), as meeting the minimum requirements called for by the ANSI/UL 1449– 4th edition safety standard.
- F. Dimensioned drawing of each suppressor type indicating mounting arrangement shall be provided.
- G. The WYE configured SPD shall incorporate seven (7) “discrete, directly connected protection elements” that protect between the line-to-neutral, line-to-ground, and neutral-to-ground conductors, the SPDs automatically reset after activating and suppressing a surge event, the SPDs provide bi-directional surge protection.
- H. Performance Overview:
 - 1. SPD shall provide as a minimum, over-current, over temperature protection via component-level thermal fusing to ensure safe end-of-life modes and prevent thermal runaway. SPDs shall incorporate short circuit current safety fusing wherever no circuit breaker is specified, per over-current requirements of current revision of National Electric Code (NEC).
 - a. Fusing mechanisms employed by the SPD must effectively coordinate their operation in conjunction with the high current abnormal over-voltage testing called for by ANSI/UL 1449-4th Edition.
 - b. SPD shall be of a parallel design utilizing fast-acting transient energy protection components that will divert surge current to the ground and/or neutral conductors as it dissipates the surge energy.
 - c. SPDs shall be of solid-state, bi-directional voltage limiting design, using Metal Oxide Varistors (MOVs) as suppression components. Devices that use spark gaps, gas tubes, rectifiers, silicon diodes or selenium cells shall not be accepted.
 - d. Main Service Entrance (Main Switch) and ATS, as well as Main Distribution and Panel-Board (Branch/Distribution) Panel SPDs shall utilize Thermally Protected MOVs (TPMOV), each

- e. Maximum continuous operating voltage (MCOV) shall be capable of sustaining minimum 115% of nominal RMS voltage continuously without degrading.
- f. The SPD shall be listed by UL, or other National Recognized Test Laboratory (NRTL), as meeting the minimum requirements called for by the ANSI/UL 1449–4th Edition safety standard.

I. Applicable Publications: Publications listed below (including amendments, addenda, revisions, and supplement) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

1. Related Documents
 - a. UL 1449-4th Edition
 - b. UL 1283
 - c. IEEE 1100-2005 (Emerald Book)
 - d. NFPA 70 (National Electrical Code – Article 285)

J. Main Service Entrance (Main Switch) and Automatic Transfer Switch (ATS) Load Side

1. Surge Protection Devices shall include:
 - a. The SPD shall be listed by UL, or other National Recognized Test Laboratory (NRTL), as meeting the minimum requirements called for by the ANSI/UL 1449-4th Edition safety standard.
 - b. ANSI/UL 1449 - 4th Edition Type 1 or Type 2 defined SPD’s Nominal Discharge Current (In) rating must be 20 kA.
 - c. SPDs shall be housed in a polycarbonate or stainless steel enclosure. NEMA enclosure rating shall be minimum Type 4 or Type 4X.
 - d. Manufacturer shall either repair or replace, at no charge to customer, any SPD that fails for a period of twenty (20) years, per the warranty statement, from the date of original purchase.
 - e. Voltage responsive circuitry.
2. Peak Single-Impulse Surge Current Rating: 200kA or 300kA per phase (Manufacturer Recommended).
3. Additional features shall include:
 - a. LED status indicators for power and function status to monitor each phase and neutral-ground protection mode
 - b. Remote monitoring capability with two form C dry type contacts. NO and NC provided, rated 125V, 2A min.
4. Maximum Voltage Protection Rating (VPR) per ANSI/UL 1449- 4th Edition Testing Standards. See Table I below:

Table I
Voltage Protection Rating (VPR)

Service Voltage	Wiring	MCOV	L-N	L-G	N-G	L-L
120/240V Split Phase	L,L,N,G	180Vac	* 900V **800V	800V	700V	* 1500V **1200V
120/208V Wye	L,L,L,N,G	180Vac	* 900V **800V	800V	700V	* 1500V **1200V
277/480V Wye	L,L,L,N,G	320Vac	*1500V **1200V	1200V	1200V	* 2500V **2000V

* 200kA rated SPD

**300kA rated SPD

K. Main Distribution Panel (MDP)

1. Surge Protection Devices shall include:
 - a. The SPD shall be listed by UL, or other National Recognized Test Laboratory (NRTL), as meeting the minimum requirements called for by the ANSI/UL 1449 - 4th Edition safety standard.
 - b. ANSI/UL 1449 – 4th Edition Type 2 defined SPD’s Nominal Discharge Current (In) rating must be 20 kA.
 - c. SPDs shall be housed in a polycarbonate or stainless steel enclosure. NEMA enclosure rating shall

- be minimum Type 4 or Type 4X.
- d. Frequency responsive circuitry: SPD products shall provide a UL 1283 certified filtration circuit.
- e. Manufacturer shall either repair or replace, at no charge to customer, any SPD that fails for a period of twenty (20) years, per the warranty statement, from the date of original purchase.
- 2. Peak Single-Impulse Surge Current Rating: 200kA or 300kA per phase (Manufacturer Recommended).
- 3. Additional features shall include:
 - a. LED status indicators for power and function status to monitor each phase and neutral-ground protection mode.
 - b. Remote monitoring capability with two form C dry type contacts. NO and NC provided, rated 125V, 2A min.
- 4. Maximum Voltage Protection Rating (VPR) per ANSI/UL 1449- 4th Edition Testing Standards. See Table II below:

Table II
Voltage Protection Rating (VPR)

Service Voltage	Wiring	MCOV	L-N	L-G	N-G	L-L
120/240V Split Phase	L,L,N,G	180Vac	* 900V **800V	800V	700V	* 1500V **1200V
120/208V Wye	L,L,L,N,G	180Vac	* 900V **800V	800V	700V	* 1500V **1200V
277/480V Wye	L,L,L,N,G	320Vac	* 1500V **1200V	1200V	1200V	* 2500V **2000V

* 200kA rated SPD

**300kA rated SPD

L. Panel-board (Branch/Distribution Panels)

- 1. Surge Protection Devices shall include:
 - a. The SPD shall be listed by UL, or other National Recognized Test Laboratory (NRTL), as meeting the minimum requirements called for by the ANSI/UL 1449 –4th Edition safety standard.
 - b. ANSI/UL 1449 – 4th Edition Type 2 defined SPD’s Nominal Discharge Current (In) rating must be 20 kA.
 - c. SPDs shall be housed in a polycarbonate or stainless steel enclosure. NEMA enclosure rating shall be minimum Type 4 or Type 4X.
 - d. Frequency responsive circuitry: SPD products shall provide a UL 1283 certified filtration circuit.
 - e. Manufacturer shall either repair or replace, at no charge to customer, any SPD that fails for a period of twenty (20) years, per the warranty statement, from the date of original purchase.
- 2. Peak Single-Impulse Surge Current Rating: 100kA per phase (Manufacturer Recommended).
- 3. Additional features shall include:
 - a. LED status indicators for power and function status to monitor each phase and neutral-ground protection mode.
 - b. Remote monitoring capability with two form C dry type contacts. NO and NC provided, rated 125V, 2A min.
- 4. Maximum Voltage Protection Rating (VPR) per ANSI/UL 1449- 4th Edition Testing Standards. See Table III below:

Table III
Voltage Protection Rating (VPR)

Service Voltage	Wiring	MCOV	L-N	L-G	N-G	L-L
120/240V Split Phase	L,L,N,G	180Vac	900V	800V	700V	1500V
120/208V Wye	L,L,L,N,G	180Vac	900V	800V	700V	1500V
277/480V Wye	L,L,L,N,G	320Vac	1500V	1200V	1200V	2500V

- M. For outdoor lighting applications, the SPD shall be installed within the light pole base and connected in accordance with manufacturer's instructions.
1. The SPD device shall be designed to protect a 480Vac, 240Vac, or 120Vac single-phase circuit.
 2. The SPD shall be listed to ANSI/UL 1449-4th Edition suitable for installation on the load of the service disconnect or for ease of maintenance install via a 20 Amp circuit breaker in a Distribution panel.
 3. The SPD shall have
 - a. Line-to-Ground Protection
 - b. The short circuit current rating of 5KA
 - c. Nominal discharge current rating of 3kA
 - d. Status Indicator LED
 4. The SPD shall be mounted in a NEMA 4X enclosure, suitable for use in all indoor or outdoor installations with ambient temperature of -40°C (-40°F) to +60°C (140°F) and relative humidity of ≤95% (non-condensing)
 5. Manufacturer shall either repair or replace, at no charge to customer, any SPD that fails for a period of twenty (20) years, per the warranty statement, from the date of original purchase.
 6. Maximum Voltage Protection Rating (VPR) per ANSI/UL 1449-4th Edition Testing Standards. See Table IV below:

Table IV
Voltage Protection Rating (VPR)

Service Voltage	Wiring	L-N	L-G	N-G
480Vac Single Phase	L,N,G	3000V	1800V	1800V
240Vac Single Phase	L,N,G	1800V	1000V	1000V
120Vac Single Phase	L,N,G	1200V	700V	700V

N. INSTALLATION

1. Install Main Service Entrance (Main Switch) and ATS, as well as Main Distribution Panel SPD units at switchboard, switchgear, or panel board on load side, with ground lead bonded to service entrance ground reference, with points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length.
2. Install SPD units for sub panel (branch/ distribution) locations and auxiliary panels with conductors or buses between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length.
3. Provide an appropriately sized circuit breaker, as a dedicated disconnecting means for SPD.
4. Avoid sharp bends in the conductors. Wire size for leads shall be as specified by manufacturer.
5. Electrical contractor (installer) shall verify the proper application of the SPD (i.e. voltage, phases, etc.). Electrical contractor shall assure that all Neutral conductors are bonded to system Ground at service entrance or serving isolation transformer prior to installation of the associated SPDs. Electrical contractor shall further ensure that Neutral-to-Ground bonds do not exist at locations that are not service entrances or newly derived power sources.
6. All labor, materials, equipment, and services necessary pertinent to the installation of the SPD system components as specified herein shall be provided by the electrical contractor (installer).

O. ACCEPTANCE CHECKS AND TESTS

1. Perform in accordance with the manufacturer's recommendations. Include the following visual and mechanical inspections and electrical tests:
 - a. Visual and Mechanical Inspections
 1. Compare equipment nameplate data with specifications and approved shop drawings.
 2. Inspect physical, electrical, and mechanical condition.
 3. Verify that disconnecting means and feeder size to SPD unit correspond to approved shop drawings
 4. Verifying tightness of accessible bolted electrical connections by calibrated torque-wrench method
 5. Clean SPD unit.
 6. Complete startup checks according to manufacturer's written instructions.
 7. Verify the correct operation of all sensing devices, alarms, and indicating devices.

P. STARTUP

1. Do not energize or connect switchgear, switchboards, or panel boards to their sources until SPD units are installed, connected, inspected & tested.
2. Do not perform insulation resistance tests of distribution wiring equipment with SPD installed. Disconnect before conducting insulation resistance tests, and reconnect immediately after testing is over.

16.3 GROUNDING SYSTEMS

1. PRIMARY GROUNDING SYSTEM

- A. Install grounding electrodes and grounding electrode conductors at each main distribution panel and dry type transformer. The grounding electrode shall consist of each of the following that are present:
1. Metal underground water pipe per NEC 250.50 (A) (1).
 2. Metal frame of building or structure per NEC 250.50 (A) (2).
 3. Concrete encased electrode (rebar) per NEC 250.50 (A) (3).

All grounding electrodes present shall be bonded together.

2. SUPPLEMENTAL GROUNDING SYSTEM

- A. Each independent building fed from a "Main Electrical Distribution Panel" (MDP) shall be provided with a site-specific grounding system in order to provide a single point ground utilizing an Electrolytic Ground System (EGS). The EGS shall be a TerraDyne® electrode as manufactured by Alltec LLC, or approved equal.
- B. Wenner 4-point soil resistivity tests shall be performed by a firm actively involved and knowledgeable of such testing. The testing shall be performed at a minimum of four (4) locations adjacent to the MDP location, in compliance to IEEE Std. 81. Test reports shall be provided to Alltec LLC for designing the grounding system and shall be provided to the FedEx Project Manager.
- C. The soil resistivity data and relevant site layout drawing shall be utilized to create the grounding system design. The main service grounding system will be evaluated to achieve a maximum of 5Ω resistance. The proposed external grounding system shall be bonded to any existing ground electrode (GE) installed at the MDP location.
- D. A Master Ground Bus Bar (MGB) shall be provided within the electrical room with a ground lead to the GE. Telco Bus Bar(s) shall be bonded back to the MGB in the electrical room in order to provide single point grounding within the building.
- E. The EGS shall comply in weight, size, and composition with the requirements of Underwriter's Laboratories (UL), and shall be listed with UL and properly labeled. The EGS may be vertical model or horizontal model.
- F. The EGS shall be a self-contained ground electrode(s) providing electrolytically enhanced grounding by hygroscopically extracting moisture from the atmosphere to activate the process. The EGS shall be 100% self-activating, sealed and maintenance free. The EGS shall be supplied pre-filled from the factory with non-hazardous metallic salts. The EGS shall have minimum thirty (30) year replacement warranty.
- G. The EGS shall consist of a 2" diameter hollow type K copper tube with a wall thickness of not less than .083", and permanently capped on top and bottom. Vent ports shall be provided in the top and leach ports provided in the bottom for dendritic formation into surrounding soils.
- H. The EGS shall be located in a non-traffic area and shall have a poly-plastic well with a bolt down flush cover with breather ports.

- I. A minimum #2 AWG solid tinned copper conductor (or approved/sized conductor defined by local codes and standards or Authority Having Jurisdiction [AHJ]) shall be utilized as a horizontal grounding component. Horizontal grounding conductor shall be encompassed in a 4"×2" trench of TerraFill® non-corrosive, electrically conductive and ground enhancing backfill.
- J. The EGS shall be installed into a bored hole (minimum 6" diameter) for vertical installation, or a 6" wide trench, 6" deeper than the vertical riser shall of the EGS for horizontal installation. Backfilling of the EGS shall be with TerraFill® and installation shall be performed as directed by manufacturer.
- K. All below grade connections shall be made by Exothermic-welding process.
- L. After installation, grounding system resistance to earth shall be tested prior to connection to main service. Certified measurements shall be submitted to Owner or Owners Agent. Testing shall utilize an earth resistance meter and be conducted in accordance with IEEE Std. 81 3-point fall of potential method. Measured resistance shall be 5Ω or less. Necessary corrections to the system shall be made if 5Ω is not achieved. Contact Alltec LLC for assistance.
- M. An electrical subpanel, located at an adjacent building or new expansion area and receiving electrical supply from an existing MDP, shall be grounded as defined by local codes and standards or Authority Having Jurisdiction (AHJ).
- N. For consultation in the design and testing for the single point grounding system, contact:

Alltec LLC
 64 Catalyst Drive
 Canton, NC 28716, USA
 Office Direct: +1.828.646.9290
 FAX: +1.828.412.4270
 Email: fedex@alltecglobal.com

16.4 PACKAGED ENGINE GENERATOR SYSTEMS

- A. Where shown on plans or where noted elsewhere, Developer shall provide and install standby power system for supply of power in event of failure of normal utility service. The emergency standby system shall provide 100% back-up power to the entire complex including but not necessarily limited to; all buildings containing electrical services, site lighting, block heaters and fueling facilities including any and all future additions planned for this facility. The generator unit and ATS breaker rating shall be sized and designed by an electrical engineer. The complete unit shall not be oversized to allow “wet stacking”.
- B. Emergency generators shall be designed and constructed to meet all current local, state or federal air emissions standards in order to reduce Oxides of Nitrogen (NOx), Volatile Organic Compounds (VOCs) and Carbon Monoxide (CO) from engines.
- C. Emergency back-up system shall consist of a diesel fuel supplied power unit, air-cooled, engine directly coupled to AC generator complete with fittings, connections, auxiliaries, control panels, safety devices, and meters necessary for complete operating system.
- D. Provide fully automatic operation so that unit takes full load within 10 seconds after power failure. On resumption of normal power after time delay on transfer switch, automatically retransfer load to normal power and automatically shut down generator, returning to starting condition ready for another operating cycle.
- E. The generator shall be capable of delivering the rated KW to the main power distribution system, at the installed location after consideration of applicable altitude de-rating factors.
- F. Secure generator/fuel tank assembly to concrete base pad as per manufacturer’s recommendations and/or as required by local code authorities with jurisdiction where unit to be placed into operation.

- G. Acceptable Manufacturers:
1. Cummins/Onan
 2. Caterpillar
 3. Kohler
- H. Generator
1. Generator Capacity: rated as required to provide designated load at 0.8 PF, 277/480 volts, 3 phase, 4 wire, 60 Hz, diesel powered.
 2. Rotation Speed: 1800 rpm.
 3. Exciter: Directly coupled with plus or minus 2 percent regulation from No load to Full load.
 4. Terminal Box: Provide terminal box for generator and excitor leads.
 5. Circuit Breakers: Provide disconnect circuit breaker of the required size at the generator.
 6. Remote Alarm Annunciator capable of metering engine status.
 7. Engine block heaters capable of maintaining engine fluids at proper operating temperatures for cold start.
 8. Battery charge with 10-amp output for the generator battery.
 9. Exhaust: Exhaust silencer shall be mounted on top of enclosure. Silencer shall be provided with corrosion resistant coating. Silencer and exhaust shall include raincap and rainshield. Position unit with exhaust air flow 180 degrees away from face of building.
 10. Engine Exerciser: Provide engine exerciser capable of running an exercising program every seven days, with load and without load operation.
- I. Fuel Tank
1. Sub-base double wall fuel tank, UL listed, capable of 24- hour operation. Low level and rupture basin alarm switches. Contractor shall provide full tank of fuel, after all generator system testing or retesting has been performed and prior to project given FXP approval as being operational complete.
- J. Automatic Transfer Switch
1. Design: Linear motor with contactors electrically operated, mechanically held and obtaining control and transfer power from the source to which it is being transferred. Provide full phase relay protection operating normal power voltage drop to 70 percent on any phase.
 2. Provide the following features in addition to automatic to automatic transfer function:
 - a. Programmed transition time delay from emergency to normal on restoration of normal power, adjustable from 0.5 to 7.5 seconds.
 - b. Time delay relay to prevent generator startup on momentary failure of normal power adjustable from one second to 5 minutes.
 - c. Remove engine starting contacts.
 - d. Time delay relay to delay generator shutdown after retransfer to normal, to permit engine cooling off period, adjustable from 20 seconds to 10 minutes.
 - e. Two indicating lights to indicate emergency transfer switch position red for emergency power, green for normal power.
 - f. Auxiliary contacts to control motorized dampers in cooling and exhaust equipment.
 - g. Automatic exerciser time clock.
 - h. One additional normally open contact on both normal and emergency relays.
 - i. One set of normally open auxiliary contacts for remote indication of normal power failure.
 3. Enclosure: Interior installation-NEMA 1R, Primary Location
Exterior installation- NEMA 3R, Secondary Location and Only if directed by Leasee
 4. Poles: Four with switching neutral.
 5. Acceptable Manufacturers:
 - a. Same as generator
 - b. ASCO
 - c. Russelectric
 - d. Zenith
- K. Catwalk platform: Provide and install galvanized open metal grating catwalk along two sides and extending the full length of the generator in order to provide a working platform in which to service the generator and provide access to the control panel. The catwalk shall be of sufficient width to provide easy access to the

generator and adequate clearance for opening of the generator cabinet doors. Access to the catwalk shall be by ships ladders at both ends of the catwalk design.

16.5 FIRE ALARM SYSTEM

- A. Fire alarm system shall be designed, and shop drawings prepared, by a licensed Professional Fire Protection Engineer or NICET Level III Fire Alarm Designer with a minimum of five years experience on projects of similar size and scope.
- B. Developer shall provide a complete fire alarm system for the Service Center Office and Dock and at the Shop Maintenance Facility which shall include, but not necessarily be limited to:
 - 1. Fire alarm control panel
 - 2. Remote annunciator panel
 - 3. Heat sensing devices
 - 4. Smoke sensing devices
 - 5. Duct detectors devices
 - 6. Manual fire alarm pull stations
 - 7. Sprinkler system riser alarms and tampers (zoned per riser and main tampers)
 - 8. Signaling appliances
 - 9. Conduit for all fire alarm cabling
- C. Provide one set of complete submittals for FFX Security Systems to review and approval before beginning work. The submittal shall include cut sheets on each device and drawings mapping out zones.
- D. Control Panel. Silent Knight Model 6808 Addressable Fire Alarm Control Panel single loop addressable FAP. Provide Digital Communicator with Model 5860R Remote Annunciator. No substitutes allowed.
 - 1. Panel shall be designed and installed to operate heat and combustion detection devices, alarm signal devices and Visual enunciator.
 - 2. Panel shall be designed with integral communicator to transmit fire alarm and supervisory signals to FedEx Freight, Inc. Central Monitoring Service in Memphis, TN.
- E. Provide the following:
 - 1. Initiating Devices
 - 2. Dual Action Pull Stations, equal to Silent Knight SK-Pull-DA.
 - 3. Photoelectric Smoke Detector, equal to System Sensor model #2400 or Silent Knight addressable.
 - 4. Duct Detector, equal to System Sensor model # D4120 or Silent Knight addressable.
 - 5. Signaling Appliances
 - a. Horn/Strobe Combination, equal to System Sensor "L-Series".
 - 1. Strobe, equal to System Sensor "L-Series".
 - 2. Horn, equal to System Sensor "L-Series".
- F. Monitoring
 - 1. Installation Company will request a completed monitoring agreement and account number information from the FedEx Freight, Inc. Project Manager 2 weeks prior to needing it brought onto service.
 - 2. Installation Company shall fax a copy of the completed monitoring agreement to FedEx Freight, Inc. Analyst, Security Systems Tech at 870-365-4567.
 - 3. FedEx Freight, Inc. will request and assign two phone lines for use with the fire alarm control panel.
 - 4. Installation Company shall be responsible for the two (2) phone lines from fire alarm control panel to Telco D mark and terminate as required.
 - 5. Installation Company shall ensure proper communication with FedEx Global Security Communication Center monitoring station in Memphis, TN.
 - 6. Fire pump signals shall be monitored per signal.
- G. Within the dock area do not install strobes and horns on faces of the column main frames, instead install on wall, midpoint between the column main frames, typically at intermediate area between coiling doors.

16.6 PRIMARY TELECOMMUNICATION AND DATA CABLING SYSTEM (ENCTS Entrance Cable Standards)

A. General Requirements – Approved Contractor

1. The bidder must be an authorized **Belden Partner Alliance Networking Contractor** for the Belden System 10GX and **Hubbell Mission Critical Certified**. The bidder must have successfully completed all Belden IBDN design and installation training provided by Belden Inc.
2. The bidder shall demonstrate proven expertise in the implementation of network cabling. Expertise can be illustrated through the inclusion of details of at least three projects involving the design and installation of a Category 5e, Category 6, or Category 6A balanced twisted-pair cabling system within the past two-year period. Names and contact information for each of the three projects shall be included.
3. The successful bidder shall hereinafter be referred to as the Contractor.
4. The Contractor shall accept complete responsibility for the design, installation, acceptance testing, and certification of the Belden System 10GXS Category 6a solution.
5. Contractor shall provide proof of its current status as a Networking Contractor in Belden's Partner Alliance Program and shall deliver Belden's Best-In-Class Warranty which includes a 25-Year Product Warranty and Lifetime Application Assurance for the installed Belden System 10GX. Hubbell Mission Critical Warranty for all Cat-6 Cable and Fiber terminations.

B. Products and Execution

This section describes the products and execution requirements relating to furnishing and installing primary entrance telecommunications cabling and communication cabling within the buildings including but not limited to: copper and fiber cabling, and support systems at the new or remodeled buildings for FedEx Freight. Scope of Work has included but not necessarily limited to:

1. Furnish and install a complete telecommunication wiring infrastructure.
2. Furnish, install, and terminate all UTP and Optical Fiber cable.
3. Furnish and install all wall plates, communication & data jacks, and patch panels.
4. Furnish and install all required cabinets and/or racks as required and as indicated.
5. Perform link or channel testing (100% of horizontal and/or backbone links/channels) and certification of all components. Furnish test results of all cabling to the owner on disk and paper format, listed by each closet, then by workstation ID.

C. Primary Entrance Cable and Conduits

1. Developer/Lessor and/or its Agent to provide and install four (4) 4" minimum diameter conduits with (3) 1" inner-ducts per conduit with pull wires for telephone and data service from the properties utility point of entry to the MDF (Main Distribution Frame)/Main Telco room. Cap conduit 24" above finished floor at telephone board in the main office MDF (see Plans for location). Each conduit should be labeled as follows.
 - Conduit 1 – Copper Service Entrance Standard
 - Conduit 2 – Fiber Service Entrance Standard
 - Conduit 3 – Broad Band
 - Conduit 4 - Spare
2. Developer / Lessor and/or their Agent shall supply estimated Telco readiness date minimum of 90 days prior to overall project completion date which will include:
 - a) Telco room permanent power including, but not limited to, all outlets, busways, panels, etc.
 - b) Telephone Back Board in Telco Room
 - c) Grounding bar in Telco Room with all accessories necessary to provide a complete and functioning system.
3. The Developer/Lessor and/or their Agent will notify FXF immediately upon completion of Telco readiness items listed above.
4. The Developer/Lessor and/or their Agent will not order any voice or data lines or any other voice or data services from any Carrier or Local Provider.

- D. Horizontal (workstation) cabling system shall consist of a minimum of two (2) 4-pair Unshielded Twisted Pair (UTP) copper cables to each work area outlet unless otherwise noted for specific locations. The cables shall be installed from the Work Area Outlet to the nearest MDF, IDF or MODS Closet
- E. All cables and related terminations, support and grounding hardware shall be furnished, installed, wired, tested, labeled, and documented by the Telecommunications contractor as detailed in this document.
- F. All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, the local Electrical Code and present manufacturing standards recognized by the telecommunications industry. Additionally, the install/finished product will be a warranted/certified Hubbell Solution for all Cat6 and Fiber. All Hubbell approved product and testing will be required. The Cat6A, wireless access point installations: The Belden REVCONNECT system is to be utilized Belden part numbers and approved cable P/N/manufacturers will be detailed in this document.
- G. Telecommunications contractor must be an approved:
 - 1. Hubbell Premise Wiring MISSION CRITICAL certified installer, able to provide a 25-year product and application assurance warranty.
 - 2. Qualified to install the Belden REVCONNECT system for the Cat6A portion of the install.
Note: Belden P/N RVUTT01 - REVCONNECT TERMINATION TOOL will be required to correctly install the CAT6A portion of the install.
- H. Approved Products - Due to the nature and type of communications all products, including but not limited to faceplates, jacks, patch panels, racks, 110 blocks, for the purpose of this document, shall be what is listed in this document. All copper and optical fiber cable products shall be one of the approved Manufactures/P/N listed for that portion of the install as specified in this document. There will be no substitutions allowed.
- I. To assure product availability and competitive pricing FXF offers the following vendor contacts for consideration of the specified products:
 - 1. Anixter 2800 Walnut Grove Rd. Little Rock, AR 72223 Phone: 1-800-255-1316 Attn: Steve Campbell
 - 2. ARDETECH Industries Inc. Phone: 800-821-5678 Attn: Irene Hodges
- J. Submittals
 - 1. Submit copies of the certification of the company and names of staff that will be performing the installation and termination of the installation to provide proof of compliance of this spec.
 - 2. Submit appropriate cut sheets and samples for all products, hardware and cabling.
 - 3. Work shall not proceed without the Owner's approval of the submitted items.
 - 4. FXF has on file and has approved items 1 & 2 for the below listed installers therefore it is not necessary to collect these items from the below companies:

If requesting bids from the following Contractors, please allow 14-business days and provide building plans, scope of work and this standards document.

Velociti, Inc.
 4780 NW 41st Street, Suite 500
 Riverside, MO. 64150
 Brian WinkleJohn – Assoc. AIA/Account Manager
 913.551.0162 - Cell 217-653-3938
 Brian.winklejohn@velociti.com

ASCC Inc.
 15 Ogle View Road
 Cranberry Township, PA 16066
 Fax: 724-776-9056
 Mike Minor - 724-772-2722 Ext 2335 minorma@ascinc.com

ASD, Inc.
 1075 Windward Ridge Pkwy

Suite 180
Alpharetta, GA 30005
Attn: Darrell Hunt
National Account Executive
Direct Phone: 615-484-8701
Email: dhunt@asd-usa.com

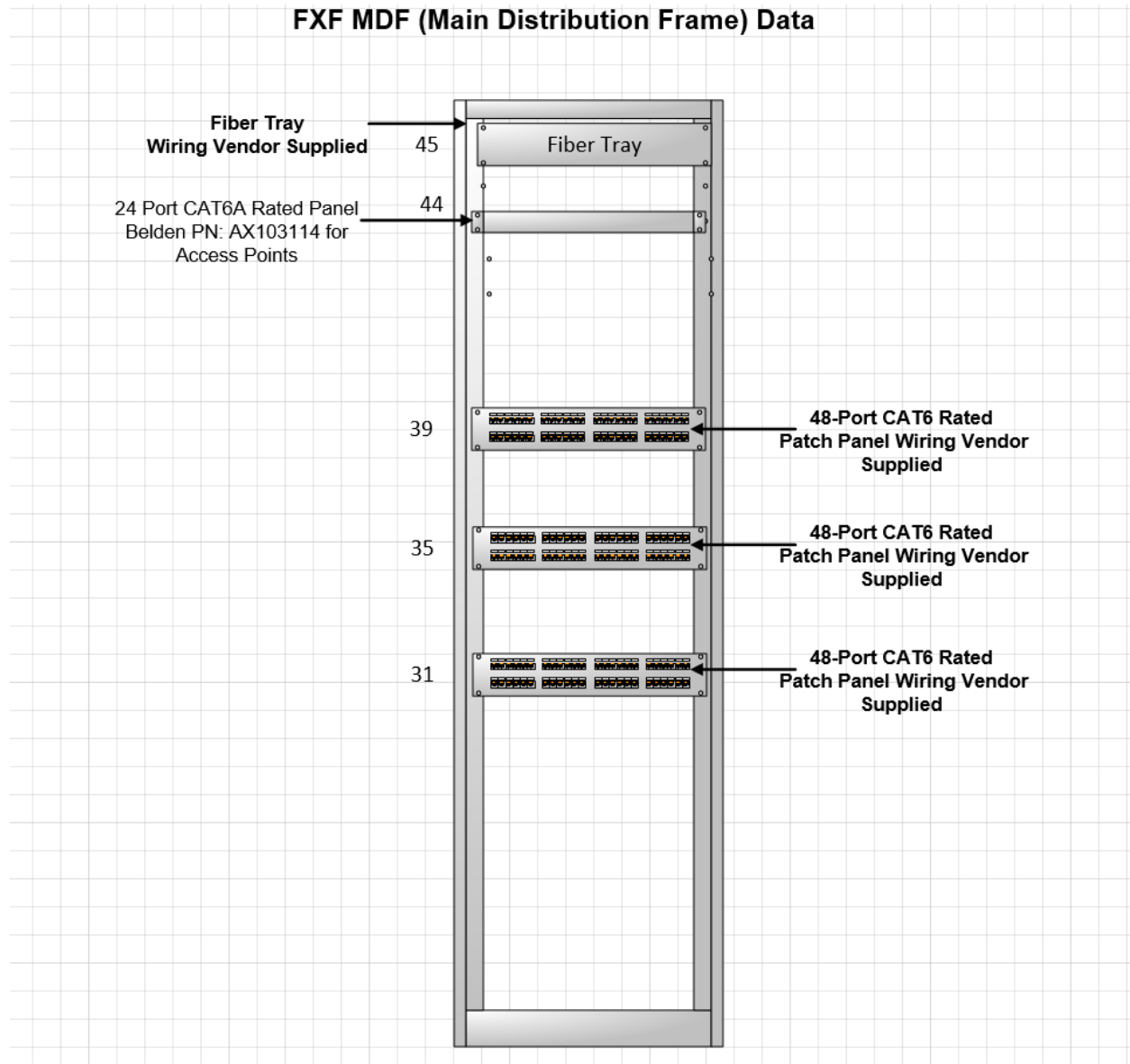
Bailiwick
4260 Norex Drive
Chaska, MN 55318
Toll Free: 800-935-8840
Fax: 952-556-5569
Andrew Lillehaugen
952-556-3864 alillehaugen@bwick.com

Progressive Technologies
11110 Petal Street, Suite 300
Dallas, TX 75238
877-309-1978
Biff Thornton
bthornton@thinkprogressive.com

- K. Data and Communication Termination – Data and voice cables shall be terminated at their designated work area location in the connector types described in the subsections below. These connector assemblies shall snap securely into the designated faceplate/Surface Mount Box.
- L. Telecommunications Outlet Assembly shall accommodate:
1. A minimum of four (4) modular jacks.
 2. Additional accommodations for specific locations as noted in the plans for optical fiber and/or additional copper cables as necessary
 3. A blank filler shall be installed when extra ports are not used.
 4. Multiple jacks that are identified in close proximity on the drawings (but not separated by a physical barrier) may be combined in a single assembly. The telecommunications contractor shall be responsible for determining the optimum compliant configuration based on the products proposed.
 5. The same orientation and positioning of jacks and connectors shall be utilized throughout the installation. Prior to installation, the telecommunications contractor shall submit the proposed configuration for each outlet assembly for review by the Owner.
 6. The modular jack shall incorporate printed label strip for identifying the outlet. Hand printed labels shall not be accepted.
- M. Faceplates/Surface Mount Boxes: Faceplates shall be:
1. Hubbell P/N IFP14W-standard other approved face plates, IFP12W-2 port single gang IFP16W 6 port single gang, color white. All unused ports of any faceplate will be filled with a blank Hubbell P/N SFBW color white
 2. Surface mount boxes – to be used at Dock Stands, color white.
 - A. 2-Port surface mounted box, Hubbell P/N ISB2W
 - B. 4 port box, Hubbell P/N ISB4W. All unused ports of any surface mounted box will be filled with a blank Hubbell P/N SFBW color white
 3. Voice / Data Jacks shall be 8-position modular jacks, T568-B, CAT6,
 - A. Voice jacks color to be White Hubbell P/N, HXJ6W
 - B. Data jacks color to be Blue Hubbell P/N HXJ6B.
 4. Wireless Access Points Plugs -Belden P/N RVAFPUBK-S1
- N. Copper Termination Block Kits –Provide 100 PR P/N 110BLK100FTK5 or 300 PR P/N 110BLK300FTK5 as required, Field Term w/ Legs, Hubbell P/N 110CB4PR10 C4 Clips will be required as well.

1. The voice cross connect shall be a passive connection between the horizontal termination blocks and the backbone termination blocks. The wall mount frames shall be field terminated kits including all blocks, connecting blocks, and designation strips. Management rings shall be mounted between vertical columns of blocks to provide management of cross-connect wire. Backbone and horizontal blocks shall use 4-pair connecting blocks. Blocks shall be oriented so that backbone terminations are located on the left and horizontal frames are located on the right of the termination field when facing the frame assembly.
- O. Modular Patch Panel (see part numbers below) - The installer shall determine to proper number and size of patch panel required for the project. The patch panel shall be sized to allow for 15% expansion capability above that as required for the project. Allow 3U of space between each patch panel for FXF furnished switches. The Patch Panel Port shall incorporate printed labels for identifying the Corresponding outlet. Hand printed labels shall not be accepted.

FXF MDF (Main Distribution Frame) Data



Modular Patch Panels -Station Wiring- CAT6

1. 24 Port Panel Hubbell P/N HP624 CAT6 BLK 1U.
2. 48 Port Panel – Hubbell P/N HP648 CAT6 XP6 BLK 2U

100 Pair 110 Rack Mount Kit- Voice

1. Hubbell P/N 110BLK50FTK5 Hubbell P/N 110CB4PR10 C4 Clips may be required as well

Modular Patch Panels-Wireless Access Points CAT6A

1. Belden P/N AX103114 24-Port KEYCONNECT Patch panel unloaded 1U Back
2. Belden P/N RVAMJKUOR-S1 REVCONNECT Jack 10GX UTP Orange (qty. as required)

Fiber Patch Panel

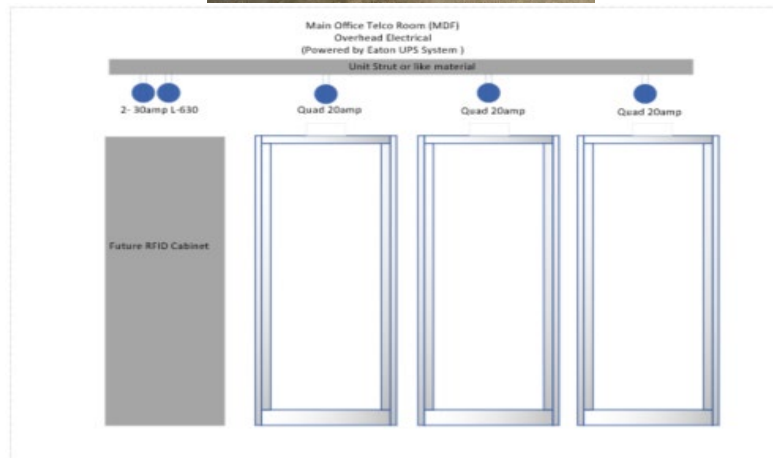
1. Hubbell P/N FPR3SP unloaded accepts 3 fiber adapter panels 1U (MDF RACK)
2. Hubbell P/N FCR2U6SP unloaded accepts 6 fiber adapter panels 2U (MDF RACK)
3. Hubbell P/N FCR2U9SP unloaded accepts 9 fiber adapter panels 2U (MDF RACK)
4. Hubbell P/N FCR3U12SP unloaded accepts 12 fiber adapter panels 3U (MDF RACK)

- P. Telco Room Equipment Racks/Cable management - Equipment racks shall provide vertical cable management and support for patch cords at front of the rack and wire management, support, and protection for the horizontal cables inside legs of the rack. The rack shall include mounting brackets for cable tray ladder rack to mount to the top of the rack. Velcro cable ties shall be provided inside the rack channels to support the horizontal cable. Rack shall be black in color to match the patch panels. Racks shall be located a minimum of 39” away from rear wall surface.
1. Rack Stand – HPW84RR19-FX - Hubbell Rack, Relay 84"H,45U,BK
 2. Rack Shelf – MCCC519-Hubbell Rack Shelf
 3. Rack Vertical Cable Trays - CS1976-FX Hubbell Rack, Relay 7"x6", Chan,w/covers,BK
 4. Horizontal Cable Management (Ladders) –

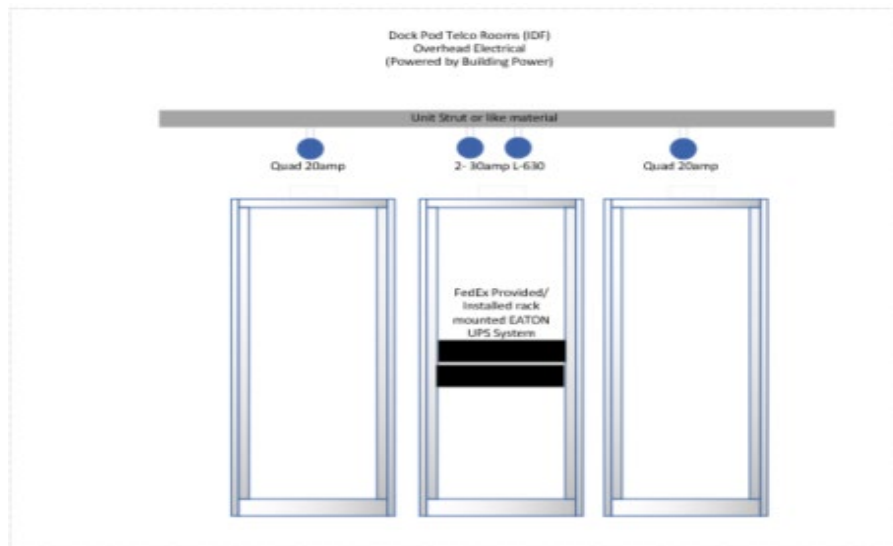
HOFFMAN 12X120" TUBULAR STEEL CABLE RUNWAY BLACK	LSS12BLK
HOFFMAN 12X48" TUBULAR STEEL CABLE RUNWAY BLACK	LSS12BLK-04
HOFFMAN 12" RUNWAY WALL ANGLE BRACKET BLACK	LWASK12BLK
HOFFMAN 09-12"H RUNWAY TO RELAY RACK MOUNTING KIT W/3" CHANNEL BLACK	LRRMPBLK
HOFFMAN BRACKET JUNCTION T KIT BLACK	LJSKB
HOFFMAN LADDER RACK END CAP	LEC

- Q. MDF Whole Room UPS System – Eaton 12 KVA Expandable UPS System, Model: Eaton 9PXM. Provide and install power required for UPS system and overhead strut/busway with needed electrical boxes as outlined in electrical specs/drawings to be mounted above telco racks from wall to wall at 7’ 6” above finished floor. Provide blocking in walls. **UPS System MUST BE PURCHASED from R.M. Stoof and Assoc.** Allow 12-14 weeks lead time. Contact Jim Stoof 412-367-9006 for installation specs and pricing. Failure to purchase from RM Stoof will not be accepted by FedEx Freight and will be rectified at cost of GC/Developer.

Main Computer Room – MDF	
Eaton 9PXM – 12kVA UPS System	
Quantity	Equipment
10	Battery Modules
3	Power Modules
1	Network Card
1	Environmental Monitoring Probe
1	External Maintenance Bypass Switch
1	Eaton Startup Services
1	(2) year onsite extended warranty service
1	PredictPulse UPS Monitoring

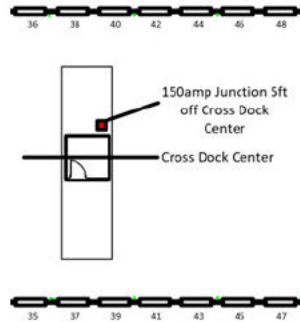


- R. IDF Dock Pod Telco rooms - Provide and install overhead strut/busway with needed electrical boxes as outlined in electrical specs/drawings to be mounted above telco racks from wall to wall at 7' 6" above finished floor. Provide blocking in walls. (UPS system for IDF Telco Rooms will be provided and installed by FedEx Freight)

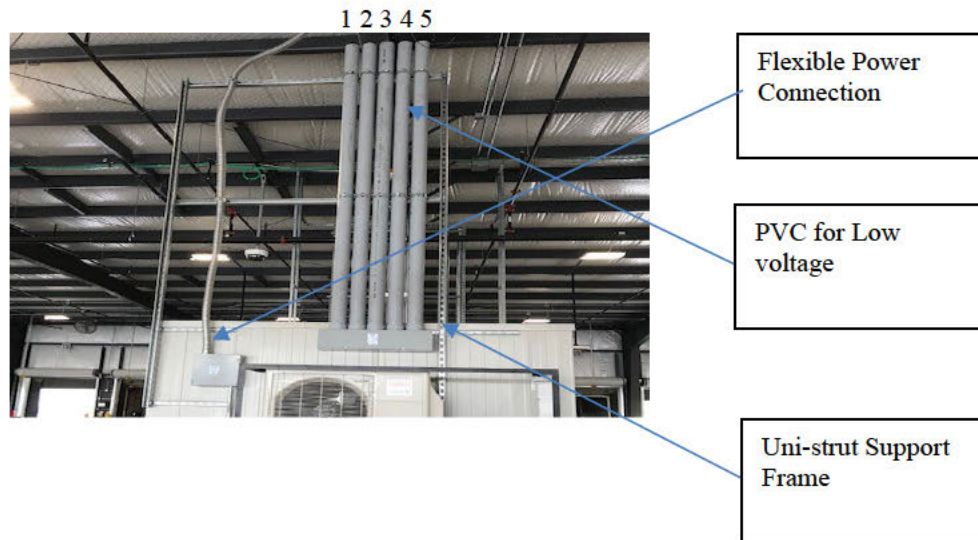


- S. IDF Networking MODS/Closet
Dock IDF MODS

1. MODS (portable Telco room for dock) – To be provided by FedEx Freight and installed by developer. Work with FXF Project Manager to determine location and date of installation. Allow 6 weeks for delivery of MODS. MODS need to be installed prior to Low Voltage and Fiber installation for Dock systems.
 - a. Power Requirements (Developer provided and installed unless otherwise noted)
 - i. Junction box with 150 Amp/240V single phase service located 5ft right of center of cross dock centered in bay identified as indicated on electrical plans. Estimated Amp draw is 75-100 amps per MODS.
 - ii. Connection of MODS to junction box once delivered and install. Flexible power connection will be supplied on MODS when delivered.



- iii. Uni-strut support frame for Low Voltage Conduit and Flex connection provided and installed by Developer
- iv. (5)- 3"x10' PVC low voltage conduits supplied with MODS but installed by Developer. Each conduit left to right as shown should be used as noted:
 1. Fiber
 2. Security CAT5/CAT6 Green
 3. Data 25 pair/CAT5/CAT6/CAT6A (Blue/Orange)
 4. Spare for RFID (installed by FXF at later date)
 5. Spare for RFID (installed by FXF at later date)



- b. Low Voltage Requirements (Developer provided and installed unless otherwise noted)

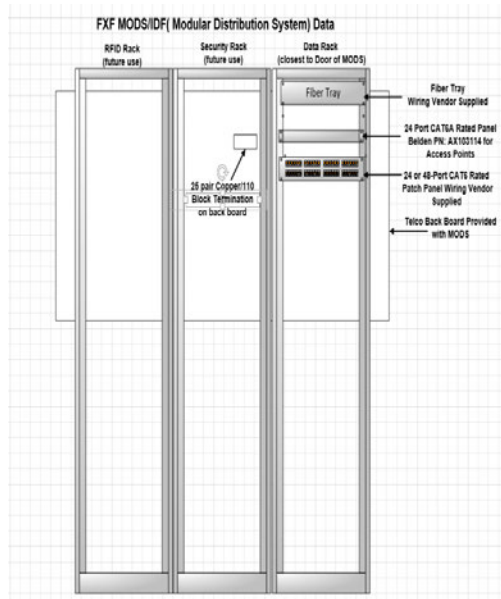
- i. MODS will come with (3) – 2 Post network racks (Data, Security and RFID). Developer is required to install Fiber and 25 Pair copper to each MODS Closet installed in the Data Rack Only. All dock stand, dock pods, access points, and maintenance bay (if applicable) station cables will be terminated in MODS Data rack.
 - ii. Paging 25 pair copper will be installed on 110 block on supplied back board
 - iii. Fiber panel and patch panel specs for MDF will be used for MODS data racks
 - iv. 25 pair 110 blocks will be mounted on provided back board in MODS Door Card Access Requirements
- c. Door to the MODS will require card access. Provide power and data as necessary. See below for hardware requirements. Contractor to verify requirements with access control system and provide a complete and functioning system.

HARDWARE SET: - DOCK TO MODS (CR)

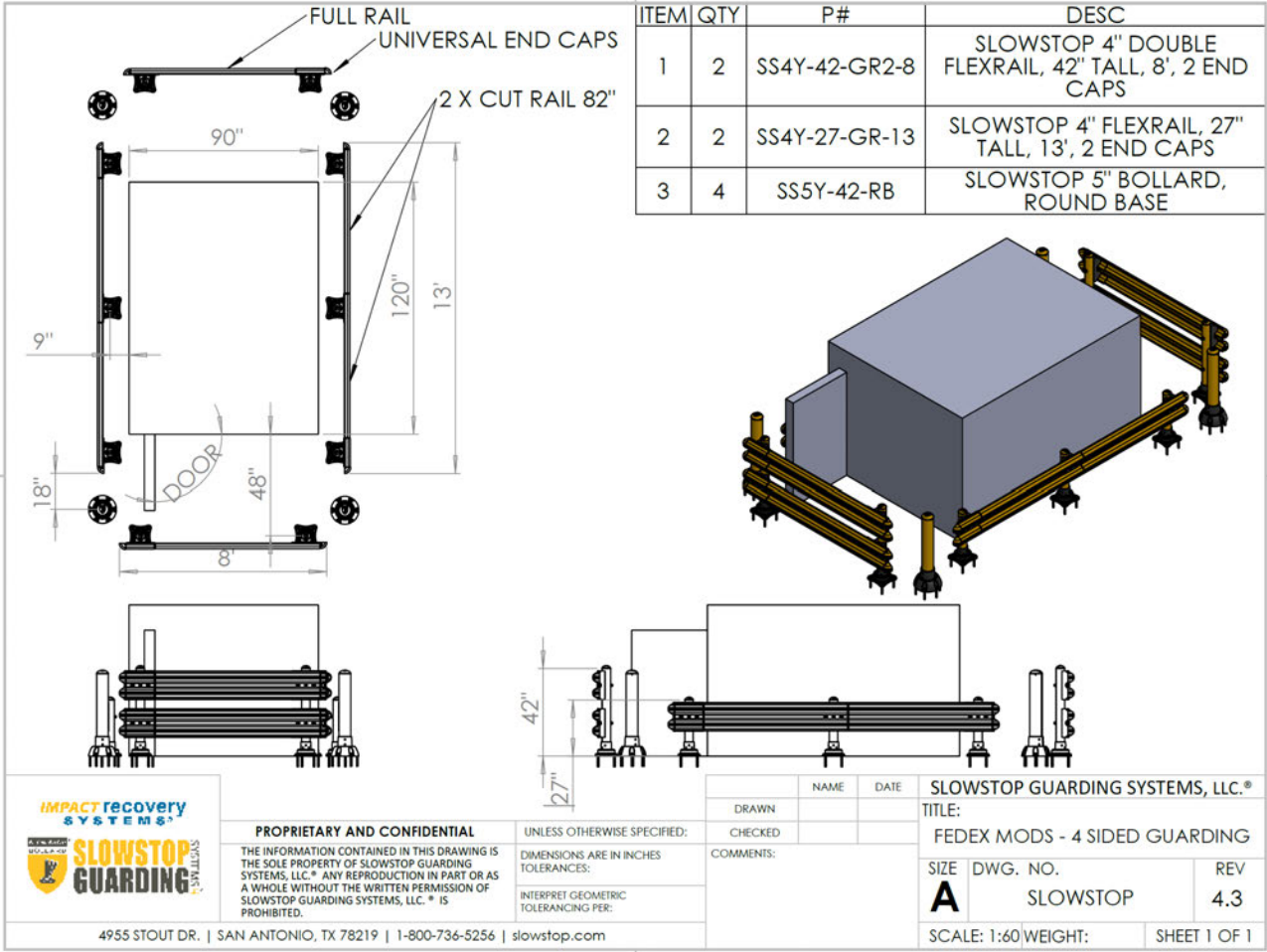
EACH TO HAVE:

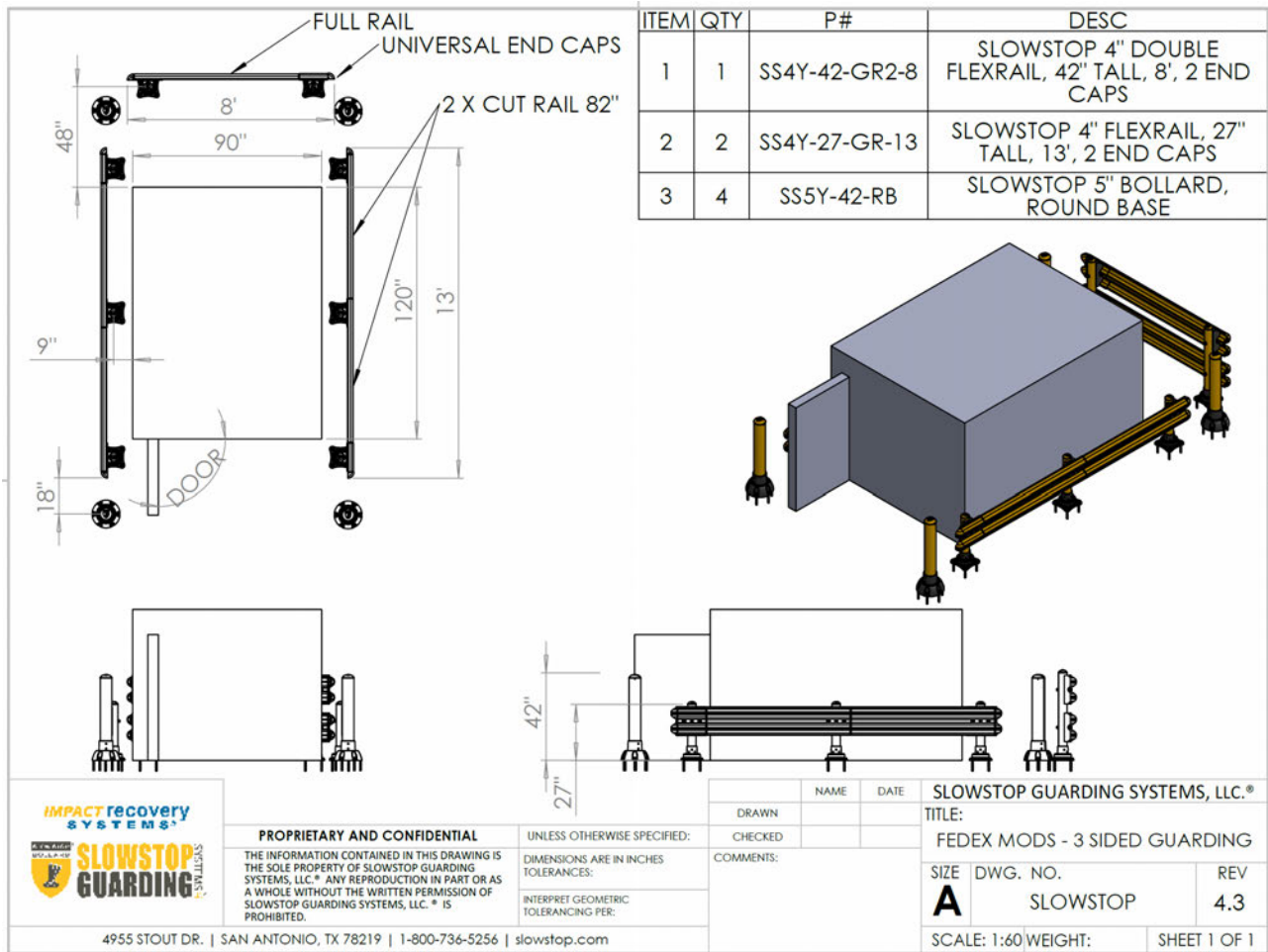
QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	ELECTRIC STRIKE	6211 FSE CON 12/16/24/28 VAC/VDC	630	VON
1	EA	DOOR CONTACT	679-05HM	BLK	SCE
1	EA	MOTION SENSOR	SCANII	WHT	SCE
1		CARD READER	BY ACCESS CONTROL PROVIDER		
1		POWER SUPPLY	BY ACCESS CONTROL PROVIDER		

OPERATION: DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ. ALWAYS FREE EGRESS.



- d. Installation of slow stop bollard guardrail system to be provided and installed by developer/contractor. 3-sided protection shall be provided when a dock stand is in front of MODS, and 4-sided protection when no dock stand is present.





T. Approved Manufacturers/Part Numbers Copper and Fiber

1. **Voice CAT6:**

- Belden- 2413 009U1000 CAT6 white CMP
- Hitachi- P/N 30025-8-WH CAT6, white Plenum
- Superior Essex- P/N: 77-240-XB, CMP-00424SUP-7U-XX, CAT6, Plenum white.

2. **Data CAT6:**

- Belden- 2413 D15U1000 CAT6 blue CMP
- Hitachi- P/N 30025-8-BL CAT6 Plenum blue
- Superior Essex- P/N: 77-240-2B, CMP-00424SUP-7U-XX, CAT6, Plenum blue.

3. **CAT6A- Wireless Access Points (*Location of Access points will need to be provided by FedEx IT Project Manager*)**

- Belden - P/N 10GXS13 003A1000 CAT6A (Orange)

4. **Analog Voice-** Distribution services will consist of direct cable runs between the MDF and MODS/IDF locations via 25 or 50 pair copper cable and shall be terminated in the MDF on 110 Block and in the MODS/IDF on a Hubbell P/N 110RM15NT Hubbell P/N 110CB4PR10 C4 Clips may be required as well depending on port requirement. All indoor cable shall be plenum rated. All 25/50 pair tie cable running underground, in conduit inside or outside the building shall be outdoor rated & Gel filled PE89 type.

U. Fiber Optic Data Cable

1. Fiber Optic Cable will be used for Data Transport between MDF-Closet A and MODS/IDF locations as noted in drawings. MODS/IDF locations include, but not limited to Shops/Fuel Island/ Dock Pod/Dock Stand/Guard Shack shall receive fiber optic cable without regard to distance from MDF network backbone.

- a. Indoor/Outdoor Armored Plenum rated tight buffer 12 strand fiber optic cable, OM3 will be used when running in conduit underground, inside or outside the building.
https://catalog.belden.com/index.cfm?event=pd&p=PF_FD3D012A9
- b. All Fiber running inside the building will be Armored Plenum rated tight buffer 12 strand fiber optic cable, OM3 https://catalog.belden.com/index.cfm?event=pd&p=PF_FI3D012A9 Approved Fiber Manufacturers and part numbers that qualify for the Hubbell warranted solution.

Belden – FD3D012A9 Indoor/Outdoor Plenum OM3 Distribution Tight Buffer 12f
 Belden - FI3D012A9 Indoor Plenum OM3 Distribution 12F Aluminum Armor Aqua
 Hitachi- P/N 61337-12 50S Armored Plenum P/N 61578-12 OM3 In/Outdoor Armored Plenum

V. Fiber Optic Connectors

1. All fiber will be terminated on LC Multimode connectors as specified below.
2. Design Make Fiber Connector: Hubbell P/N FCLCMM LC epoxy polish or P/N **FCLC900K50GM12 ProClick**
3. Fiber will be terminated into rack mounted unit for MDF Closet A and MODS/IDF

W. Copper Cable Protection - All copper circuits shall be provided with protection between each building with an entrance cable protector panel. All building-to-building circuits shall be routed through this protector. The protector shall be connected with a #6 AWG copper bonding conductor between the protector ground lug and the TC ground point.

1. 25 Pair outdoor - CIRCA TEL P/N 1880ECA1-25.
2. 50 Pair outdoor – CIRCA TEL P/N 1880ECA1-50
3. Protector Module 5 pin black - CIRCA TEL, 4B1FS-240.

X. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB) used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways, and other associated hardware that has the potential to act as a current carrying conductor. The TBB shall be installed independent of the building's electrical and building ground and shall be grounded to single point source.

1. The Telco equipment room in each building shall be equipped with a telecommunications main grounding bus bar (TMGB) and shall be connected to the building electrical single point grounding system.
2. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. entering or residing in the TR or ER shall be grounded to the respective TMGB using a minimum #6 AWG stranded copper bonding conductor and compression connectors.

Y. Cable Installation – Voice and Data cable shall be installed in accordance with manufacturer's recommendations and best industry practices. Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points. Where conduits are left empty, a pull cord (nylon; 1/8" minimum) shall be installed. Horizontal distribution cables shall be bundled in groups of no more than 50 cables. If a J-hook or trapeze system is used to support cable bundles all horizontal cables shall be supported at a maximum of 48 to 60 inch (1.2 to 1.5 meter) intervals. At no point shall cable(s) be attached to ceiling wires or rest on acoustic ceiling grids or panels. Cable shall be installed above fire-sprinkler lines and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices. Cables shall be identified by a self-adhesive label. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate.

Z. All cables shall be neatly bundled and dressed to their respective equipment rack or blocks. Each rack or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties. Cables labeled within the bundle, where the label is obscured from view shall not be acceptable.

AA. All voice/data cable penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate UL Listed fire stop system.

BB. Copper and Fiber Cable Service Loops

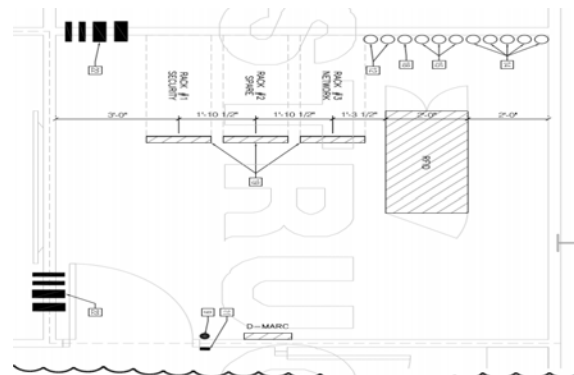
1. The wiring vendor will leave a 20 ft. service loop at each location and at the MDF for both copper and fiber so either can be moved 20 ft. in the future.
2. The installation will adhere to applicable EIA/TIA, BICSI standards and local Building codes. The wiring vendor must notify the FXF project manager of any runs that exceed the recommended distance for Ethernet.

CC. Installation of Equipment Racks – each shall be securely attached to the concrete floor using minimum 3/8” hardware or as required by local codes and shall be placed with a minimum of 36-inch clearance from the walls on all sides of the rack. Each rack shall be grounded to the telecommunications ground bus bar.

1. Rack mount screws not used for installing patch panels and other hardware shall be bagged and left with the rack upon completion of the installation.
2. Wall mounted termination block fields shall be mounted on 4’ x 8’ x .75” void free plywood. The plywood shall be mounted vertically 12” above the finished floor. The plywood shall be painted with two coats of white fire-retardant paint.
3. Wall mounted termination block fields shall be installed with the lowest edge of the mounting frame 18” from the finished floor.



<Photo Example of 4 rack layout>



<CAD diagram example of 3 Rack Layout>
<RFID Cabinet supplied and install by FXF>

DD. Testing and Documentation requirements.

1. CAT6 and CAT6A cables and termination hardware shall be 100% tested for defects in installation and to verify continuity of the cabling system performance. Each cable installed will be tested with a level 3 test. Tests include Wire Map (continuity and polarity), Length, Near End Cross talk (NEXT), Attenuation, Far End Cross Talk (FNEXT), Equal Level Far End Cross Talk (ELFEXT), Power Sum Equal Level Far End Cross Talk (PSELFEXT) Power Sum Near End Cross Talk (PSNEXT), Propagation Delay, and Delay Skew at rates up to 100 MHz. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and the cable re-tested prior to final acceptance.
2. Fiber testing shall be performed on all fibers in the completed end to end system. All fiber optic cables will be tested on the reel for continuity. After terminating the fiber strands, the wiring vendor will visually inspect each fiber end face at 100X magnification and refinish fibers with visible defects or striations in the core area. Loss will be measured with a “Power Meter, testing end-to-end at 850nm and 1300nm wavelengths for Multi-Mode and 1310nm and 1550nm for Single Mode. Testing will be in accordance with EIA/TIA-526-14, Method B. The link loss will not exceed by more than 1.0 dB the expected loss budget based on the number of mated connector pairs, the connector's published loss per mated pair and the cable's published loss based on distance. Test results will be recorded on a hard copy printout and documented in the final installation report.

3. Category 3 Testing-The wiring vendor will test the category 3 cables for continuity, shorts, and crossed pairs.
4. Upon completion of the installation, the telecommunications contractor shall provide three (3) full documentation sets to the FXF Project Manager/DNI for approval. Documentation shall be submitted within ten (10) working days of the completion of the testing phase. This is inclusive of all test result, digital pictures and draft as-built drawings. Draft drawings may include annotations done by hand.

EE. Miscellaneous Equipment

1. Office Speakers – Valcom V-1020C Ceiling Speaker; Developer shall provide & install at all locations noted on plans. Each cable shall be continuous home-run to nearest Telco Closet (A, B, etc). Daisy-chained equipment not allowed.

CAT6 Cable Required:

White/Blue	Trip/A-Green	Blue/White.....
Red	White/Orange	Ring/B-
Orange/White -24vdc	Ground-Black	
	White	

2. Dock Paging Horns – Valcom V-1036C Horn Loudspeaker; Developer shall provide & install at all locations noted on plans. Each cable shall be continuous home-run to nearest Telco Closet (A, B, etc). Daisy-chained equipment not allowed.

CAT6 Cable Required:

White/Blue	Trip/A-Green	Blue/White.....
Red	White/Orange	Ring/B-
Orange/White -24vdc	Ground-Black	
	White	

3. 25 Pair Cable to all MODS/IDF’s including SHOP
 - a. A 25 Pair copper cable will be ran to all MODS/IDF’s on Dock from the MDF.
 - b. A 25 Pair copper underground gel filled cable will be ran to the SHOP IDF from the MDF.
 - c. A 110 block will be provided at each dock MODS/IDF to patch in the 25 Pair copper cable.
 - d. A 110 block will be provided in the SHOP IDF mounted on backboard wall.

DD. Data Security Wiring Standards:

1. Video Security – Beldon **GREEN**
 - A. CMP-00424IBDN-7RB-04
 - B. BELDEN 2413 005A1000 23-4P UTP-CMP SOL BC CAT6 RPO/FEP/FRLSPVC GREEN
 - C. 1000FT RIB NONBONDED-PAIR
2. Security Intercom – Beldon **PINK**
 - A. CMP-00424IBDN-7RB-12
 - B. BELDEN 2413 012A1000
 - C. 23-4P UTP-CMP SOL BC CAT6 FRPO/FEP/FRLSPVC PINK
 - D. 1000FT RIB NONBONDED-PAIR

16.7 SECURITY CARD ACCESS CONTROL

A. Requirements

1. The Contractor shall provide and install a complete and working security card access system to provide entry security into the Service Center Office, Pod, Dock and portions of the Shop Maintenance Facility when scheduled for construction. All card access control panels and power supplies shall be installed within the Telco room as per manufacturer recommendations or FedEx Freight Security approved vented (fan exhausted) NEMA 3R enclosure. No splices are allowed in cable runs between device and head end.
2. Security access into the facility will be controlled by electronic card access where shown in the included drawings.

3. The installing card access integrator/contractor shall be Lenel Certified and selected from FedEx Freight Security's preferred integrator list below: (No Substitutes)

Lenel Certified FFX Preferred List:

- a. Convergent Technologies (US, Canada, Mexico)
Jason Barton, PE
404.210.0606
Jason.Barton@convergent.com
- b. Access Control Integration
Mike Lee
901.380.5527
mlee@myaccesscontrol.com
- c. Progressive Technology, Inc.(US)
Biff Thornton
214.392.3911
bthornton@thinkprogressive.com
- d. Paladin Technologies Inc./VideoTronics Inc.(VTI) Security (US, Canada, and Mexico)
Doug Adams
720.291.6886
DAdams@PaladinTechnologies.com
- e. Pawlak Industries Inc. (NOEA)
Henry Pawlak
519.469.1534
hp@pawlakinc.com
- f. Integrated Protection Services Inc.(US)
Frank O'Connell
513.404.9942
foconnell@integratedprotection.com

4. The Developer/General Contractors shall provide the necessary junction boxes and conduits for pulling the conductors (cables) and hardware as required for a complete and operational system. Cost for these items shall be included in the developer's construction costs.

B. Components

The card access system shall include, but not necessarily be limited to the following components:

1. Card Access Control Panels, Reader Boards, Readers and Associated Boards
2. Locks and Components
3. Video Intercom Call Stations and Master Stations
4. Turnstiles and Handicapped Gates
5. Card Reader Pedestals and Camera Poles.
6. NEMA Enclosures for Cabling Extensions
7. Fiber Optic Media Converter
8. Fiber Optic Security Cabling
9. NEMA Uninterruptable Power Supplies

C. Products

1. Card Access Controls, Reader Boards, Access Panels, and Card Readers

- A. Control Board
 - 1. Intelligent Dual Reader Controller (IDRC) – Lenel Part LNL-X4420 (no substitutes).
 - 2. Single board for interfacing one or two doors to an OnGuard System. Ethernet connection provided.
 - 3. Manufactured by Lenel.
 - 4. Panel shall be designed and installed to manufacturer’s specification.
- B. Dual Reader Interface Modules
 - 1. Lenel Part – LNL – 1320 – S3 (No Substitutes).
 - 2. Provides expansion of two (2) card readers to the LNL-4420 and provides Eight (8) supervised inputs and six (6) form C relay outputs.
- C. Input Control Module (as required)
 - 1. Lenel Part – LNL – 1100-S3
 - 2. Provides Sixteen (16) supervised inputs.
- D. Output Control Module (as required)
 - 1. Lenel Part – LNL-1200-S3
 - 2. Provides Sixteen (16) supervised inputs.
- E. Power Supply for Card Access and Lock Power
 - 1. LifeSafety Power Part – FPO150/250-2C82D8PE8M2 for “**main building**” (No substitutes)
 - a. LifeSafety Power, Power Supply/Battery Charger for 16 Doors, 150W + 250W (dual output),12/24 VDC,16 control outputs, 16 Aux Class II outputs.
 - 2. LifeSafety Power Part – FPO75-B100C4D8PE2M for the “**shop**” (No substitutes)
 - a. LifeSafety Power, Power Supply/Battery Charger for 4 Doors, 75W, 12/24VDC, 8 control outputs, 8 AUX Class II outputs.
- F. Card Readers
 - 1. HID MaxiProx Model 5375A
 - a. 24” Long Range Card Reader
 - b. Use on Truck and Employee Entrance/Exit Lanes
 - c. No substitution
 - 2. Lenel multi-tech single gang with keypad Model LNL-R11325-FDX
 - a. Standard Proximity Reader
 - b. Use on Standard Doors without Glass
 - 3. Lenel multi-tech mini-mullion Model LNL-R11330-FDX (Only Where Specified)
 - a. Narrow width reader
 - b. Use on Aluminum Frame Mullion Glass doors
- G. Approved Card Reader Wiring
 - 1. Exterior
 - a. Maxiprox Readers – 18/6 STR SH WBLOCK Gray 1M from readers back to NEMA enclosures (West Penn Cable Part number # AQC3186GY1000) No Substitutes.
 - b. Lenel Readers – 18/6 STR SH WBLOCK Gray 1M from readers back to the NEMA enclosures. (West Penn Cable Part # AQC3186GY1000) No Substitutes.
 - 2. Interior

- a. Lenel Readers - Lock Power, Card Reader, Door Contract, REX Applications 4C18+4C22+3P22+2C22 Shield FLMST Yellow (Belden Cable Part # 658AFJ 0041000) No Substitutes.

2. Card Reader Pedestals and Accessories

- A. Dual Height Reader Post – Truck Entry/Exit.
 1. Wright Steel – DHRP 6536 or DHRP7040 per Drawing. (No Substitutes)
 - a. TOP POST MOUNT PLATE:
 1. Wright Steel – PA1218-5 Poly Adaptor Plate. (No Substitutes)
 2. HID MaxiProx 5375 Long Range Readers (see Item F 1. above).
 3. Axis 2N IP Force Part # 01337-001 Intercom Video Station (See Item 4c below).
 - b. BOTTOM POST MOUNT PLATE:
 1. Wright Steel – PA6X8-6 Poly Adaptor Plate (No Substitutes).
 2. Axis 2N IP Force Part # 01337-001 Intercom Door Station (See Item 4c below)
- B. Single Height Reader Post – Employee Parking Entry/Exit
 1. Wright Steel – EERP3.5 or EERP4.0 (No Substitutes)
 - a. MOUNT PLATE
 2. Wright Steel – PA1218-5 Poly Adaptor Plate (No Substitutes)
 - a.. HID MaxiProx 5375 Long Range Reader (Item 4c below)
 - b. Axis 2N IP Force Part # 01337-001 Intercom Video Door Station
- C. Man Gates and Turnstiles
 1. Wright Steel Kits – SS10X10-L and SS10X10-R (One right and one left for each gate opening)
 2. Lenel multi-tech single gang with keypad Model LNL-R11325FDX
 3. Axis 2N IP Force Part # 01337-001 Intercom Door Station (See Item 4c below)
- D. Patio to Breakroom
 1. Wright Steel Kit – SS10X10-M
 2. Lenel multi-tech single gang with keypad Model LNL-R11325FDX
 3. Axis 2N IP Solo Part # 01301-001 Intercom Door Station (See Item 4c below)
- E. Front Office Door
 1. Lenel multi-tech single gang with keypad Model LNL-R11325FDX
 2. Axis 2N IP Solo Part # 01301-001 Intercom Door Station (See Item 4c below)
- F. Dock to office and Dock to Breakroom
 1. Lenel multi-tech single gang with keypad Model LNL-R11325FDX
 2. Axis 2N IP Solo Part # 01301-001 Intercom Door Station (See Item 4c below)
- G. Remaining Office doors (**Where specified on drawings**)
 1. Lenel multi-tech single gang with keypad Model LNL-R11325FDX

3. Locks and Lock Components (Only where specified on drawings)

- A. Electric Strike
 1. Assa Abloy - HES Model 5000C (for doors with Cylindrical locksets)
 2. Assa Abloy - HES 9600 Series (for doors with panic hardware)
 3. Von Duprin - See 08700 Finish Hardware section.
- B. Passive Infrared (PIR) – Free Egress device
 1. Bosch Model DS160 Egress motion detector
- C. Door Contact
 1. Recessed Door Contact ¾ inch – Schlage 679-05HM (preferred)

2. Surface Mount Door Contact

D. Blue LED Strobe light – where specified on drawings

1. Blue LED Strobe light Part # SL-1301-BAQ/B. This is programmed for all doors and as a held open after 2 minutes and will set off strobe and the built-in sounder on the motion for the door that is held open.

4. **Video Intercom Call Stations and Master Stations**

A. Axis 2N Video Intercom with SIP Capability

1. Attached to Security Network Switch in Telco Room.
2. All devices are PoE

B. Axis 2N Indoor View Master Stations

1. Model # 02087-001 & Desk Stand Model # 02039-001
2. Installed in Office Reception Area, Dispatch Office Area, and Pods Areas. (As specified on drawings).

C. Axis 2N Intercom Video Door Station – Used at Truck Gates Entry/Exit, Employee Parking Gates Entry/Exit

1. Model # Axis 2N IP Force 01337-001 (SIP Compatible) Intercom Door Station.

D. Axis 2N Intercom Video Door Station – Used at the turnstiles entry/exit, handicap gates entry/exit, and doors that are designated to have an intercom and card reader combo.

1. Axis 2N model # Axis 2N IP force 01337-001(SIP Compatible) Intercom Door Station.
2. Provide the correct Wright Steel backbox as indicated.
 - a. Visitor Gate (Qty 1 Model SS10X10-R, Qty 1 Model SS10X10L)
 - b. Turnstile and ADA (Qty 2 Model SS10X10-R, Qty 2 Model SS10X10L)
 - c. Patio to Breakroom (Qty 1 Model SS10X10-M)

Note All applications using the backbox configuration must have the reader fastened to the left of the Axis 2N (Intercom Device).

Note Front door, Dock to Office door, and Dock to Breakroom door will be surface mounted and require their own junction box.

E. Axis 2N (Intercom Device) Wire Requirements

1. Exterior (All) - Outdoor Gel filled (jet Black) CAT6 from Axis 2N Intercom device to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02) (No Substitutes)
2. Interior (All) – Multi-Conductor – Enhanced Category 6 Nonbonded-Pair Cables, 4-Pair U/UTP CMP Reel-in-Box PINK (Belden Part # CMP-00424IBDN-7RB-12) (No Substitutes)
3. Pink patch cables are required for Axis 2N Intercom Device connections between security integrator provided patch panel and the security network switch.

F. See section E below for Axis 2N Intercom Device IP assignments, Switch locations, and Port numbers

5. **Turnstiles and Handicap Gates and Operator Relays**

A. As manufactured by Alvarado Manufacturing Company, 12660 Colony Street, Chino, CA – Telephone (800) 423-4143.

B. Turnstile Gate: shall be Alvarado Model MST47-6XGL-FX Full Height Turnstile, galvanized, two-way electric lock w/separate card reader and intercom controls for each direction and shall feature the following:

1. Bi-directional momentary pulse relay.

2. Bi-directional time delay relay (20 seconds).
 3. Bi-directional rotation feedback signal.
 4. Bi-directional push-to-test button.
 5. J-box with outlets inside top channel.
 6. Provide standard card reader.
- C. Handicap Gate shall be Alvarado Model MSGX-E or MSGX-S
1. MSGX Full Height Security Gate, no substitutions. Features of the gate shall include stainless steel pull handle in the entry direction; Electric Strike Lock (fail Safe); no door hardware in the exit direction; and a hydraulic closure mechanism, Norton Model #7500.
 2. Separate Card Reader and Intercom – see in '4-D' above.
- D. Gate Operator Relay
1. Provide connectivity from NEMA to Gate Operator as specified and shown on drawings.
 - a. Power Wire / Trigger Wire for outputs requirements – 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

6. Card Reader Pedestals and Camera Poles

- A. Provide all steel posts and Poly Plates as detailed on the drawings. These items must be purchased from Wright Steel (NO SUBSTITUTES):

Wright Steel &
Machine Co
402 Industrial Park Road
Harrison AR 72601.
Telephone: 800-814-7291
Contact: Steve Wright

7. NEMA Enclosures and Head-End Equipment for Cabling Extension

- A. NEMA Enclosure
1. Purchase semi-assembled NEMA 3R rated cabinets from Anixter Inc. (NO SUBSTITUTES)
 - a. Cabinet Part # FEDEXFRT-A

Wesco/Anixter Inc.
6935 Appling Farms Parkway
Memphis, TN 38133
Telephone: (501) 590-6560
Contact: Steve Campbell
Steve.campbell@anixter.com

2. Provide and install all 120/240/208/277 VAC power circuits as required for the Gate Motors, Turnstiles, ADA Gates, Electronic Security Equipment, NEMA enclosure heaters and fan/filter kit as required.
3. All wiring shall be sized for voltage drop as required by the NEC. Coordinate all power requirements with FFX prior to installation.
4. Used for Yard Gate Entry/Exit, Employee Gate Entry/Exit, Employee Turnstile and Handicap Gate and Visitor gates.



NEMA Enclosure Identification (Hoffman WF75LP (55" X 36" X 16") with A48P36 Mounting Plate)

C. MDF/Telco Head End

1. Provide and install Fiber Optic Head-End in Telco Room Security Rack.
 - a. Corning Fiber Optic Closet Housing (Corning CCH-03U)

Fiber Optic Security Cabling

Bill of Material			
ITEM	QTY	Part Number	Desc.
1	1	L1-FEDX-CFP	CUSTOM SUB PANEL R2 DRILLED,TAPED FOR FEDEX ACCESS CONTROL PANEL PROJECT
2	1	SPH-01P	12-F WALL-MT ENCLOSURE SINGLE PANEL HOUSING CCH NOT INCLUDED
3	1	CCH-CP12-E4	12 FIBER PANEL LC DUPLEX LOADED MM OM3/OM4, 6 ADAPTERS PER PANEL AQUA ADAPTER
4	1	SPH-DIN-KIT	DIN RAIL BRACKET, FOR DIN RAIL MOUNTING FOR THE SPH-01P
5	1	CMPCT-DIN-MNT=	MOUNTING RAIL KIT FOR SWITCH
6	1	CWPP12WBL	Mini-Com®, Wall Mount, Patch Panel, 12 Port, Black
7	6	XXXXX	Modules
8	1	LNL-X2220	INTELLIGENT DUAL READER CONTROLLER (IDRC)
9	2	LNL-1320-S3	DUAL READER INTERFACE MODULE
10	10	MJ8-POE	SURGE PROTECTOR
11	1	EB-20	BUSBAR EARTH NEUT BUSBAR 20 BRASS
12	1	PD8ULCB	UL RECOGNIZED POWER CONVERTS ONE INPUT TO 8 PTC PROTECTED OUTPUTS
13	1	EFLOW6NB	TWO (2) OUTPUT POWER SUPPLY/CHARGER W/FIRE ALARM DISCONNECT
14	6	DTK-4LVLP CR	CARD READER SURGE PROTECTION 12V POWER, 24V POWER
15	2	DTK-4LVLP SCPLV	4 PAIR - 30V- TERMINAL STRIP 16-22 AWG - 150MA SELF RESETTABLE
16	13	249-117	TERMINAL BLOCK END STOP 10MM SNAP MOUNT GRAY
17	8	2004-1401	4 COND THRU TERMINAL BLOCKS 10 AWG -20 AWG GREY
18	5	2004-1407	4-COND GROUND TERMINAL BLOCKS 20-10 AWG GREEN/YELLOW
19	2	2004-402	PUSH-IN JUMPER BARS 2-WAY GREY INSULATED
20	3	2004-1492	END AND INTERMEDIATE PLATE 1 MM / 0.039 IN THICK
21	AN	17322005	NCNR/NRTV ENTRELEC DIN RAIL 2 METER 35X7.5MM 18X6.3 MM SLOTS
22	1	5SJ4220-7HG41	20 AMP 2 POLE MINI CIRCUIT BREAKER UL489
23	2	5SJ4103-7HG41	3 AMP 1 POLE MINI CIRCUIT BREAKER UL489
24	1	5SJ4110-7HG41	10 AMP UL 489 MINI CIRCUIT BREAKER 1 POLE 240V 14KA
25	1	DS72US-230S-AI	SURGE PROTECTIVE DEVICE 230V AC -35-85 DEG TEMP MODE L-N L-G N-G
26	1	SDRS-0500-H1	UPS, 500W, DIN RAIL MOUNT
27	1	52171-1/2	4" SQ BX, 2-1/8D, 1/2" KO
28	1	907C	4" SQUARE EXPOSED WORK COVER (2-GANG) DUPLEX RECEPTACLES 1/2" DEEP, 7.3" CUBIC
29	2	CR20-W	20 AMP, 125 VOLT, NEMA 5-20R, 2P, 3W, NARROW BODY DUPLEX RECEPTACLE
30	1		ROMEX CONNECTOR, 1/2"
31	1	DAH2001A	ELECTRIC HEATER 200 WATT 115V 50/60HZ ALUMINUM
32	1	G1.5X2LG6	1.5" X 2" PVC WIRING DUCT SLOTTED SIDEWALL LT GRAY 6' LENGTHS ROHS
33	1	C1.5LG6	DUCT FIBER-DUCT 6' X 1.5" W COVER PVC LIGHT GRAY ROHS
34	32	93505A446	MALE-FEMALE THREADED HEX STANDOFF ALUMINUM, 1/4" HEX 1" LONG, 6-32 THREAD
35	32	90272A147	STEEL PAN HEAD PHILLIPS SCREWS 7/16" LONG, 6-32 THREAD
36	55	90402A827	STEEL PAN HEAD SCREWS W/ EXT-TOOTH LOCK WASHER, 3/8" LONG 10-32 THREAD
37	50	1015-12/65-2	UL1015 12 65 STR TNC PVC RED CSA TEW ROHS
38	50	1015-12/65-9	UL1015 12 65 STR TNC PVC WHT CSA TEW ROHS
39	50	1015-12/65-54	UL1015 12 65 STR TNC PVC GRN/YEL SPIRAL STRIPE 105C 600V ROHS
40	1	SNMP-DA87-01	SNMP/WEB CARD IN A COMPACT EXTERNAL MODULE FOR DIN RAIL UPS

Tab 8 - Standard Build-to-Suit RFP and Specifications
JBR – New 48 Door Dock, Office and Shop
RFP – 11/16/23

- A. Fiber Specifications
 - 1. Fiber Optic Cable will be used for Data Transport between MDF-Closet A and NEMA/IDF locations as noted in drawings. NEMA locations include, Yard Gates Entry/Exit, Employee Gates Entry/Exit, Employee Turnstile and Handicap Gate, and Visitor Gate.
 - 2. Indoor/Outdoor Armored Plenum rated tight buffer 24-strand fiber optic cable, OM3 will be used when running in conduit underground, inside or outside the building.
 - 3. Approved Fiber – Corning 24 strand OM3 Fiber, Indoor/Outdoor Armored, cable, Riser Multimode (Corning Part # 024TUF-T4180DA1)
 - 4. Approved Fiber – Superior Essex 24-Strand OM3, Indoor/Outdoor Armored, 10G/300, OFCR (Riser) (Superior Essex Part # L3024NW01)
- B. Fiber Optic Connectors
 - 1. All fiber will be terminated on LC Multimode connectors as specified below:
 - 2. Design Make Fiber Connector: Hubbell P/N FCLCMM LC epoxy polish or P/N FCLC900K50GM12 ProClick.
 - 3. Fiber will be terminated into rack mounted unit for MDF Closet A and the fiber box assembly P/N ATFBMR included inside the NEMA/IDF cabinet.

9. NEMA Power Supply for MaxiProx Readers

- A. At All cabinets. See details in exhibits below.

10. Programming System

- 1. The Lenel access control contractor shall request Programming Proposal for addressing all Panels, Readers, Inputs and Outputs from: Access Control Integration (ACI) in Memphis, TN. Contact Mike Lee at 901-380-5527. Include programming from ACI in proposal. A reader worksheet will be provided for ACI to perform required programming. A copy of the worksheet shall be provided to FedEx Security for approval prior to programming.

Security Contact
 Brandon Parker or Stephen Shier
 2200 Forward Drive
 Harrison, AR. 72601
 (870) 704-5071 or 870-517-3934
 fxfsecuritysystems@fedex.com

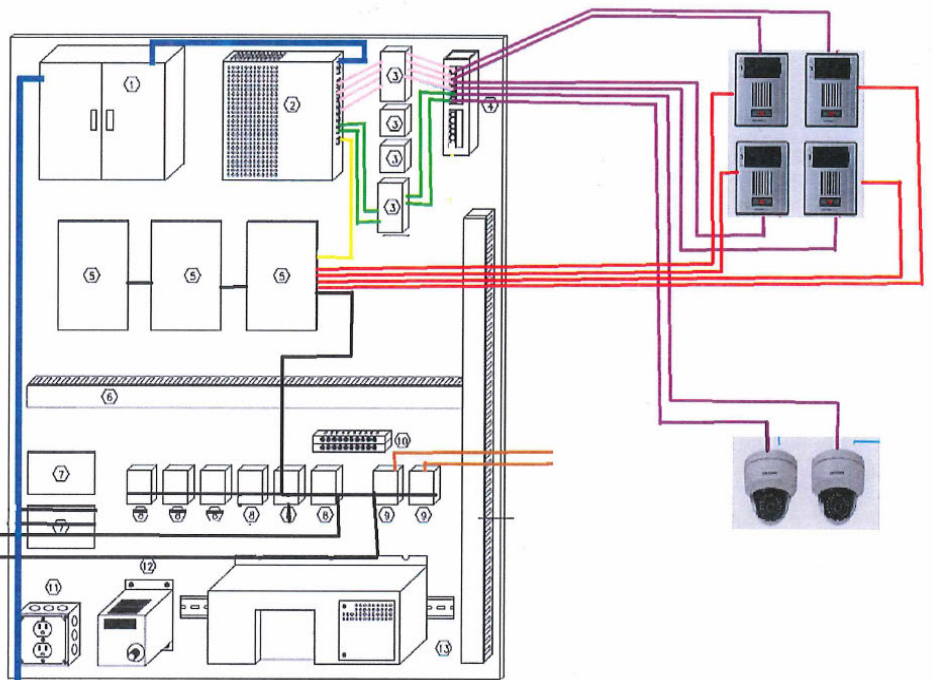
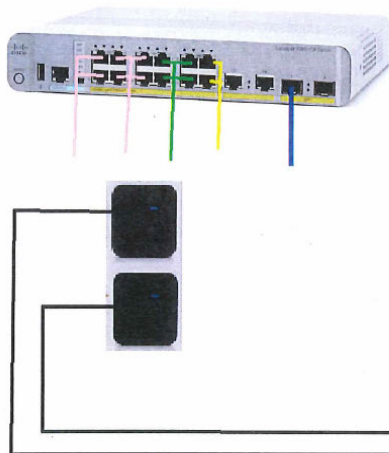
- 2. The Lenel contractor will install a data connection from FedEx Freight Operations network to initial Lenel panel in the LifeSafety Power Supply cabinet.
 - a. Yellow CAT6 patch cable shall be used for Access Control connection to the network.
- 3. The Lenel contractor will program the *IP address and other required info into the LAN module. (*Provided by FedEx Freight Security Systems)
- 4. All low voltage, fiber and other associated cables and devices shall be completely installed, terminated and ready for operation once programmed. At the same time, the Lenel access control contractor shall provide the access point location within the access control panel for each of the supplied card readers.
- 5. Downloading of the card access system will not be done until FedEx Freight Inc. moves the network into the facility during the scheduled week FFXF moves into the facility. The Lenel contractor must be on site over the opening weekend when IP address cutover takes place for validation of all card access, intercom, gates, turnstiles, and all ancillary components are working properly. This begins on the Friday before the opening date set for the Monday to follow.

11. NEMA Details

1. Detail Truck and Yard

NEMA Enclosure Detail

Truck / Yard Entrance
Scale: NTS



MDF to each NEMA Enclosure - Approved Fiber – Corning 24 strand OM3 Fiber, Indoor/Outdoor Armored, cable, Riser Multimode (Corning Part # 024TUF-T4180DA1)

Approved Fiber – Superior Essex 24-Strand OM3 Multimode, Indoor/Outdoor Armored, 10G/300, OFCR (Riser)(Superior Essex Part # L3024NW01)

Video Intercom Patch Cables (PINK) 1'

Maxiprox Readers - 18/6 STR SH WBLOCK Gray 1M from readers back to NEMA enclosures (West Penn Part number # AQC3186GY1000) No Substitutes.

Camera Patch Cables (GREEN) 1'

Video Intercom to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Video Intercom to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Network Patch Cable (YELLOW) 1.5'

Cameras to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Camera to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Video Intercom Trigger to Lenel Control Board - 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

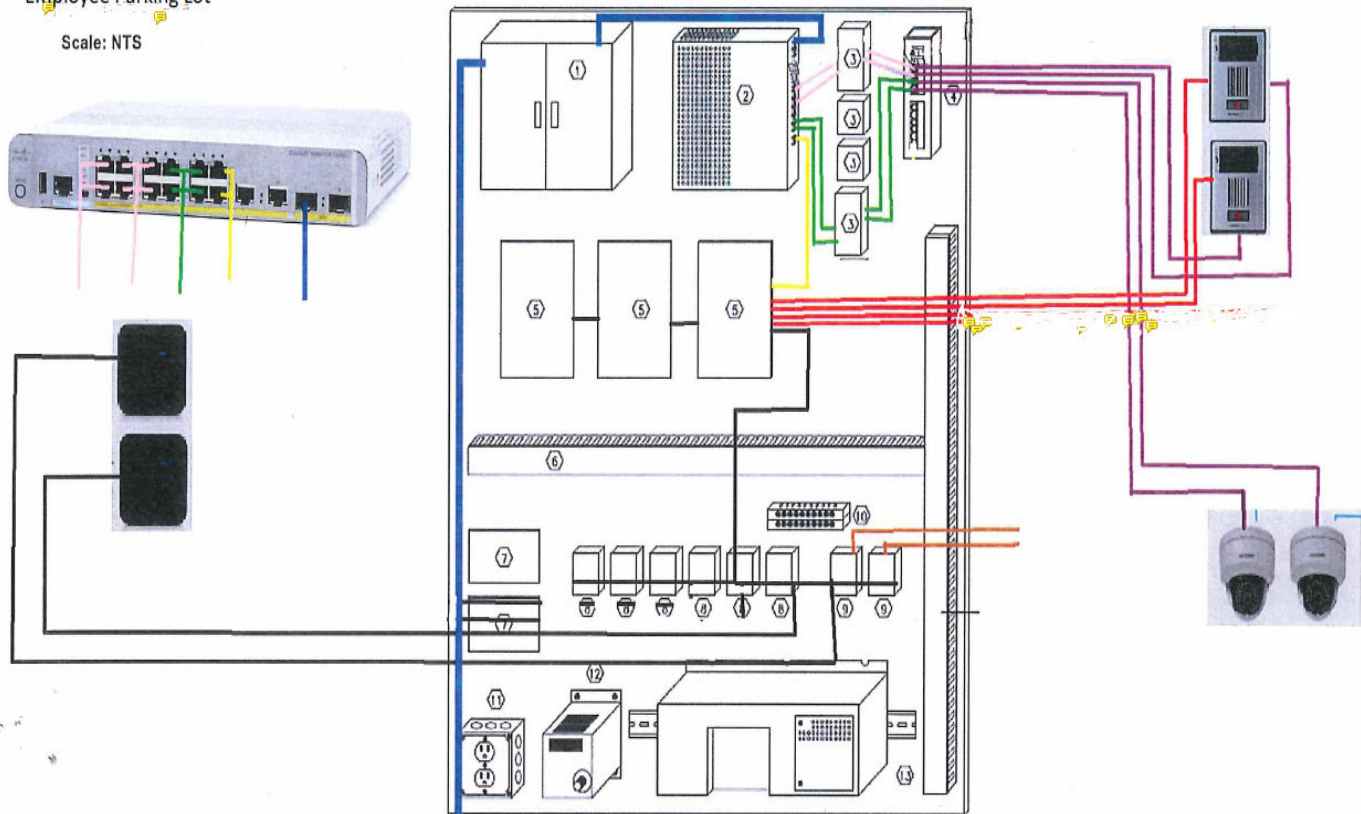
Gate Power Wire – 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

2. Detail Employee Parking

NEMA Enclosure Detail

Employee Parking Lot

Scale: NTS



MDF to each NEMA Enclosure - Approved Fiber – Corning 24 strand OM3 Fiber, Indoor/Outdoor Armored, cable, Riser Multimode (Coming Part # 024TUF-T4180DA1)

Approved Fiber – Superior Essex 24-Strand OM3 Multimode, Indoor/Outdoor Armored, 10G/300, OFCR (Riser)(Superior Essex Part # L3024NW01)

Video Intercom Patch Cables (PINK) 1'

Maxiprox Readers - 18/6 STR SH WBLOCK Gray 1M from readers back to NEMA enclosures (West Penn Part number # AQC3186GY1000) No Substitutes.

Camera Patch Cables (GREEN) 1'

Video Intercom to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Video Intercom to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Network Patch Cable (YELLOW) 1.5'

Cameras to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Camera to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Video Intercom Trigger to Lenel Control Board - 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

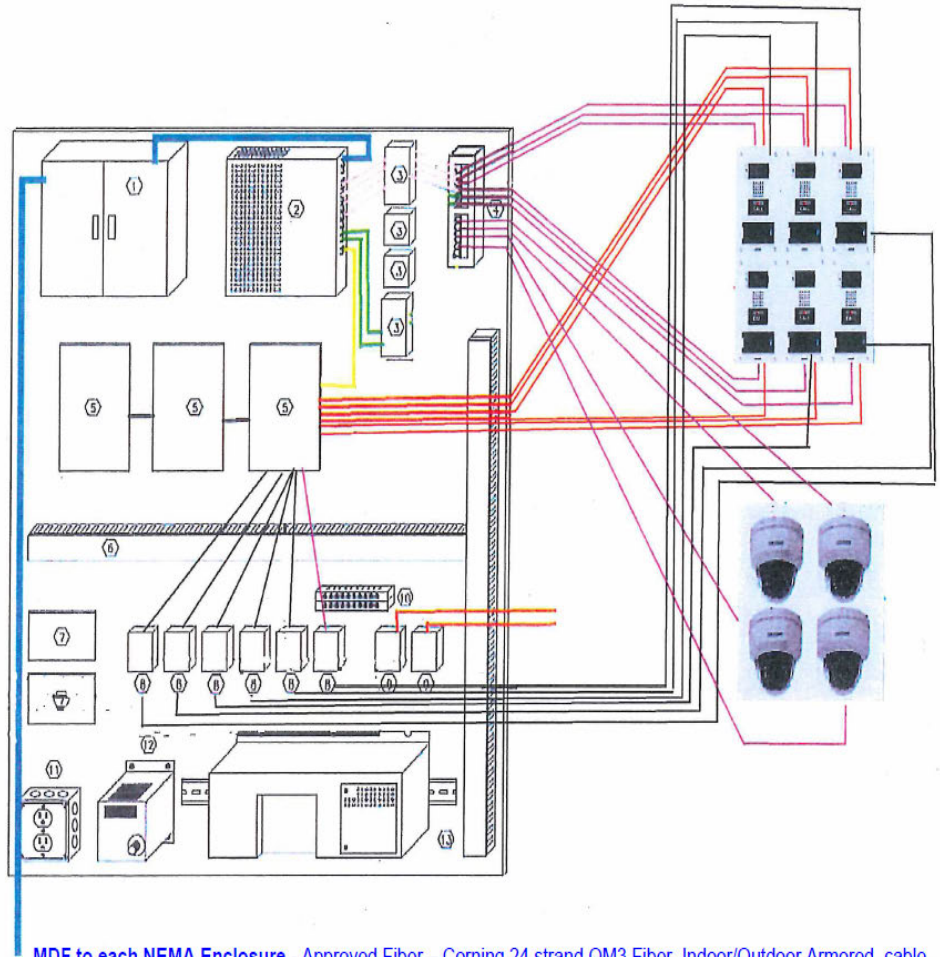
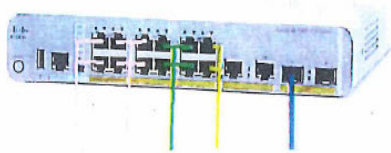
Gate Power Wire – 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

3. Detail Handicap Gates and Turnstiles

NEMA Enclosure Detail

Visitor Gate/ADA & Turnstile Combo

Scale: NTS



MDF to each NEMA Enclosure - Approved Fiber – Corning 24 strand OM3 Fiber, Indoor/Outdoor Armored, cable, Riser Multimode (Corning Part # 024TUF-T4180DA1)

Approved Fiber – Superior Essex 24-Strand OM3 Multimode, Indoor/Outdoor Armored, 10G/300, OFCR (Riser) (Superior Essex Part # L3024NW01).

Video Intercom Patch Cables (PINK) 1'

HID Reader (RP10) - 18/6 STR SH WBLOCK Gray 1M from readers back to NEMA enclosures (West Penn Part number # AQC3186GY1000) No Substitutes.

Camera Patch Cables (GREEN) 1'

Video Intercom to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Video Intercom to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Network Patch Cable (YELLOW) 1.5

Cameras to NEMA Enclosure - Outdoor Gel filled (jet Black) CAT6 from Camera to NEMA enclosures (Belden Part # OSP-CM00424BDN-C6-02)

Video Intercom Trigger to Lenel Control Board - 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

Gate Power Wire – 18/2 STR CMP I/O Black 1M (West Penn Part # AQ224BK1000) No Substitutes

12. Intercom IP and Naming details

Door Station	Assigned IP Address	Mask	Switch Location	Switch Port Number
Main Truck Gate In-Bound (Upper)	192.168.240.200	255.255.255.0	NEMA Yard IDF 1	Port 1
Main Truck Gate In-Bound (Lower)	192.168.240.201	255.255.255.0	NEMA Yard IDF 1	Port 2
Main Truck Gate Out-Bound (Upper)	192.168.240.202	255.255.255.0	NEMA Yard IDF 1	Port 3
Main Truck Gate Out-Bound (Lower)	192.168.240.203	255.255.255.0	NEMA Yard IDF 1	Port 4
Employee Parking Lot In-Bound	192.168.240.204	255.255.255.0	NEMA Yard IDF 2	Port 1
Employee Parking Lot Out-Bound	192.168.240.205	255.255.255.0	NEMA Yard IDF2	Port 2
Visitor Man Gate In-Bound	192.168.240.206	255.255.255.0	NEMA Yard IDF2	Port 3
Visitor Man GateOut-Bound	192.168.240.207	255.255.255.0	NEMA Yard IDF2	Port 4
Employee Turnstile In-Bound	192.168.240.208	255.255.255.0	NEMA Yard IDF 3	Port 1
Employee Turnstile Out-Bound	192.168.240.209	255.255.255.0	NEMA Yard IDF 3	Port 2
ADA Gate In-Bound	192.168.240.210	255.255.255.0	NEMA Yard IDF 3	Port 3
ADA Gate Out-Bound	192.168.240.211	255.255.255.0	NEMA Yard IDF 3	Port 4
Tractor/Driver Turnstile In-Bound	192.168.240.212	255.255.255.0	NEMA Yard IDF 3	Port 5
Tractor/Driver Turnstile Out-Bound	192.168.240.213	255.255.255.0	NEMA Yard IDF 3	Port 6
Front Door	192.168.240.214	255.255.255.0	MDF Security Switch	Port 1
Patio to Breakroom	192.168.240.215	255.255.255.0	MDF Security Switch	Port 2
Dock to Breakroom	192.168.240.216	255.255.255.0	MDF Security Switch	Port 3
Breakroom to office/Driver Check in	192.168.240.217	255.255.255.0	MDF Security Switch	Port 4
Reception Master Station	192.168.240.218	255.255.255.0	MDF Security Switch	Port 5
Dispatch Master Station	192.168.240.219	255.255.255.0	MDF Security Switch	Port 6
Pod Master Station	192.168.240.220	255.255.255.0	MDF Security Switch	Port 7
Guard Shack Master Station	192.168.240.221	255.255.255.0	MDF Security Switch	Port 8

16.8 DOCK FANS – DAYTON/TPI – NOT USED

16.9 DOCK FANS – PATTERSON

- A. Where indicated and scheduled on drawings, provide an install electric industrial grade non-oscillating air circulator fan as specified.
- B. Fans at 80' wide docks or less: Provide Patterson 22" High Velocity Industrial Non-Oscillating Air Circulator Fan, 5570 cfm, with yoke mount YM mounting bracket, 277 volt/1.85 amps/512 watts, maintenance free 1/2 hp direct drive motor with sealed bearings, powder coated steel barrel, 3-blade galvalume propeller, continuous duty cycle, 69 lbs, 2-year warranty. At existing sites, field verify voltage available before ordering fans. One fan required at each bay and shall alternate location in each bay as shown on drawings.
- C. Fans at 81' wide docks or more: Provide Patterson 22" High Velocity Industrial Non-Oscillating Air Circulator Fan, 5570 cfm, with yoke mount YM mounting bracket, 277 volt/1.85 amps/512 watts, maintenance free 1/2 hp direct drive motor with sealed bearings, powder coated steel barrel, 3-blade galvalume propeller, continuous duty cycle, 69 lbs, 2-year warranty. At existing sites, field verify voltage available before ordering fans. Two fans required at each bay.
- D. Fans at Shop Service Bays & Maintenance Service Bays: Provide Patterson 22" High Velocity Industrial

Non-Oscillating Air Circulator Fan, 5570 cfm, with yoke mount YM mounting bracket, 277 volt/1.85 amps/512 watts, maintenance free 1/2 hp direct drive motor with sealed bearings, powder coated steel barrel, 3-blade galvalume propeller, continuous duty cycle, 69 lbs, 2-year warranty. At existing sites, field verify voltage available before ordering fans.

E. Contact:

Matt Patterson/FedEx National Accounts Mgr
Patterson Fan Company
1120 Northpoint Blvd
Blythewood, SC 29229
800.768.3985 Ext 102
Email: matt@pattersonfan.com

F. Mount fans to structure as per manufacturer's recommendations and provide safety cable.

G. Electrical system for fans shall be designed and installed to allow for 277v, 1-phase motor operation. Fan shall be furnished meeting such specification. Provide sufficient number of circuits so as not to load each circuit more than 80% of its rated capacity, with on-off switch for each fan circuit.

End of Tab 8 - Specifications