Attachment 1.6 to Exhibit A

SECTION 00 00 10 – BUILDING NARRATIVE

1. ARCHITECTURAL DESIGN NARRATIVE

General

The following Project Description consists of narratives and an outline specification index as appropriate to convey performance requirements and basis of design information proposed for the Project. It is issued as a part of the "Request for Proposals (RFP) To Design, Build, & Finance Relocation of 1685 North Throop Operations" Documents, dated 05.24.2017. The intent of this document is to supplement the RFP documents and to assist in the development of an estimate of project construction cost and to engage entities to provide design/build/finance services.

This narrative addresses the framework for the scope of work for each of the three buildings. The scope of work for the proposed projects for the Department of Fleet and Facility Management entails relocation of operations from 1685 N. Throop to the following three sites, referred to as follows herein:

- **Project 1 – Main Heavy Duty Shop**
- **Project 2 – North Side Satellite Shop**
- **Project 3 – Fuel Station**

Provide buildings as described individually below, with bay sizing and height clearances that responds to the space requirements of the individual programs housed within for each building. Buildings are to be installed and designed in accordance with applicable code authorities and the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder and shall be coordinated with the results of reports to be obtained and preliminary site plans provided.

The design and construction of this project is to follow the City of Chicago Sustainable Operations Plan. The plan is located at the link listed below:

https://www.cityofchicago.org/content/dam/city/depts/dgs/supp_info/ChicagoSustainableOperationsPlan_v0_April2015.pdf

As stated in Exhibit A, it is assumed that the new garage structures would be classified as follows, based on a preliminary review by the City of Chicago Department of Buildings:

- Class H-3, Garage (Division 3, 13-56-200)
- Type 1-A Fire Resistive Construction (Division 6, Section 13-60-020)
- One story with no basement, maximum 45' high
- Fully sprinklered
- Minimum 2 hour fire-rated materials and enclosures separating different occupancies (CNG protection / Division , Table 13-056-280)
- Minimum fire protection at columns as follows (Division 6, 13-60-100, Note k):
    - o 4 hour fire-rated materials and enclosures around columns up to 14' above floor
    - o 1 hour fire-rated materials and enclosures around columns between 14'-20' above floor
    - o No rating required above 20 feet

The Successful Bidder shall assume at least one meeting with appropriate City of Chicago & Department of Buildings reviewers to confirm the preliminary review assumptions. Appropriate

changes to be coordinated with the design based off of feedback from these meetings to secure proper permits and approvals.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

Successful Bidder is responsible for verifying performance and/or suitability of any systems to be used or proposing reasonable Alternates to be considered. Such verification shall be performed prior to any demolition or construction.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Description of Work – Project 1 - Main Heavy Duty Shop

Refer to Exhibit A for an overall outline of the site plan and individual program areas. New construction shall meet the following requirements, including, but not limited to:

Exterior Envelope Assembly

- Exterior walls to be coordinated with structural steel/CMU systems framed and insulated to meet required Chicago Energy Conservation Code / IECC R-values, especially in the Administrative wing.
- Roof Assembly to be coordinated with structural composite concrete/steel systems and insulated to meet required Chicago Energy Conservation Code / IECC R-values, minimum R-30. Roof to be TPO with a minimum of 4" rigid of insulation – roof design will need to be coordinated with applicable codes.
- Exterior fenestration, including windows and clerestories, shall comply with all Chicago Energy Conservation Code / IECC U- and SHGC values, as follows:
    - o U-Value (max.): 0.35
    - o SHGC (max.): 0.40
- All exterior walls and structural framing members are to be fireproofed to meet NFPA and CBC requirements in accordance with the selected construction type.

Interior Construction

- Interior walls to be coordinated with structural steel/CMU systems framed and insulated to meet required fire-rated and acoustical separations in accordance with NFPA and Chicago Building Code requirements per the selected construction type.
- Class E occupancy areas, such as the Administrative Wing, must be separated from the main garage by rated walls in accordance with applicable code requirements.
- All administrative, garage support areas, and service office walls bordering the garage to be typical CMU construction. All walls to be sufficiently acoustically insulated to mitigate sound transfer between shop machinery and adjacent programs.
- **Administrative Wing**

    - o Interior walls to consist of typical metal stud and drywall construction. Private offices, toilet rooms, dispatch center, training room, library, MDF/IDF Rooms, and conference rooms to include acoustical batt insulation.
    - o Ceilings throughout the administrative wing to consist of a cleanable acoustical ceiling tile. Ceilings in bathroom areas should include hold down clips.
    - o Flooring shall consist of carpet tiles in the private offices/conference rooms, and cleanable resilient/epoxy flooring in the restrooms, open office, and lobby areas. Back of house/work areas to receive VCT flooring or sealed concrete.

- **Garage Floor / Shop Areas**

    - o Interior walls to consist of typical painted CMU / metal partition construction. Paint shop, wash bays, sandblast room and other potentially hazardous areas to be separated by an overhead door and arranged to allow for proper ventilation.
    - o Blacksmith and Sheet Metal shops to be partitioned by chain-link/premanufactured metal fencing that is open to structure above. No solid partitions to be used at these locations.
    - o Sandblast & Paint shops shall consist of premanufactured, self-contained units to be installed in designated areas on the garage floor. Units shall be coordinated with the mechanical, electrical, and plumbing systems to provide proper power and ventilation as recommended by manufacturer, required by associated systems and equipment, and in accordance with all applicable codes and regulations.
    - o Compressor area and all areas subject to fluids as a part of the program shall have a depressed floor slab, sloped adequately for collection. Design to be coordinated with mechanical and plumbing systems to allow for safe, sanitary, and environmentally friendly disposal. Refer to City of Chicago Sustainable Operations Plan for more information.
    - o Ceilings shall be exposed to underside of structure with overhead bay lighting coordinated with structural, mechanical, and plumbing systems. Ceiling elements shall be fireproofed as required by local codes.
    - o Flooring shall consist of sealed concrete throughout, including striping and appropriate marking to indicate work areas and flow of traffic. Top surface shall be roughened/coated appropriately to provide adequate slip resistance while maintaining cleanability / durability.

Description of Work – Project 2 – North Side Satellite Shop

New construction of the satellite shop shall be very similar to the requirements indicated for the Main Heavy Duty Shop above. Refer to Exhibit A for specific differences in programs, equipment, and layout required.

Description of Work – Project 3 – Fuel Station

Refer to Exhibit A for an overall outline of the site plan and individual program areas. New construction shall meet the following requirements, including, but not limited to:

Exterior Envelope Assembly

- Exterior walls to be coordinated with structural steel/CMU systems framed and insulated to meet required Chicago Energy Conservation Code / IECC R-values, especially in the Administrative wing.
- Roof Assembly to be coordinated with structural composite concrete/steel systems and insulated to meet required Chicago Energy Conservation Code / IECC R-values, minimum R-30. Roof to be TPO with a minimum of 4” rigid of insulation – roof design will need to be coordinated with applicable codes.
- Exterior fenestration, including windows and clerestories, shall comply with all Chicago Energy Conservation Code / IECC U- and SHGC values, as follows:
    - o U-Value (max.): 0.35
    - o SHGC (max.): 0.40
- All exterior walls and structural framing members are to be fireproofed to meet NFPA and CBC requirements in accordance with the selected construction type.

Interior Construction

- Interior walls to be coordinated with structural steel/CMU systems framed and insulated to meet required fire-rated and acoustical separations in accordance with NFPA and Chicago Building Code requirements per the selected construction type.
- **Attendant Area**
  - o Interior walls to consist of typical metal stud and drywall construction.
  - o Ceilings to consist of a cleanable acoustical ceiling tile. Ceilings in bathroom areas should include hold down clips.
  - o Flooring shall consist of resilient/epoxy flooring in the majority of the attend area. Back of house/work areas to receive VCT or Epoxy flooring.
- **Oil Storage Room**
  - o Interior walls to consist of typical CMU construction and rated appropriately to separate the attendant area from hazardous use. Walls to be properly insulated to protect contents of room.
  - o Ceilings to be exposed to underside of structure with overhead lighting coordinated with structural, mechanical, and plumbing systems.
  - o Flooring shall consist of sealed concrete.
  - o Compressor area and all areas subject to fluids as a part of the program shall have a depressed floor slab, sloped adequately for collection. Design to be coordinated with mechanical and plumbing systems to allow for safe, sanitary, and environmentally friendly disposal. Refer to City of Chicago Sustainable Operations Plan for more information.

Refer to Section 00 00 20 – 'Specification Index' for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

2. STRUCTURAL DESIGN NARRATIVE

General

Provide single story steel structural system with bay sizing and height clearances that responds to the mechanical, electrical, and plumbing systems to be used, as well as the space requirements of the individual programs housed within. The intent is to provide complete structural systems for each building, consisting of concrete/CMU foundation walls, concrete slabs, steel columns, and open web steel joists to support and frame the new structures at each location. Systems are to be installed and designed in accordance with applicable code authorities and Divisions 16-18 of the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder and shall be coordinated with the results of Geotech and soils reports to be obtained.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

All structural members are to be sized and dimensioned in accordance with loading requirements and soils reports and based off of coordination with the architectural intent and mechanical, electrical, plumbing, fire suppression systems. Successful Bidder to verify performance and/or suitability of any systems to be used. Such verification shall be performed prior to any demolition or construction.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Description of Work

The intent is to provide a complete and fully functional structural system for each structure as outlined herein to comply with code authorities having jurisdiction, as well as required live, dead, and wind loads in compliance with Divisions 16-18 of the Chicago Building Code.

Furnish and install complete systems, including, but not limited to:

General Description – Main / Satellite Garages

- Provide complete, functional, and approved structural system, consisting of concrete spread footings; steel columns; composite concrete/metal deck roof slab supported by steel beam and bar joist system. Frame all clerestory windows/skylights as necessary to provide appropriate daylighting.
- Sizing and composition of framing members and footings to be designed in accordance with results of Geotech surveys and required live, dead, and wind loads by applicable codes.
- Coordinate bay sizing and loads with architectural intent, equipment intended to be used, and vehicle passageways as necessary.
- Provide lateral bracing and coordinate between separate structural systems as necessary.
- Known load requirements include, but are not limited to:
    - o Live Loads:
        - ▪ Main (Heavy Duty) Garage: 250 psf
        - ▪ Satellite Garage: 125 psf
        - ▪ Admin/General Corridors: 100 psf
        - ▪ Shops: 125 psf
    - o Roof Loads:
        - ▪ Snow Loads: To be Designed
        - ▪ Rain Loads: 25 psf
    - o Lateral Loads:
        - ▪ Wind Load (Minimum): 30 psf

General Description – Fuel Station/Depot

- Provide complete, functional, and approved structural system, consisting of concrete spread footings; steel columns; composite concrete/metal deck roof slab supported by steel beam and bar joist system. Underground vault storage for tanks to be installed within grounds – refer to Architectural Narrative for tank capacities. Frame all windows as necessary to provide appropriate daylighting.
- Sizing and composition of framing members and footings to be designed in accordance with results of Geotech surveys and required live, dead, and wind loads by applicable codes.
- Known load requirements include, but are not limited to:
    - o Live Loads:
        - ▪ Fuel Station: 250 psf
        - ▪ Attendant / Occupant Area: 100 psf
    - o Roof Loads:
        - ▪ Snow Loads: To be Designed
        - ▪ Rain Loads: 25 psf
    - o Lateral Loads:
        - ▪ Wind Load (Minimum): 30 psf

Refer to Section 00 00 20 – ‘Specification Index’ for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

3. FIRE PROTECTION DESIGN NARRATIVE

General

Provide Fire Protection system zoned appropriately to respond to the various occupancies and hazardous conditions to be housed within. The intent is to provide complete sprinkler systems installed and designed in accordance with NFPA and Division 09 of the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

All penetrations and sleeves are to be sized and dimensioned based off of coordination with the structural system. Successful Bidder to verify performance and/or suitability of any existing utility feeds and/or systems to be used. Such verification shall be performed prior to any demolition or construction.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Refer to Section 00 00 20 – 'Specification Index' for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

Description of Work

The intent is to provide sprinkler protection throughout all areas of new construction to comply with NFPA 13 as fully sprinklered.

Furnish and install complete and operable automatic sprinkler systems for each building including, but not limited to:

Overall Design - Heavy / Satellite Garages & Fuel Station/Depot

- Provide complete wet pipe automatic sprinkler systems and related equipment throughout the entire building as required due to new construction.
- Provide hose connections throughout building, locations to be coordinated with structural, electrical and plumbing systems.
- Supervised sprinkler floor control valve at each zone with combination drain and inspectors test connection.
- Fire pump acceptance test
- Waterflow and tamper switches
- Sleeves/firestopping as required
- Spare sprinkler cabinets with spare sprinklers and sprinkler wrench
- Hydraulic calculations & as-built drawings
- Fire extinguishers/cabinets throughout the entire building as required
- Auxiliary drains as necessary
- Access Panels. Coordinate work with all other trades.
- Electric power supply and associated accessories to furnish and install complete integrated notification system as required by NFPA / Chicago Code, including, but not limited to: waterflow switches, tamper switches, local alarm system, releasing panels, strobes, and alarm bells.

Hangers and Supports

- Hangers shall be spaced as required by NFPA 13.
- All hangars and components used in non-tempered garage areas and exposed to atmospheric conditions shall be electro-zinc plated, no plain steel shall be allowed.

- Hangar assemblies supporting the pipe supplying an end sprinkler in a pendant position shall be restrained to prevent upward movement and located no greater than 12" for sprinkler head.

Pipes and Fittings/Valves and Devices/FA Notification Devices

- All fitting material, and installation shall be per NFPA 13 Requirements.
- Pressure ratings of all fittings, valves, and devices shall meet and/or exceed maximum working pressure available within systems.
- All pipings/fittings shall be UL listed and approved.
- Install waterflow/valve supervisory switches for all valves on the fire protection system.

Drains

- Pipe all drains and inspector's test connection to outside locations where water drained will not damage equipment, vehicles, or injure personnel.
- Underground piping shall be flushed before connection to interior sprinkler piping.

Identification

- Provide metal signs on control, drain, test valves, etc. to identify their purposes and functions in accordance with NFPA 13.
- Provide hydraulic placard for each sprinkler system in accordance with NFPA 13.

Fire Stopping

- Fire stopping shall be required at all floor and fire-rated wall/partition penetrations. Installation shall be in strict accordance with the manufacturer's published directions and per fire tested designs that have been accepted by the appropriate code authority having jurisdiction.

The Successful Bidder shall be responsible during the installation and testing periods of the sprinkler system for any loss or damage to the work caused by leaks in any equipment, by unplugged or disconnected pipes, fittings, or by overflow and shall be responsible for the necessary replacements or repairs.

Refer to Section 00 00 20 – 'Specification Index' for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

4. PLUMBING DESIGN NARRATIVE

General

Provide plumbing system to respond to the spaces, fixtures, and equipment to be housed within, as well as allowing integration with the layout of the structural system selected. The intent is to provide complete and operable systems of sanitary sewers, vent piping, storm drain piping, domestic cold, hot, and hot water return systems, and grease waste systems for each building. System is to be installed and designed in accordance with applicable code authorities and Division 29 of the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

All penetrations and sleeves are to be sized and dimensioned based off of coordination with the structural system. Successful Bidder to verify performance and/or suitability of any existing utility feeds and/or systems to be used. Such verification shall be performed prior to any demolition or construction.

All plumbing systems and piping systems shall be tested, cleaned, flushed and, where appropriate, sterilized per local, state and federal applicable standards.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Description of Work

The intent is to provide complete and operable systems of sanitary sewers, vent piping, storm drain piping, domestic cold, hot, and hot water return systems, and grease waste systems for each building. This includes, but is not limited to:

Overall Design - Heavy / Satellite Garages & Fuel Station/Depot

- Provide complete sanitary plumbing systems and related fixtures/equipment throughout the administrative portion of the building as required (Main / Satellite Garage).

- **Cold Water System**
  - o Provide main cold water distribution piping with expansion loops and shutoff valves as required. Provide separate shutoff valves in corridor ceilings as necessary tor toilet rooms, kitchens, and equipment.
  - o Provide water distribution valves as required by code and as listed below. Valves shall be installed within accessible locations and/or provided with access panels in locations as necessary.
    - At all water main separations
    - At each branch extension from mains
    - Immediately outside each room where plumbing occurs
    - At each piece of equipment
  - o Provide pipes, fittings, valves, air chambers, air shock absorber, di-electric unions, vacuum breakers, hangers and supporting steel, code required backflow preventers, pressure reducing valves, pumps, and miscellaneous related items for a complete and operable system.
  - o The cold water serving the various areas of each building shall be routed above ceiling level, through chases, and in pipe sleeves. The piping shall not be cast into the concrete. All pipe sleeves shall have fire proofing.
  - o Provide and install stop valves at each fixture.
  - o Provide cold water hose bibs with code approved/elevated vacuum breaker at appropriate points throughout the garage bay.
  - o The cold water system shall be designed to maintain a minimum constant water pressure at each fixture of at least thirty (30) psi at all flush valves and tanks and/or the minimum pressure recommended by the fixture manufacturer.

- **Hot Water System**
  - o Furnish and install electric water heaters with storage for the bathroom areas. The water heaters shall operate at 130˚ F.
  - o Extend hot water from mixing valves to all plumbing fixtures, equipment, and outlets requiring hot water.
  - o Provide main hot water distribution piping with expansion loops and shutoff valves as required in accessible ceilings and chases.
  - o Refer to description of cold water system for requirements on distribution, valves, and piping locations.

- **Storm Water System**
  - o Furnish and install roof drains and storm water management systems as necessary to collect all storm drainage. Size all gravity piping and interior system as necessary supply a complete operable storm water system.

- o Roof drain and building storm drain sizing shall be based on requirements in the applicable building codes.
- o Provide a secondary (emergency) roof drainage system consisting of overflow roof drains and independent collected and pipe storm drainage system within the building.
- o Provide and locate exterior trench drains, catch basins, and automatic sumps as necessary near entries and exterior lots and work areas.

- **Sanitary Waste System**
  - o Provide waste/soil and vent piping to each and every plumbing fixture, floor drain, and item of equipment as required by code.
  - o Provide cleanouts in soil, waste, and sewer lines as required by code.
  - o Provide sanitary vent system complete with individual fixture vents, drain vents, vent stacks, stack vents, and extensions to roof terminations. Locate vent terminals away from fresh air intakes or openings per code. Each fixture and drain shall be individually trapped and vented.
  - o Provide an independent grease sanitary system to equipment and outlets the require grease waste connections by code.
  - o All floor drains, including drains below grade, shall be individually vented.
  - o Provide floor drains in all public toilet rooms, trash rooms, and where required by code. At a minimum, floor drain locations shall include, but not be limited to the following locations:
    - ▪ Pump rooms
    - ▪ Mechanical Equipment Rooms
  - o Provide trench drains for the garage spaces as necessary.
- Plumbing fixture counts and locations to be coordinated with occupancy requirements and structural, mechanical, and electrical systems to be used based on applicable codes.
- All plumbing lines and associated equipment to be properly isolated for vibration and insulated as necessary.
- All restrooms to be ADA accessible.

Refer to Section 00 00 20 – 'Specification Index' for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

5. MECHANICAL DESIGN NARRATIVE

General

Provide a mechanical system to respond to the spaces, fixtures, and equipment to be housed within, as well as allowing integration with the layout of the structural system selected. Temperatures and conditions required to maintain the vehicles and equipment within the garage bays will be crucial. The intent is to provide complete and operable assemblies of heating, ventilating, and air conditioning systems for each building. System is to be installed and designed in accordance with applicable code authorities and Division 28 of the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

All penetrations and sleeves are to be sized and dimensioned based off of coordination with the structural system. Successful Bidder to verify performance and/or suitability of any existing utility feeds and/or systems to be used. Such verification shall be performed prior to any demolition or construction.

All mechanical systems and equipment shall be tested, balanced, and commissioned per local, state and federal applicable standards.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Products, including equipment, devices, fixtures, and materials shall be new; UL listed wherever applicable, and bear appropriate identification.

All exterior ductwork to be properly insulated per manufacturer's recommendations and in accordance with applicable codes to maintain an operable system.

Description of Work

The intent is to provide complete and operable assemblies of heating, ventilating, and air conditioning systems for each building. This includes, but is not limited to:

Overall Design - Heavy / Satellite Garages & Fuel Station/Depot

- Provide complete and operable assemblies of heating, ventilating, and air conditioning systems and related equipment throughout the entire building as required due to new construction. Primary elements shall include, but are not limited to:
    - o Rooftop air handling units sized and powered appropriately to condition entire space
    - o Properly sized ductwork, supply and return terminals, transfer grilles, diffusers, and VAV boxes as necessary to provide a fully designed system compliant with all applicable code authorities. Administrative wing, paint booths, sandblast room, and garage support areas to receive drops and ducted supplies/returns as required. All open garage spaces shall include drops directly from the rooftop units located to adequately ventilate and condition the space.
    - o Large industrial HVLS ceiling/wall mounted fans spaced and numbered appropriately to provide air movement throughout the garage spaces as required.
- Successful bidder is responsible for incorporating including necessary considerations in the design of each system including, but not limited to, the following criteria:

    - o Outdoor Conditions (or as required by code, whichever is more stringent)
        - ▪ Winter: 0 ˚ F
        - ▪ Summer: 91 ˚ F DB, 75 ˚ F WB
    - o Indoor Conditions (or as required by code, whichever is more stringent)

	Summer	Winter
▪ Lobby/Offices	72 ˚ F / 50% RH max	68 ˚ F
▪ Attendant Area	72 ˚ F / 50% RH max	68 ˚ F
▪ Garage / Shops	Ventilated	Determined by Equipment
▪ Mech/Elec Rooms	Ventilated	Not Required

    - o Acoustic Requirements (minimize vibration)
    - o Design Loads
        - ▪ Lighting and Power Loads (to be coordinated with equipment and requirements of electrical system selected)
        - ▪ People Loads (Coordinate with expected occupant load and conform to ASHRAE 62.1 and all other applicable codes)
        - ▪ Exposure Loads
        - ▪ Ventilation Loads (Outdoor air per Code or ASHRAE 62.1, whichever is greater)

- Provide digital Building Automation System (BAS) fully integrated and zoned based off of occupancies and separations. System shall be Direct Digital Control (DDC), electronic with open architecture. Provide all necessary wiring, thermostats, motor operated dampers, sensors, alarms and devices necessary for complete and operational systems.

- o BAS shall allow remote start/stop and adjustment of setpoints for rooftop units and toilet exhaust fans via a modem, internet, or Ethernet connection.
- o Provide a building fire department override panel for fire department control of major systems and exhaust fans. Override panel shall be located adjacent to the building fire alarm panel.
- o Provide alarms and status for rooftop units and toilet exhaust fans
- o Mount and wire all unit controls and panels in accessible areas
- o Provide readout of status and sensor inputs, setting of control points, and display of alarms at each primary control panel.

- Size ducts (where applicable) appropriately as required by Code as well as the following criteria, whichever is more stringent:
  - o Ductwork shall be sized to maintain pressure drop or velocities as noted below (whichever results in a larger duct size):
    - ▪ Open Office
      - • Main supply and return ducts — 800 ft/min max.
      - • Branches to diffusers — 600 ft/min max.
      - • Transfer ducts — 0.05” per 100 equivalent feet of duct
    - ▪ Low Pressure Ductwork
      - • Low pressure supply/exhaust — Pressure drop of 0.08” per 100 equivalent feet of ductwork OR 1,200 ft/min max.
      - • Return shafts — 1,200 ft/min max.
      - • Inlets to return shaft — 1,000 ft/min max.
    - ▪ Constant volume supply — 1,200 ft/min/max
    - ▪ Transfer ductwork — 300 ft/min max.

- Distribute insulated chilled water piping to rooftop air handling units. Extend insulated condensate drain piping to rooftop drains as necessary. Extend rooftop unit drains to splash blocks.
- Provide all miscellaneous equipment and devices as required, including expansion tanks, relief valves, air separators, air vents, refrigerant vents, drains, valves, unions, flanges, thermometers and gauges, expansion joints, anchors, guides, and installation of controls integrated with BAS system.
- Provide vibration isolation and sound control measures on all interior equipment as necessary including, but not limited to, the following:
  - o Flexible connectors on suction and discharge of base mounted pumps
  - o Spring isolators on roof-top units, fans over 3/4 HP, piping within mechanical rooms, and ductwork within 40 feet of AHUs
  - o Flexible duct connections to fans / AHUs
  - o Acoustic silencers at inlet and discharge of fans and air handling unit where required for quiet operation
- Coordinate piping for all water feeds as necessary with plumbing system selected and in accordance with all prevailing codes.

Refer to Section 00 00 20 – ‘Specification Index’ for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

6. ELECTRICAL DESIGN NARRATIVE

General

Provide an electrical system to respond to the spaces, fixtures, and equipment to be housed within, as well as allowing integration with the layout of the structural system selected. Lighting shall be coordinated with natural lighting elements to provide a well-lit space during the hours of operation, while minimizing energy costs and usage as much as possible. The intent is to provide complete

and operable electrical and lighting systems for each building. System is to be installed and designed in accordance with applicable code authorities and Division 27 of the Chicago Building Code. Final design, installation, and performance shall be the responsibility of the Successful Bidder.

All work to be performed and installed in strict accordance with all applicable rules and regulations of local, state and federal governments, and other authorities having lawful jurisdiction.

All penetrations, conduits, and sleeves are to be sized and dimensioned based off of coordination with the structural, mechanical, and plumbing systems. Successful Bidder to verify performance and/or suitability of any existing utility feeds and/or systems to be used. Such verification shall be performed prior to any demolition or construction.

All electrical systems and equipment shall be tested per local, state and federal applicable standards.

It is the Successful Bidder's responsibility to verify that the areas and equipment provided are sufficient for the systems required.

Products, including equipment, devices, fixtures, and materials shall be new; UL listed wherever applicable, and bear appropriate identification.

Description of Work

The intent is to provide complete and operable electrical and lighting systems for each building. This includes, but is not limited to:

Overall Design - Heavy / Satellite Garages & Fuel Station/Depot

- Provide complete and operable assemblies of electrical and lighting systems and related equipment throughout the buildings as required due to new construction. All lighting elements are to be designed to meet IECC / Chicago Code requirements or as outlined below, whichever is more stringent. Primary elements shall include, but are not limited to:

    - Energy efficient, overhead LED lighting with lumen packages to adequately light the space. LED fixtures shall include solid-state lamp drivers.
    - Light values shall be balanced and coordinated with natural lighting. Lighting levels to meet or exceed IESNA standards. Light watt densities and manual/automatic controls to meet or exceed energy conservation code requirements. Recommended values are as follows – code requirements shall govern where more stringent:
        - Corridors: 20 FC / 200 lux
        - Conference Rooms: 50 FC / 500 lux
        - Garage: 50 FC / 500 lux
        - Lobby: 30 FC / 300 lux
        - Open Office: 50 FC / 500 lux
        - Private Offices: 50 FC / 500 lux
        - Restrooms: 20 FC / 200 lux
        - Support spaces: 20 FC / 200 lux
    - Min 100kW emergency natural gas generator set and associated distribution to serve building emergency and option standby loads. Automatic transfer switches shall be supplied for code-required emergency loads, with separate automatic transfer switch with load add-shed functions for optional standby loads.
        - Emergency Electrical Loads shall include the following at a minimum (where applicable for each building):
            - Emergency and exit lighting
            - Fire alarm and life safety systems

- Smoke exhaust system
- MDF/IDF room infrastructure
- Security system
- Building Automation System (BAS) control panels
- Emergency telecom network feeds

o Building electrical distribution system designed and installed according to code authorities having jurisdiction, including the following elements:
  - Switchboards with all necessary buses, remote operators, ground fault protection, and distribution devices
  - Distribution panels, including all accessories and devices
  - Branch panels, including all accessories and devices
  - Heavy-duty local equipment disconnect switches for each unit of mechanical equipment
  - Heavy-duty motor starters
  - Transformers, including all accessories and devices
  - Relay-based PLC controlled lighting panels for control of lighting systems in administration areas in accordance with energy conservation code and program requirements. Vacancy sensors shall also be supplied for enclosed rooms and offices in the administration wing.

o Integrated grounding system, including:
  - Minimum four (4) copper clad ground rods below main electrical room
  - Connections to incoming cold water main
  - Connections to electrical and telephone services
  - Connections to structural steel and metallic components
  - Ground conductors for feeders / branch circuits

o Raceways and supports as necessary to supply power and data to all necessary equipment, including spring type vibration isolation.

o Wiring devices and specification grade receptacles/switches as necessary in each area, responding to governing codes and program requirements.

o Stand-alone fire alarm and life safety system, including the following elements:
  - Addressable electronically operated, UL listed, main control panel located in the electrical room, providing initiation, notification, and control in accordance with the authorities having jurisdiction.
  - System printer providing hard-copy records of each alarm occurrence, including time and location.
  - Pull stations at entrances to each exit and stair door, and within long corridors and large open spaces.
  - Duct smoke detectors within air handling supply and return ducts and at entrance to return air shafts. Shall include remote test stations and indication lights for each detector.
  - Magnetic hold opens at smoke/fire doors.
  - Fire bells and strobes at fire department connections.
  - Connections to local fire department via central station.
  - Connections to water flow, tamper switches, and air pressure switches.

o Communications system, including raceways and power for telecom.

o Direct feeds, breakers, and independent circuits as required to individual equipment as required by the program.

Refer to Section 00 00 20 – ‘Specification Index’ for an outline of the systems expected to be incorporated into the design and construction of the three (3) new facilities.

END OF SECTION 00 00 10

SECTION 00 00 20 - SPECIFICATION INDEX

Issued For	Request for Proposal									

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07 21 00	THERMAL INSULATION									
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07 42 13.13	FORMED METAL WALL PANELS									
07 54 23	THERMOPLASTIC POLYOLEFIN (TPO) ROOFING									
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07 92 00	JOINT SEALANTS										
07 95 13	EXPANSION JOINT COVER ASSEMBLIES										
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08 41 13	ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS										
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08 71 00	DOOR HARDWARE										
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N/A											
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N/A											
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END OF SECTION 00 00 20