TABLE OF CONTENTS

ARCHITECTURE

SECTION 16000

ELECTRICAL

PART 1 -SYSTEM DESCRIPTION / OUTLINE SPECIFICATIONS

1.00 PROJECT OVERVIEW

A. This project includes the construction of an approximately 66,800 square foot new 5– story office building addition with Lower Level / Basement located at 300 Fore Street, Portland, Maine.

B. The Work of this section shall include applicable criteria as listed in Section 15050 – "General MEP / FP Criteria as well as Division 1 as if bound herein.

C. The base building power infrastructure and electrical systems for this building shall accommodate the future proposed tenants as follows:

1. Level 1 Tenants: Provisions only.

2. Level LL, 2, 3, 4, 5, and Mezzanine: Full infrastructure to include feeders, panelboards, and transformers.

D. All tenants shall be utility metered for power consumption.

E. Emergency power for exit and egress lighting shall be via individual battery backed ballasts within selected normal lighting fixtures and self-contained battery backed exit signs.

F. The work under this Section shall include the furnishing of all materials, labor, equipment and supplies and the performance of all operations to provide complete working Electrical and Fire Alarm systems, properly tested, and ready for operation. The work includes all necessary minor details and accessories required to make the work complete, even though such items may not be expressly shown or specified in the contract documents.

~~D~~G. Related Documents:

1. Section 01100 – "SUMMARY AND GENERAL REQUIREMENTS

2. Section 15050 – "GENERAL MEP / FP CRITERIA"

3. Provisions established within the Drawings and within General Conditions of the Contract, including General and Supplementary Conditions and Division 1 - General Requirements are collectively applicable to this Section as if rewritten and bound herein.

4. All Contractors, Subcontractors, Suppliers, etc. shall be governed by all applicable Sections of these Documents with reference to their respective areas of work including coordination of their work with other trades.

   a. Each Contractor, Subcontractor, Supplier, etc. shall review **all Sections of the Specifications and all Drawings** and shall be responsible for all work pertaining to their trade regardless of Drawing or Section of Specifications within which it is written.

   b. Construction details of the building are illustrated on Architectural and Structural Drawings. This Contractor shall thoroughly acquaint himself with the details before submitting his bid or proceeding with engineering as no allowance will be made because of unfamiliarity with these details. Any discrepancies in the architectural construction documents shall be submitted to the Owner in writing in the form of a "Clarification Request" (CR) or a "Request for

Information" (RFI) for review and response prior to the subcontractor submitting a proposal for the work or proceeding with the work.

c. This Trade Contractor shall place all inserts to accommodate the ultimate installation of the work of this trade. Set sleeves in place in forms before concrete is placed, and in masonry walls while they are under construction.

~~E~~H. The Work of this section, in general, to include the following items:

1. Identification
2. Raceways and Conduit
3. Wire and Cable (600V)
4. Wiring Devices and Plates
5. Outlet Boxes
6. Junction Boxes, Pull Boxes and Wireways
7. Safety Disconnect Switches
8. Panelboards
9. Dry Type Transformers
10. Fuses
11. Lamps and Light Fixtures
12. Building Grounding System
13. Fire Alarm System
14. Switchboard
15. Motor Starters
16. Underground Ductbank / Precast Manholes /Precast Handholes
17. Lightning Protection - Optional
18. Telecommunications and Data Raceway System - Optional
19. Lighting Control Panel, Contactors, Relays and Time Switches
20. Sleeving
21. Fire Seal and Fireproof Sealant
22. Supervision and Approval
23. Electrical Connections to HVAC and Plumbing Equipment, and other Equipmentprovided under other Sections or by Owner.
24. Relocation of existing electrical components that interfere with new construction and removal and disposal of obsolete components.
25. Short Circuit Protection and Coordination Study
26. Testing
27. Operating and maintenance instructions and manuals
28. Shop drawings

29. Record (as-built) Drawings

1.01 DEMOLITION

A. Demolition as defined by the architect shall be selective.

1. Relocation of existing Central Maine Power (CMP) pad mounted transformer serving adjacent building. The relocation shall be by CMP.

2. Re-wire existing/relocated mechanical equipment serving adjacent building.

1.02 SEQUENCING OF WORK

A. The project will be sequenced to keep utility power to the existing building located adjacent to the new 300 Fore Street building. Refer to the overall schedule for additional detail.

1.03 DESIGN CRITERIA

A. Refer to the attached Schematic Design Service Calculation for the basis of design for the incoming Utility Service size .

1.04 ELECTRIC SERVICE

The building shall be serviced via a CMP transformer vault adjacent to the building. The secondary electric service to the building shall be provided by the electrical contractor via an underground ductbank.

A. Provide grounding of the underground secondary service entrance conductors (copper conductors in Schedule 40 PVC, concrete encased). Primary shall be in accordance with scope defined for the Site (beyond 10' buffer from building).

B. The main electric room shall contain the proposed 2500-ampere 480Y/277-volt main switchboard (MSB). Main breaker shall be 100% rated insulated case with an adjustable electronic trip unit and customer metering. Distribution over-current protective devices shall be bolt-on thermal magnetic circuit breakers unless noted otherwise on attached sketch SD SKE-2. All bus shall be copper. AIC based upon infinite bus for available fault from the utility shall be 100,000 Amperes symmetrical. Utility metering shall be provided as shown on sketch SD SKE-1.

C. The MSB shall be provided with an external TVSS, capable of a Maximum Surge Current Rating of 125kA per mode (250kA per phase).

D. Major house loads shall be serviced from the MSB including the elevator, roof top air conditioning equipment and other loads in excess of 200A.

1.05 ELECTRICAL DISTRIBUTION

A. Refer to the attached sketches SD SKE-1 and SD SKE-2 for distribution system requirements.

B. All panelboards shall be provided with copper bus, bolt on circuit breakers and have door-in-door construction. Aluminum shall not be allowed for conducting electricity.

C. Wiring methods for all feeders shall be EMT for interior and rigid steel where exposed exterior. All feeder conductors shall be copper.

1.06 CONVENIENCE POWER

A. Provide general-purpose convenience outlets throughout the common core corridors, electric closets, and storage closets.

B. Provide GFCI protected outlets in each restroom, at each janitor's closet, at rooftop equipment locations and for elevator pits and machine rooms.

1.07 LIGHTING

A. Lighting shall be provided in accordance with the architectural reflected ceiling plans, the lighting consultant's fixture schedule and the specifications and system descriptions that follow.

B. Lighting shall consist of a combination of incandescent and fluorescent lamps/fixtures.

C. Lighting design levels are as follows:

1. Office area 50 foot-candles maintained. Typical fixture is a 4 foot long pendant fixture with 80% uplight and 20% downlight. Basis of design is "Corelite" Class A Direct/Indirect with open baffle and flat end plates.
2. Mechanical/electrical closets 40 foot-candles maintained
3. Storage/janitor closets 30 foot-candles maintained
4. Corridors 30 foot-candles maintained

D. HID lighting shall be provided at the exterior of all entrance/egress doors; surface mounted unless overhead available for recessed fixtures.

E. Lighting Controls:

1. General lighting within open office areas shall be controlled via occupancy sensors.
2. Lighting in conference rooms shall be controlled via dimmer switches.
3. Lighting in storage areas and restrooms shall be via occupancy sensors.
4. Exterior lighting shall be controlled by photocell ON and either timed sweep or photocell OFF dependent upon function and location.

F. Emergency lighting shall be via individual battery backed ballasts within selected normal lighting fixtures and self contained battery backed exit signs.

1.08 HVAC

A. Power wire (5) roof top A/C units for Lower Level, floors 2, 3, 4, and 5 ~~and Mezzanine~~ tenants. Provide fused disconnects, GFCI protected convenience power and illumination at the equipment. Units shall be wired to distribution panels as detailed on attached sketch SD SKE-1.

B. Power for (3) split system constant volume air handling units (AHU's) and (3) exhaust fans for Level 1 tenants will be provided under tenant fit-out. Provide fused disconnects, GFCI protected convenience power and illumination at the equipment.

C. Power wire (1) cooling system (fan coil or split system DX unit) for the elevator machine room. Provide fused disconnects, GFCI protected convenience power and illumination at the equipment. Unit shall be wired to house panelboards.

D. Power for tenant fan powered boxes and perimeter electric radiation will be provided under tenant build out.

E. Existing Building:

1. Re-feed (3) existing condensing unit for the first floor retail areas and (1) existing packaged VAV gas electric units due to relocation of units.
2. Power wire (1) new roof mounted kitchen hood exhaust fan.
3. New and existing units shall be wired to existing panelboards located in existing building.

F. Power wire cabinet wall heaters in the entry vestibules and stairwells to house panelboards.

G. Power wire Toilet, Electric Room and Mechanical Room exhaust fans for with associated magnetic motor starters. Fan controls shall be via signal from the ATC contractor.

H. Provide ATC contractor 120-volt power for deriving low voltage control at multiple locations and as defined by Section 15000.

I. Provide duct smoke detectors for installation in the supply and return of each rooftop by the HVAC contractor. Interconnect the detectors into the fire alarm system for trouble indication. The HVAC ATC contractor shall wire the detectors for unit showdown.

J. Install heat trace systems on exterior piping requiring freeze protection. Circuits powering heat trace shall be Ground Fault of equipment rated.

K. Power wire (1) domestic electric water heater and associated circulating hot water pumps with associated magnetic motor starters.

L. Power for tenant domestic electric water heaters will be provided under tenant build out.

M. The electrical contractor shall provide all required disconnects, magnetic starters and variable speed drives necessary for the operation and control of all supplied HVAC equipment.

1.09 FIRE PROTECTION

A. Wire sprinkler tamper and flow devices provided and installed by the Fire Protection contractor for trouble and alarm indication into the fire alarm control panel.

B. Each flow switch shall be independently zoned.

C. Tamper switch actuation shall initiate system supervisory alarms.

1.10 FIRE ALARM

A. Provide an addressable fire alarm system equal to Simplex 4100 for initiation device monitoring and evacuation signal initiation. Initiation devices shall include:

B. Manual pull stations at each egress and stairwell entry.

C. Sprinkler flow and tamper switches.

D. Smoke and heat detectors. Detectors shall be analog addressable to provide means of alarm verification and define maintenance cycles.

E. Analog addressable duct smoke detectors. Provide addressable control modules for interface with the HVAC equipment for automated shutdown.

F. The building shall be provided with 100% smoke detector coverage of the egress paths (corridors and stairwells).

G. The building shall be provided with 100% smoke detector coverage to supplement the life safety protection of the proposed sprinkler system.

H. Alarm notification shall be via horn/strobe units in compliance with ADA requirements for strobe illumination levels. Strobes shall be synchronized.

I. Wiring methods for all fire alarm initiation and notification circuits shall be Type MC where concealed and EMT where exposed interior. Type CI cable shall be utilized for all interconnecting communications cables between panels and for NAC circuits which originate outside of the alarm zone. MC shall be listed for fire alarm service and identified with continuous red markings. EMT shall be identified as fire alarm service by red spray painted couplings and junction box covers.

J. The fire alarm system shall be interconnected with the security system to unlock all doors upon an alarm signal.

K. Fire department notification shall be via master box, radio master box or digital dialer. A signal shall be forwarded to security for both system trouble and alarm.

1.11 TELEPHONE / DATA

A. The electrical contractor shall be responsible for device provisions only, consisting of box eliminator and pull string to ceiling above.

B. Incoming service for telecommunications shall be provided via (2) 4” PVC.

1.12 LIGHTENING PROTECTION

A. Provide a Lightening Protection system connected to the building steel framework.

END OF SECTION