

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

CITY OF PORTLAND

BUILDING INSPECTION

PERMIT

Permit Number: 101301
PERMIT ISSUED

Please Read Application And Notes, If Any, Attached

This is to certify that Middle Street Office Tower A/TBA

has permission to Interior alterations to create a video-conference room.

NOV - 5

AT 100 Middle St CBL 029 E006001

City of Portland

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of buildings and structures, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

Notification of inspection must be given and written permission procured before this building or part thereof is lathed or otherwise closed-in. 24 HOUR NOTICE IS REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. CAPT. R. [Signature]

Health Dept. _____

Appeal Board _____

Other _____
Department Name

[Signature]
Director, Building & Inspection Services

PENALTY FOR REMOVING THIS CARD

SCANNED



CITY OF PORTLAND, MAINE
Department of Building Inspections

Original Receipt

Oct. 14 2010

Received from RT Building & Construction Co.

Location of Work 100 Albee St. 2nd fl.

Cost of Construction \$ _____ Building Fee: _____

Permit Fee \$ _____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: 7000

Building (IL) Plumbing (I5) _____ Electrical (I2) _____ Site Plan (U2) _____

Other _____

CBL: 029 E 006

Check #: 1357 **Total Collected \$** 7000

**No work is to be started until permit issued.
Please keep original receipt for your records.**

Taken by: [Signature]

WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy



CITY OF PORTLAND, MAINE

Department of Building Inspections

Original Receipt

Oct. 14 2010

Received from RT Dooley, a Balfour Beatty Co.

Location of Work 100 Middle St. floor 02

Cost of Construction \$ _____ Building Fee: _____

Permit Fee \$ _____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: 870.00

Building (IL) Plumbing (I5) _____ Electrical (I2) _____ Site Plan (U2) _____

Other _____

CBL: 029 E 006

Check #: 1357 Total Collected \$ 870.00

**No work is to be started until permit issued.
Please keep original receipt for your records.**

Taken by: Wayle *Handed over receipt*

WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy

10/14/10 James

City of Portland, Maine - Building or Use Permit Application
 389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 10-1301	Issue Date:	CBL: 029 E006001
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Location of Construction: 100 Middle St - <i>560-#2</i>	Owner Name: Middle Street Office Tower A	Owner Address: 100 Middle St	Phone:
Business Name: Bank of America	Contractor Name: TBA	Contractor Address: Portland	Phone:
Lessee/Buyer's Name	Phone:	Permit Type: Alterations - Commercial	Zone: <i>B-3</i>

Past Use: Commercial / Bank of America	Proposed Use: Commercial / Bank of America: Interior alterations to create a video-teleconference room.	Permit Fee: \$870.00	Cost of Work: \$85,000.00	CEO District: 1
Proposed Project Description: Interior alterations to create a video-teleconference room.		FIRE DEPT: <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied <i>*See Conditions</i>	INSPECTION: Use Group: <i>B</i> Type: <i>2</i> <i>TBC 2003</i>	
		Signature: <i>(KL)</i>	Signature: <i>(Signature)</i>	
PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)				
Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied				
Signature: _____ Date: _____				

Permit Taken By: gg	Date Applied For: 10/14/2010	Zoning Approval		
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- This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
- Building permits do not include plumbing, septic or electrical work.
- Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

PERMIT ISSUED

NOV - 5

City of Portland

Special Zone or Reviews <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan Maj <input type="checkbox"/> Minor <input type="checkbox"/> MM <input type="checkbox"/> Date: <i>10/18/10</i>	Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied Date: _____	Historic Preservation <input checked="" type="checkbox"/> Not in District or Landmark <input type="checkbox"/> Does Not Require Review <input type="checkbox"/> Requires Review <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/Conditions <input type="checkbox"/> Denied Date: <i>(Signature)</i>
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CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT	ADDRESS	DATE	PHONE
RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE		DATE	PHONE

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No: 10-1301	Date Applied For: 10/14/2010	CBL: 029 E006001
-----------------------	---------------------------------	---------------------

Location of Construction: 100 Middle St	Owner Name: Middle Street Office Tower A	Owner Address: 100 Middle St	Phone:
Business Name: Bank of America	Contractor Name: TBA	Contractor Address: Portland	Phone:
Lessee/Buyer's Name	Phone:	Permit Type: Alterations - Commercial	

Proposed Use: Commercial / Bank of America: Interior alterations to create a video-teleconference room.	Proposed Project Description: Interior alterations to create a video-teleconference room.
--	--

Dept: Zoning **Status:** Approved **Reviewer:** Marge Schmuckal **Approval Date:** 10/18/2010
Note: **Ok to Issue:**

Dept: Building **Status:** Approved with Conditions **Reviewer:** Tammy Munson **Approval Date:** 11/05/2010
Note: **Ok to Issue:**

- 1) All penetrations through rated assemblies must be protected by an approved firestop system installed in accordance with ASTM 814 or UL 1479, per IBC 2003 Section 712.
- 2) Separate permits are required for any electrical, plumbing, sprinkler, fire alarm HVAC systems, heating appliances, including pellet/wood stoves, commercial hood exhaust systems and fuel tanks. Separate plans may need to be submitted for approval as a part of this process.

Dept: Fire **Status:** Approved with Conditions **Reviewer:** Capt Keith Gautreau **Approval Date:** 10/26/2010
Note: **Ok to Issue:**

- 1) Fire Alarm system shall be maintained.
If system is to be off line over 4 hours a fire watch shall be in place.
Dispatch notification required 874-8576.
- 2) Sprinkler protection shall be maintained.
Where the system is to be shut down for maintenance or repair, the system shall be checked at the end of each day to insure the system has been placed back in service.
- 3) Emergency lights are required to be tested at the electrical panel on the same circuit as the lighting for the area they serve.
- 4) Fire extinguishers required. Installation per NFPA 10
- 5) Emergency lights and exit signs are required. Emergency lights and exit signs are required to be labeled in relation to the panel and circuit.
- 6) The Fire alarm and Sprinkler systems shall be reviewed by a licensed contractor[s] for code compliance.
Compliance letters are required.
- 7) All construction shall comply with City Code Chapter 10.
- 8) This permit is being approved on the basis of the plans submitted. Any deviation from the plans would require amendments and approval.

PERMIT ISSUED

NOV - 5

City of Portland

BUILDING PERMIT INSPECTION PROCEDURES

Please call 874-8703 or 874-8693 (ONLY)
or email: buildinginspections@portlandmaine.gov

With the issuance of this permit, the owner, builder or their designee is required to provide adequate notice to the City of Portland Inspection Services for the following inspections. Appointments must be requested 48 to 72 hours in advance of the required inspection. The inspection date will need to be confirmed by this office.

- Please read the conditions of approval that is attached to this permit!! Contact this office if you have any questions.
- Permits expire in 6 months, if the project is not started or ceases for 6 months.
- If the inspection requirements are not followed as stated below additional fees may be incurred due to the issuance of a "Stop Work Order" and subsequent release to continue with construction.

 X Framing/Rough Plumbing/Electrical: Prior to Any Insulating or drywalling

 X Final inspection required at completion of work.

The project cannot move to the next phase prior to the required inspection and approval to continue, REGARDLESS OF THE NOTICE OR CIRCUMSTANCES.

IF THE PERMIT REQUIRES A CERTIFICATE OF OCCUPANCY, IT MUST BE PAID FOR AND ISSUED TO THE OWNER OR DESIGNEE BEFORE THE SPACE MAY BE OCCUPIED.

PERMIT ISSUED

NOV - 5

City of Portland



General Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.


Location/Address of Construction: <u>100 Middle Street - Floor 02</u>		
Total Square Footage of Proposed Structure/Area <u>381 SF</u>		Square Footage of Lot
Tax Assessor's Chart, Block & Lot Chart# Block# Lot# <u>089 2 006</u>	Applicant *must be owner, Lessee or Buyer* Name <u>JAMES MATTHEWS FOR BANK OF AMERICA</u> Address <u>13400 RIVERSIDE DR #202</u> City, State & Zip <u>SHERMAN OAKS CA 91423</u>	Telephone: <u>816 786 8900</u>
Lessee/DBA (If Applicable) <u>BANK OF AMERICA</u>	Owner (if different from Applicant) Name <u>100 MIDDLE ST</u> Address <u>PORTLAND ME 04101</u> City, State & Zip <u>300 432 1000</u>	Cost Of Work: \$ <u>85,000</u> C of O Fee: \$ _____ Total Fee: \$ _____
Current legal use (i.e. single family) <u>Business</u> If vacant, what was the previous use? <u>N/A</u> Proposed Specific use: <u>EXIST - BUSINESS</u> Is property part of a subdivision? <u>N/A</u> If yes, please name _____ Project description: <u>Interior alterations to create a video-conference room.</u>		
Contractor's name: <u>'TO BE DETERMINED'</u> Address: _____ City, State & Zip _____ Telephone: _____ Who should we contact when the permit is ready: _____ Telephone: _____ Mailing address: _____		

Received by mail 10/14/10 GO

Please submit all of the information outlined on the applicable Checklist. Failure to do so will result in the automatic denial of your permit.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature: 	Date: <u>10-8-10</u>
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This is not a permit; you may not commence ANY work until the permit is issue



Certificate of Design Application

From Designer:

Nelco Architecture, Inc

Date:

Sept. 23, 2010

Job Name:

Bank of America - Telepresence Room

Address of Construction:

100 Middle Street - Floor 02

2003 International Building Code

Construction project was designed to the building code criteria listed below:

Building Code & Year 2003 IBC Use Group Classification (s) B

Type of Construction EXIST TO REMAIN

Will the Structure have a Fire suppression system in Accordance with Section 903.3.1 of the 2003 IRC YES (EXIST FIRESPRINK)

Is the Structure mixed use? NO If yes, separated or non separated or non separated (section 302.3) _____

Supervisory alarm System? N/A Geotechnical/Soils report required? (See Section 1802.2) N/A

Structural Design Calculations

N/A Submitted for all structural members (106.1 - 106.11)

- _____ Live load reduction
- _____ Roof *live* loads (1603.1.2, 1607.11)
- _____ Roof snow loads (1603.7.3, 1608)
- _____ Ground snow load, P_g (1608.2)
- _____ If $P_g > 10$ psf, flat-roof snow load P_f
- _____ If $P_g > 10$ psf, snow exposure factor, C_e
- _____ If $P_g > 10$ psf, snow load importance factor, I_s
- _____ Roof thermal factor, C_t (1608.4)
- _____ Sloped roof snowload, P_s (1608.4)
- _____ Seismic design category (1616.3)
- _____ Basic seismic force resisting system (1617.6.2)
- _____ Response modification coefficient, R and deflection amplification factor C_d (1617.6.2)
- _____ Analysis procedure (1616.6, 1617.5)
- _____ Design base shear (1617.4, 1617.5.1)

Design Loads on Construction Documents (1603)

Uniformly distributed floor live loads (7603.11, 1807)

Floor Area Use	Loads Shown
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Wind loads (1603.1.4, 1609)

- _____ Design option utilized (1609.1.1, 1609.6)
- _____ Basic wind speed (1809.3)
- _____ Building category and wind importance Factor, I_w table 1604.5, 1609.5
- _____ Wind exposure category (1609.4)
- _____ Internal pressure coefficient (ASCE 7)
- _____ Component and cladding pressures (1609.1.1, 1609.6.2.2)
- _____ Main force wind pressures (7603.1.1, 1609.6.2.1)

Flood loads (1803.1.6, 1612)

- _____ Flood Hazard area (1612.3)
- _____ Elevation of structure

Earth design data (1603.1.5, 1614-1623)

- _____ Design option utilized (1614.1)
- _____ Seismic use group ("Category")
- _____ Spectral response coefficients, S_D s & S_{D1} (1615.1)
- _____ Site class (1615.1.5)

Other loads

- _____ Concentrated loads (1607.4)
- _____ Partition loads (1607.5)
- _____ Misc. loads (Table 1607.8, 1607.6.1, 1607.7, 1607.12, 1607.13, 1610, 1611, 2404)



Commercial Interior & Change of Use Permit Application Checklist

All of the following information is required and must be submitted. Checking off each item as you prepare your application package will ensure your package is complete and will help to expedite the permitting process.

One (1) complete set of construction drawings must include:

Note: Construction documents for costs in excess of \$50,000.00 must be prepared by a Design Professional and bear their seal.

- Cross sections w/framing details
- Detail of any new walls or permanent partitions
- Floor plans and elevations
- Window and door schedules
- Complete electrical and plumbing layout.
- Mechanical drawings for any specialized equipment such as furnaces, chimneys, gas equipment, HVAC equipment or other types of work that may require special review
- Insulation R-factors of walls, ceilings, floors & U-factors of windows as per the IECC 2003
- Proof of ownership is required if it is inconsistent with the assessors records.
- Reduced plans or electronic files in PDF format are required if originals are larger than 11" x 17".
- Per State Fire Marshall, all new bathrooms must be ADA compliant.

Separate permits are required for internal and external plumbing, HVAC & electrical installations.

For additions less than 500 sq. ft. or that does not affect parking or traffic, a site plan exemption should be filed including:

- The shape and dimension of the lot, footprint of the existing and proposed structure and the distance from the actual property lines.
- Location and dimensions of parking areas and driveways, street spaces and building frontage.
- Dimensional floor plan of existing space and dimensional floor plan of proposed space.

A Minor Site Plan Review is required for any change of use between 5,000 and 10,000 sq. ft. (cumulatively within a 3-year period)

Fire Department requirements.

The following shall be submitted on a separate sheet:

- Name, address and phone number of applicant **and** the project architect.
- Proposed use of structure (NFPA and IBC classification)
- Square footage of proposed structure (total and per story)
- Existing and proposed fire protection of structure.
- Separate plans shall be submitted for
 - a) Suppression system
 - b) Detection System (separate permit is required)
- A separate Life Safety Plan must include:
 - a) Fire resistance ratings of all means of egress
 - b) Travel distance from most remote point to exit discharge
 - c) Location of any required fire extinguishers
 - d) Location of emergency lighting
 - e) Location of exit signs
 - f) NFPA 101 code summary
- Elevators shall be sized to fit an 80" x 24" stretcher.

For questions on Fire Department requirements call the Fire Prevention Officer at (207) 874-8405.

Please submit all of the information outlined in this application checklist. If the application is incomplete, the application may be refused.

In order to be sure the City fully understands the full scope of the project, the Planning and Development Department may request additional information prior to the issuance of a permit. For further information or to download copies of this form and other applications visit the Inspections Division on-line at www.portlandmaine.gov, or stop by the Inspections Division office, room 315 City Hall or call 874-8703.

Permit Fee: \$30.00 for the first \$1000.00 construction cost, \$10.00 per additional \$1000.00 cost

This is not a Permit; you may not commence any work until the Permit is issued.



Accessibility Building Code Certificate

Designer:

Nelco Architecture, Inc

Address of Project:

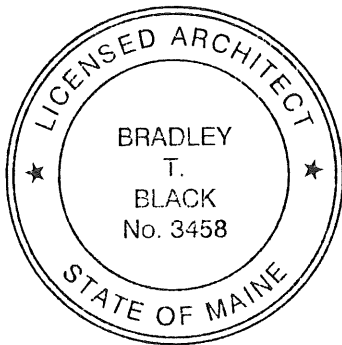
100 Middle Street - Floor 02

Nature of Project:

Interior alterations to create
a video-teleconference room.

The technical submissions covering the proposed construction work as described above have been designed in compliance with applicable referenced standards found in the Maine Human Rights Law and Federal Americans with Disability Act. Residential Buildings with 4 units or more must conform to the Federal Fair Housing Accessibility Standards. Please provide proof of compliance if applicable.

(SEAL)



Signature:

Bradley T. Black

Title:

Managing Principal

Firm:

Nelco Architecture, Inc.

Address:

1349 W. Peachtree St NE Suite 1300
Atlanta, GA 30309

Phone:

404.873.3697

For more information or to download this form and other permit applications visit the Inspections Division on our website at www.portlandmaine.gov



Certificate of Design

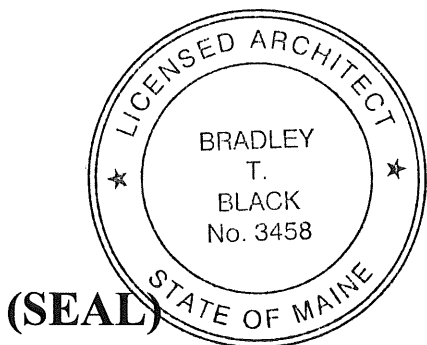
Date: 9-23-2010

From: Nelco Architecture, Inc.

These plans and / or specifications covering construction work on:

Bank of America - Telepresence Room
100 Middle Street - Floor 02

Have been designed and drawn up by the undersigned, a Maine registered Architect / Engineer according to the **2003 International Building Code** and local amendments.



Signature: Bradley T. Black

Title: Managing Principal

Firm: Nelco Architecture, Inc.

Address: 1349 W. Peachtree St NE, Suite 1300
Atlanta, GA 30309

Phone: 404.873.3697

For more information or to download this form and other permit applications visit the Inspections Division on our website at www.portlandmaine.gov



CITY OF PORTLAND, MAINE

Department of Building Inspections

Original Receipt

Oct. 14 2010

Received from RT Dooley & Balfour Beatty Co.

Location of Work 100 Middle St. floor 02

Cost of Construction \$ _____ Building Fee: _____

Permit Fee \$ _____ Site Fee: _____

Certificate of Occupancy Fee: _____

Total: 870.00

Building (IL) Plumbing (I5) _____ Electrical (I2) _____ Site Plan (U2) _____

Other _____

CBL: 029 E 006

Check #: 1357 Total Collected \$ 870.00

**No work is to be started until permit issued.
Please keep original receipt for your records.**

Taken by: Doyle *Handed over receipt*

WHITE - Applicant's Copy
YELLOW - Office Copy
PINK - Permit Copy

*@ 815 688 2016
10/14/10 James*

TELEPRESENCE ROOM: 3010 SERIES

100 Middle Street - Floor 02
Portland, ME 04101

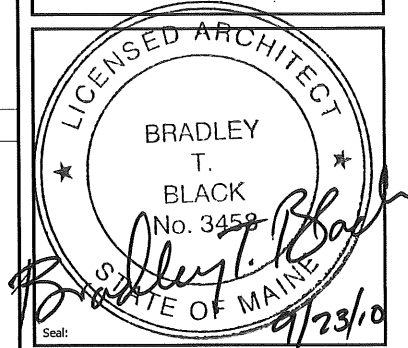
CLIENT CONTACT: Josh McConaughey
(980) 387-2991

NELSON CONTACT: Chris Nylander
(904) 657-8610

NELSON

Nelco Architecture, Inc.
a licensed affiliate

1349 West Peachtree St, NE - Suite 1300
Atlanta, GA 30309
Phone: (404) 873-3697
Fax: (678) 904-1510



NELCO ARCHITECTURE, INC.

12400 COIT RD.
SUITE 510
DALLAS, TX 75257
PHONE: (972) 644-8830
Consultant:

SYSKA HENNESSY GROUP, INC.

525 N. TRYON STREET
CHARLOTTE, NC 28255
PHONE: (980) 388-3911



Consultant:

Bank of America



**Balfour Beatty
Construction**

Client:

Issued for Permit/Pricing	09/10/2010
Client Review and Approval	08/31/2010
Description:	No: By: Date:

TELEPRESENCE ROOM - ME1-504-02-E0A5

Floor 02
100 Middle St.
Portland, ME 04101

Project Title & Address:

COVER SHEET

Sheet Title:	
Proj. No.:	09.00924.00
Drawn By:	MA
Checked By:	CN
P.M.:	CN

AN-1

ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS. THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

© NELSON - ALL RIGHTS RESERVED

BUILDING DATA

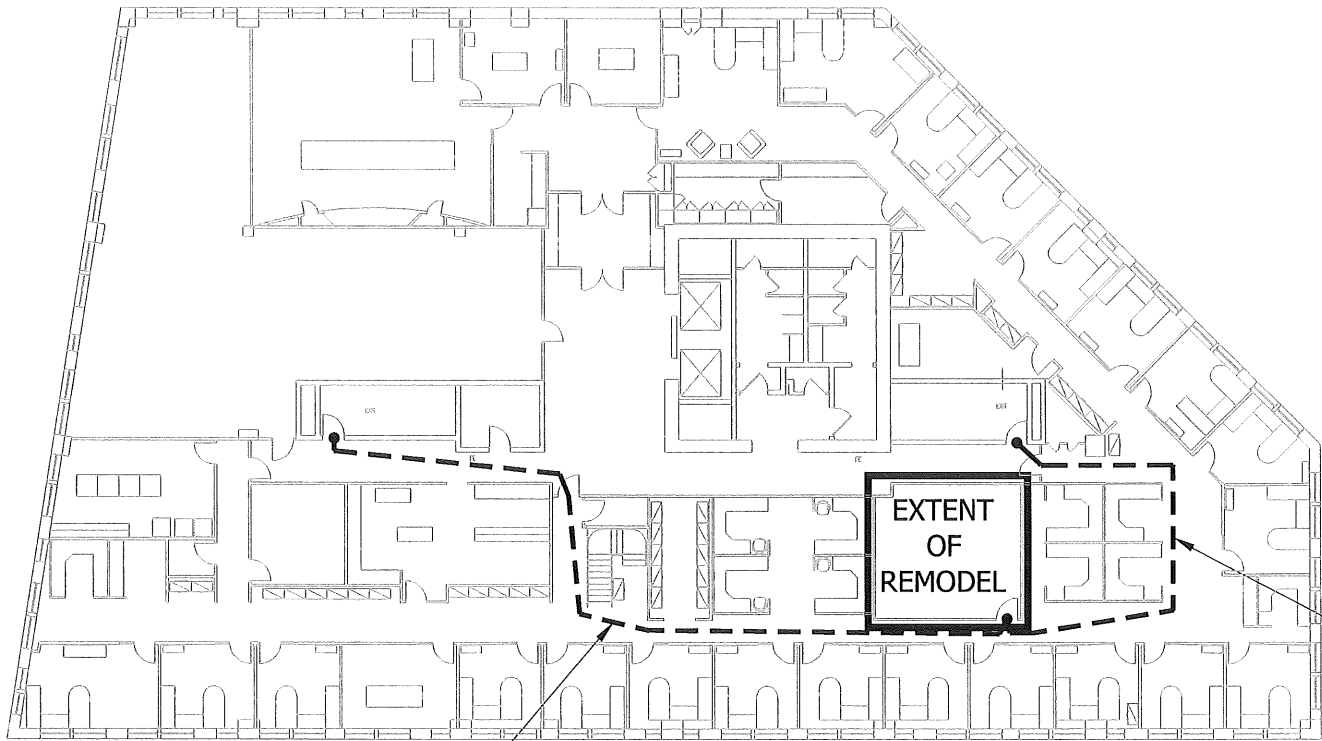
BUILDING CODE:	2009 IBC
STRUCTURAL CODE:	2009 IBC
MECHANICAL CODE:	2009 IBC
ELECTRICAL CODE:	2002 NEC
PLUMBING CODE:	Maine State International Plumbing Code (UPC 2000)
BUILDING OCCUPANCY:	B - Business
CONSTRUCTION CLASSIFICATION:	On File With City
FIRE PROTECTION SYSTEM:	Sprinkler System
NUMBER OF STORIES:	1 Affected by Remodel
PROJECT SCOPE:	Interior Room Remodel

DRAWING INDEX

Sheet Number	Sheet Title	Drawing Revision Number
General		
AN-1	Cover Sheet	
AN-2	General Notes	
AN-3	Life Safety Plan & Building Code Data	
Architectural		
A0-1	Demolition Plan	
A0-2	Reflected Ceiling Demolition Plan	
A1-1	Construction Plan	
A2-1	Reflected Ceiling Plan	
A4-1	Finish Plan & Schedule	
A7-1	Partition Details	
Mechanical		
M0-1	Mechanical Specifications	
M0-2	Mechanical Symbols and Abbreviations	
M1-1	Mechanical Plan	
M1-2	Mechanical Schedules and Details	
Electrical		
E0-1	Electrical Specifications Sheet 1 of 4	
E0-2	Electrical Specifications Sheet 2 of 4	
E0-3	Electrical Specifications Sheet 3 of 4	
E0-4	Electrical Specifications Sheet 4 of 4	
E2-1	Lighting Plan	
E3-1	Power/Systems Plan	
E4-1	Electrical Riser and Panel Schedule	

GENERAL NOTES

- The work shall conform to the applicable building code, and other ordinances, codes and regulations listed in the specifications or on the drawings, and required by local building authorities. The governing codes, rules and regulations are collectively referred to as "the code". The contractor shall report any inconsistencies, conflicts or omissions he may discover to the architect for interpretation prior to performing the work.
- The general contractor shall contact building management to determine the rules of the building relative to construction; when and how deliveries can be made, what phases and types of construction may be done on regular or overtime basis, and in general any special building requirements which will affect the cost of all work borne by the general contractor. All work shall conform to all base building standard specifications and building regulations, which the contractor shall obtain prior to submission of bid.
- The general contractor shall be responsible for the sub-contractors receipt of complete sets of these documents, as well as all future addenda, field directives and change orders, etc.
- The AIA Standard Document "A201" titled "General Conditions of the Contract for Construction" shall be considered part of the general conditions of this work.
- The contractor shall coordinate with the building management the storage of all materials and shall provide protection as necessary to prevent vandalism and loss of materials by theft or damage sustained due to exposure to inappropriate environmental conditions and will make good any damage or losses at his own expense without charge to the owner.
- Where adjacent areas beyond the immediate construction area will be occupied during the construction period, the contractor shall:
 - Conform to owners and tenant requirements for hours of construction operations, access to tenant spaces and allowable noise level during tenant business hours.
 - Construction operations shall not block hallways or means of egress for tenants of building.
 - Construction operations shall not cause interruptions of electrical services to the tenants of the building without prior notification and approvals.
 - Properly protected all floors, mail chutes and stair doors in public areas subject to construction traffic. Shoe wiping mats will be installed at all openings between construction areas and all public spaces. All active areas shall be kept clean and free from debris.
 - Erect and maintain temporary bracing, lights, dustproof partitions, barricades, fences, and warning signs as necessary to prevent injury, noise, dust and inconvenience to other tenants, the public, and to prevent damage to adjacent construction which is to be left in place.
- All cutting, chasing, drilling or demolition of walls, slabs, etc. requiring the use of jack hammers or other heavy hand or power tools shall be performed after regular business hours on an overtime basis if necessary, unless the building management and any affected tenants provide a written waiver expressly permitting otherwise.
- The contractor shall assume sole and complete responsibility for job site conditions during the course of construction of this project including safety of all persons and property. This requirement shall apply continuously and not be limited to normal working hours. The contractor shall provide public protection as necessary and required by governing agencies, having jurisdiction, until client acceptance of the premises.
- The general contractor is solely responsible for the provision and maintenance of all bracing, shoring, enclosures, barriers or scaffolding required to provide a safe working environment as dictated by site conditions and the progress of work.
- During the entire construction period, all exits, exit lighting, fire protection devices and alarms shall be continuously maintained, in conformance with local building code and other governing entity requirements. Unless otherwise noted, all existing, services and devices shall remain active.
- The general contractor shall at all times protect the property of the client and the building owner. This includes but is not limited to windows, floor and ceiling finishes, public toilets, elevators, doors & bucks, electrical and air-conditioning equipment. The general contractor shall also properly protect any adjoining property, any damage to the same caused by the contractor's work or workmen must be made good, in a timely fashion, without delay. Patching and replacement of damaged work shall be done at the cost and expense of the contractor responsible for the damage. The general contractor shall be fully responsible for all of his sub-contractors. If the contractor fails to complete the repairs in a timely fashion, said repairs will be made by a contractor selected by the owner's representative and back charged accordingly. Timely fashion includes, but is not limited to any amount of time which will limit the disruption of the operation of tenant's work places, the buildings operations, access and compromise safety or presents a health risk, etc.
- The contractor shall indemnify and save harmless the landlord, the tenant, and architect against any and all claims and demands for the damage to the property of any person, firm or individual or for personal injuries (including death) arising out of, or suffered while engaged in, or caused, in whole or in part, by the execution of the work; he shall well and truly defend the landlord, tenant and architect and shall pay all monies awarded for such damages or injuries (including death), all costs including attorney's fees sustained, and shall obtain a full acquittance and release in favor of the landlord, tenant and architect, unless such liability results solely from the negligence of the landlord, tenant, architect, its agents or employees.
- The architect shall not be held responsible for the performance of any work, nor for the means and methods of construction chosen by the general contractor or any of his sub-contractors, nor shall he guarantee the performance of their contracts.
- The contractor shall perform daily cleaning of the job site during the construction period and shall protect finished work from damage. Immediately prior to tenant occupancy, the contractor shall perform final cleaning of the work area including, but not limited to, wet wiping of furniture, casework, and wall covering, washing and waxing of VCT flooring, and the vacuuming of carpet. All cleaning shall be in accordance with manufacturers' recommendations.
- The general contractor is responsible to coordinate work of all sub-contractors and shall perform such miscellaneous work as may be necessary for them to complete their work. It is expected that the general contractor shall also closely coordinate his work with that of all other vendors retained by the client to assure that all schedules are met and that work proceeds without delay. Bidders, before submitting proposals, shall visit and carefully examine the area affected by the work to familiarize themselves with the existing conditions and the difficulties that will affect the execution of the work. Submission of a proposal will be construed as evidence that such an examination has been made, and later claims will not be recognized for extra labor, equipment, or materials, required because of difficulties encountered which could have been reasonably foreseen had such an examination been made. The general contractor shall verify all conditions and dimensions on the job site and report any and all discrepancies and/or unusual conditions to the architect prior to finalizing bids or commencement of any construction.
- The general contractor shall make known any and all limitations, exclusions, or modifications to the project during the bid selection period. Any and all limitations, exclusions, or modifications not itemized in the bid proposal documents are presumed "Included", in which case no additional monies will be allocated for this work.
- All work costs submitted for this project are furnished without obligation; the client reserves the right to accept or reject any proposal or any of its cost submitted.
- Existing construction and dimensions shown are per existing drawings. All existing information must be verified in the field. Neither the owner nor the architects are responsible for accuracy of existing information. Existing construction conditions in areas where new work is not planned may not be completely shown.
- Within one (1) week, (5 business days) of the award of this contract, prior to mobilization for any work, the general contractor shall furnish a construction schedule showing the chronologically the phases of his work, and all related work for the completion of the project. This schedule shall indicate all ordering lead times, length of time for each phase, its start and completion, with a projected completion date.
- Contractor and subcontractors shall attend job meetings as required by this contract.
- All required permits must be obtained from the fire department prior to start of construction. The Contractor shall obtain all permits for all development work, pay all fees for permits and check all governing authorities specifications. All costs for inspections and/or tests shall be the responsibility of the general contractor, unless noted otherwise.
- The general contractor shall pay the expenses for all transportation; hoisting and elevator use charges on all his materials or equipment to the point of use, and shall be responsible for all unloading, checking and storage of the same in connection with this contract.
- Do not scale these drawings; written dimensions shall govern. Should any dimensional discrepancies be encountered, clarifications shall be obtained from the office of the Architect.
- Large scale details shall govern over smaller scale plans and elevations.
- Install all equipment and materials as per manufacturers' recommendations. Any difficulties are to be reported to the architect immediately.
- The contractor and each subcontractor shall warrantee all work performed by him directly for a minimum period of one (1) year. All defects occurring in the guaranteed period shall be corrected at no additional cost.
- The site and buildings shall be maintained accessible to and functional for the physically handicapped. All ramps shall be fitted with a non-slip finish.
- The client, Architect, consultants and all inspectors from pertinent agencies shall be permitted access to the job site at all times during normal working hours.
- The general contractor shall provide all labor, materials, and equipment as necessary to execute all work as shown on these drawings except where noted as not in contract (N.I.C.). Unless otherwise noted on these drawings or in the specifications as being not in contract or existing, all items, materials, etc., and the installation of same are a part of the contract defined by these drawings and specifications.
- Minor details not shown or specified, but necessary for proper construction of any part of the work, shall be included as if they were indicated in the drawings, unless otherwise agreed upon. Where the contract, construction notes or drawings call for any work of a more stringent nature than that required by the building code, or any other entity having jurisdiction over the work, the work of the more stringent nature called shall be furnished in all cases.
- Details are intended to show the intent of the design. Minor modifications may be required to suit the field dimensions or conditions and such modifications shall be included as part of the work of the contract.
- All work shall be executed in a workmanlike manner by mechanics and tradesmen skilled in their respective trades and in accordance with the best practices of the trades involved.
- All work shall be plumb, level and true. The contractor shall lay out all work and establish all points, grades, lines and levels and assume full responsibility for the same.
- The contractor shall confirm the availability and delivery times for all specified items upon receipt of the contract documents. Should any of the specified items availability pose a delay to the on time completion of the project, the contractor shall notify the client immediately and propose an equivalent substitution if such a delay is not acceptable to the client.
- Substitution of all equals shall be only as approved by the office of the Architect. Where the term "or equal" is used the Architect shall be the sole judge of equality based upon the information furnished by the contractor. Substitutions must be accepted in writing before they may be used.
- The general contractor shall use the master specification of approved samples for all exposed materials and finishes required by this contract.
- If the general contractor, the owner, or the owners representative substitutes a material, method of attachment, revises a construction detail, or in any way alters the work such that it no longer conforms to these documents, without the written acceptance of the office of the Architect; such action will relieve the Architect of any responsibility or liability including but not limited to aesthetic consequences, subsequent failure(s) and personal or property damage attributable to this change.
- The Architects approval or review of separate individual item(s) of substitution shall not constitute the review of and assembly in which the item functions within.
- Approved alternates from the "Master Specifications" shall not relieve the contractor of obligations or responsibilities from the requirements of these contract documents, unless the office of the Architect is notified of, and specifically approves of such deviations at the time of the submission.
- The Approved "Master Specifications" shall not relieve the general contractor obligation for coordination nor waive responsibility for "field measure".
- Any changes in the scope of work, or in construction details, whether due to field conditions, or omissions, by the contractor, architect or owner, shall be documented by the architect and approved, prior to execution.
- Should the general contractor claim that an issue, directed revision or change to the original contract involves additional cost under his contract, he shall give written notice immediately, but shall not proceeding to execute the work, until written approval for the change request is received. No such claims shall be valid unless so made. Unless otherwise agreed, no payment for such claims will be made until final settlement.
- All claims for additional work will be submitted in writing for the client's approval. The contractor shall include a complete narrative description of the work to be performed as well as, materials to be used, the room number of the area or space being worked in and under whose authorization the work to be performed was initiated.
- The presence of a representative of the Architect on the job site does not imply concurrence with or the approval of any work. The general contractor shall call to the attention of the office of the Architect, in writing, any and all specific items for which acceptance is required.
- Upon substantial completion of the work the general contractor shall be responsible for corrections and unsatisfactory and/or incomplete work conditions. Final payment will be contingent on the completion of the scope of work under the terms of the Owner-Contractor Agreement.
- The contractor shall maintain at the site, for the owner, one record copy of all drawings, permits, approved shop drawings, submittals and samples, on which to record all changes during construction. Access to these shall be provided for the use of all trades, client representatives and the architect, during all phases of construction.
- During the course of construction, actual locations shall be indicated to scale in red ink on the owners record drawings for all runs of mechanical and electrical work including concealed work which deviates from the drawings. Upon completion of the project, including all punchlist items, this information shall be neatly transferred by the contractor to a set of drawings, which shall be marked "As Built Set" and copies shall be provided to both the owner and the Architect. Within three (3) weeks (15 business days) of the receipt of the "As Built Set" approval for final payment to the contractor shall be granted or reasonable cause shown why such approval has been denied.
- Prior to the completion of his work the general contractor shall assemble and furnish the client/owner, in a loose leaf binder(s), a complete set of manufacturers catalogues, operating instructions, maintenance instructions and similar data, as well as all guarantee(s) for all equipment and operable devices furnished or installed by the general contractor under this contract, and shall orient and instruct the personnel designated by the client/owner in the operation of all such equipment.
- The contractor shall immediately notify the owner upon encountering hazardous materials. The owner shall retain a qualified consultant who shall arrange for the prompt identification, testing, treatment, remediation and storage of the hazard as required by law and good construction practices. The architect shall bear no responsibility for work related to these materials.
- All contractors shall carry property damage and public liability insurance as required by any governing agencies having jurisdiction and complying with statutory requirements for disability and workmen's compensation.



TRAVEL DISTANCE = 116'-2"

TRAVEL DISTANCE = 68'-11"

LIFE SAFETY PLAN

1
AN-3
N.T.S.

BUILDING CODE DATA

Name Of Project: TELEPRESENCE; 3010 SERIES
 Street Address: 100 Middle St.
 City/State/Zip: Portland, ME 04101
 Room Number: EGM
 Area of Room: 381 SF
 Area of Building: 2nd Floor
 Owner/ Contact Person: BANK OF AMERICA (TENANT)
 Owners Agent: Josh McConaughy Phone 980-657-8610
 Owned By: City/County Private State
 Code Enforcement Jurisdiction: City Portland County

LEAD DESIGN PROFESSIONAL: Chris Nylander

DESIGNER	NAME	NAME	LICENSE #	TELEPHONE #
Architectural	Brad	Black	ARC3458	617-423-2692
Electrical	James E.	Meyer	12110	972-644-8830
Plumbing	N/A	---	---	---
Mechanical	James E.	Meyer	12110	972-644-8830
Structural	N/A	---	---	---
Sprinkler - Standpipe	N/A	---	---	---

APPLICABLE CODES:

New Construction Renovation

Building 2009 IBC
 Mechanical 2009 IBC
 Plumbing Maine State International Plumbing Code (UPC 2000)
 Accessibility ADAAG

Electrical 2002 NEC
 Energy 2009 IECC

BUILDING INFORMATION:

CONSTRUCTION TYPE: On File w/ City SOURCE: Bldg Mngmt City Original CD's Previous Nelson Project

Is the building sprinklered? No Yes How tall is the building? N/A
 Are the corridor walls rated? No Yes Are the demising walls rated? No Yes
 What is the building structure? Concrete Steel Wood If steel, is the steel fire-protected? No Yes

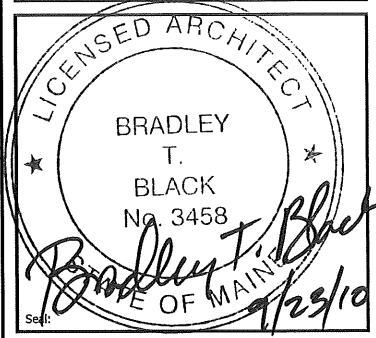
OCCUPANCY DATA:
 OCCUPANCY TYPE(S): B - BUSINESS OCCUPANCY FACTOR: 100 S.F.
 (S.F./Occupant)

SQUARE FOOTAGE:
 TOTAL SQUARE FOOTAGE: 381 SF



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Consultant: SYSKA HENNESSY GROUP

Bank of America

Balfour Beatty Construction

Client:

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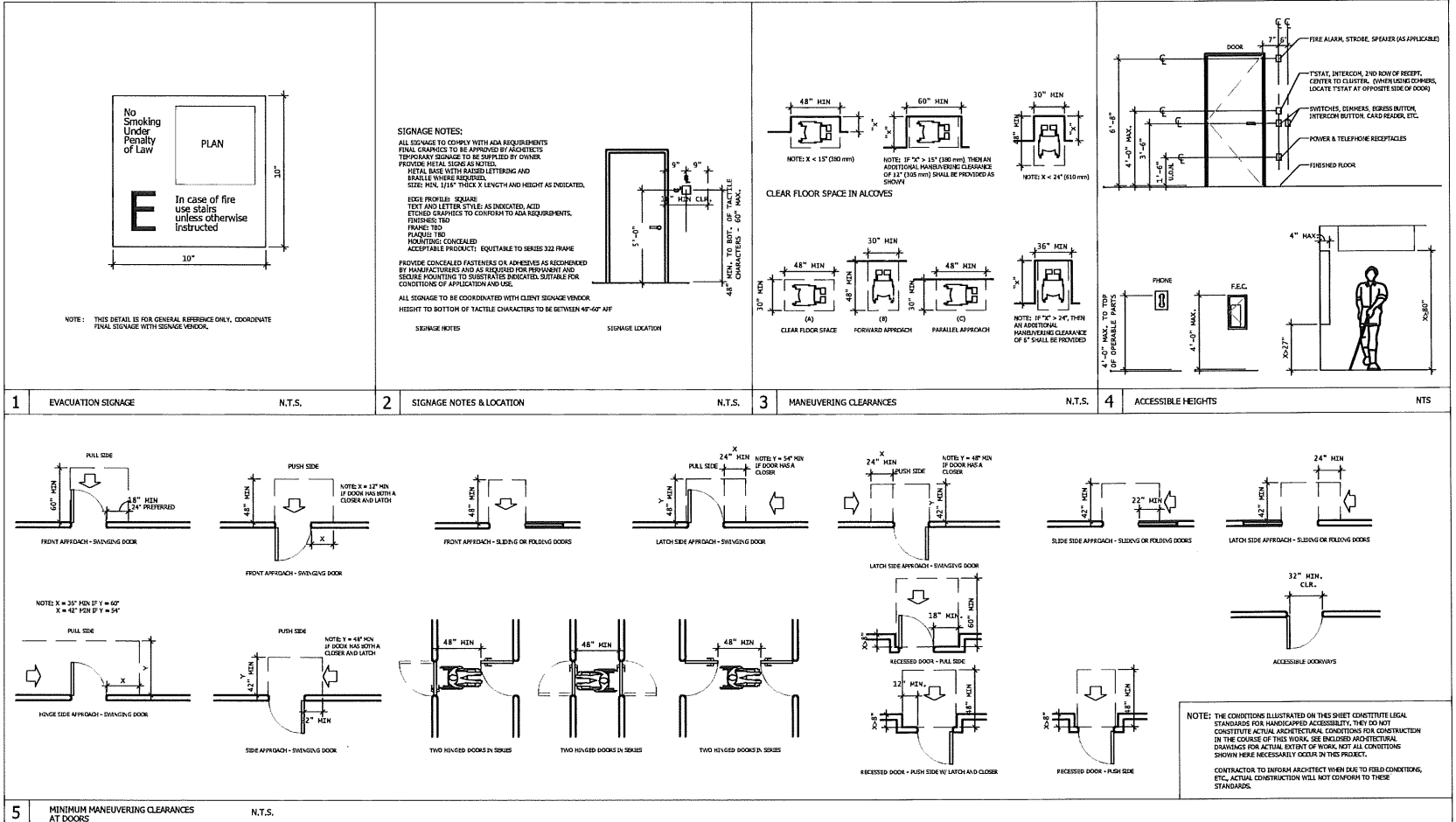
TELEPRESENCE ROOM - ME1-504-02-E0A5
 Floor 02
 100 Middle St.
 Portland, ME 04101
 Project Title & Address:

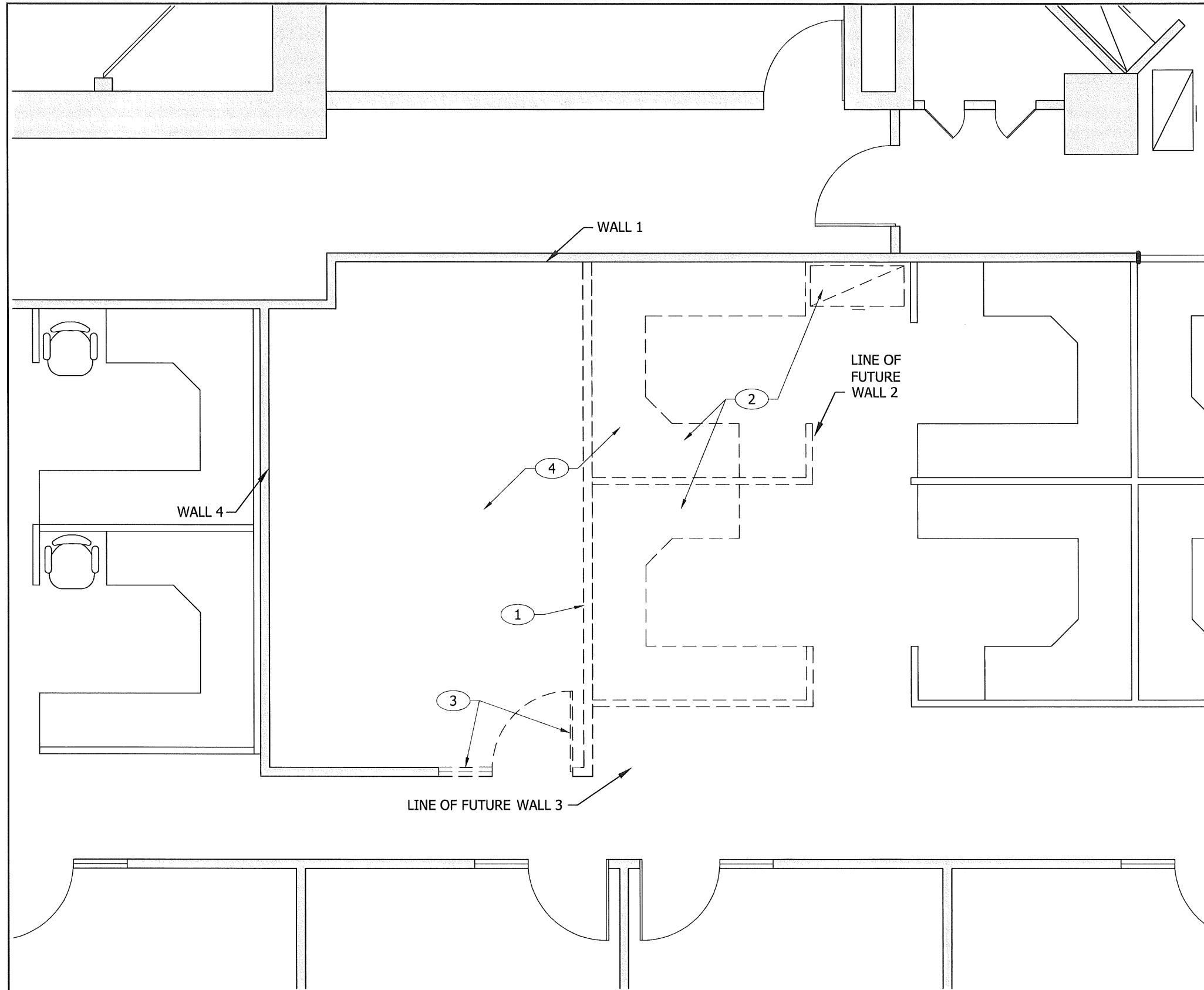
LIFE SAFETY PLAN AND BUILDING CODE DATA

Sheet Title:	AN-3
Proj. No.:	
Drawn By:	
Checked By:	
P.M.:	

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DEMOLITION PLAN KEY NOTE:

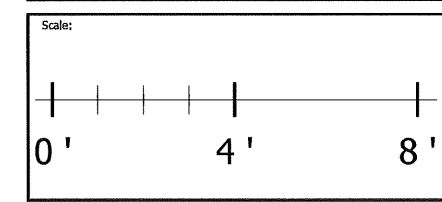
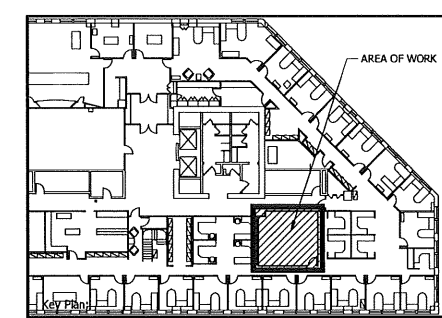
- ① REMOVE EXISTING WALL AS INDICATED.
- ② REMOVE EXISTING SYSTEMS FURNITURE AND PLACE IN OWNER INVENTORY.
- ③ REMOVE EXISTING DOOR, SIDELITE AND FRAME. PLACE IN OWNER INVENTORY.
- ④ REMOVE EXISTING FLOORING, BASE AND WALLCOVERING, IF APPLICABLE, THROUGHOUT AREA DEFINED BY FUTURE ROOM WALLS. PREP ALL SURFACES TO RECEIVE NEW FINISHES.

DEMOLITION LEGEND:

- EXISTING DRYWALL PARTITION TO BE REMOVED
- EXISTING DOOR AND FRAME TO BE REMOVED

DEMOLITION PLAN GENERAL NOTES:

REFER TO SHEET AN-2 FOR DEMOLITION NOTES.



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LICENSED ARCHITECT

BRADLEY
 T.
 BLACK
 No. 3458

Bradley T. Black
 9/23/10

STATE OF MASSACHUSETTS

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Consultant:

Bank of America

Balfour Beatty Construction

Client:

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TELEPRESENCE ROOM - ME1-504-02-E0A5
 Floor 02
 100 Middle St.
 Portland, ME 04101
 Project Title & Address:

DEMOLITION PLAN

Sheet Title:

Proj. No.: 09.00924.00

Drawn By: MA

Checked By: CN

P.M.: CN

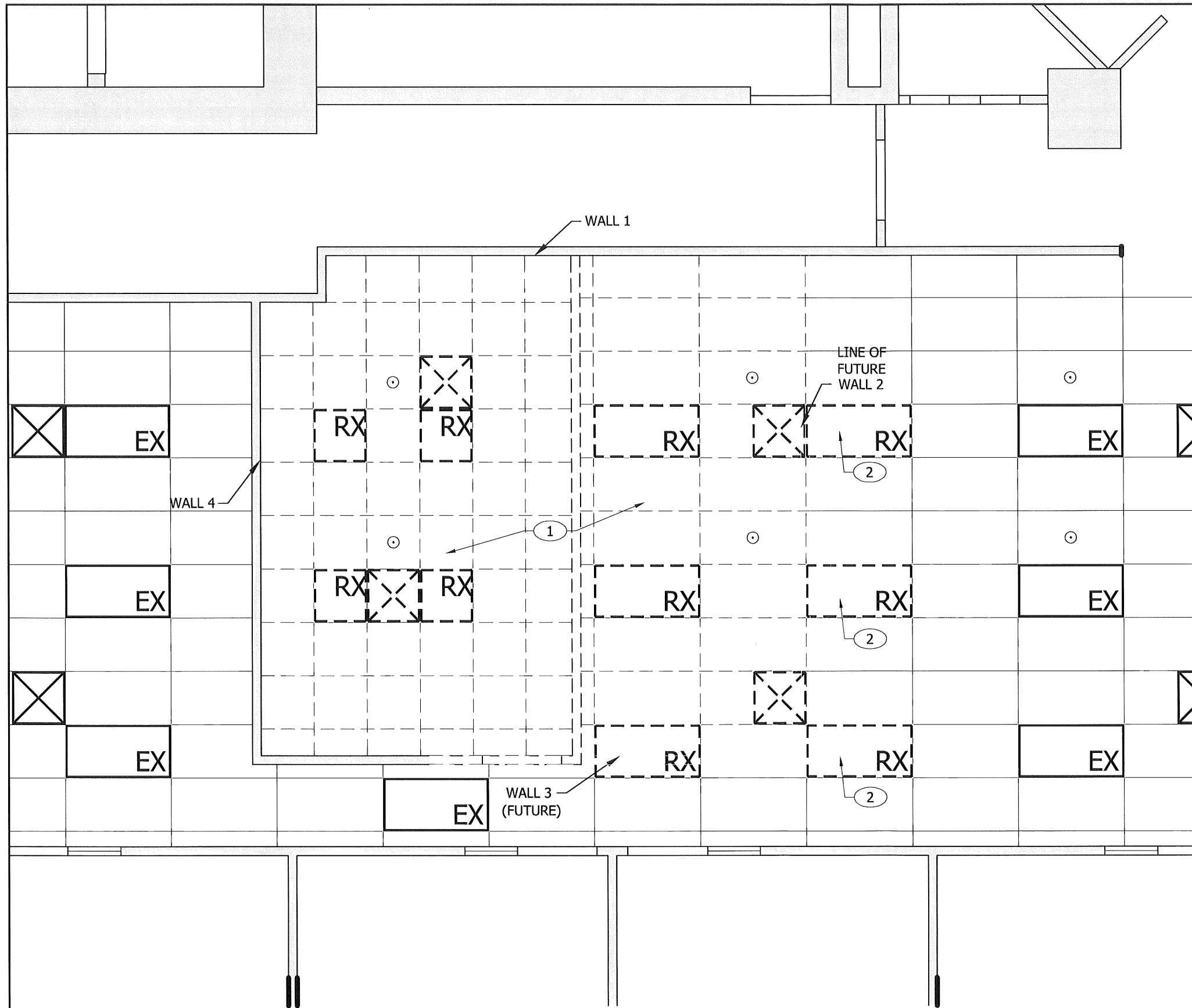
A0-1

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1
 A0-1

DEMOLITION PLAN
 1/2"=1'-0"



REFLECTED CEILING DEMO PLAN KEY NOTES:

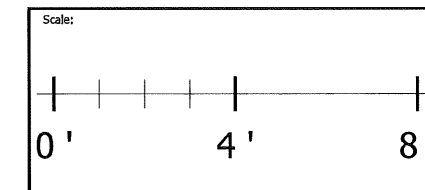
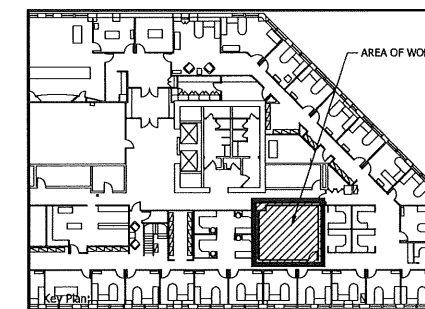
- ① REMOVE EXISTING CEILING TILES, GRID, LIGHTS AND HVAC DIFFUSERS THROUGHOUT AREA INDICATED BY BOUNDS OF FUTURE WALLS 2 AND 3. ALL SPRINKLER HEADS TO REMAIN. RESERVE (3) 2x2 FIXTURES FOR POSSIBLE RELOCATION.
- ② EXISTING LIGHTING SHOWN IN APPROXIMATE LOCATION. VERIFY IN FIELD. IF NEW WALL 2 INTERFERES WITH EXISTING LIGHTING, REMOVE AND PLACE IN OWNER INVENTORY.

REFLECTED CEILING LEGEND

- EXISTING SPRINKLER HEAD
- [RX] EXISTING 2x2 LIGHT FIXTURE TO BE REMOVED
- [RX] EXISTING 2x4 LIGHT FIXTURE TO BE REMOVED
- [EX] EXISTING LIGHT FIXTURE TO REMAIN
- [X] SUPPLY AIR REGISTER TO BE REMOVED
- [X] SUPPLY AIR REGISTER TO REMAIN
- [+ +] EXISTING CEILING GRID TO BE REMOVED
- [+ +] EXISTING CEILING GRID TO REMAIN

REFLECTED CEILING DEMO NOTES:

REFER TO SHEET AN-2 FOR REFLECTED CEILING DEMO NOTES.



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 Seal: *Bradley T. Black* 09/23/10

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 525 N. TRYON STREET
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 Consultant: **SYSKA HENNESSY GROUP**

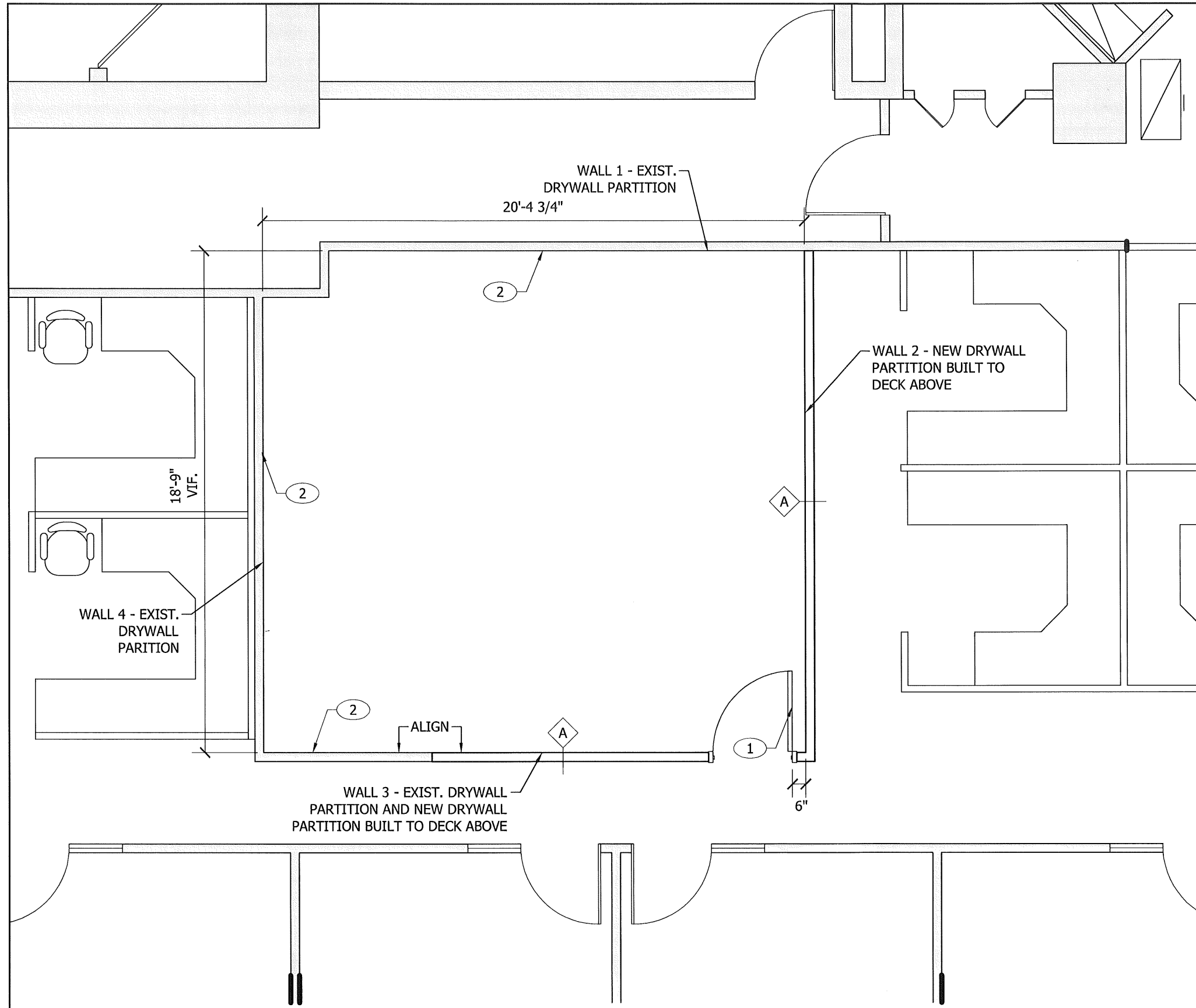
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Balfour Beatty Construction
 Client:

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 Floor 02
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 Project Title & Address:

REFLECTED CEILING DEMOLITION PLAN
 Sheet Title:
 Proj. No.: 09.00924.00
 Drawn By: MA
 Checked By: CN
 P.M.: CN
A0-2
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1 REFLECTED CEILING DEMOLITION PLAN
 A0-2 1/2"=1'-0"



CONSTRUCTION PLAN KEY NOTES:

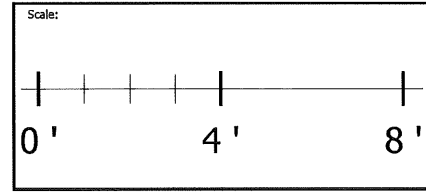
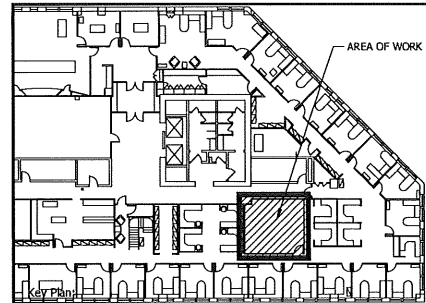
- ① NEW SOLID CORE WOODEN DOOR AND HOLLOW METAL FRAME WITH HARDWARE TO MATCH EXIST. ADJACENT. DOOR TO RECEIVE PEMKO AUTOMATIC DOOR BOTTOM (411 ARL 36) AND PEMKO SOUND GASKET (SMOKE SEAL 588 D, BLACK) ALONG WITH DOME FLOOR STOP. SEE FINISH PLAN FOR FINISH INFORMATION.
- ② IF EXIST. PARTITIONS ARE NOT BUILT TO DECK ABOVE, INSTALL SOUND BATT INSULATION IN CEILING OUT TO A DISTANCE OF 3'-0" FROM THE FACE OF EACH SIDE OF WALL.

CONSTRUCTION LEGEND

- NEW DOOR W/ FRAME
- NEW PARTITION
- EXISTING PARTITION TO REMAIN
- WALL TYPE - SEE A7-1 FOR DETAIL

CONSTRUCTION PLAN GENERAL NOTES:

REFER TO SHEET AN-2 FOR CONSTRUCTION NOTES.



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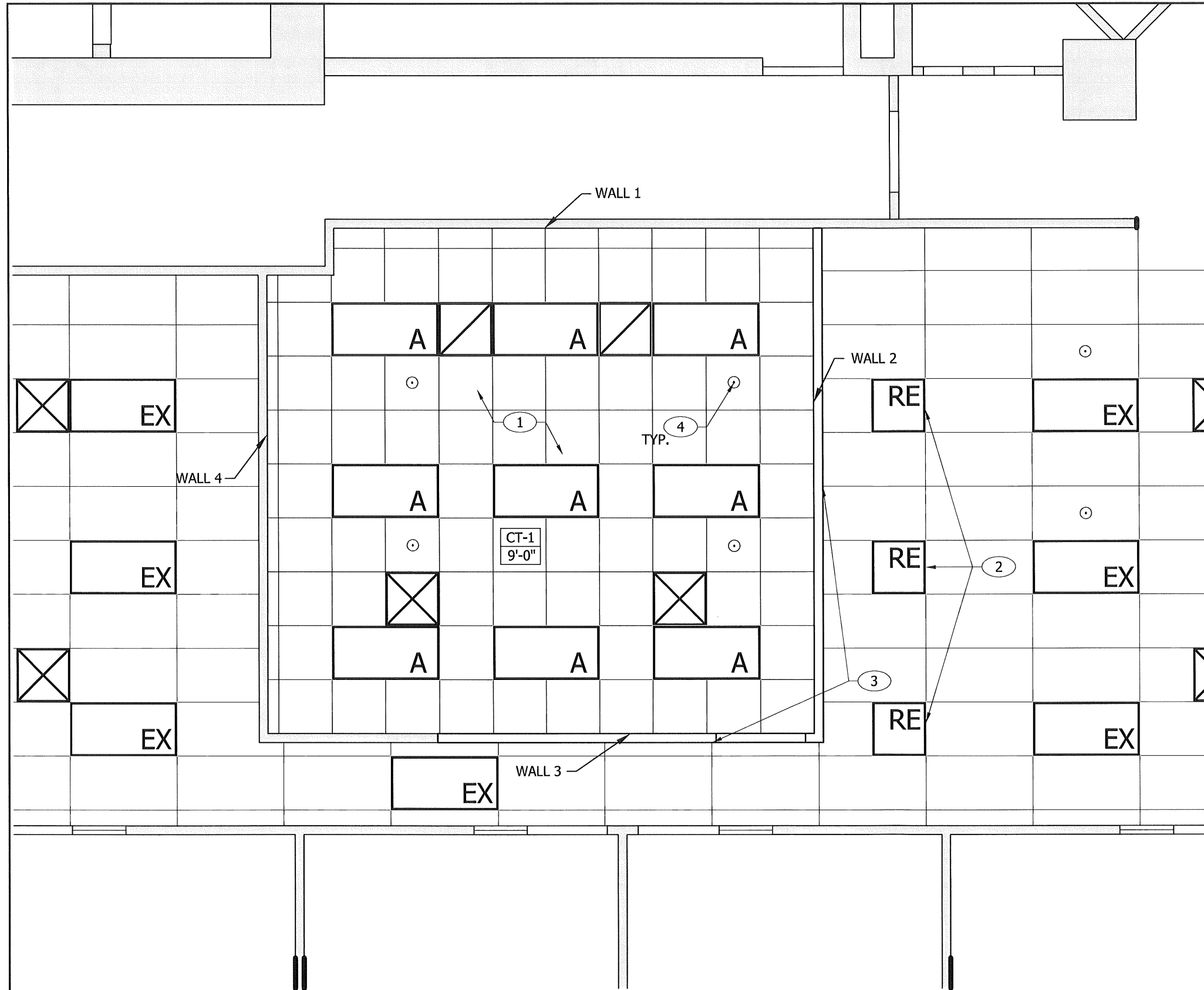
TELEPRESENCE ROOM - ME1-504-02-E0A5
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 Project Title & Address:

CONSTRUCTION PLAN

Sheet Title:
 Prof. No.:
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 A1-1

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1
 A1-1
CONSTRUCTION PLAN
 1/2"=1'-0"

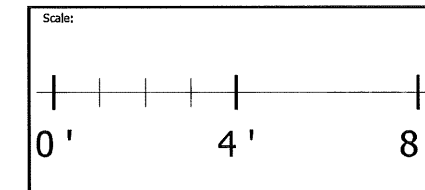
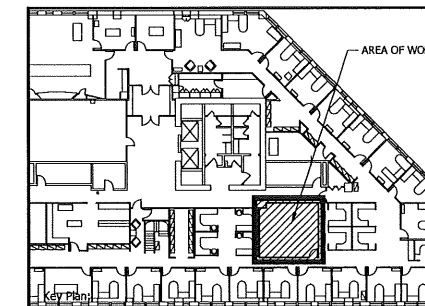


REFLECTED CEILING PLAN KEY NOTES:

- ① INSTALL NEW CEILING TILE AND GRID, LIGHTS, AND DIFFUSERS IN ROOM AS INDICATED. SEE MECH/ELEC. DRAWINGS FOR ADDITIONAL INFO. COORDINATE WITH EXISTING SPRINKLERS IN FIELD.
- ② RELOCATE EXISTING 2x2 LIGHTS IF REMOVAL OF EXISTING 2x4 LIGHTS AT THESE LOCATIONS WAS NECESSARY.
- ③ PATCH EXISTING GRID AT EDGE OF NEW WALL CONSTRUCTION.
- ④ RECENTER EXISTING SPRINKLER HEADS IN NEW CEILING TILE AS INDICATED.

REFLECTED CEILING LEGEND

- SPRINKLER HEAD
- A NEW LIGHTING - REFERENCE ENGINEER'S DOCUMENTS FOR SPECIFICATION
- EX EXISTING LIGHTING
- RE RELOCATED LIGHTING
- X SUPPLY AIR REGISTER
- Z RETURN AIR REGISTER
- EXISTING CEILING TILE AND GRID.
- NEW CEILING TILE AND GRID.



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REFLECTED CEILING PLAN

Sheet Title:	A2-1
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1 REFLECTED CEILING PLAN
 A2-1 1/2"=1'-0"

CEILING TILE AND GRID

CT-1 **TILE**
 DESCRIPTION: ULTIMA 24" X 24" BEVELED TEGULAR
 MANUFACTURER: ARMSTRONG
 MODEL: 1912
 SIZE: 24" X 24"
 MATERIAL: DURABRITE FINISH, WHITE, HUMIGUARD PLUS, BEVELED TEGULAR
 LOCATION: TELEPRESENCE ROOM

GRID
 MANUFACTURER: ARMSTRONG
 SERIES: 6100 MODEL: 9/16 INTERLUDE XL
 MODEL: DIMENSIONAL T

PAINT

P1 **PAINT**
 MFR: BENJAMIN MOORE
 NAME: HUNTINGTON BEIGE
 NUMBER: HC-2L
 FINISH: EGGSHELL

BASE

B1 **RUBBER BASE**
 MFR: ROPPE
 NAME: 632 FLAX
 COLOR: 2.5"
 NOTES: USE WITH P-1



CARPET

C1 **CARPET TILE**
 MFR: TANDUS
 DESCRIPTION: MONOLITHIC OR ASHLAR MONOLITHIC
 SIZE: 24"
 STYLE NAME: DISTRICT
 STYLE NUMBER: 1001 382-033
 COLOR NAME: BROWN SATIN
 NOTE: EXISTING CARPET TO BE REPLACED AS NECESSARY, TO BE DETERMINED BY OWNER.

FINISH KEY NOTES

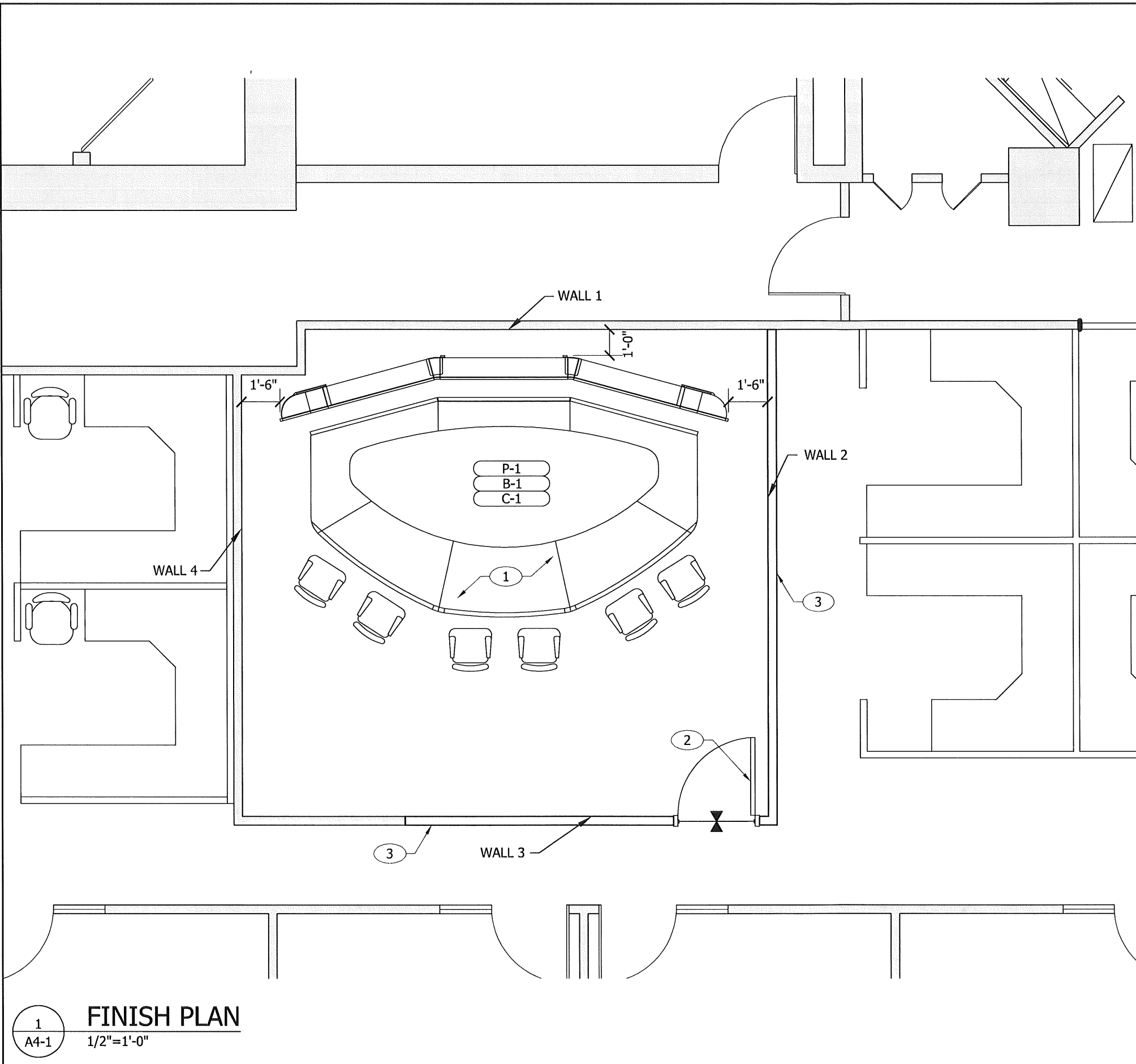
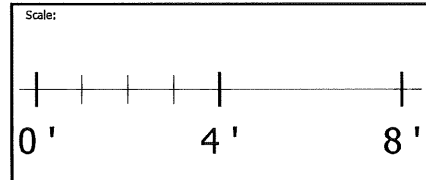
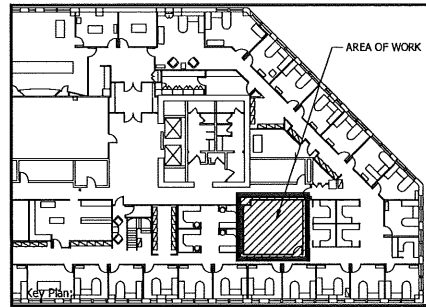
- ① PAINT WALLS P1. INSTALL NEW CARPET AND BASE. SEE FINISH SCHEDULE FOR ADDITIONAL INFORMATION.
- ② PAINT ROOM SIDE OF NEW DOOR AND FRAME TO MATCH P1. OPPOSITE SIDE OF DOOR AND FRAME TO MATCH EXISTING ADJACENT.
- ③ APPLY NEW WALL FINISH AND BASE TO MATCH EXISTING ADJACENT.

FINISH SYMBOL LEGEND

-  FINISHES
-  FLOORING TRANSITION

FINISH PLAN GENERAL NOTES:

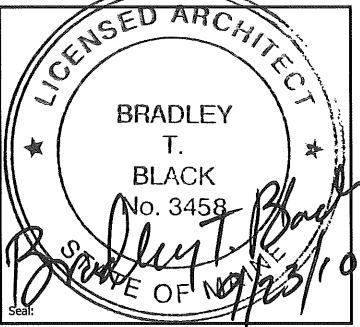
REFER TO SHEET AN-2 FOR FINISH NOTES.



1
A4-1
FINISH PLAN
 1/2"=1'-0"



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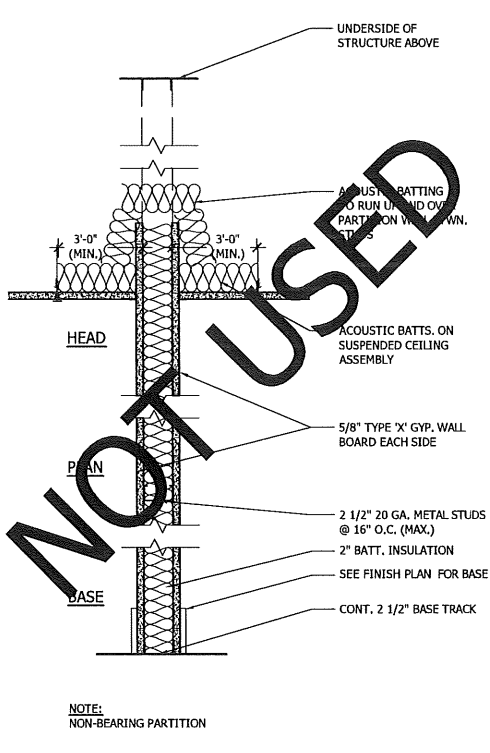
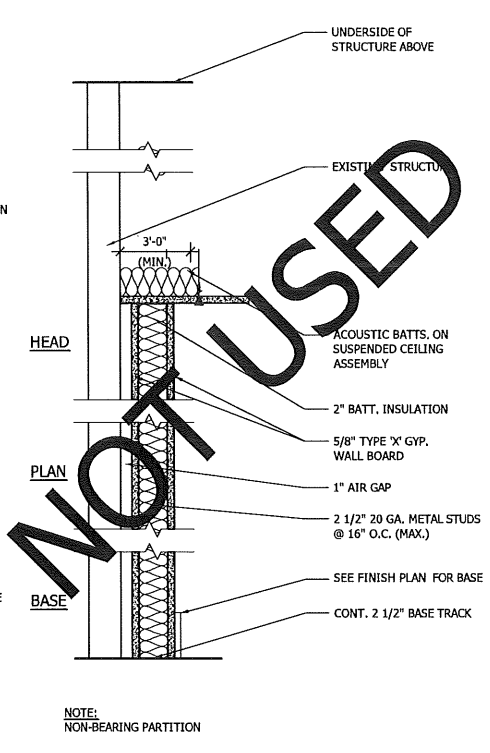
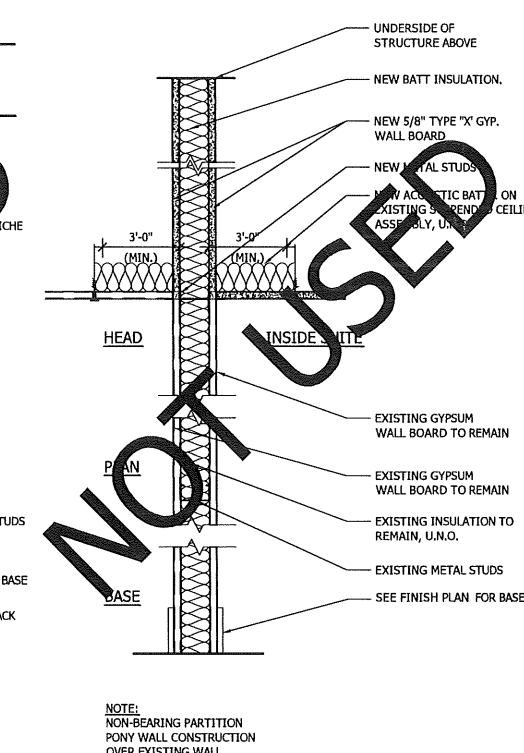
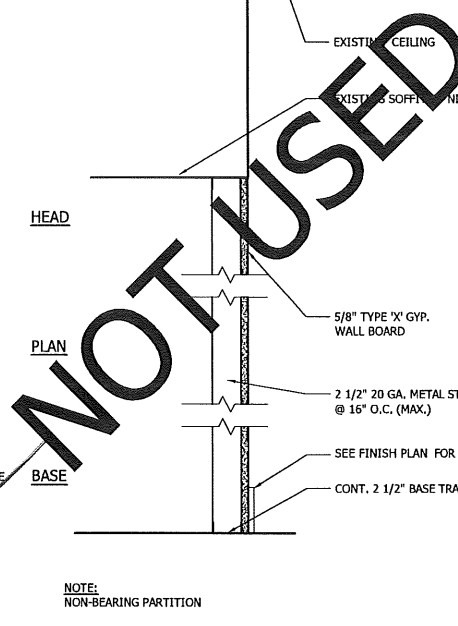
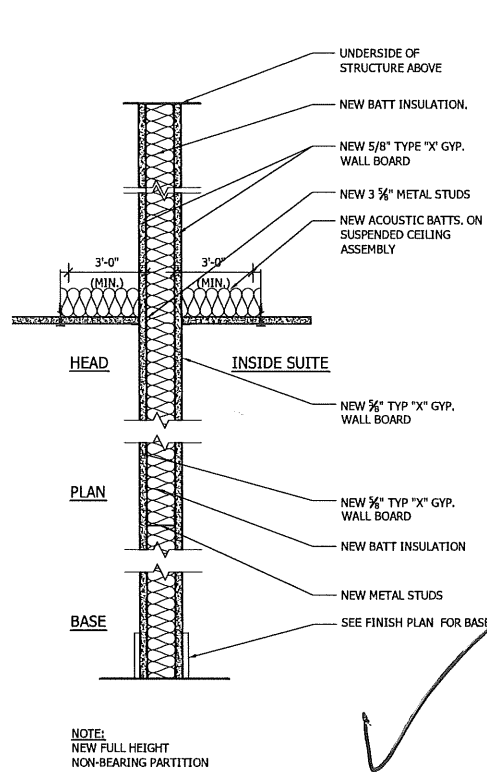
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FINISH PLAN & SCHEDULE

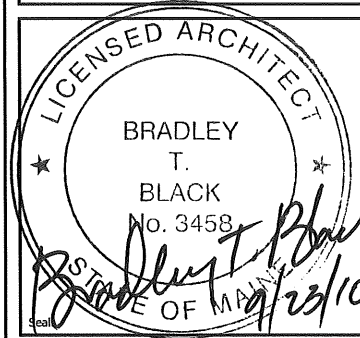
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- 1 WALL TYPE A
A7-1 1 1/2"=1'-0"
- 2 WALL TYPE B
A7-1 1 1/2"=1'-0"
- 3 WALL TYPE C
A7-1 1 1/2"=1'-0"
- 4 WALL TYPE D
A7-1 1 1/2"=1'-0"
- 5 WALL TYPE E
A7-1 1 1/2"=1'-0"

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PARTITION DETAILS

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BASIC MECHANICAL REQUIREMENTS

- REFER TO PLANS FOR ADDITIONAL NOTES.
- CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES AND TAXES.
- MAKE NO CHANGES WITHOUT THE WRITTEN PERMISSION FROM THE ENGINEER.
- THESE PLANS ARE DIAGRAMMATIC IN NATURE, CONTRACTORS SHALL INCLUDE APPROPRIATE ALLOWANCES FOR OFFSETS AS REQUIRED TO ACCOMMODATE VERTICAL AND HORIZONTAL VARIATIONS IN THE LOCATIONS AND ELEVATIONS OF DUCTWORK, PIPING AND EXISTING CONDITIONS.
- ALL MATERIAL AND EQUIPMENT INDICATED ON THE PLANS AND DESCRIBED IN THE SPECIFICATIONS SHALL BE PROVIDED BY THE CONTRACTOR NEW AND THE BEST PRODUCTS OF REPUTABLE MANUFACTURERS AND SHALL BE IN NEW CONDITION AT ACCEPTANCE OF WORK.
- PROVIDE ALL EQUIPMENT, MATERIAL LABOR, SUPERVISION, COSTS, AND SERVICES REQUIRED TO INSTALL COMPLETE AND WORKING SYSTEMS INCLUDING ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLY INCIDENTAL OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFICALLY SPECIFIED OR SHOWN.
- WHEN USED IN THESE SPECIFICATIONS, THE WORD "PROVIDE" IS DEFINED TO MEAN "FURNISH AND INSTALL" MATERIALS, EQUIPMENT, ETC.
- GUARANTEE ALL MATERIALS, LABOR AND EQUIPMENT FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE. PAY FOR ANY REPAIRS OR REPLACEMENTS CAUSED BY DEFECTIVE WORKMANSHIP OR FAULTY MATERIALS AS CONSTRUED HEREIN WITHIN THE PERIOD COVERED BY THE GUARANTEE.
- VISIT SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. NO ALLOWANCE WILL BE MADE FOR LACK OF KNOWLEDGE OF EXISTING CONDITIONS. ANY ADJUSTMENTS IN DUCTWORK AND PIPING SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- EACH TRADE SHALL COORDINATE THE ROUTING AND INSTALLATION OF HIS WORK WITH THAT OF ALL OTHER TRADES THROUGH THE GENERAL CONTRACTOR.
- PENETRATIONS OF WALLS OR FLOORS FOR THE PASSAGE OF PIPING, DUCTWORK, OR OTHER EQUIPMENT SHALL BE PROPERLY SEALED AFTER INSTALLATION OF EQUIPMENT. FIELD VERIFY EXISTING WALL PENETRATIONS AND PROPERLY SEAL AS REQUIRED TO MAINTAIN WALL OR FLOOR RATING.
- ARRANGE FOR REQUIRED CHASES, SLOTS AND OPENINGS. CONTRACTOR IS LIABLE FOR CUTTING OR PATCHING MADE NECESSARY BY HIS FAILURE TO MAKE PROPER ARRANGEMENTS IN THIS RESPECT.
- CONTRACTOR ASSUMES RESPONSIBILITY FOR PROPER ARRANGEMENT OF PIPES, DUCTS, ETC., TO CONNECT APPROVED EQUIPMENT IN A PROPER AND APPROVED MANNER. FOLLOW EQUIPMENT MANUFACTURER'S DETAILED INSTRUCTIONS AND THE CONTRACT DOCUMENTS. NOTIFY THE ARCHITECT BEFORE PROCEEDING. NO EQUIPMENT INSTALLATION OR CONNECTIONS SHALL BE MADE IN A MANNER THAT VOIDS THE MANUFACTURERS' WARRANTY.
- VERIFY THE ACTUAL LOCATION OF EXISTING STRUCTURAL MEMBERS AND COORDINATE INSTALLATION OF THE IMPROVEMENTS ACCORDINGLY. THE CONTRACTOR SHALL ALSO COORDINATE WITH ALL OTHER TRADES TO AVOID FIELD INTERFERENCE, AND SHALL MAKE OFFSETS AND TRANSITIONS AS REQUIRED.
- INSTALL ALL WORK IN A NEAT AND PROFESSIONAL MANNER, USING ONLY WORKMEN THOROUGHLY QUALIFIED IN THE TRADE OF DUTIES THEY ARE TO PERFORM. ROUGH WORK WILL BE REJECTED.
- UNLESS OTHERWISE REQUIRED BY TRADE CUSTOM OR SPECIFIED UNDER ANOTHER SECTION OF THE SPECIFICATIONS, CUTTING AND PATCHING SHALL BE DONE BY THE APPROPRIATE TRADE, BUT CONTRACTOR SHALL FURNISH SKETCHES SHOWING THE LOCATIONS AND SIZES OF ALL OPENINGS, CHASES, ETC. REQUIRED.
- DO NOT CUT STRUCTURAL MEMBERS WITHOUT THE APPROVAL OF THE ARCHITECT, AND ALL SUCH CUTTING SHALL BE DONE IN A MANNER DIRECTED BY HIM.
- PIPE, CONTROL DEVICES AND WIRING WHICH IS TO REMAIN IN SERVICE SHALL BE RECONNECTED IF DISCONNECTED FOR BUILDING ALTERATIONS.
- THE PRODUCTS/MATERIALS SPECIFICALLY NAMED IN THE SPECIFICATION AND/OR ON THE DRAWINGS ARE THE BASIS OF DESIGN. THE ENGINEER AND/OR OWNER'S REPRESENTATIVE RESERVES THE RIGHT TO REJECT PRODUCT/MATERIALS, EVEN IF FROM OTHER ACCEPTABLE MANUFACTURER'S, IF IT IS FELT THEY DO NOT MEET THE INTENT OF THE SPECIFICATION.
- THE ENGINEER RESERVES THE SOLE RIGHT FOR THE APPROVAL OF PROPOSED MATERIAL FOR EQUIPMENT, AND THE PHRASE, "OR AN APPROVED EQUIVALENT", USED IN THESE SPECIFICATIONS, OR ON THE DRAWINGS, SHALL BE INTERPRETED TO MEAN AN EQUIVALENT APPROVED BY THE ENGINEER.
- ALL CHANGES REQUIRED BY USE OF ALTERNATE EQUIPMENT SHALL BE MADE AT NO ADDITIONAL COST TO THE OWNER; AND ALL COSTS INCURRED BY OTHER TRADES, PUBLIC UTILITIES OR THE OWNER, AS A RESULT OF THE USE OF SUCH EQUIPMENT, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- IDENTIFY THE DIFFERENCES IN PROPOSED ALTERNATE MATERIAL OR EQUIPMENT AS COMPARED TO THAT SPECIFIED, AND SHALL INDICATE THE BENEFITS TO THE PROJECTS AS A RESULT OF SELECTING THE ALTERNATIVE.

- EQUIPMENT ARRANGEMENTS, DUCT SIZES, PIPING CONNECTIONS, ETC. ARE BASED ON THE EQUIPMENT SCHEDULED. CONTRACTOR SHALL ADJUST SIZES AND ROUTING TO ACCOMMODATE ACTUAL SYSTEMS PROVIDED.
- WHERE CONNECTION IS MADE TO EXISTING SYSTEMS, FIELD VERIFY EXACT LOCATION, SIZE AND CONNECTION REQUIREMENTS AND PROVIDE TRANSITIONS AS REQUIRED. PATCH INSULATION AND OVERLAP VAPOR BARRIER AS APPLICABLE.
- SUPPORT FOR ALL EQUIPMENT, DUCT, PIPING, ETC SHALL BE FASTENED TO THE TOP CHORD OF THE JOIST AND/OR TOP FLANGE OF BEAMS.
- MAINTAIN WORK AREA CLEAN AT ALL TIMES DURING CONSTRUCTION.
- PROTECT THE STRUCTURE, FURNISHINGS, FINISHES, AND ADJACENT MATERIALS NOT INDICATED OR SCHEDULED TO BE REMOVED. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO PREVENT THE SPREAD OF DUST AND DIRT TO ADJACENT AREAS. FACTORY PAINTED EQUIPMENT THAT HAS BEEN SCRATCHED OR MARRED SHALL BE REPAINTED TO MATCH ORIGINAL FACTORY COLOR. ALL EQUIPMENT AND SYSTEMS SHALL BE PROTECTED AGAINST FREEZING, FLOODING, CORROSION, AND OTHER FORMS OF DAMAGE PRIOR TO ACCEPTANCE BY THE OWNER.
- PATCH EXISTING FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS AND EXPERIENCED INSTALLERS. INSTALLERS' QUALIFICATIONS REFER TO THE MATERIALS AND METHODS REQUIRED FOR THE SURFACE AND BUILDING COMPONENTS BEING PATCHED.
- PRIOR TO FINAL ACCEPTANCE, ALL SYSTEMS SHALL BE TESTED AND OPERATED TO DEMONSTRATE PERFORMANCE TO THE SATISFACTION OF THE ENGINEER. DEFECTS DEMONSTRATED BY INSPECTIONS AND TESTS SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT THE SUBCONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL DEVELOP AND MAINTAIN AT THE JOB-SITE A SET OF PRINTS ON WHICH SHALL BE ACCURATELY INDICATED THE ACTUAL INSTALLATION OF ALL WORK UNDER THIS DIVISION, INDICATING ANY VARIATION FROM THE CONTRACT DRAWINGS, INCLUDING CHANGES IN SIZES, LOCATIONS AND DIMENSIONS. CHANGES SHALL BE CLEARLY AND COMPLETELY INDICATED AS THE WORK PROGRESSES. THESE PROGRESS PRINTS SHALL BE AVAILABLE FOR INSPECTION BY THE ARCHITECT/ENGINEER AND SHALL BE USED TO DETERMINE THE PROGRESS OF THE WORK. AT THE COMPLETION OF WORK, PREPARE A NEW SET OF REPRODUCIBLE RECORD DRAWINGS OF THE WORK AS ACTUALLY NOTED ON THE MARK-UP PRINTS (INCLUDING PUNCH LIST ITEMS AND TESTING) AND SUBMIT TO THE ARCHITECT/ENGINEER FOR TRANSMISSION TO THE OWNER.
- ALL WORK SHALL CONFORM WITH APPLICABLE MECHANICAL, BUILDING CODES, AUTHORITIES HAVING JURISDICTION AND APPLICABLE INDUSTRY STANDARDS.

SUBMITTALS

- CONTRACTOR SHALL SUBMIT ELECTRONIC FILES IN PDF FILE FORMAT FOR THE FOLLOWING MATERIALS AND EQUIPMENT:
 - AIR HANDLING UNITS
 - CEILING AIR DEVICES
 - TAB FIRM QUALIFICATIONS
 - TAB CERTIFIED REPORT
 - MECHANICAL IDENTIFICATION
 - FLEXIBLE DUCTWORK
 - FIRE PROTECTION LAYOUT
 - DUCT INSULATION
 - PIPE MATERIAL AND HANGERS

HVAC EQUIPMENT & MATERIALS

- FAN POWERED BOXES, VAV BOXES & AIR HANDLING UNITS SHALL BE AS SCHEDULED.
- CEILING AIR DEVICES: STEEL CONSTRUCTION WITH ENAMEL FINISH, AS MANUFACTURED BY TITUS, METAL AIRE OR KRUEGER.
- FLEXIBLE DUCTWORK: PROVIDE AS SPECIFIED.

HANGERS & SUPPORTS

- ALL EQUIPMENT AND PIPING SHALL BE PROPERLY SUPPORTED WITHIN THE BUILDING AND ADEQUATE PROVISIONS SHALL BE MADE FOR SLOPE AND ANCHORAGE. HANGERS, RODS, CLAMPS, AND INSERTS SHALL BE APPROVED BY U.L. FOR THE SERVICE INTENDED.
- UNLESS SPECIFICALLY NOTED DIFFERENTLY ON THE DRAWINGS, PIPING SHALL BE SUPPORTED WITH GALVANIZED STEEL CLEVIS HANGERS WITH GALVANIZED HANGER RODS AND GRINNELL TYPE 28, 29, OR 30 BEAM CLAMP.
- INSTALL HANGERS, SUPPORTS, CLAMPS AND ATTACHMENTS TO SUPPORT PIPING PROPERLY FROM BUILDING STRUCTURE. COMPLY WITH THE REQUIREMENTS OF MSS SP-69 AND SP-89. INSTALL HANGERS AND SUPPORTS COMPLETE WITH NECESSARY INSERTS, BOLTS, RODS, NUTS, WASHERS, AND OTHER ACCESSORIES. INSTALL ADDITIONAL ATTACHMENTS AT CONCENTRATED LOADS, INCLUDING VALVES, FLANGES, GUIDES, STRAINERS, EXPANSION JOINTS, AND AT CHANGES IN DIRECTION OF PIPING.

MECHANICAL IDENTIFICATION

- PROVIDE ENGRAVED LAMINATED PLASTIC NAMEPLATES ON ALL EQUIPMENT, CONTROL PANELS, ETC. NAMEPLATES SHALL BE MINIMUM 1 1/2" x 4", BLACK WITH WHITE LETTERS. LETTERING SHALL BE MINIMUM OF 3/8" HIGH.
- PROVIDE PRE-PRINTED ADHESIVE TAPE LABELS, WITH FLOW DIRECTION ARROWS, ON ALL PIPING. LABELS SHALL BE MINIMUM 1 1/2" WIDE ON PIPES WITH OUTSIDE DIAMETERS (INCLUDING INSULATION, IF ANY) OF 6" AND LESS, 2 1/2" WIDE FOR LARGER PIPES. COLOR OF LABEL SHALL COMPLY WITH ANSI A13.1. LOCATE LABEL NEAR EACH VALVE, NEAR EACH BRANCH, AND SPACED ALONG PIPE RUNS AT NO MORE THAN 50' INTERVALS.
- IDENTIFICATION MATERIALS SHALL BE AS MANUFACTURED BY W.H. BRADY CO., SETON NAMEPLATE CO., OR APPROVED EQUIVALENT.
- PROVIDE BRASS TAGS FOR ALL ISOLATION VALVES AT DOMESTIC WATER LINES MARKING IT'S SERVICE/USAGE.

INSULATION

- CONCEALED AIR CONDITIONING DUCTS: INSULATE ALL CONCEALED SUPPLY AIR DUCTS WITH 2" THICK, 3/4 LB. DENSITY FIBERGLASS FLEXIBLE BLANKET INSULATION FACED WITH A FIRE RESISTIVE FOIL SCRIM KRAFT (FSK) VAPOR BARRIER JACKET WITH A 2" TAB ON ONE EDGE. INSULATION SHALL BE WRAPPED ON DUCTS WITH FACING OVERLAPPING ALL JOINTS AT LEAST 2" AND HELD IN PLACE WITH 1/2" OUTWARD CLINCHING STAPLES ON 4" CENTERS. STAPLES AND SEAMS ARE TO BE SEALED WITH A BRUSH COAT OF VAPOR BARRIER MASTIC. THE INSTALLED R-VALUE AT 25% COMPRESSION SHALL BE A MINIMUM OF 5.0.
- PIPE INSULATION: RIGID FIBERGLASS WITH VAPOR BARRIER JACKET OR FLEXIBLE UNICELLULAR TYPE, WITH MAXIMUM 25/50 FLAME SPREAD/SMOKE DEVELOPED RATING. WHERE POSSIBLE, UNICELLULAR INSULATION SHALL BE SLIPPED OVER THE TUBING AS FULL CYLINDER. INSULATION OF PIPING SHALL BE VAPOR TIGHT AND CONTINUOUS THROUGH HANGERS, WALLS, ETC. PROVIDE GALVANIZED SHEET METAL SADDLES AT HANGERS. INSULATION CONDUCTIVITY SHALL NOT EXCEED 0.27 BTU PER INCH / HR, SF, °F. AS APPLICABLE. PROVIDE INSULATION THICKNESS AS FOLLOWS, OR AS REQUIRED PER 2003 IECC:
 - CONDENSATE DRAIN - 1/2"
 - CHILLED WATER - 1"
- INSULATION OF DUCTWORK AND PIPING PASSING THROUGH NON-RATED WALLS SHALL BE CONTINUOUS THROUGH THE WALL PENETRATION.
- WHEN THE EXISTING CEILING HAS BEEN REMOVED, VISUALLY INSPECT ALL EXISTING INSULATION. REPAIR OR PATCH AS REQUIRED WHERE INSULATION IS TORN OR MISSING.

DUCTWORK & DUCT ACCESSORIES

- GENERAL: CONSTRUCT ALL SUPPLY DUCTWORK AND ACCESSORIES UPSTREAM OF TERMINAL BOXES IN ACCORDANCE WITH THE LATEST EDITION OF SMACNA STANDARDS FOR 6" PRESSURE CLASS AND SEAL CLASS B. CONSTRUCT ALL SUPPLY DUCTWORK DOWNSTREAM OF TERMINAL DEVICES FOR 2" PRESSURE CLASS. CONSTRUCT ALL RETURN, EXHAUST OR TRANSFER AIR DUCTS TO 1" PRESSURE CLASS.
- METAL DUCTWORK: FABRICATE ALL DUCTWORK, HOUSINGS, DAMPERS, AND ALL OTHER DUCT RELATED ACCESSORIES FROM GALVANIZED STEEL SHEETS.
- INSTALL ALL DUCTWORK ABOVE CEILING AND HOLD TIGHT TO UNDERSIDE OF STRUCTURE ABOVE, UNLESS OTHERWISE INDICATED. TRANSITION RECTANGULAR DUCT ON BOTTOM AND SIDES ONLY. ALL DUCT SIZES ARE IN INCHES AND ARE CLEAR AIRSTREAM DIMENSIONS.
- CHANGES TO DUCT DUE TO FIELD CONDITIONS SHALL BE MADE ONLY IF THE DUCT SIZE FREE AREA IS MAINTAINED AND SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
- FLEXIBLE DUCT: U.L.-181 CLASS INSULATED (R6 MIN.) WITH ALUMINIZED POLYESTER OUTER JACKET AND AN ACOUSTICALLY TRANSPARENT CPE INNER FILM, FLEXMASTER USA, TYPE BM, OR EQUIVALENT. MAXIMUM LENGTH SHALL BE 5 FEET. FOR A TYPICAL 8" DIAMETER DUCT THE DECIBEL REDUCTION SHALL RANGE FROM 11db TO 46db.
- BALANCING DAMPERS: PROVIDE MANUAL VOLUME BALANCING DAMPERS AT ALL LOW PRESSURE SUPPLY TAPS. PROVIDE LOCKING HAND QUADRANT AND WHERE INSULATED A 2" STANDOFF BRACKET.
- CONICAL FITTINGS: PROVIDE AT ALL LOW PRESSURE DUCT TAPS A 26 GAUGE CONICAL BELLMOUTH FITTING EQUAL TO FLEXMASTER TYPE CB.
- ALL DUCT JOINTS SHALL BE SEALED WITH HARDCAST 601 OR EQUIVALENT.

- PROVIDE U.L. LISTED FIRE DAMPERS IN TWO HOUR OR GREATER FIRE WALLS. LINKAGE SHALL BE 165°F TYPE. INSTALLATION SHALL BE IN ACCORDANCE WITH ALL U.L. AND MANUFACTURER REQUIREMENTS. WHERE SPECIFIED INSIDE DUCTWORK, DAMPER BLADES SHALL BE OUT OF THE AIRSTREAM. PROVIDE ACCESS PANELS IN DUCTWORK IN A LOCATION TO SERVICE FIRE DAMPERS. ACCESS PANELS SHALL BE OF THE INSULATED DOOR TYPE ON ALL INSULATED DUCTS AND SHALL NOT BE COVERED BY DUCT INSULATION. ACCESS PANELS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. MINIMUM SIZE OF ACCESS PANELS SHALL BE 12"x12" EXCEPT WHERE DUCT IS LESS THAN 14" WIDE IN WHICH CASE ONE DIMENSION SHALL BE 12" AND THE OTHER SHALL BE 2" LESS THAN THE DUCT WIDTH. PROVIDE ALL PRODUCTS AS MANUFACTURED BY GREENHECK.

TESTING, ADJUSTING AND BALANCING (TAB)

- AN AABC (ASSOCIATED AIR BALANCE COUNCIL) CERTIFIED TEST & BALANCE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES AND PERFORM ALL OPERATIONS REQUIRED FOR COMPLETE BALANCING OF THE AIR SYSTEMS AND RELATED WORK AS INDICATED ON THE DRAWINGS AND SPECIFIED HEREIN. THIS FIRM SHALL BE IMPARTIAL AND INDEPENDENT OF THE MECHANICAL SUBCONTRACTOR. THE CONTRACTOR SHALL BE KNOWLEDGEABLE OF PNEUMATIC VAV TEMPERATURE CONTROLS AND THE BUILDING STANDARD TEMPERATURE CONTROL SOFTWARE TO MAKE ADJUSTMENTS AS REQUIRED. PROVIDE SUBMITTALS OF TAB FIRM QUALIFICATIONS FOR APPROVAL BEFORE WORK PROCEEDS.
- BALANCING SHALL NOT BE PERFORMED UNTIL ALL MECHANICAL EQUIPMENT IS PROPERLY INSTALLED AND IS 100% OPERATIONAL, ALL TEMPERATURE CONTROLS ARE INSTALLED AND CALIBRATED AND ALL SYSTEMS ARE CLEANED.
- SUBMIT TO OWNER SIX (6) COPIES OF BALANCING AND TESTING RECORDS OF TESTS SPECIFIED HEREIN SHOWING THE AIR DISTRIBUTION SYSTEMS HAVE BEEN BALANCED AND ARE DELIVERING SPECIFIED QUANTITIES.
- EACH PIECE OF EQUIPMENT AND EACH AIR DEVICE SHALL BE IDENTIFIED AS TO LOCATION, SERVICE, MANUFACTURER AND MODEL NUMBER. THIS INFORMATION SHALL BE RECORDED AND INCLUDED IN THE FINAL BALANCE REPORT. A FULL SIZED FLOOR PLAN OF THE PROJECT SPACE SHALL BE PROVIDED NOTING ALL SUPPLY AND RETURN AIR DEVICES IN RELATION TO THE VALUES IN THE WRITTEN REPORT. THIS DRAWING SHALL ACCURATELY NOTE DIFFUSER LOCATIONS, POINTS OF CONNECTION TO MAINS AND EQUIPMENT LOCATIONS AS BUILT. NOTIFY ENGINEER OF CONFLICTS IN DESIGN DRAWINGS TO AS BUILT DRAWINGS AVAILABLE AFFECTING TAB WORK.
- AFTER ADJUSTMENTS ARE COMPLETED, THE AIR CONDITIONING, HEATING, AND VENTILATING SYSTEMS SHALL BE TESTED, AND THE FOLLOWING INFORMATION RECORDED AND INCLUDED IN THE FINAL BALANCE REPORT:
 - COVER PAGE:
 - PROJECT NAME AND LOCATION
 - DATE WORK PERFORMED AND NAME OF PERSONNEL USED
 - CERTIFICATION OF COMPANY
 - PROJECT SUMMARY AND COMMENTS
 - AIR DEVICES:
 - EACH AIR DEVICE SHALL BE IDENTIFIED AS TO LOCATION AND SERVICE
 - PROVIDE NECK SIZE, FACE SIZE AND TYPE
 - REQUIRED CFM AND TEST RESULTANT CFM AT EACH AIR DEVICE
 - HVAC EQUIPMENT:
 - MANUFACTURER NAMEPLATE DATA
 - SUPPLY AIR CFM
 - SUPPLY AIR TEMPERATURE

TEMPERATURE CONTROLS

- MOUNT ALL TEMPERATURE SENSORS WHERE INDICATED ON PLANS AT 4'-0" AFF. INSTALL ON WALL ABOVE LIGHT SWITCH, TYPICAL.
- CONTRACTOR TO PROVIDE REQUIRED CONTROL WIRING/PNEUMATIC TUBING TO ACCOMMODATE RELOCATED SENSORS.
- CALIBRATE AND REPAIR/REPLACE WHERE REQUIRED DEFICIENT TEMPERATURE SENSORS TO MEET EXISTING BUILDING STANDARDS.
- CONTRACTOR TO VERIFY PROPER OPERATION OF CONTROLS FOR EXISTING TERMINAL DEVICES.

FIRE PROTECTION

- AS APPLICABLE, ADJUST THE EXISTING FIRE SPRINKLER SYSTEM AS REQUIRED TO PROVIDE FULL COVERAGE FOR THE NEW ARCHITECTURAL FINISH OUT OF THE AREA OF CONSTRUCTION INCLUDING ADDING OR RELOCATING HEADS. REFERENCE THE ARCHITECTURAL REFLECTED CEILING PLAN AND PROVIDE SPRINKLER HEAD LAYOUT TO AVOID CONFLICT. ANY EXISTING SPRINKLER HEADS LOCATED WITHIN THE PROJECT AREA OBSERVED TO NOT BE IN COMPLIANCE OF PRESENT CODES ARE TO BE CORRECTED. PROVIDE A SHOP DRAWING OF PROPOSED WORK AND NEW SPRINKLER HEAD LOCATIONS. ALL SPRINKLER HEADS WITHIN A GIVEN ROOM SHALL MATCH. ALL SPRINKLER HEADS SHALL BE BASE BUILDING STANDARD TYPE. IN NO CASE MAY SPRINKLER HEADS MANUFACTURED BY CENTRAL SPRINKLER COMPANY BE USED ON THIS PROJECT.

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ISSUED FOR REVIEW	JRM	08.31.10
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 Portland, ME 04101

Project Title & Address:

MECHANICAL SPECIFICATIONS

Sheet Title:
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MECHANICAL SYMBOLS	
SYMBOL	DESCRIPTION
	NEW EQUIPMENT
	EXISTING EQUIPMENT
	EXISTING EQUIPMENT TO BE REMOVED OR RELOCATED
	NEW DUCT
	EXISTING DUCT TO REMAIN
	EXISTING DUCT OR PIPING TO BE REMOVED OR RELOCATED
	ACOUSTICAL DUCT LINING
	NEW SUPPLY DIFFUSER OR SLOT DIFFUSER
	EXISTING SUPPLY DIFFUSER TO REMAIN
	EXISTING SUPPLY DIFFUSER TO BE REMOVED OR RELOCATED
	NEW R/A OR EXHAUST GRILLE
	EXISTING R/A OR EXHAUST GRILLE TO REMAIN
	EXISTING R/A OR EXHAUST GRILLE TO BE REMOVED OR RELOCATED
	FLEXIBLE DUCT
	SUPPLY DUCT RISER
	RETURN, EXH OR OA DUCT RISER
	SIDEWALL SUPPLY GRILLE OR REGISTER
	THERMOSTAT
	CONICAL TAP WITH VOLUME DAMPER
	MANUAL VOLUME DAMPER
	FIRE DAMPER
	MOTORIZED DAMPER
	SMOKE DAMPER
	COMBINATION FIRE & SMOKE DAMPER
	PARALLEL BLADE DAMPER
	OPPOSED BLADE DAMPER
	NEW CONNECTION TO EXISTING

ALL SYMBOLS SHOWN MAY NOT APPEAR IN ALL DRAWINGS. SYMBOLS ARE SHOWN SCHEMATIC AND MAY NOT BE TO SCALE.

ABBREVIATIONS

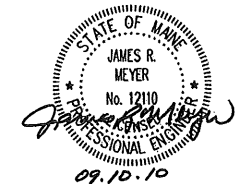
ABBV.	DESCRIPTION	ABBV.	DESCRIPTION	ABBV.	DESCRIPTION	ABBV.	DESCRIPTION
A	AMPERE	F	DEGREES FAHRENHEIT	M	MOTOR	S	SUPPLY AIR OR SHOCK ABSORBER
AMP	AMPERE	FC	FAN COIL UNIT	MAX	MAXIMUM	SA	SANITARY
AFF	ABOVE FINISHED FLOOR	FCO	FLOOR CLEANOUT	MBH	THOUSAND BTU PER HOUR	SCH	SCHEDULE
AHU	AIR HANDLING UNIT	FD	FIRE DAMPER OR FLOOR DRAIN	MCA	MINIMUM CIRCUIT AMPACITY	SD	SMOKE DAMPER
APPROX	APPROXIMATE(LY)	FDC	FIRE DEPARTMENT CONNECTION	ND	MOTORIZED DAMPER	SECT	SECTION
ARCH	ARCHITECTURAL OR ARCHITECT	FIN	FINISH OR FINISHED	MECH	MECHANICAL	SF	SQUARE FOOT
AMB.	AMBIENT	FLA	FULL LOAD AMPS	MER	MECHANICAL EQUIPMENT ROOM	SG	SUPPLY GRILLE
ATC	AUTOMATIC TEMPERATURE CONTROL	FLX	FLEXIBLE	MFR	MANUFACTURER	SIM	SIMILAR
		FLG	FLANGED	NH	MANHOLE	SP	STATIC PRESSURE
		FLR	FLOOR	MIN	MINIMUM	SPECS	SPECIFICATIONS
B	BACKDRAFT DAMPER	FOB	FLAT ON BOTTOM	MOC	MAXIMUM OVER CURRENT PROTECTION	SPKL	SPRINKLER
BDD	BACKDRAFT DAMPER	FOT	FLAT ON TOP			SQ	SQUARE
BFP	BACKFLOW PREVENTER	FS	FEET PER MINUTE	N/A	NOT APPLICABLE	SS	SERVICE SINK OR STAINLESS STEEL
BLDG	BUILDING	FSW	FEET PER SECOND	NC	NORMALLY CLOSED	ST	STORM
B.O.D.	BOTTOM OF DUCT	FT	FOOT OR FEET	NFHB	NON-FREEZE HOSE BIBB	STD	STANDARD
B.O.P.	BOTTOM OF PIPE	FTG	FOOTING OR FITTING	NFWH	NON-FREEZE WALL HYDRANT	STL	STEEL
BTU	BRITISH THERMAL UNIT	FURN	FURNISH	NG	NATURAL GAS	STOR	STORAGE
BTUH	BRITISH THERMAL UNIT PER HOUR			NIC	NOT IN CONTRACT	SW	SWITCH
				NO	NORMALLY OPEN		
				NO.	NUMBER	T	TEMPERATURE
				NOM	NOMINAL	TEMP	TEMPERATURE
				NTS	NOT TO SCALE	TG	TRANSFER GRILLE
C	COMPRESSED AIR	G	GAS	O	OUTSIDE AIR	THRD	THREADED
CA	COMPRESSED AIR	GAL	GALLON	OA	OUTSIDE AIR	T.O.	TRANSFER OPENING
CB	CATCH BASIN	GCO	GRADE CLEANOUT	OAT	OUTSIDE AIR TEMPERATURE	T.O.P.	TOP OF PIPE
CLG	CEILING	GPH	GALLONS PER HOUR	OB	OPPOSED BLADE DAMPER	T.O.D.	TOP OF DUCT
CFM	CUBIC FEET PER MINUTE	GPM	GALLONS PER MINUTE	OC	ON CENTER	T&P	TEMPERATURE AND PRESSURE
CI	CAST IRON	GWR	GLYCOL/WATER RETURN	OD	OUTSIDE DIAMETER	TS	TAMPER SWITCH
CI	CAST IRON	GWS	GLYCOL/WATER SUPPLY	OPNG	OPENING	TYP	TYPICAL
CIRC	CIRCULATION						
C	CENTERLINE	H	HANDICAP	P	POLYBUTYLENE	TEMP	TEMPERATURE
C	CENTERLINE	H/C	HANDICAP	U/F	PUMPED CONDENSATE	TG	TRANSFER GRILLE
CD	CLEANOUT	HB	HOSE BIBB	U/G	PUMPED CONDENSATE	THRD	THREADED
CD2	CARBON DIOXIDE	HD	HUB DRAIN	PD	PRESSURE DROP	T.O.	TRANSFER OPENING
COL	COLUMN	HOR	HORIZONTAL	PE	POLYETHYLENE	T.O.P.	TOP OF PIPE
CONC	CONCRETE	HP	HORSEPOWER / HEATPUMP	PLBG	PLUMBING	T.O.D.	TOP OF DUCT
CONN	CONNECT	HR	HOUR	PRESS	PRESSURE	T&P	TEMPERATURE AND PRESSURE
CONTR	CONTRACTOR	HVAC	HEATING, VENTILATION & AIR CONDITIONING	PRV	PRESSURE REDUCING VALVE	TS	TAMPER SWITCH
CONTR	CONTRACTOR	HW	HOT WATER	PSI	POUNDS PER SQUARE INCH	TYP	TYPICAL
CU	CITY WATER	HWS	HOT WATER SUPPLY	PSIG	POUNDS PER SQUARE INCH GAUGE		
CW	CITY WATER	HWR	HOT WATER RETURN	PVC	POLYVINYL CHLORIDE	U	UNDER FLOOR
		HZ	FREQUENCY			U/F	UNDERGROUND
D	DRAIN	I	INSIDE DIAMETER			U/G	UNDERGROUND
D	DRAIN	ID	INSIDE DIAMETER	Q	QUANTITY	UL	UNDERWRITER'S LABORATORIES
DB	DRY BULB TEMPERATURE, °F	IN	INCH	QTY	QUANTITY	UNO	UNLESS NOTED OTHERWISE
DIFF	DIFFUSER	INSUL	INSULATE	R	RETURN AIR	UR	URINAL
DIA	DIAMETER	INV	INVERT	RA	REQUIRED	V	VENT OR VOLT
DIM	DIMENSION	J	JANITOR	REQ'D	REQUIRED	VAC	VACUUM OR VOLT ALTER CURRENT
DN	DOWN	JAN	JANITOR	RET	RETURN	VAR	VARIABLE
DOM	DOMESTIC	K	KILOWATT(S)	RD	ROOF DRAIN	VAV	VARIABLE VOLUME AIR TERMINAL
DS	DUCT SILENCER OR DOWNSPOUT	L	LEAVING AIR TEMPERATURE	RG	RETURN GRILLE	VD	VOLUME DAMPER (MANUAL)
DS	DUCT SILENCER OR DOWNSPOUT	LAV	LAVATORY	RH	RELATIVE HUMIDITY	VOL	VOLUME
DWGS	DRAWINGS	LB	POUND	RL	RAIN LEADER	VTR	VENT THRU ROOF
DWV	DRAINAGE, WASTE & VENT	LBS/HR	POUNDS PER HOUR	RTU	ROOFTOP UNIT		
DX	DIRECT EXPANSION	LRA	LOCKED ROTOR AMPS			W	WITH
		LVG	LEAVING			W/OUT	WITHOUT
		LWT	LEAVING WATER TEMPERATURE			W	WASTE OR WATT
E	EACH					WB	WET BULB TEMPERATURE, °F
EA	ENTERING AIR TEMPERATURE					WC	WATER CLOSET
EAT	ELECTRIC OR ELECTRICAL					W.C.	WATER COLUMN
ELEC	ELECTRIC OR ELECTRICAL					WCO	WALL CLEANOUT
ELEV	ELEVATOR OR ELEVATION					WG	WATER GAUGE
ENT	ENTERING					WGT	WEIGHT
ENT	ENTERING						
EQUIP	EQUIPMENT						
ES/EW	EMERGENCY SHOWER/EYEWASH						
ESP	EXTERNAL STATIC PRESSURE						
EW	ELECTRIC WATER COOLER						
EWT	ENTERING WATER TEMPERATURE						
EXIST	EXISTING						
EXH	EXHAUST						
EXP	EXPANSION						

ALL ABBREVIATIONS SHOWN MAY NOT APPEAR ON ALL DRAWINGS.

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MECHANICAL SYMBOLS AND
ABBREVIATIONS

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Proj. No.:

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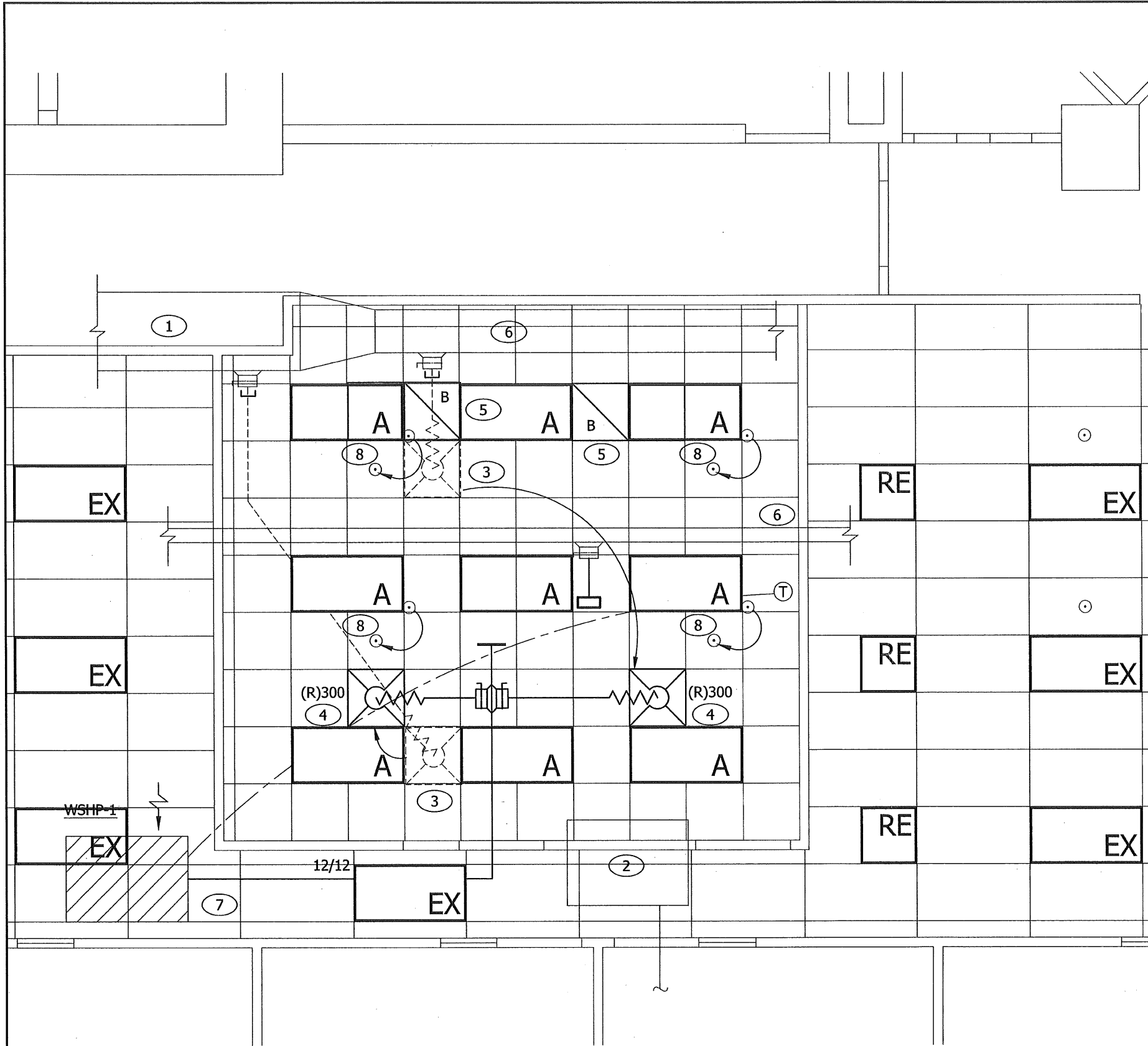
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M0-2

ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS. THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

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1
M1-1
MECHANICAL PLAN
1/4"=1'-0"

GENERAL NOTES:

1. THE DESIGN INTENT IS TO REUSE AS MUCH OF THE EXISTING HVAC SYSTEM AS POSSIBLE, VERIFY AND DOCUMENT EXISTING CONDITIONS.
2. REFER TO DRAWINGS M0-1 FOR MECHANICAL SPECIFICATIONS, AND M0-2 FOR SYMBOLS AND ABBREVIATIONS.
3. CONTRACTOR SHALL COORDINATE WITH ARCHITECTURAL PLANS TO DETERMINE MINIMUM HEIGHTS FOR DUCTWORK AND EQUIPMENT.
4. ALL EXISTING MECHANICAL EQUIPMENT WITHIN THE AREA OF RENOVATION TO BE REUSED SHALL BE THOROUGHLY CLEANED AND SERVICED TO NEW CONDITION.
5. THESE DRAWINGS WERE PRODUCED BASED ON "AS-BUILT" DRAWINGS FURNISHED BY THE OWNER. CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE SITE PRIOR TO BID. ANY DEVIATIONS FROM DRAWINGS SHALL BE REPORTED TO THE ENGINEER PRIOR TO BEGINNING CONSTRUCTION.

KEYED NOTES:

- 1 EXISTING WSHP AND ASSOCIATED DUCT SERVING ADJACENT AREA TO REMAIN. REBALANCE UNIT TO DISTRIBUTE AIR EVENLY TO REMAINING DIFFUSERS.
- 2 EXISTING WSHP AND THERMOSTAT SERVING OUTSIDE SPACE TO REMAIN. VERIFY EXACT LOCATION AND RELOCATE AS REQUIRED IF IT INTERFERES WITH NEW CONSTRUCTION.
- 3 DISCONNECT EXISTING DIFFUSERS AND RELATED DUCT FROM APPROXIMATELY THIS LOCATION, CAP DUCT BRANCH AT MAIN. RELOCATE DIFFUSERS PER NOTE 4.
- 4 CONNECT RELOCATED SUPPLY DIFFUSERS TO NEW WSHP. REFER TO DETAIL AND SCHEDULE ON M1-2. COORDINATE PLACEMENT OF SUPPLY DIFFUSERS WITH ARCHITECTURAL CEILING PLAN.
- 5 INSTALL NEW TYPE 'B' RETURN GRILLE AND RETURN AIR BOOT. REFER TO DETAIL AND SCHEDULE ON M1-2.
- 6 EXISTING SUPPLY AIR DUCTWORK TO REMAIN AS IS.
- 7 NEW WSHP. CONNECT TO EXISTING CONDENSER WATER SUPPLY AND RETURN PIPING. REF SCHEDULE AND DETAIL ON M1-2.
- 8 RELOCATE EXISTING SPRINKLER HEADS TO CENTER OF CEILING TILES. SUB-CONTRACTOR TO BE RESPONSIBLE FOR RELOCATION.

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MECHANICAL PLAN

Sheet Title:

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P.M.:	JRM

M1-1

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AIR DEVICE SCHEDULE				
DESIGNATION	DESCRIPTION	PANEL SIZE	TITUS MODEL NO.	REMARKS
A	CEILING SUPPLY	24" x 24"	OMNI	1,2
B	CEILING RETURN	24" x 24"	50F	1,2,3,4

NOTES:

- COLOR TO MATCH CEILING/WALL.
- CONTRACTOR IS RESPONSIBLE TO PROVIDE THE AIR DEVICE FRAME AND MOUNTING SYSTEM TO MATCH THE ARCHITECT CEILING/WALL TYPES. SEE ARCHITECTURAL DRAWINGS FOR COORDINATION.
- PROVIDE SHEET METAL PLENUM FOR DUCT CONNECTION.
- PROVIDE ATTENUATED RETURN DUCT. REFER TO 1/M1-2.

AIR DEVICE LEGEND (A/400)	
'A'	DIFFUSER OR GRILLE TYPE
400	AIRFLOW, CFM

NECK SIZE LEGEND	
0 TO 100 CFM - 6"Ø	351 TO 500 CFM - 12"Ø
101 TO 240 CFM - 8"Ø	501 TO 800 CFM - 14"Ø
241 TO 350 CFM - 10"Ø	

WATER SOURCE HEAT PUMP UNIT										
DESIGNATION	COOLING DATA		SUPPLY FAN		VOLT/ PHASE	UNIT MCA	MAX FUSE	WEIGHT (LBS.)	MANUFACTURE AND MODEL NO.	REMARKS
	TOTAL MBH	SENSIBLE MBH	CFM (HIGH)	EXT. SP. IN.						
WSHP-1	20.4	14.8	600	0.5	208/3	17.2	25	300	CLIMATE MASTER TTH 026	SEE NOTES.

NOTES:

- PROVIDE WITH WALL MOUNTED THERMOSTAT CONTROL.
- PROVIDE WITH (1) POINT-TYPE LEAK DETECTOR.
- PROVIDE WITH FACTORY INSTALLED CONDENSATE DRAIN PUMP.
- UNIT TO BE PLENUM MOUNTED.
- PROVIDE WITH FACTORY INSTALLED DISCONNECT SWITCH.
- UNIT SCHEDULED IS BASIS OF DESIGN. PROVIDE UNIT TO MATCH BUILDING STANDARD.

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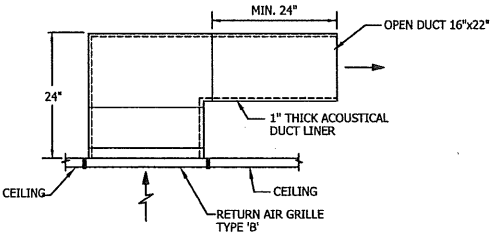
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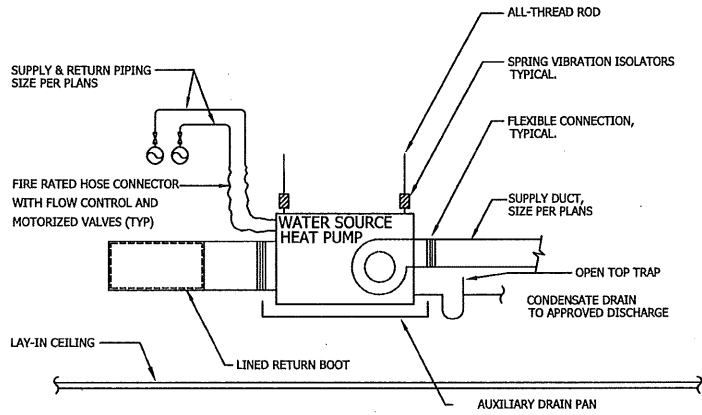
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MECHANICAL SCHEDULES AND DETAILS
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M1-2

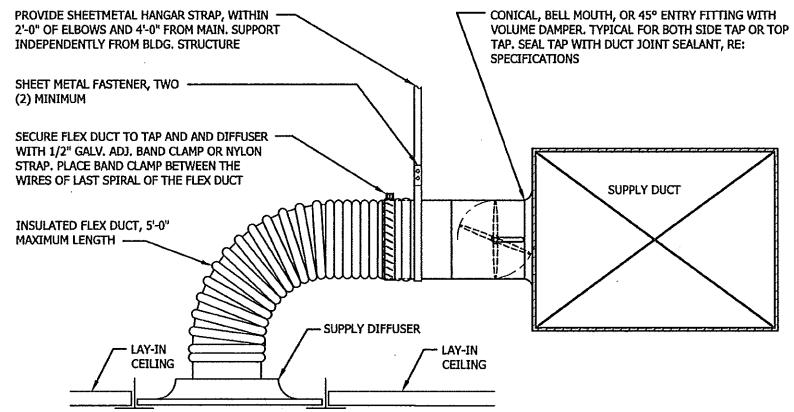
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1 ATTENUATED RETURN AIR DUCT
 SCALE: NONE



3 WATER SOURCE HEAT PUMP DETAIL
 SCALE: NONE



2 SUPPLY DIFFUSER DETAIL
 SCALE: NONE

PART 1 GENERAL INSTRUCTIONS

1-1 GENERAL REQUIREMENTS

ALL REQUIREMENTS ON DRAWING GNO.01 AND THE GENERAL AND SUPPLEMENTARY CONDITIONS OF THESE SPECIFICATIONS APPLY TO THIS SECTION AND DIVISION. WHERE THE REQUIREMENTS OF THIS SECTION AND DIVISION EXCEED THOSE OF DRAWING GNO.01, THIS SECTION AND DIVISION TAKE PRECEDENCE. BECOME THOROUGHLY FAMILIAR WITH ALL REQUIREMENTS THAT AFFECT THIS DIVISION, SECTION OR BOTH. WORK REQUIRED UNDER THIS DIVISION INCLUDES ALL MATERIAL, EQUIPMENT, APPLIANCES, AND LABOR REQUIRED TO COMPLETE THE ENTIRE ELECTRICAL SYSTEM AS REQUIRED BY THE DRAWINGS AND SPECIFICATIONS, OR REASONABLY INFERRED TO BE NECESSARY TO FACILITATE EACH SYSTEM'S FUNCTIONALITY AS IMPLIED BY THE DESIGN AND THE EQUIPMENT SPECIFIED.

THE SPECIFICATIONS AND DRAWINGS FOR THE PROJECT ARE COMPLEMENTARY, AND PORTIONS OF THE WORK DESCRIBED IN ONE, SHALL BE PROVIDED AS IF DESCRIBED IN BOTH. IN THE EVENT OF DISCREPANCIES, NOTIFY THE ENGINEER AND REQUEST CLARIFICATION PRIOR TO PROCEEDING WITH THE WORK INVOLVED.

DRAWINGS ARE GRAPHIC REPRESENTATIONS OF THE WORK UPON WHICH THE CONTRACT IS BASED. THEY SHOW THE MATERIALS AND THEIR RELATIONSHIP TO ONE ANOTHER, INCLUDING SIZES, SHAPES, LOCATIONS, AND CONNECTIONS. THEY ALSO CONVEY THE SCOPE OF WORK, INDICATING THE INTENDED GENERAL ARRANGEMENT OF THE EQUIPMENT, FIXTURES, OUTLETS AND CIRCUITS WITHOUT SHOWING ALL OF THE EXACT DETAILS AS TO ELEVATIONS, OFFSETS, CONTROL LINES, AND OTHER INSTALLATION REQUIREMENTS. USE THE DRAWINGS AS A GUIDE WHEN LAYING OUT THE WORK AND TO VERIFY THAT MATERIALS AND EQUIPMENT WILL FIT INTO THE DESIGNATED SPACES AND WHICH, WHEN INSTALLED PER MANUFACTURERS' REQUIREMENTS, WILL ENSURE A COMPLETE, COORDINATED, SATISFACTORY AND PROPERLY OPERATING SYSTEM.

DRAWINGS ARE SCHEMATIC IN NATURE, SHOW THE VARIOUS COMPONENTS OF THE SYSTEMS APPROXIMATELY TO SCALE AND ATTEMPT TO INDICATE HOW THEY SHALL BE INTEGRATED WITH OTHER PARTS OF THE WORK. FIGURED DIMENSIONS TAKE PRECEDENCE TO SCALED DIMENSIONS. DETERMINE EXACT LOCATIONS BY JOB MEASUREMENTS, BY CHECKING THE REQUIREMENTS OF OTHER TRADES, AND BY REVIEWING ALL CONTRACT DOCUMENTS. CORRECT ERRORS THAT COULD HAVE BEEN AVOIDED BY PROPER CHECKING AND INSPECTION, AT NO ADDITIONAL COST.

SPECIFICATIONS DEFINE THE QUALITATIVE REQUIREMENTS FOR PRODUCTS, MATERIALS, AND WORKMANSHIP UPON WHICH THE CONTRACT IS BASED.

1-2 DEFINITIONS

WHENEVER USED IN THESE SPECIFICATIONS OR DRAWINGS, THE FOLLOWING TERMS SHALL HAVE THE INDICATED MEANINGS:

- 1. FURNISH TO SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLING, INSTALLING, AND SIMILAR OPERATIONS.
- 2. INSTALL TO PERFORM ALL OPERATIONS AT THE PROJECT SITE, INCLUDING, BUT NOT LIMITED TO, AND AS REQUIRED: UNLOADING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, TESTING, COMMISSIONING, STARTING UP AND SIMILAR OPERATIONS, COMPLETE, AND READY FOR THE INTENDED USE.
- 3. PROVIDE TO FURNISH AND INSTALL COMPLETE, AND READY FOR THE INTENDED USE.
- 4. FURNISHED BY OWNER (OR OWNER-FURNISHED) OR FURNISHED BY OTHERS: AN ITEM FURNISHED BY THE OWNER OR UNDER OTHER DIVISIONS OR CONTRACTS, AND INSTALLED UNDER THE REQUIREMENTS OF THIS DIVISION, COMPLETE, AND READY FOR THE INTENDED USE, INCLUDING ALL ITEMS AND SERVICES INCIDENTAL TO THE WORK NECESSARY FOR PROPER INSTALLATION AND OPERATION. INCLUDE THE INSTALLATION UNDER THE WARRANTY REQUIRED BY THIS DIVISION.
- 5. ENGINEER: WHERE REFERENCED IN THIS DIVISION, "ENGINEER" IS THE ENGINEER OF RECORD AND THE DESIGN PROFESSIONAL FOR THE WORK UNDER THIS DIVISION, AND IS A CONSULTANT TO, AND AN AUTHORIZED REPRESENTATIVE OF, THE ARCHITECT, AS DEFINED IN THE GENERAL AND/OR SUPPLEMENTARY CONDITIONS. WHEN USED IN THIS DIVISION, IT MEANS INCREASED INVOLVEMENT BY, AND OBLIGATIONS TO, THE ENGINEER, IN ADDITION TO INVOLVEMENT BY, AND OBLIGATIONS TO, THE ARCHITECT.
- 6. AHJ: THE LOCAL CODE AND/OR INSPECTION AGENCY, AUTHORITY HAVING JURISDICTION OVER THE WORK.
- 7. NRTL: NATIONALLY RECOGNIZED TESTING LABORATORY, AS DEFINED AND LISTED BY OSHA IN 29 CFR 1910.7 (E.g., UL, ETL, CSA), AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.
- 8. THE TERMS "EQUIVALENT" OR "EQUAL" ARE USED SYNONYMOUSLY AND SHALL MEAN "ACCEPTED BY OR ACCEPTABLE TO THE ENGINEER AS EQUIVALENT TO THE ITEM OR MANUFACTURER SPECIFIED", "EQUIVALENT" OR "EQUAL" PRODUCTS SHALL BE LABELED, LISTED, CERTIFIED, OR ALL THREE, BY AN NRTL, AND ACCEPTABLE TO THE AHJ OVER THIS PROJECT.

1-3 PRE-BID SITE VISIT

PERSONALLY INSPECT THE SITE OF THE PROPOSED WORK AND BECOME FULLY INFORMED OF CONDITIONS UNDER WHICH THE WORK IS TO BE DONE. FAILURE TO DO SO WILL NOT BE CONSIDERED SUFFICIENT JUSTIFICATION TO REQUEST OR OBTAIN EXTRA COMPENSATION OVER AND ABOVE THE CONTRACT PRICE.

1-4 MATERIAL AND WORKMANSHIP

PROVIDE ALL MATERIAL AND EQUIPMENT NEW AND IN FIRST CLASS CONDITION. PROVIDE MARKINGS OR A NAMEPLATE FOR ALL MATERIAL AND EQUIPMENT IDENTIFYING THE MANUFACTURER AND PROVIDING SUFFICIENT REFERENCE TO ESTABLISH QUALITY, SIZE AND CAPACITY. ALL WORKMANSHIP SHALL BE OF THE FINEST POSSIBLE BY EXPERIENCED MECHANICS OF THE PROPER TRADE. IN GENERAL, PROVIDE THE FOLLOWING QUALITY GRADE(S) FOR ALL MATERIALS AND EQUIPMENT (LIGHT DUTY AND RESIDENTIAL TYPE EQUIPMENT WILL NOT BE ACCEPTABLE):

- 1. COMMERCIAL SPECIFICATION GRADE

PROVIDE ALL HOSTIS, SCAFFOLDS, STAGING, RUNWAYS, TOOLS, MACHINERY AND EQUIPMENT REQUIRED FOR THE INSTALLATION AND PERFORMANCE OF THE ELECTRICAL WORK. STORE AND MAINTAIN MATERIAL AND EQUIPMENT IN CLEAN CONDITION, AND PROTECTED FROM WEATHER, MOISTURE, AND PHYSICAL DAMAGE.

FURNISH ONLY MATERIAL AND EQUIPMENT THAT ARE LISTED, LABELED, CERTIFIED, OR ALL THREE, BY A NATIONALLY RECOGNIZED TESTING LABORATORY, WHENEVER ANY LISTING OR LABELING EXISTS FOR THE TYPES OF MATERIAL AND EQUIPMENT SPECIFIED. AT A MINIMUM, GENERAL WORK PRACTICES FOR ELECTRICAL CONSTRUCTION SHALL BE IN ACCORDANCE WITH NECA 1 (LATEST EDITION), "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION".

1-5 MANUFACTURERS

IN OTHER ARTICLES WHERE LISTS OF MANUFACTURERS ARE INTRODUCED, SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

WHERE MANUFACTURERS ARE NOT LISTED, PROVIDE PRODUCTS SUBJECT TO COMPLIANCE WITH REQUIREMENTS FOR MANUFACTURERS THAT HAVE BEEN ACTIVELY INVOLVED IN MANUFACTURING THE SPECIFIED PRODUCT FOR NO LESS THAN 5 YEARS.

1-6 COORDINATION

COORDINATE ALL WORK WITH OTHER DIVISIONS AND TRADES SO THAT VARIOUS COMPONENTS OF THE ELECTRICAL SYSTEMS ARE INSTALLED AT THE PROPER TIME, FIT THE AVAILABLE SPACE AND ALLOW PROPER SERVICE ACCESS TO ALL EQUIPMENT. REFER TO ALL DRAWINGS, INCLUDING, BUT NOT LIMITED TO, CIVIL, ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND PLUMBING, AND TO RELEVANT EQUIPMENT SUBMITTALS AND SHOP DRAWINGS TO DETERMINE THE EXTENT OF CLEAR SPACES. MAKE ALL OFFSETS REQUIRED TO CLEAR EQUIPMENT, BEAMS AND OTHER STRUCTURAL MEMBERS, AND TO FACILITATE CONCEALING RACEWAYS IN THE MANNER ANTICIPATED IN THE DESIGN. PROVIDE MATERIALS WITH TRM THAT WILL FIT PROPERLY THE TYPES OF CEILING, WALL, OR FLOOR FINISHES ACTUALLY INSTALLED.

1-7 ORDINANCES, CODES AND CLIENT STANDARDS

COMPLY WITH NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) STANDARDS, STATE AND LOCAL BUILDING CODES, AND ALL OTHER APPLICABLE CODES AND ORDINANCES FOR PERFORMANCE, WORKMANSHIP, EQUIPMENT, AND MATERIALS. ADDITIONALLY, COMPLY WITH RULES AND REGULATIONS OF PUBLIC UTILITIES AND MUNICIPAL DEPARTMENTS AFFECTED BY CONNECTION OF SERVICES.

WHERE CONFLICTS BETWEEN VARIOUS CODES, ORDINANCES, RULES, AND REGULATIONS EXIST, COMPLY WITH THE MOST STRINGENT. WHEREVER REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, EXCEED THOSE OF THE ABOVE ITEMS, THE REQUIREMENTS OF THESE SPECIFICATIONS, DRAWINGS, OR BOTH, SHALL GOVERN. CODE COMPLIANCE, AT A MINIMUM, IS MANDATORY. CONTRIBUTE NOTHING IN THESE CONSTRUCTION DOCUMENTS AS PERMITTING WORK NOT IN COMPLIANCE, AT A MINIMUM, WITH THESE CODES.

PROVIDE AND MAINTAIN ALL NECESSARY SIGNAL LIGHTS AND GUARDS FOR THE SAFETY OF THE PUBLIC. OBTAIN AND PAY FOR ALL PERMITS FOR WORK IN THIS DIVISION.

WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, BANK OF AMERICA STANDARDS, BANK OF AMERICA CRITICAL FACILITY GUIDELINES AND ASSOCIATED BULLETINS. BANK OF AMERICA STANDARDS, BANK OF AMERICA CRITICAL FACILITY GUIDELINES AND ASSOCIATED BULLETINS CAN BE OBTAINED FROM THE CORE PROJECT MANAGER.

1-8 PROTECTION OF EQUIPMENT AND MATERIALS

STORE AND PROTECT FROM DAMAGE EQUIPMENT AND MATERIALS DELIVERED TO JOB SITE, IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. FOR MATERIALS AND EQUIPMENT SUSCEPTIBLE TO CHANGING WEATHER CONDITIONS, DAMPNESS, OR TEMPERATURE VARIATIONS, STORE INSIDE IN PROPERLY CONDITIONED SPACES. FOR MATERIALS AND EQUIPMENT NOT SUSCEPTIBLE TO THESE CONDITIONS, COVER WITH WATERPROOF, TEAR-RESISTANT, HEAVY TARP OR POLYETHYLENE PLASTIC AS REQUIRED TO PROTECT FROM PLASTER, DIRT, PAINT, WATER, OR PHYSICAL DAMAGE. EQUIPMENT AND MATERIAL THAT HAS BEEN DAMAGED BY CONSTRUCTION ACTIVITIES WILL BE REJECTED, AND CONTRACTOR SHALL FURNISH NEW EQUIPMENT AND MATERIAL OF A LIKE KIND.

PLUG OR CAP OPEN ENDS OF CONDUITS WHILE STORED AND INSTALLED DURING CONSTRUCTION WHEN NOT IN USE, TO PREVENT THE ENTRANCE OF DEBRIS INTO THE SYSTEMS.

RE-ESTABLISH SERVICE TO EXISTING EQUIPMENT THAT MAY HAVE BEEN INTERRUPTED DUE TO REMODELING.

1-9 SUBSTITUTIONS

INCLUDE IN THE BASE BID THE PRODUCTS SPECIFICALLY NAMED IN THESE SPECIFICATIONS OR ON THE DRAWINGS. SUBMIT, IN THE FORM OF ALTERNATES, WITH THE BID, PRODUCTS OF ANY OTHER MANUFACTURERS FOR SIMILAR USE, PROVIDED THE DIFFERENCES IN COST, IF ANY, ARE INCLUDED FOR EACH PROPOSED ALTERNATE. PRIOR TO THE BID DATE, SUBSTITUTIONS WILL NOT BE CONSIDERED UNLESS SUBMITTED TO THE ARCHITECT, FOR ENGINEER'S REVIEW, IMMEDIATELY PRIOR TO THE DATE FOR RECEIPT OF BIDS. INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED AND A COMPLETE DESCRIPTION OF THE PROPOSED SUBSTITUTE INCLUDING CUTSHEETS, PHOTOMETRIC DATA, AND ALL OTHER INFORMATION NECESSARY FOR AN EVALUATION FOR EACH SUCH REQUEST. PROVIDE FACTORY GENERATED POINT-BY-POINT CALCULATIONS FOR ALL EXTERIOR LIGHT FIXTURES (PHOTOMETRIC FILES SUPPLIED SO THE ENGINEER CAN GENERATE A POINT-BY-POINT DO NOT SUFFICE FOR THE POINT-BY-POINT CALCULATIONS). PROVIDE INTERIOR POINT-BY-POINT CALCULATIONS AT THE DISCRETION OF THE ENGINEER. SUBMIT A \$100.00 REVIEW FEE TO THE ENGINEER WITH EACH SUCH POINT-BY-POINT CALCULATION FOR USE OF ELECTRONIC BASE FILES.

THE ENGINEER WILL HAVE THE FINAL AUTHORITY AS TO WHETHER THE PRODUCT IS AN ACCEPTABLE REPLACEMENT TO THE SPECIFIED ITEM. THE PROPOSED SUBSTITUTION MAY ALSO BE REJECTED BY THE ARCHITECT FOR AESTHETIC REASONS IF FELT NECESSARY OR DESIRABLE. IN THE EVENT THE PROPOSED SUBSTITUTIONS HEREIN DESCRIBED ARE REJECTED, FURNISH THE SPECIFIED ITEM.

1-10 SUBMITTALS

ASSEMBLE AND SUBMIT TO THE ARCHITECT, FOR ENGINEER'S REVIEW, MANUFACTURERS' PRODUCT LITERATURE FOR ALL MATERIAL AND ALL EQUIPMENT TO BE FURNISHED, INSTALLED, OR BOTH, UNDER THIS DIVISION, INCLUDING SHOP DRAWINGS, MANUFACTURERS' PRODUCT DATA AND PERFORMANCE SHEETS, SAMPLES, AND OTHER SUBMITTALS REQUIRED BY THIS DIVISION. PROVIDE THE SUBMITTALS REQUIRED BY NA ELECTRONIC FILE IN PDF FORMAT. BEFORE SUBMITTING, VERIFY THAT ALL MATERIALS AND EQUIPMENT SUBMITTED ARE MUTUALLY COMPATIBLE AND SUITABLE FOR THE INTENDED USE, FIT THE AVAILABLE SPACES, AND ALLOW AMPLE AND CODE-REQUIRED ROOM FOR ACCESS AND MAINTENANCE. SUBMITTALS SHALL CONTAIN THE FOLLOWING INFORMATION. SUBMITTALS NOT SO IDENTIFIED WILL BE RETURNED TO THE CONTRACTOR WITHOUT ACTION:

- 1. THE PROJECT NAME AND LOCATION (STREET ADDRESS, FLOOR/SUITE NUMBER, CITY AND STATE).
- 2. THE APPLICABLE SPECIFICATION SECTION AND PARAGRAPH.
- 3. THE SUBMITTAL DATE.
- 4. THE CONTRACTOR'S STAMP, WHICH SHALL CERTIFY THAT THE STAMPED DRAWINGS HAVE BEEN CHECKED BY THE CONTRACTOR, COMPLY WITH THE DRAWINGS AND SPECIFICATIONS, AND HAVE BEEN COORDINATED WITH OTHER TRADES.
- 5. BLANK PAGE FOR PLACEMENT OF ENGINEERS REVIEW STAMP.

TRANSMIT SUBMITTALS AS EARLY AS REQUIRED TO SUPPORT THE PROJECT SCHEDULE. ALLOW FOR FIVE DAYS ENGINEER REVIEW TIME. TRANSMIT SUBMITTALS AS SOON AS POSSIBLE AFTER NOTICE TO PROCEED AND BEFORE CONSTRUCTION STARTS. THE ENGINEER'S SUBMITTAL REVIEWS WILL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS IN DIMENSIONS, DETAILS, SIZE OF MEMBERS, OR QUANTITIES, OR FOR OMITTING COMPONENTS OR FITTINGS, OR FOR NOT COORDINATING ITEMS WITH ACTUAL BUILDING CONDITIONS.

1-11 ELECTRONIC DRAWING FILES

ELECTRONIC FILES FOR AS-BUILT COMPLETION CAN BE PROVIDED TO CONTRACTORS UPON REQUEST.

1-12 TRAINING

AT A TIME MUTUALLY AGREED UPON BETWEEN THE OWNER AND CONTRACTOR, TRAIN OWNER'S DESIGNATED PERSONNEL ON THE OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED FOR THIS PROJECT.

PROVIDE TRAINING TO INCLUDE BUT NOT BE LIMITED TO AN OVERVIEW OF THE SYSTEM AND/OR EQUIPMENT AS IT RELATES TO THE FACILITY AS A WHOLE, OPERATION AND MAINTENANCE PROCEDURES AND SCHEDULES RELATED TO STARTUP AND SHUTDOWN, TROUBLESHOOTING, SERVICING, PREVENTIVE MAINTENANCE AND APPROPRIATE OPERATION INTERVENTION; AND REVIEW OF DATA INCLUDING IN THE OPERATION AND MAINTENANCE INSTRUMENTATIONS.

SCHEDULE TRAINING WITH OWNER WITH AT LEAST 7 DAYS IN ADVANCE NOTICE.

1-13 WARRANTIES

WARRANT EACH SYSTEM AND EACH ELEMENT THEREOF AGAINST ALL DEFECTS DUE TO FAULTY WORKMANSHIP, INSTALLATION, PRODUCT DESIGN OR MATERIAL FOR A PERIOD OF 12 MONTHS FROM DATE OF SUBSTANTIAL COMPLETION, UNLESS SPECIFIC ITEMS ARE NOTED TO CARRY A LONGER WARRANTY IN THE CONSTRUCTION DOCUMENTS OR MANUFACTURER'S STANDARD WARRANTY EXCEEDS 12 MONTHS. REMEDY ALL DEFECTS, OCCURRING WITHIN THE WARRANTY PERIOD(S), AS STATED IN THE GENERAL CONDITIONS AND DIVISION 1.

ALSO WARRANT THE FOLLOWING ADDITIONAL ITEMS:

- 1. ALL RACEWAYS ARE FREE FROM OBSTRUCTIONS, HOLES, CRUSHING, OR BREAKS OF ANY NATURE.
- 2. ALL RACEWAY SEALS ARE EFFECTIVE.
- 3. THE ENTIRE ELECTRICAL SYSTEM IS FREE FROM ALL SHORT CIRCUITS AND UNWANTED OPEN CIRCUITS AND GROUNDS.

THE ABOVE WARRANTIES SHALL INCLUDE LABOR AND MATERIAL. MAKE REPAIRS OR REPLACEMENTS WITHOUT ANY ADDITIONAL COSTS TO THE OWNER.

PERFORM THE REMEDIAL WORK PROMPTLY, UPON WRITTEN NOTICE FROM THE ENGINEER OR OWNER.

AT THE TIME OF SUBSTANTIAL COMPLETION, DELIVER TO THE OWNER ALL WARRANTIES, IN WRITING AND PROPERLY EXECUTED, INCLUDING TERM LIMITS FOR WARRANTIES EXTENDING BEYOND THE ONE YEAR PERIOD, EACH WARRANTY INSTRUMENT BEING ADDRESSED TO THE OWNER AND STATING THE COMMENCEMENT DATE AND TERM.

1-14 MISCELLANEOUS REMODELING WORK

PROVIDE ALL DEMOLITION OF EXISTING ELECTRICAL SYSTEMS AND NEW ELECTRICAL SYSTEM MODIFICATIONS REQUIRED BECAUSE OF BUILDING REMODELING, AS NOTED ON THE DRAWINGS, OR NECESSARY FOR PROPER OPERATION AND NEW CONSTRUCTION. REMOVE ALL ABANDONED CABLES AND WIRING ABOVE ACCESSIBLE CEILING AND VENTILATION SHAFTS.

EXERCISE EXTREME CAUTION IN THE INSTALLATION OF THIS WORK TO AVOID AN ELECTRICAL SHOCK ACCIDENT. THE FACILITY IS EXISTING AND MAY REMAIN IN OPERATION DURING THIS WORK. COORDINATE ALL WORK SCHEDULES WITH THE BUILDING MANAGEMENT PRIOR TO DE-ENERGIZING ANY ELECTRICAL CIRCUITS TO AVOID CONFLICTS WITH ANY OTHER TENANT'S OPERATION. ALLOW 3 DAYS PRIOR CONFIRMED NOTIFICATION.

VERIFY THAT NEW AND EXISTING TO REMAIN INSTALLATIONS ARE CODE COMPLIANT, AND MAKE CORRECTIONS AS REQUIRED.

DEVELOP AND MAINTAIN A SET OF "RED-LINE AS-BUILT" DRAWINGS. THESE DRAWINGS SHALL BE MAINTAINED AT THE PROJECT CONSTRUCTION SITE AND AVAILABLE TO THE ENGINEER UPON REQUEST. THEY SHALL BE CURRENT AND SHALL REFLECT ALL ACTUAL ASPECTS OF THE ELECTRICAL INSTALLATION WHICH DEVIATED FROM THE PRESENT ELECTRICAL DESIGN DRAWINGS. THESE DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER WITHIN 10 DAYS OF SUBSTANTIAL COMPLETION OF THE WORK AND MUST INCLUDE ALL PUNCH LIST ITEMS.

VERIFY THE LOADING OF EACH CIRCUIT AFFECTED BY THE REMODELING. DO NOT LOAD CIRCUITS TO MORE THAN BOX OF ITS RATING.

PROVIDE UPDATED, TYPED DIRECTORY FOR EACH PANELBOARD BEING USED OR MODIFIED UNDER THIS CONTRACT. DESIGNATE NEW CIRCUITS AND SUITE BEING SERVED.

NO MC CABLE OR BY CABLE SHALL BE INSTALLED FOR THIS PROJECT UNDER ANY CIRCUMSTANCES. THESE CABLE TYPES ARE PROHIBITED PER BOA STANDARDS.

FLEXIBLE STEEL CONDUIT SHALL BE USED TO WIRE ALL LIGHT FIXTURES AND EQUIPMENT CONNECTIONS REQUIRED FOR VIBRATION OR EASE OF MAINTENANCE IN LENGTHS FROM 18 INCHES TO 72 INCHES ONLY.

CONDUIT AND CABLE ABOVE CEILING SHALL BE SUPPORTED BY A UNISTRUT AND ALL-THREAD ROD TRAPEZE. EACH PIECE OF CONDUIT SHALL BE SECURED TO THE TRAPEZE WITH A CONDUIT STRAP. THE TRAPEZE SUPPORTS SHALL BE INSTALLED PER CODE PLUS A MINIMUM OF 12" ABOVE THE CEILING.

PANELBOARDS SHALL HAVE DOOR-IN-DOOR COVERS. PANELBOARD BUSS BARS SHALL BE TIN-PLATED COPPER AND BOLT-ON BREAKERS.

PRIOR TO BID, THE EXISTING LIGHTING INSTALLATION SHALL BE INSPECTED TO VERIFY COMPATIBILITY WITH EXPANSION AND DUAL SWITCHING. NO CHANGE ORDER SHALL BE ISSUED DURING CONSTRUCTION FOR CHANGES DUE TO INCOMPATIBILITY.

NO CHANGES SHALL BE MADE TO THE CIRCUITING SHOWN WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER OF RECORD. CIRCUIT NUMBERS SHALL BE INDICATED ON EACH JUNCTION BOX.

TRANSFORMERS SHALL HAVE COPPER WINDINGS, HIGH GRADE SILICON STEEL FIELDS, AND INSULATION TEMPERATURE RISE OF AT LEAST 200 DEGREES C. ALUMINUM WINDINGS ARE NOT ACCEPTABLE.

AT THE TIME OF FINAL PUNCH LIST, AN ELECTRICIAN MAY BE REQUIRED TO ASSIST IN THE REMOVAL OF PANEL COVERS, JUNCTION BOX COVERS, RECEPTACLES, SWITCHES, AND OTHER ELECTRICAL DEVICES.

PART 2 ELECTRICAL WORK

2-1 BUILDING OPERATION

COMPLY WITH THE SCHEDULE OF OPERATIONS AS OUTLINED IN THE ARCHITECTURAL PORTIONS OF THIS SPECIFICATION. BUILDING FACILITY SHALL BE MAINTAINED IN CONTINUOUS OPERATION. ACCOMPLISH WORK THAT REQUIRES INTERRUPTION OF BUILDING AND BUILDING TENANT OPERATIONS AT A TIME WHEN THE BUILDING IS NOT IN OPERATION, AND ONLY WITH WRITTEN APPROVAL OF BUILDING OWNER AND/OR AFFECTED TENANT(S). COORDINATE INTERRUPTION OF BUILDING OPERATION WITH THE OWNER AND/OR TENANT(S) A MINIMUM OF DAYS IN ADVANCE OF WORK.

2-2 INCIDENTAL DAMAGE

REPAIR ALL STREETS, SIDEWALKS, DRIVES, PAVING, WALLS, FLOORING, FINISHES, AND OTHER FACILITIES DAMAGED IN THE COURSE OF THIS WORK. REPAIR MATERIALS SHALL MATCH EXISTING CONSTRUCTION. ALL BACKFILLING AND REPAIRING SHALL MEET ALL REQUIREMENTS OF THE OWNER, CITY AND OTHERS HAVING JURISDICTION. REPAIR WORK SHALL BE FIRST CLASS UTILIZING THE BEST MATERIALS AND TRADESMEN TO PERFORM ALL NECESSARY REPAIR WORK. CONFORM TO ALL REQUIREMENTS OF DIVISION 2 OF THESE SPECIFICATIONS.

2-3 CUTTING AND PATCHING

FOLLOWING THE REQUIREMENTS IN DIVISION 1, CUT WALLS, FLOORS, CEILING, AND OTHER PORTIONS OF THE FACILITY AS REQUIRED TO PERFORM WORK UNDER THIS DIVISION. OBTAIN PERMISSION OF THE ARCHITECT, OWNER, AND OWNER'S DESIGNATED STRUCTURAL ENGINEER BEFORE DOING ANY CUTTING. CUT ALL HOLES AS SMALL AS POSSIBLE. PATCH WALLS, FLOORS, AND OTHER PORTIONS OF THE FACILITY AS REQUIRED BY WORK UNDER THIS DIVISION. ALL PATCHING SHALL BE FIRST CLASS AND SHALL MATCH THE ORIGINAL MATERIAL AND CONSTRUCTION, INCLUDING FIRE RATINGS IF APPLICABLE; DO NOT CUT OR PENETRATE MATERIAL AND CONSTRUCTION, INCLUDING FIRE RATINGS. DO NOT CUT OR PENETRATE STRUCTURAL ELEMENTS. BEFORE ANY NEW FLOOR CORES ARE MADE, PROVIDE A LETTER FROM THE BUILDING OWNERS STRUCTURAL ENGINEER APPROVING THE LOCATION OF EACH NEW FLOOR CORE. THE LETTER SHALL ADDRESS CORES FOR FOR CONDUIT AND WIRE/DIOLD PIPE-THRU'S. WHERE A LETTER IS NOT SUPPLIED TO THE ENGINEER AND ARCHITECT OF RECORD BEFORE ANY FLOOR CORES ARE MADE, THE CONTRACTOR ASSUMES ALL LIABILITY FOR ANY AND ALL ISSUES THAT MAY OR COULD ARISE FROM CORING THE FLOOR.

2-4 ROUGH-IN

COORDINATE WITHOUT DELAY ALL ROUGHING-IN WITH OTHER DIVISIONS. CONCEAL ALL RACEWAYS EXCEPT IN UNFINISHED AREAS AND WHERE OTHERWISE INDICATED ON THE DRAWINGS.

2-5 SUPPORT SYSTEMS

STEEL SLOTTED SUPPORT SYSTEMS (SLOTTED CHANNEL): COMPLY WITH MFMA-3, FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY; 12-GAUGE, 1-5/8-INCH BY 1-5/8-INCH; COOPER B-LINE, ERICO INTERNATIONAL CORPORATION, POWER-STRUT, THOMAS & BETTS CORPORATION, UNISTRUT.

FINISHES:

- 1. METALLIC COATINGS: HOT-DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-3.
- 2. NONMETALLIC COATINGS: MANUFACTURER'S STANDARD PVC, POLYURETHANE, OR POLYESTER COATING APPLIED ACCORDING TO MFMA-3.
- 3. PAINTED COATINGS: MANUFACTURER'S STANDARD PAINTED COATING APPLIED ACCORDING TO MFMA-3.
- 4. STAINLESS STEEL: TYPE 304, PER ASTM A240.
- 5. ALUMINUM (EXTRUDED): TYPE 6063-T6, PER ASTM B221

FIELD FABRICATION:

- 1. WHERE FIELD CUTTING OF STANDARD LENGTHS OF CHANNEL ARE REQUIRED, MAKE CUTS STRAIGHT AND PERPENDICULAR TO MANUFACTURED SURFACES.
- 2. FOR FIELD-CUT OR DAMAGED SURFACES OF COATED CHANNELS, DRESS CUT ENDS, DAMAGED SURFACES, OR BOTH, WITH AN ABRASIVE MATERIAL (E.G., FILE, GRINDING STONE, OR SIMILAR) AND CLEANSER TO REMOVE OILS, RUST, SHARP EDGES AND SHARPS.
- 3. FOR CHANNEL WITH A FACTORY-APPLIED COATING, RE-FINISH CUT EDGES WITH A COATING COMPATIBLE WITH THE FACTORY FINISH AND AS RECOMMENDED BY THE MANUFACTURER (E.G., MANUFACTURER'S TOUCH-UP PAINT OR ZINC-RICH COLD-GALVANIZING COMPOUND, AS APPLICABLE).

2-6 PENETRATIONS

COORDINATE SLEEVE SELECTION AND APPLICATION WITH SELECTION AND APPLICATION OF FIRE-STOPPING MATERIALS. MAINTAIN FIRE AND UL RATING OF WALL AND FLOOR TYPE.

WALLS AND FLOORS:

- 1. SLEEVES FOR RACEWAYS AND CABLES:
 - A. STEEL PIPE SLEEVES: ASTM A 53/A 53M, TYPE E, GRADE B, SCHEDULE 40, GALVANIZED STEEL, PLAN ENDS AND DRIP RINGS.
 - B. CAST-IRON PIPE SLEEVES: CAST OR FABRICATED "WALL PIPE," EQUIVALENT TO DUCTILE-IRON PRESSURE PIPE, WITH PLAN ENDS AND INTEGRAL WATERSTOP, UNLESS OTHERWISE INDICATED.
- 2. SLEEVES FOR RECTANGULAR OPENINGS: GALVANIZED SHEET STEEL WITH MINIMUM 0.052-INCH THICKNESS AS INDICATED AND OF LENGTH TO SUIT APPLICATION.

2-7 FIRE STOPPING FLOOR AND WALL PENETRATIONS

FIRE RESISTANT PENETRATION SEALANTS: TWO PART, FOAMED IN PLACE, SILICONE SEALANT FORMULATED FOR USE IN THROUGH PENETRATION FIRE STOPPING AROUND CABLES, RACEWAYS, AND CABLE TRAY PENETRATIONS THROUGH FIRE RATED WALLS AND FLOORS. SEALANTS AND ACCESSORIES SHALL HAVE FIRE RESISTANCE RATINGS INDICATED, AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES IN ACCORDANCE WITH ASTM E 814, BY UNDERWRITERS' LABORATORIES, INC., OR OTHER NRTL ACCEPTABLE TO AHJ.

PRODUCTS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE ONE OF THE FOLLOWING:

- 1. "3M FIRE STOP FOAM #2001," 3M CORP.
- 2. "METACALK 836+," RECTORSSEAL.
- 3. "SPECSEAL PENSL 200 SILICONE FOAM," SPECIFY TECHNOLOGY INC.
- 4. "FIRE STOP SYSTEM," UNITED STATES GYPSUM COMPANY.

2-8 ACCESS DOORS

PROVIDE ACCESS DOORS IN CEILINGS AND WALLS, WHERE INDICATED OR REQUIRED FOR ACCESS OR MAINTENANCE TO CONCEALED EQUIPMENT INSTALLED UNDER THIS SECTION. PROVIDE CONCEALED HINGES, SCREWDRIVER-TYPE LOCK, AND ANCHOR STRAPS. MANUFACTURED BY MILCOR, ZURU, TTUS, OR EQUAL. OBTAIN ARCHITECT'S APPROVAL OF TYPE, SIZE, LOCATION AND COLOR BEFORE ORDERING.

2-9 EQUIPMENT FURNISHED BY OTHERS

PROVIDE NECESSARY EQUIPMENT AND ACCESSORIES THAT ARE NOT PROVIDED BY THE EQUIPMENT SUPPLIER OR OWNER TO COMPLETE INSTALLATION OF EQUIPMENT FURNISHED BY OTHERS, IN LOCATIONS AS INDICATED ON THE DRAWINGS, SPECIFIED HEREIN, OR BOTH. EQUIPMENT AND ACCESSORIES NOT PROVIDED BY THE EQUIPMENT SUPPLIER MAY INCLUDE SUCH ITEMS AS FLEXIBLE CORES AND PLUGS, AS REQUIRED FOR PROPER OPERATION OF THE COMPLETE SYSTEM, IN ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS.

MAINTAIN ALL CORRECT ROUGH-IN DIMENSIONS, AND VERIFY THEM WITH ARCHITECT, OWNER'S REPRESENTATIVE, EQUIPMENT SUPPLIER, OR ALL THREE, PRIOR TO ROUGH-IN AND SERVICE INSTALLATIONS.

2-10 CLEANING

IN ADDITION TO THE REQUIREMENTS OF DRAWING GNO.01, REMOVE FROM THE PREMISES DIRT AND REFUSE RESULTING FROM THE PERFORMANCE OF THE ELECTRICAL WORK, AS REQUIRED, TO PREVENT ACCUMULATION. COOPERATE IN MAINTAINING REASONABLY CLEAN PREMISES AT ALL TIMES. IMMEDIATELY PRIOR TO FINAL INSPECTION, MAKE A FINAL CLEANUP OF DIRT AND REFUSE RESULTING FROM THE WORK. CLEAN ALL MATERIAL AND EQUIPMENT INSTALLED UNDER THIS DIVISION. REMOVE DIRT, DUST, PLASTER, STAINS AND FOREIGN MATTER FROM ALL SURFACES. TOUCH UP AND RESTORE ALL DAMAGED FINISHES TO THEIR ORIGINAL CONDITION.

2-11 ADJUSTING, ALIGNING AND TESTING

ADJUST, ALIGN, AND TEST ALL ELECTRICAL EQUIPMENT ON THIS PROJECT PROVIDED UNDER THIS DIVISION AND ALL ELECTRICAL EQUIPMENT FURNISHED BY OTHERS FOR INSTALLATION OR WIRING UNDER THIS DIVISION, FOR PROPER OPERATION.

TEST ALL SYSTEMS AND EQUIPMENT ACCORDING TO THE REQUIREMENTS IN NETA ATS (LATEST EDITION) AND ALL ADDITIONAL REQUIREMENTS SPECIFIED IN FOLLOWING SECTIONS. PROVIDE COPIES OF ALL TEST REPORTS TO THE ENGINEER OF RECORD.

MAINTAIN THE FOLLOWING ON THE PROJECT PREMISES AT ALL TIMES: A TRUE RMS READING VOLTMETER, A TRUE RMS READING AMMETER, AND A MEGOHMMETER INSULATION RESISTANCE TESTER. PROVIDE TEST DATA READINGS AS REQUESTED OR AS REQUIRED BY THE ENGINEER.

ALL CIRCUIT BREAKERS RATED 100A OR GREATER SHALL BE BENCH TESTED PER THE BANK OF AMERICA CIRCUIT BREAKER TESTING REQUIREMENTS IN THE CRITICAL FACILITY GUIDE LINES BEFORE INSTALLATION IN ANY PANELBOARDS.

2-12 EQUIPMENT IDENTIFICATION

PROVIDE EQUIPMENT IDENTIFICATION NAMEPLATES:

- 1. ON ALL PANELBOARDS, SWITCHES, STARTERS, AND DIMMERS, A/C UNITS, AND METERS.
- 2. WHERE INDICATED ON THE DRAWINGS.
- 3. RECEPTACLE FACEPLATES AND JUNCTION BOXES WITH CIRCUIT AND PANEL.
- 4. LIGHT SWITCH FACEPLATES BACKSIDE WITH CIRCUIT AND PANEL.

NAMEPLATES:

- 1. ENGRAVED, CONTRASTING COLOR, THREE-LAYER, LAMINATED PLASTIC INDICATING THE NAME OF THE EQUIPMENT, LOAD, OR CIRCUIT AS DESIGNATED ON THE DRAWINGS AND IN THE SPECIFICATIONS.
- 2. SELF-ADHERING, WITH A PERMANENT, WEATHERPROOF ADHESIVE.
- 3. ATTACHMENT METHOD SHALL BE ACCEPTABLE TO THE MANUFACTURERS OF THE EQUIPMENT TO WHICH THE NAMEPLATES ARE BEING APPLIED.
- 4. COLOR: BLACK BACKGROUND WITH WHITE LETTERS FOR NORMAL POWER. LETTER HEIGHT: 1/4-INCH MINIMUM.
- 5. LIGHT SWITCH FACEPLATES: PERMANENT BLACK MAGIC MARKER.

2-13 SYSTEM START UP

PRIOR TO STARTING UP THE ELECTRICAL SYSTEMS:

- 1. CHECK ALL COMPONENTS AND DEVICES.
- 2. LUBRICATE ITEMS ACCORDINGLY.
- 3. TIGHTEN SCREWS AND BOLTS FOR CONNECTORS AND TERMINALS ACCORDING TO MANUFACTURER'S PUBLISHED TORQUE-TIGHTENING VALUES. IF MANUFACTURER'S TORQUE VALUES ARE NOT INDICATED, USE THOSE SPECIFIED IN UL 486A AND UL 486B.
- 4. ADJUST TAPS ON EACH TRANSFORMER FOR RATED SECONDARY VOLTAGE.
- 5. CHECK AND RECORD BUILDING'S SERVICE ENTRANCE VOLTAGE, GROUNDING CONDITIONS, GROUNDING RESISTANCE, AND PROPER PHASING.
- 6. BALANCE ALL SINGLE-PHASE LOADS AT EACH PANELBOARD, REDISTRIBUTING BRANCH CIRCUIT CONNECTIONS UNTIL BALANCE IS ACHIEVED. DO NOT TYPE UP FINAL PANELBOARD DIRECTORIES UNTIL ALL REBALANCING AND REDISTRIBUTION OF CIRCUITS ARE COMPLETE.
- 7. REPLACE ALL BURNED-OUT LAMPS, LAMPS NOT UNIFORM IN COLOR, AND LAMPS USED FOR TEMPORARY CONSTRUCTION LIGHTING IN PERMANENT LIGHT FIXTURES.
- 8. AFTER ALL SYSTEMS HAVE BEEN INSPECTED AND ADJUSTED, CONFIRM ALL OPERATING FEATURES REQUIRED BY THE DRAWINGS AND SPECIFICATIONS AND MAKE FINAL ADJUSTMENTS AS NECESSARY.

PART 3 EXISTING EQUIPMENT REUSE AND REMOVAL

REMOVE ALL EXISTING WIRING, LIGHT FIXTURES, EXPOSED CONDUITS AND OTHER ELECTRICAL INSTALLATIONS NOT REUSED PRIOR TO SUBSTANTIAL COMPLETION OF THE WORK. COORDINATE WITH G.C.

EXISTING RACEWAYS MAY BE REUSED IF THEIR POINTS OF TERMINATION ARE SUITABLE; IF THEY MEET OR EXCEED CURRENT APPLICABLE CODES; IF THEY ARE CLEAN INSIDE WITH NO EVIDENCE OF RUST OR BURRS; IF THEY ARE FREE FROM CRACKS, FLATTENED SECTIONS OR SHARP EDGES; AND, IF SUFFICIENTLY LOCATED TO AVOID CONFLICTS WITH OTHER TRADES OR INSTALLATIONS. CAREFULLY TIE-UP ALL EXISTING CONDUITS REUSED UNDER THIS CONTRACT TO REMOVE ALL DEBRIS AND OBSTRUCTIONS, AND SWAB UNTIL ALL MOISTURE IS REMOVED.

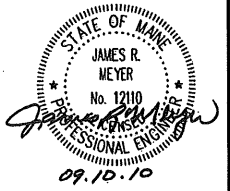
CUT, PATCH, AND REPAIR WHERE REQUIRED FOR NEW ELECTRICAL INSTALLATIONS, AND PATCH AND REPAIR ALL SURFACE DAMAGE RESULTING FROM THIS WORK. CUT FLUSH WITH THE FLOOR AND PLUG AT BOTH ENDS, RACEWAYS STUBBED ABOVE THE FLOOR AND NOT USED AT SUBSTANTIAL COMPLETION OF THE WORK.

RELOCATE ALL EXISTING ELECTRICAL SYSTEMS REQUIRED TO BE IN OPERATION AT SUBSTANTIAL COMPLETION OF THE CONTRACT, IF REQUIRED, AS A RESULT OF WORK INCLUDED UNDER THIS CONTRACT, EVEN IF NOT SPECIFICALLY INDICATED IN THE DRAWINGS OR SPECIFICATIONS.



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PART 4 BASIC ELECTRICAL MATERIALS AND METHODS

4.1 METHODS

4.1-1 RACEWAYS

METALLIC CONDUIT AND TUBING:

- ELECTRICAL METALLIC TUBING AND FITTINGS (EMT): ANSI C80.3, UL 797.
- FLEXIBLE METAL CONDUIT (FMC): ZINC-COATED STEEL OR ALUMINUM, UL 1.
- INTERMEDIATE METAL CONDUIT (IMC): HOT-DIP GALVANIZED RIGID STEEL CONDUIT: ANSI C80.6, UL 1242.
- LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC): FLEXIBLE STEEL CONDUIT WITH PVC JACKET: UL 360
- RIGID METAL CONDUIT (RMC): HOT-DIP GALVANIZED RIGID STEEL CONDUIT (GRS): ANSI C80.1, UL 6.
- RIGID ALUMINUM CONDUIT (RAC): ANSI C80.5, UL 6A.
- PLASTIC COATED IMC, RMC, AND FITTINGS: NEMA RN 1, UL LISTED.
- IMC AND RMC FITTINGS: NEMA FB 1; COMPATIBLE WITH CONDUIT TYPE AND MATERIAL, UL LISTED

NON-METALLIC CONDUIT AND TUBING:

- RIGID NONMETALLIC CONDUIT (RNC): SCHEDULE 40 PVC, 90 DEG C RATED, NEMA TC-2, UL 651; FITTINGS: NEMA TC 3, TO 6; UL 514, COMPATIBLE WITH CONDUIT/TUBING TYPE AND MATERIAL, UL LISTED.

4.1-2 RACEWAY INSTALLATION

INSTALL ALL RACEWAYS A MINIMUM OF 12" ABOVE SUSPENDED CEILING, CONCEALED IN WALLS OR FLOORS EXCEPT WHERE OTHERWISE INDICATED. FOR AREAS WHERE CONDUITS MUST BE ROUTED CLOSER THAN 12", WRITTEN APPROVAL FROM THE ENGINEER OF RECORD MUST BE OBTAINED.

PROVIDE ROSC FOR ALL CONDUITS RUN UNDERGROUND, EXPOSED TO WEATHER, OR EXPOSED TO OTHER HAZARDOUS CONDITIONS. PROVIDE ROSC INSTALLED BELOW GRADE WITH A CORROSION RESISTANT BONDED-PLASTIC OR APPROVED MASTIC COATING. THIS SHALL INCLUDE THE 90-DEGREE ELBOW BELOW GRADE AND THE ENTIRE VERTICAL TRANSITION TO ABOVE GRADE.

ALL OTHER RACEWAY MAY BE EMT WHERE APPROVED BY LOCAL CODE. USE COMPRESSION TYPE FITTINGS FOR EMT, WITH ALL FITTINGS UL LISTED FOR THE ENVIRONMENT IN WHICH THEY ARE USED.

AT CONTRACTOR'S OPTION, PVC CONDUIT MAY BE USED UNDERGROUND WHERE PERMITTED BY LOCAL CODE AND WHERE NOT SPECIFICALLY RESTRICTED BY THESE DOCUMENTS. WHEN USED, PROVIDE COATED GRS, AS SPECIFIED ABOVE, FOR ALL BENDS GREATER THAN 30 DEGREES, INCLUDING THE 90-DEGREE ELBOWS BELOW GRADE AND THE ENTIRE VERTICAL RISERS FOR TRANSITIONS FROM BELOW TO ABOVE GRADE OR ABOVE-SLAB.

USE FMC FOR FINAL CONNECTION TO EACH MOTOR AND TRANSFORMER, AND TO ANY DEVICE THAT WOULD OTHERWISE TRANSMIT MOTION, VIBRATION, OR NOISE. WHERE EXPOSED TO LIQUIDS, VAPORS OR SUNLIGHT, USE LFMC. PROVIDE ALL FMC AND LFMC WITH AN INSULATED BONDING CONDUCTOR.

USE ONLY METAL RACEWAYS FOR ALL POWER WIRING FROM THE OUTPUT OF VARIABLE FREQUENCY DRIVES TO THEIR RESPECTIVE MOTORS.

INSTALL RACEWAYS PARALLEL AND PERPENDICULAR TO BUILDING LINES.

INSTALL RACEWAYS TO REQUIREMENTS OF STRUCTURE AND TO REQUIREMENTS OF ALL OTHER WORK ON THE PROJECT. INSTALL RACEWAY TO CLEAR ALL OPENINGS, DEPRESSIONS, PIPES, DUCTS, REINFORCING STEEL, AND OTHER IRREMOVABLE OBSTACLES. INSTALL RACEWAYS SET IN FORMS FOR CONCRETE STRUCTURE IN SUCH A MANNER THAT INSTALLATION WILL NOT AFFECT THE STRENGTH OF THE STRUCTURE. EXCEPT WHERE APPROVED IN WRITING BY THE ENGINEER, INSTALL NO RACEWAY IN A SLAB-ON-GRADE. LOCATE RACEWAY IN GRANULAR FILL BELOW SLABS-ON-GRADE.

INSTALL RACEWAYS CONTINUOUS BETWEEN CONNECTIONS TO OUTLETS, BOXES AND CABINETS WITH A MINIMUM POSSIBLE NUMBER OF BENDS AND NOT MORE THAN THE EQUIVALENT OF FOUR 90-DEGREE BENDS BETWEEN CONNECTIONS. USE MANUFACTURED ELBOWS FOR ALL 45-DEGREE AND 90-DEGREE BENDS. UNLESS APPROVED BY THE ENGINEER IN ADVANCE, MAKE OTHER BENDS SMOOTH AND EVEN AND WITHOUT FLATTENING RACEWAY OR FLAKING GALVANIZING OR ENAMEL. RADI OF BENDS SHALL BE AS LONG AS POSSIBLE AND NEVER SHORTER THAN THE CORRESPONDING TRADE ELBOW. USE LONG RADIUS ELBOWS WHERE NECESSARY, INDICATED, OR BOTH.

SECURELY FASTEN RACEWAYS IN PLACE WITH APPROVED STRAPS, HANGERS AND STEEL SUPPORTS AS REQUIRED. ATTACH RACEWAY SUPPORTS TO THE BUILDING STRUCTURE. SUPPORT RACEWAYS FOR FEEDERS WITH TRAPEZOID SUPPORTS MADE OF ALL THREAD ROD AND UNISTRUT, SPACED NOT OVER 10 FEET APART. SECURELY CLAMP VERTICAL FEEDER RACEWAYS TO STRUCTURAL STEEL MEMBERS ATTACHED TO STRUCTURE. INSTALL CABLE CLAMPS FOR SUPPORT OF VERTICAL FEEDERS WHERE REQUIRED. ADD RACEWAY SUPPORTS WITHIN 12 INCHES OF ALL BENDS, ON BOTH SIDES OF THE BENDS. DO NOT SUPPORT RACEWAYS FROM SUSPENDED CEILING COMPONENTS.

FEAR RACEWAY ENDS, THOROUGHLY CLEAN RACEWAYS BEFORE INSTALLATION, AND KEEP CLEAN AFTER INSTALLATION. PLUG OR COVER OPENINGS AND BOXES AS REQUIRED TO KEEP RACEWAYS CLEAN DURING CONSTRUCTION AND FISH ALL RACEWAYS CLEAR OF OBSTRUCTIONS BEFORE PULLING CONDUCTORS WIRES. PROVIDE RACEWAYS OF AMPLE SIZE FOR PULLING OF WIRE AND NOT SMALLER THAN CODE REQUIREMENTS AND NOT LESS THAN 3/4-INCH IN SIZE, UNLESS OTHERWISE INDICATED ON DRAWINGS.

EMT UP TO 2", IMC OR RIGID GALVANIZED STEEL GREATER THAN 2". ONLY STEEL COMPRESSION FITTINGS SHALL BE USED. SET SCREW FITTINGS ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES. DO NOT RUN MORE THAN 6 CURRENT-CARRYING CONDUCTORS IN ANY ONE CONDUIT, UNLESS OTHERWISE NOTED. ALL CONDUITS SHALL CONTAIN A SEPARATE EQUIPMENT GROUND WIRE.

PROTECT ALL RACEWAY INSTALLATIONS AGAINST DAMAGE DURING CONSTRUCTION. REPAIR ALL RACEWAYS DAMAGED OR MOVED OUT OF LINE AFTER ROUGHING-IN TO MEET ENGINEER'S APPROVAL WITHOUT ADDITIONAL COST TO THE OWNER.

ALIGN AND INSTALL TRUE AND PLUMB ALL RACEWAY TERMINATIONS AT PANELBOARDS, SWITCHBOARDS, MOTOR CONTROL EQUIPMENT AND JUNCTION BOXES.

INSTALL APPROVED EXPANSION/DEFLECTION FITTINGS WHERE RACEWAYS PASS THROUGH (IF EMBEDDED) OR ACROSS (IF EXPOSED) EXPANSION JOINTS.

INSTALL A PULL WIRE IN EACH EMPTY RACEWAY THAT IS LEFT FOR INSTALLATION OF CONDUCTORS OR CABLES UNDER OTHER DIVISIONS OR CONTRACTS. USE POLYPROPYLENE OR MONOFILAMENT PLASTIC LINE WITH NOT LESS THAN 200-LB TENSILE STRENGTH. LEAVE AT LEAST 24 INCHES OF SLACK AT EACH END OF PULL WIRE. INSTALL A PULL WIRE IN ALL RACEWAYS 1" OR GREATER IN SIZE THAT HAVE ROOM FOR ADDITIONAL WIRE TO BE ADDED.

MAKE ALL JOINTS AND CONNECTIONS IN A MANNER THAT WILL ENSURE MECHANICAL STRENGTH AND ELECTRICAL CONTINUITY.

EFFECTIVELY SEAL RACEWAYS, BY INSTALLING A CONDUIT FITTING AT THE BOUNDARY OF THE TWO SPACES, AND FILLING IT WITH AN APPROVED PLUMBE MATERIAL, AFTER CONDUCTORS OR CABLES HAVE BEEN INSTALLED AND TESTED, WHERE:

- RACEWAYS PASS FROM NON-COOLED TO COOLED SPACES.
- RACEWAYS TRANSITION FROM OUTSIDE A FACILITY OR ENCLOSURE TO INSIDE, WHETHER BURIED OR EXPOSED.

4.1-3 BUSHINGS AND LOCKNUTS

RIGIDLY TERMINATE CONDUITS ENTERING SHEET METAL ENCLOSURES TO THE ENCLOSURE WITH A PLASTIC BUSHING AND LOCKNUT ON THE INSIDE AND A LOCKNUT OR AN APPROVED HUB ON THE OUTSIDE. CONDUIT SHALL ENTER THE ENCLOSURE SQUARELY.

PROVIDE BUSHINGS AND LOCKNUTS MADE OF GALVANIZED MALLEABLE IRON WITH SHARP, CLEAN-CUT THREADS.

WHERE EMT ENTERS A BOX, PROVIDE APPROVED EMT COMPRESSION CONNECTORS. SET SCREW CONNECTORS ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES.

USE INSULATED, GROUNDING, OR COMBINATION, BUSHINGS WHEREVER CONNECTION IS SUBJECT TO VIBRATION OR MOISTURE, WHEN REQUIRED BY NFPA 70, OR BOTH.

INSTALL PLASTIC BUSHINGS ON ALL EXISTING CONDUITS CONNECTORS.

4.1-4 CONDUCTORS AND CABLES

CONDUCTOR MATERIAL:

- ANNEALED (SOFT) COPPER COMPLYING WITH IECA 5-95-658/NEMA WC70; SOLID CONDUCTOR FOR NO. 14 AWG AND SMALLER; CONCENTRIC, COMPRESSED STRANDED FOR NO. 12 AWG AND LARGER.
- CONDUCTOR INSULATION TYPES: 90-DEGREE C-RATED, TYPE THHN/THWN-2 OR XHHN-2 COMPLYING WITH IECA 5-95-658/NEMA WC70.
- SIZES OF CONDUCTORS AND CABLES INDICATED OR SPECIFIED ARE IN AMERICAN WIRE GAGE (AWG - BROWN AND SHARPE).
- UNLESS INDICATED OTHERWISE, SPECIAL PURPOSE CONDUCTORS AND CABLES, SUCH AS LOW VOLTAGE CONTROL AND SHIELDED INSTRUMENT WIRING, SHALL BE AS RECOMMENDED BY THE SYSTEM EQUIPMENT MANUFACTURER.

ALL FEEDER AND BRANCH CIRCUIT CONDUCTORS NO. 12 AWG AND LARGER: STRANDED, TYPE THHN-2 OR XHHN-2 INSULATION.

ALL BRANCH CIRCUIT WIRING: SHALL NOT BE NOT SMALLER THAN NO. 12 AWG. IF NO CONDUCTOR SIZE IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE CONDUCTORS AND CONDUIT SIZED PER NFPA 70 AND BASED ON THE INDICATED BRANCH CIRCUIT OVERCURRENT PROTECTIVE DEVICE (OCPD) RATING AND NUMBER OF POLES, WHERE NO CIRCUIT SIZE (I.E., CONDUCTORS AND OCPD) IS INDICATED ON THE DRAWINGS FOR A BRANCH CIRCUIT, PROVIDE THREE NO. 12 AWG CONDUCTORS, IN 3/4-INCH RACEWAY, AND A 20A CIRCUIT BREAKER.

CONDUCTORS FIELD-INSTALLED WITHIN FLUORESCENT LIGHT FIXTURE CHANNELS: TYPE THHN.

CONTROL WIRING: STRANDED COPPER CONDUCTORS, 600V INSULATION, OF THE PROPER TYPE, SIZE AND NUMBER AS REQUIRED TO ACCOMPLISH SPECIFIED FUNCTION. MINIMUM SIZE: NO. 14 AWG, UNLESS NOTED OTHERWISE.

4.1-5 INSTALLATION OF CONDUCTORS AND CABLES

INSTALL ALL WIRING IN APPROVED RACEWAY AND ENCLOSURES, EXCEPT WHERE SPECIFIED OR INDICATED.

NO MC CABLE OR BX CABLE SHALL BE INSTALLED FOR THIS PROJECT UNDER ANY CIRCUMSTANCES. THESE CABLE TYPES ARE PROHIBITED PER BOA STANDARDS.

SUPPORT ALL CONDUCTORS AND CABLES IN VERTICAL INSTALLATIONS, AS REQUIRED BY NFPA 70, BY INSTALLING CABLE SUPPORTS OR PLUG-TYPE CONDUIT RISER SUPPORTS, OR WIRE-MESH SAFETY GRIPS.

INSTALL ALL CONDUCTORS AND CABLE IN RACEWAYS CONTINUOUS WITHOUT TAPS OR SPLICES. SPLICE OR TAP ONLY IN APPROVED BOXES AND ENCLOSURES WITH APPROVED SOLDERLESS CONNECTORS, OR CRIMP CONNECTORS AND TERMINAL BLOCKS FOR CONTROL WIRING, AND KEEP TO THE MINIMUM REQUIRED. INSULATE ALL SPLICES, TAPS, AND JOINTS AS REQUIRED BY CODES.

ALL MATERIALS USED TO TERMINATE, SPLICE OR TAP CONDUCTORS: DESIGNED FOR, PROPERLY SIZED FOR, AND UL LISTED FOR THE SPECIFIC APPLICATION AND CONDUCTORS INVOLVED, AND INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, USING THE MANUFACTURER'S RECOMMENDED TOOLS.

WHERE WIRING IS INDICATED AS INSTALLED, BUT THE CONNECTION IS INDICATED "FUTURE" OR "BY OTHER DIVISION, TRADES, OR CONTRACTS", LEAVE A MINIMUM 3-FOOT "PITAL" AT THE BOX, TAPE THE ENDS OF THE CONDUCTORS, AND COVER THE BOX. THE NUMBER OF CONDUCTORS IN A SPECIFIC RACEWAY "HOME RUN" IS INDICATED WITH CROSS LINES (TRX MARKS) ON EACH "CIRCUIT RUN" ON THE DRAWINGS. IN GENERAL, THE DIRECTION OF BRANCH CIRCUIT "HOME RUN" ROUTING IS INDICATED ON THE DRAWINGS, COMPLETE WITH CIRCUIT NUMBERS AND PANELBOARD DESIGNATION. CONTINUE ALL SUCH "HOME RUN" WIRING TO THE DESIGNATED PANELBOARD, AS THOUGH "CIRCUIT RUNS" WERE INDICATED IN THEIR ENTIRETY.

WHEN MULTIPLE HOME RUNS ARE COMBINED INTO A SINGLE RACEWAY SUCH THAT THE NUMBER OF CONDUCTORS EXCEEDS FOUR (CONDUCTOR COUNT IS MADE UP OF ANY COMBINATION OF PHASE AND NEUTRAL CONDUCTORS), THE FOLLOWING RESTRICTIONS APPLY, WHICH ARE IN ADDITION TO THOSE IN NFPA 70:

- EMERGENCY POWER CIRCUITS - INCLUDES ALL CIRCUITS COVERED UNDER ARTICLES 700, 701 AND 702.
 - A. MAXIMUM OF 16 CONDUCTORS IN A SINGLE RACEWAY. FOR UP TO EIGHT CONDUCTORS IN A RACEWAY, MINIMUM RACEWAY SIZE: 3/4-INCH. FOR GREATER THAN EIGHT CONDUCTORS, MINIMUM RACEWAY SIZE: 1-INCH. DO NOT INSTALL ANY OTHER TYPE OF CIRCUIT IN THIS RACEWAY.
 - B. THE MINIMUM WIRE SIZE FOR ALL CONDUCTORS IN THIS RACEWAY: NO. 10 AWG.
 - C. ONLY 15A AND 20A BRANCH CIRCUIT HOMERUNS MAY BE COMBINED INTO ONE RACEWAY.
- GFCl CIRCUITS:
DO NOT USE MULTI-CONDUCTOR CIRCUITS, WITH A SHARED NEUTRAL, FOR ANY GFCl CIRCUIT BREAKER OR RECEPTACLE CIRCUIT.

FOR BRANCH CIRCUITS FEED FROM GFCl CIRCUIT BREAKERS, LIMIT THE ONE-WAY CONDUCTOR LENGTH TO 100 FEET BETWEEN THE PANELBOARD AND THE MOST REMOTE RECEPTACLE OR LOAD ON THE GFCl CIRCUIT.

WIRING SHALL HAVE INSULATION OF THE PROPER COLOR TO MATCH COLOR CODE SYSTEM IN THE TABLE BELOW. IN LARGER SIZES, WHERE PROPERLY COLORED INSULATION IS NOT AVAILABLE, USE VINYL PLASTIC ELECTRICAL TAPE OF THE APPROPRIATE COLOR AROUND EACH CONDUCTOR AT ALL TERMINATION POINTS, JUNCTION AND PULL BOXES.

REFERENCE DETAIL FOR SYSTEM VOLTAGE.

System Voltage	Conductor Type	Color
120/240	Phase A	Black
	Phase B	Red
	Neutral	White
	Equipment Ground	Green
	Isolated Ground	Green w/yellow stripe
240delta/120	Phase A	Black
	Phase B (High Leg)	Orange
	Phase C	Red
	Neutral	White
	Equipment Ground	Green
208Y/120	Phase A	Black
	Phase B	Red
	Phase C	Blue
	Neutral	White
	Equipment Ground	Green
480Y/277	Phase A	Brown
	Phase B	Orange
	Phase C	Yellow
	Neutral	Gray
	Equipment Ground	Green

PROPERLY IDENTIFY ALL TERMINAL BLOCKS AND WIRE TERMINALS FOR CONTROL WIRING WITH VINYL STICK-ON MARKERS OR EQUIVALENT. PROVIDE ENGINEER WITH A LIST OF PROPOSED IDENTIFYING NUMBERS FOR REVIEW PRIOR TO INSTALLING MARKERS.

PROVIDE AN EQUIPMENT-GROUNDING CONDUCTOR, OR BONDING JUMPER, AS APPLICABLE, IN ALL FEEDER AND NON-LIGHTING BRANCH CIRCUITS, SIZED IN ACCORDANCE WITH NFPA 70 TABLES 250.66 OR 250.122, AS APPLICABLE, UNLESS INDICATED AS LARGER ON THE DRAWINGS.

PROVIDE AN EQUIPMENT-GROUNDING CONDUCTOR, OR BONDING JUMPER, AS APPLICABLE, IN ALL BRANCH CIRCUITS AND FEEDERS, SIZED IN ACCORDANCE WITH NFPA 70 TABLES 250.66 OR 250.122, AS APPLICABLE, UNLESS INDICATED AS LARGER ON THE DRAWINGS.

VOLTAGE DROP IN BRANCH CIRCUITS SHALL NOT EXCEED 2 PERCENT.

4.1-6 JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS

PROVIDE JUNCTION BOXES, PULL BOXES, CABINETS AND WIREWAYS WHEREVER NECESSARY FOR PROPER INSTALLATION OF VARIOUS ELECTRICAL SYSTEMS ACCORDING TO NFPA 70 AND WHERE INDICATED ON THE DRAWINGS. SIZE AS REQUIRED FOR THE SPECIFIC FUNCTION OR AS REQUIRED BY NFPA 70, WHICHEVER IS LARGER. CONSTRUCTION SHALL BE OF A NEMA DESIGN SUITABLE FOR THE ENVIRONMENT INSTALLED. INSTALL ENGRAVED NAMEPLATES ON ALL J-BOXES, PULL BOXES, CABINETS AND WIREWAYS THAT PROVIDE NAME OF CIRCUITS EITHER TERMINATED, SPLICED, OR PASSING THRU AND THE NAME OF THE PANELBOARD THE CIRCUITS ORIGINATE.

4.1-7 OUTLET BOXES

ALL OUTLETS INCLUDING LIGHT FIXTURE, SWITCH, RECEPTACLE, AND SIMILAR OUTLETS: NATIONAL ELECTRICAL APPLICATION, STEEL CITY, RACO OR APPROVED EQUAL, GALVANIZED STEEL, HOOKOUT BOXES, SUITABLE IN DESIGN TO THE PURPOSE THEY SERVE AND THE SPACE THEY OCCUPY. SIZE AS REQUIRED FOR THE SPECIFIC FUNCTION OR AS REQUIRED BY NFPA 70, WHICHEVER IS LARGER. SET ALL OUTLET BOXES IN WALLS, COLUMNS, FLOORS, OR CEILINGS SO THEY ARE FLUSH WITH THE FINISHED SURFACE, ACCURATELY SET, AND RIGIDLY SECURED IN POSITION. PROVIDE PLASTER RINGS, EXTENSION RINGS AND/OR MASONRY RINGS AS REQUIRED FOR FLUSH MOUNTING. PROVIDE APPROVED CAST OUTLET BOXES, WITH HUBS AND WEATHERPROOF COVERS, IN ALL AREAS SUBJECT TO DAMP, WET, OR HARSH CONDITIONS.

EACH OUTLET AND/OR FIXTURE SHALL BE PROVIDED WITH 4 INCH SQUARE DEEP OUTLET BOX WITH APPROPRIATE COVER AND WIRING TO SUIT FIELD CONDITIONS.

ELECTRICAL MATERIALS USED ON THIS PROJECT SHALL BE UL LISTED AND LABELED.

4.1-8 OUTLET LOCATIONS

COORDINATE LOCATIONS OF OUTLET BOXES. OUTLETS ARE ONLY APPROXIMATELY LOCATED ON THE SMALL SCALE DRAWINGS. USE GREAT CARE IN THE ACTUAL LOCATION BY CONSULTING THE VARIOUS LARGE SCALE DETAILED DRAWINGS USED BY OTHER DIVISION TRADES, AND BY SECURING DEFINITE LOCATIONS FROM THE ARCHITECT.

4.1-9 MOUNTING HEIGHTS

UNLESS OTHERWISE NOTED, INSTALL WIRING DEVICES AS INDICATED BELOW (NOTE: ALL DIMENSIONS ARE TO THE BOTTOM OF THE OUTLET BOX UNLESS OTHERWISE NOTED):

RECEPTACLES:

- GENERAL:
 - VERTICALLY WITH THE GROUND SLOT MOUNTED AT THE TOP: 16 INCHES TO RECEPTACLE CENTER ABOVE FINISHED FLOOR.
 - HORIZONTALLY, WITH NEUTRAL SLOT MOUNTED AT THE TOP: 16 INCHES TO RECEPTACLE CENTER ABOVE FINISHED FLOOR.
 - AS NOTED ON DRAWINGS.
- ABOVE COUNTERS:
 - AS NOTED (SEE DRAWINGS)
- MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS AND JANITORS CLOSETS: 44 INCHES ABOVE FINISHED FLOOR, VERTICALLY.
- WEATHERPROOF EXTERIOR RECEPTACLES: 24 INCHES ABOVE FINISHED GRADE OR ROOF, OR AS INDICATED ON DRAWINGS, VERTICALLY.
- GFCl RECEPTACLES: SAME AS GENERAL RECEPTACLES.
- ISOLATED GROUND RECEPTACLES: SAME AS GENERAL.
- CONCRETE BLOCK WALLS: DIMENSIONS ABOVE MAY BE ADJUSTED SLIGHTLY, AS REQUIRED TO COMPENSATE FOR VARIABLE JOINT DIMENSIONS, SUCH THAT BOTTOM OR TOP OF BOXES, AS APPLICABLE, ARE AT BLOCK JOINTS.

SWITCHES:

- GENERAL: 44 INCHES TO CENTERLINE ABOVE FINISHED FLOOR.
- ABOVE COUNTERS: SAME AS FOR RECEPTACLES.
- CONCRETE BLOCK WALLS: 40 INCHES ABOVE FINISHED FLOOR (DIMENSION MAY BE ADJUSTED SLIGHTLY, AS REQUIRED TO COMPENSATE FOR VARIABLE JOINT DIMENSIONS, SUCH THAT BOTTOM OF BOXES ARE AT BLOCK JOINTS).
- WALLS WITH WAINSCOTING: 6 INCHES MINIMUM ABOVE WAINSCOTING, BUT NOT EXCEEDING 48 INCHES ABOVE FINISHED FLOOR.
- WHERE MULTIPLE SWITCHES ARE REQUIRED, CONTRACTOR SHALL INSTALL ALL SWITCHES IN COMMON BOX, DIVIDED AS REQUIRED, UNDER A COMMON SWITCHPLATE.

MULTI-OUTLET ASSEMBLIES:

- 48 INCHES ABOVE FINISHED FLOOR, AS INDICATED ON THE DRAWINGS, OR 6 INCHES ABOVE COUNTER TOP.

TELEPHONE/DATA OUTLET BOXES:

- GENERAL: MATCH MOUNTING HEIGHT OF ADJACENT WIRING DEVICE LISTED ABOVE.
- FOR OTHER THAN WIRING DEVICES, REFER TO PARAGRAPHS, ARTICLES, SECTIONS, DIVISIONS, OR DRAWINGS TO OBTAIN MOUNTING HEIGHTS FOR SPECIFIC EQUIPMENT OR SYSTEMS.

4.1-10 WIRING DEVICES

PROVIDE THE FOLLOWING WIRING DEVICES WHERE SHOWN ON DRAWINGS OR REQUIRED. MINOR CHANGES RELATIVE TO THE LOCATION OF ELECTRICAL EQUIPMENT MAY BE MADE TO COMPLY WITH STRUCTURAL AND BUILDING REQUIREMENTS AS DETERMINED IN THE COURSE OF CONSTRUCTION. PROVIDE ALL WIRING DEVICES OF THE SAME MANUFACTURER AND NOT MIXED ON THE PROJECT, TO THE MAXIMUM EXTENT POSSIBLE. ALL DEVICES SHALL BE GREY IN COLOR:

Type of Device	Hubbell	Pass & Seymour	Leviton	Cooper Wiring Devices
Duplex Receptacle	21621-GREY	26242-1-GREY	5352-GREY	5352-GREY
Quad/4-Place	HBL 420-GREY	420-GREY	21254-GREY	N/A
Single Pole Switch	CS1221-GREY	PS 20 ACH-GREY	1221-2-GREY	2221-GREY
Three-way Switch	CS1223-GREY	PS 20AC3-GREY	1223-2-GREY	2223-GREY
Four-way Switch	CS1224-GREY	PS 20AC4-GREY	1224-2-GREY	2224-GREY
Key Switch	HBL1221L-GREY	PS20AC1L-GREY	1221-2L-GREY	2221L-GREY
Wall-box Dimmer (1.5KW), SP3W, Incandescent	AS153-GREY	9158-GREY	61500-3-GREY	N/A
Momentary SPDT, Center-Off Switch	HBL 1557-GREY	1251-GREY	1257-GREY	1995-GREY

4.1-11 SWITCH AND OUTLET COVER PLATES

SWITCH AND OUTLET PLATES: GREY COLORED, SMOOTH NYLON; BY THE SAME MANUFACTURER AS THE WIRING DEVICES, WHERE EVER POSSIBLE. VERIFY SPECIFIED MATERIALS WITH ARCHITECT BEFORE INSTALLATION. INSTALL GROUPS OF SWITCHES UNDER ONE GANGED-PLATE, USUALLY HORIZONTALLY; OR, WHERE REQUIRED BY DETAILS, VERTICALLY. SET ALL COVER PLATES PLUMB, PARALLEL, AND FINISHED FLUSH WITH THE WALL.

4.1-12 WEATHERPROOF COVER PLATES

PROVIDE GFCl RECEPTACLES FOR DESIGNATED WEATHERPROOF RECEPTACLES, UNLESS INDICATED OTHERWISE ON THE DRAWINGS.

FOR UNATTENDED, WET LOCATIONS: IN-USE NEMA 3R, UL-LABELED PLATES MOLDED FROM A CLEAR HIGH IMPACT ULTRAVIOLET STABILIZED POLYCARBONATE MATERIAL FOR EASY VERIFICATION THAT CORUS ARE PLUGGED IN AND THAT THE GFCl IS FUNCTIONING.

COVER PLATES: BY THE SAME MANUFACTURER AS THE WIRING DEVICES; COMPLYING WITH NFPA 70 406.8 (A) OR (B) REQUIREMENTS FOR ATTENDED OR UNATTENDED USE AS APPLICABLE.

4.2 ELECTRICAL GROUNDING

4.2-1 GROUNDING

PERMANENTLY AND EFFECTIVELY GROUND AND BOND THE ELECTRICAL INSTALLATION IN A THOROUGH AND EFFICIENT MANNER, AND IN CONFORMANCE, AT A MINIMUM, WITH NFPA 70, OR THESE DOCUMENTS, WHERE THEY EXCEED CODE REQUIREMENTS. USE BARE OR INSULATED CONDUCTORS, AS SPECIFIED HEREIN, AND OTHER MATERIALS INDICATED ON THE DRAWINGS.

4.3 DISTRIBUTION AND CONTROL EQUIPMENT

4.3-1 LIGHTING AND APPLIANCE PANELBOARDS

PANELBOARDS: SQUARE D TYPE NQDD (FOR 240/208V SERVICE) OR NF (FOR 480V SERVICE) OR APPROVED EQUAL BY SIEMENS, CUTLER HAMMER, OR GENERAL ELECTRIC, AS SCHEDULED ON THE DRAWINGS; COMPLETE WITH BOLT-ON THERMAL MAGNETIC, MOLDED CASE CIRCUIT BREAKERS ASSEMBLED IN A DEAD-FRONT FINISHED CABINET CONTAINING A TYPED WRITTEN CARD DIRECTORY INDICATING EXACTLY WHAT EACH CIRCUIT BREAKER CONTROLS; FULLY-RATED OR SERIES-RATED AND WITH THE INTEGRATED SHORT CIRCUIT CURRENT RATINGS INDICATED ON THE DRAWINGS. PLUG-IN TYPE BREAKERS WILL NOT BE ACCEPTABLE. ALL TWO AND THREE POLE BREAKERS: COMMON TRIP TYPE. BREAKERS USED AS SWITCHES FOR 120V OR 277V LIGHTING CIRCUITS: APPROVED FOR THE PURPOSE AND MARKED "SW". BREAKERS USED FOR THE PROTECTION OF HVAC AND REFRIGERATION EQUIPMENT: HVAC TYPE. PANELBOARDS SHALL HAVE DOOR-IN-DOOR COVERS, TIN PLATED COPPER BUSES, AND FEED THRU LUGS.

4.3-2 CIRCUIT BREAKERS IN EXISTING PANELBOARDS

PROVIDE NEW CIRCUIT BREAKERS, FOR INSTALLATION IN EXISTING PANELBOARDS OF THE SAME MANUFACTURER, TYPE AND SHORT CIRCUIT CURRENT INTERRUPTING RATINGS AS THE EXISTING PANELBOARD CIRCUIT BREAKERS.

4.3-3 SERIES RATINGS ON PANELBOARDS

LABEL PANELBOARDS WITH A UL INTEGRATED SHORT CIRCUIT CURRENT RATING. WHEN SERIES RATINGS ARE APPLIED WITH INTEGRAL OR REMOTE UPSTREAM DEVICES, PROVIDE LABELS COMPLYING WITH NFPA 70 ARTICLES 240.68 AND 110.22. IN ADDITION TO THE WARNING LABEL, INCLUDE, AT A MINIMUM, THE FOLLOWING CONDITIONS OF THE UL 67 SERIES RATINGS:

- SIZE AND TYPE OF UPSTREAM DEVICE.
- BRANCH DEVICES THAT CAN BE USED.
- UL SERIES SHORT CIRCUIT CURRENT RATING.

SERIES RATINGS SHALL COVER ALL TRIP RATINGS OF INSTALLED FRAMES.

4.3-4 DISCONNECT (SAFETY) SWITCHES

DISCONNECT (SAFETY) SWITCHES: SQUARE D, SIEMENS, CUTLER HAMMER, OR GENERAL ELECTRIC FUSED OR NON-FUSED (AS INDICATED ON DRAWINGS OR REQUIRED) NEMA KSI, HEAVY DUTY, EXTERNALLY OPERATED, VISIBLE-BLADE SAFETY SWITCHES; NEMA ENCLOSURE TYPE INDICATED ON THE DRAWINGS OR SUITABLE FOR THE ENVIRONMENT IN WHICH INSTALLED. BASED ON FLUIBLE SWITCH AND FUSE SIZES INDICATED, INCLUDE CLASS R, J, OR L FUSE PROMOSIONS AS APPLICABLE.

WHERE INDICATED, PROVIDE FUSIBLE SWITCHES PERMANENTLY LABELED AS SUITABLE FOR USE AS SERVICE ENTRANCE EQUIPMENT, WITH INTEGRAL AND SEPARATE NEUTRAL AND GROUND ASSEMBLIES, SUITABLE FOR THE SIZES OF CONDUCTORS INDICATED. DO NOT DOUBLE-LUG ANY TERMINATIONS NOT SPECIFICALLY LISTED AS SUITABLE FOR MORE THAN ONE CONDUCTOR.

PROVIDE SWITCHES WHERE NOT FURNISHED WITH THE STARTING EQUIPMENT, AT ALL OTHER POINTS REQUIRED BY NFPA 70, AND WHERE INDICATED ON THE DRAWINGS.

4.3-5 FUSES

PROVIDE EACH CIRCUIT AND SET OF FUSE CLIPS THROUGHOUT THE WORK WITH BUSSMANN, FERRAZ SHAWMUT, OR LITLUFUSE FUSES, SIZES AND TYPES AS REQUIRED OR INDICATED. ALL FUSES LARGER THAN 600A: UL CLASS L, SIMILAR TO TYPE RRP-C BUSSMANN LOW PEAK OR EQUAL. FUSES USED TO PROTECT MOTORS: UL CLASS RK5, BUSSMANN FUSELON OR EQUAL. FUSES USED TO PROTECT ALL OTHER ELECTRICAL EQUIPMENT: UL CLASS RK1, DUAL ELEMENT, BUSSMAN LPS/LPN OR EQUAL. ALL FUSED DEVICES SHALL BE LABELED AS TO TYPE AND SIZE OF FUSE REQUIRED.

FURNISH THREE SPARE FUSES OF EACH SIZE AND TYPE USED ON THE PROJECT (EXCEPT FOR MAIN SWITCH FUSES, FURNISH ONE SPARE), NEATLY CONTAINED IN A PROPERLY LABELED CABINET.

4.4 LIGHT FIXTURES, LAMPS AND BALLASTS

4.4-1 LIGHT FIXTURE LOCATIONS

LIGHT FIXTURES SHOWN ON THE ELECTRICAL DRAWINGS REPRESENT GENERAL ARRANGEMENTS ONLY. REFER TO ARCHITECTURAL DRAWINGS FOR MORE EXACT LOCATIONS. COORDINATE LOCATION WITH ALL OTHER TRADES BEFORE INSTALLATION TO AVOID CONFLICTS. COORDINATE LIGHT FIXTURE LOCATIONS IN MECHANICAL ROOMS WITH FINAL INSTALLED PIPING AND DUCTWORK LAYOUTS.

4.4-2 LIGHT FIXTURES

LIGHT FIXTURES FURNISHED BY OWNER WHERE INDICATED ON SCHEDULE. COMPLY WITH ALL NOTES AND SPECIFICATIONS AS INDICATED IN SCHEDULE. INSTALL AND PROMISE AS NEEDED ALL LIGHT FIXTURES AS SCHEDULED ON DRAWINGS, INCLUDING ALL LAMPS, ALL NECESSARY ACCESSORIES, MATERIAL AND LABOR TO SECURELY HANG, CLEAN, AND MAKE LIGHT FIXTURES COMPLETELY READY FOR USE. LIGHT FIXTURE MODEL NUMBERS SCHEDULED ON THE DRAWINGS SHOW ONLY THE MANUFACTURER, GRADE AND STYLE OF LIGHT FIXTURES REQUIRED. PROVIDE ALL HANGERS, SUPPORTS, AND MISCELLANEOUS HARDWARE REQUIRED TO INSTALL LIGHT FIXTURES; PROPER TRIM TO FIT EACH CEILING CONDITION ACTUALLY ENCOUNTERED; ADDITIONAL THE WIRES CONNECTED TO STRUCTURE TO CONFORM TO SEISMIC REQUIREMENTS AND WHERE REQUIRED BY THE APPLICABLE BUILDING CODE.



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4-4-3 LAMPS

1. PROVIDE LAMPS AS INDICATED ON THE DRAWINGS FOR ALL LIGHT FIXTURES UNLESS PROVIDED BY OWNER, OR, IF NOT INDICATED, PROVIDE LAMPS AS RECOMMENDED BY THE LIGHT FIXTURE MANUFACTURER. IN ALL CASES, LAMPS SHALL BE COMPATIBLE WITH THE SPECIFIED LIGHT FIXTURE. ACCEPTABLE LAMP MANUFACTURERS: GENERAL ELECTRIC, OSRAM/SYLVANIA, PHILIPS, OR VENTURE.

4-5 MISCELLANEOUS ELECTRICAL

4-5-1 WIRING OF MECHANICAL EQUIPMENT

1. PROVIDE ALL RACEWAYS AND POWER WIRING FOR ALL DIVISION 15 EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS, INCLUDING, BUT NOT LIMITED TO, PUMPS, WATER HEATERS, AND HVAC EQUIPMENT, AND ALL LINE-VOLTAGE CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15. CONNECT PER MANUFACTURERS' WIRING DIAGRAMS. COORDINATE WITH DIVISION 15 FOR DISCONNECTS FURNISHED WITH EQUIPMENT, AND PROVIDE ALL DISCONNECT SWITCHES AS REQUIRED. AFTER INSTALLING WIRING, VERIFY THAT EACH MOTOR LOAD HAS THE CORRECT PHASE ROTATION.

2. VERIFY THE ACTUAL "MAXIMUM OVERCURRENT PROTECTION" (MOCP) DEVICE RATINGS AND "MINIMUM CIRCUIT AMPACITY" (MCA) CONDUCTOR SIZING FOR MECHANICAL EQUIPMENT FROM THE EQUIPMENT NAMEPLATE. BASE ELECTRICAL INSTALLATIONS ON ACTUAL REQUIRED AMPERAGES, WHICH MAY VARY SOMEWHAT FROM THE CONDUCTOR AND EQUIPMENT SIZES SHOWN ON THE DRAWINGS; HOWEVER, IN NO CASE, REDUCE THE SIZE OF CONDUCTORS INDICATED ON THE DRAWINGS WITHOUT AUTHORIZATION FROM THE ENGINEER. PROVIDE PROPERLY SIZED ELECTRICAL WIRING AND EQUIPMENT WITHOUT EXTRA COST TO THE OWNER. NOTIFY THE ENGINEER OF ALL CHANGES REQUIRED IN THE ELECTRICAL INSTALLATION DUE TO EQUIPMENT VARIANCES SO THAT THE EFFECTS ON FEEDERS, BRANCH CIRCUITS, PANELBOARDS, FUSES AND CIRCUIT BREAKERS CAN BE CHECKED PRIOR TO PURCHASING AND INSTALLATION. COORDINATE WITH DIVISION 15 TO VERIFY THE ACTUAL AMPACITIES AND CORRECT SIZES OF ALL CONDUCTORS AND OVERCURRENT PROTECTIVE DEVICES FOR ALL EQUIPMENT, AND CORRECT OVERLOAD HEATERS FOR ALL MOTORS, WHEN STARTERS ARE PROVIDED UNDER DIVISION 16.

4-5-2 WIRING OF THERMOSTATS, TIME AND TEMPERATURE CONTROLS

PROVIDE ALL RACEWAYS, POWER WIRING, CONTROL AND INTERLOCK WIRING NOT PROVIDED UNDER DIVISION 15, FOR ALL THERMOSTATS, TEMPERATURE CONTROL DEVICES, AND CONTROLS, INCLUDING, BUT NOT LIMITED TO, NIGHT-STATS, WATER HEATER INTERLOCKS, TIME SWITCHES AND OVERRIIDE TIMERS. SEE MECHANICAL DRAWINGS FOR LOCATIONS AND TEMPERATURE CONTROL DIAGRAM. LOW VOLTAGE CONDUCTORS FOR THERMOSTATS AND TEMPERATURE CONTROL SYSTEM MAY BE RUN EXPOSED ABOVE FINISHED ACCESSIBLE CEILING, IF APPROVED AND LISTED FOR THIS PURPOSE, BUT SHALL BE INSTALLED IN CONDUIT WITHIN WALLS AND WHERE EXPOSED IN THE WORK AREAS.

4-5-3 TELEPHONE SYSTEM PROVISIONS

PROVIDE FLUSH MOUNTED TELEPHONE OUTLET BOXES WITH 1-INCH EMT STUB-UP CONCEALED TO ACCESSIBLE CEILING SPACE AT LOCATIONS AS INDICATED ON THE DRAWINGS.

4-5-4 DATA SYSTEM PROVISIONS

PROVIDE FLUSH MOUNTED DATA OUTLET BOXES WITH 1-INCH CONDUIT STUB-UP CONCEALED TO ACCESSIBLE CEILING SPACE AT LOCATIONS AS INDICATED ON THE DRAWINGS. INSTALL A PULL STRING IN THE CONDUIT.

4-5-8 MISCELLANEOUS EQUIPMENT AND CONNECTIONS

1. PROVIDE WIRING AND CONNECTIONS TO ILLUMINATED CASES.

2. ALL WIRING AND CONNECTIONS TO EQUIPMENT FURNISHED BY OTHERS.

3. ALL RACEWAYS, AND ALL WIRING AND CONNECTIONS OF DEVICES TO ENERGY MANAGEMENT SYSTEM THAT ARE NOT THE RESPONSIBILITY OF DIVISION 15.

4-5-9 SEISMIC PROTECTION

SEISMIC PROTECTION OF LIGHT FIXTURES, AND RACEWAYS, PANELBOARDS AND SWITCHGEAR SHALL MEET REQUIREMENTS OF LOCAL CODE IN EFFECT.

4-5-10 FIRE ALARM AND DETECTION SYSTEM

1. WORK INCLUDED IN THIS SECTION

A. PROVIDE THE FIRE ALARM AND DETECTION DEVICES AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN. SYSTEM SHALL BE WIRED, CONNECTED, VERIFIED AND LEFT IN FIRST CLASS OPERATING CONDITION.

B. DEVICES SHALL MATCH EXISTING SYSTEM MANUFACTURER AND SHALL BE RATED FOR USE AS INDICATED ON DRAWINGS.

4-5-11 DEMOLITION

1. FURNISH ALL LABOR, EQUIPMENT AND MATERIALS REQUIRED TO DEMOLISH, CAP, PATCH, REPAIR AND DISPOSE OF THE DIVISION 16 SYSTEMS NO LONGER REQUIRED AS PART OF AN ACTIVE SYSTEM OF THE PROJECT AS SPECIFIED HEREIN AND AS INDICATED ON THE DRAWINGS.

2. UNDER THIS SCOPE, FURNISH ALL LABOR, EQUIPMENT, APPLIANCES AND MATERIALS TO PERFORM ALL OPERATIONS IN CONNECTION WITH THE DEMOLITION OF THE DIVISION 16 SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN AND/OR AS REQUIRED BY THE LOCAL BUILDING CODE. THE WORK SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:

A. UNLESS OTHERWISE NOTED IN THE CONSTRUCTION DOCUMENTS, ALL ELECTRICAL EQUIPMENT SHALL REVIEW THE EXISTING CONDITIONS, IN ADDITION TO THE ARCHITECTURAL DOCUMENTS, AND THE DIVISION 15/16 DOCUMENTS, TO DETERMINE THE COMPLETE SCOPE OF WORK.

B. REMOVE ALL EXISTING ELECTRICAL EQUIPMENT, BUSWAYS, CONDUIT, RACEWAYS, LIGHT FIXTURES, WIRING AND ASSOCIATED EQUIPMENT WITHIN THE AREA TO BE DEMOLISHED, WHETHER SPECIFICALLY INDICATED OR NOT, THAT IS NO LONGER REQUIRED UNLESS OTHERWISE INDICATED.

C. OPENINGS REMAINING IN ENCLOSURES AS A RESULT OF DEMOLITION SHALL BE SEALED WITH SHEET METAL CAP OR OTHER APPROVED APPROPRIATE MEANS, UNLESS OTHERWISE INDICATED.

D. WHERE EXISTING EQUIPMENT IS TO BE RELOCATED, EXTREME CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING THE REMOVAL AND REINSTALLATION. WHERE DAMAGE OCCURS, THE EQUIPMENT SHALL BE REPLACED OR REPAIRED TO THE SATISFACTION AND APPROVAL OF THE ARCHITECT AT NO ADDITIONAL COST TO THE OWNER.

E. PROVIDE FOR CUTTING, PATCHING AND RESTORATION OF EXISTING FINISHES.

F. PROVIDE FOR REMOVAL, DISPOSAL AND SALVAGE OF EQUIPMENT SALVAGE OF EQUIPMENT FROM JOB SITE.

G. PROVIDE FOR CLEANING, TESTING AND REPAIR OF EXISTING EQUIPMENT TO BE REUSED.

3. PERFORM A COMPREHENSIVE FIELD INSPECTION OF THE EXISTING CONDITIONS TO THOROUGHLY FAMILIARIZE HIMSELF WITH THE PROJECT AND DETERMINE THE COMPLETE SCOPE OF NEW AND DEMOLITION WORK. THE CONTRACTOR SHALL VERIFY IN THE FIELD EXACT SIZES, CAPACITIES, AND LOCATIONS OF ALL EXISTING EQUIPMENT PRIOR TO INSTALLATION OF ANY PROPOSED WORK. PROPOSED WORK SHALL BE COORDINATED WITH EXISTING CONDITIONS TO ASSURE PROPER INSTALLATION. THIS FIELD SURVEY AND DETERMINATION OF THE COMPLETE SCOPE OF WORK SHALL BE PERFORMED PRIOR TO THE FINAL BID. SPECIFIC ATTENTION IS BROUGHT TO PHYSICALLY LARGER AND HEAVY PIECES OF EQUIPMENT THAT ARE NEW TO BE INSTALLED OR EXISTING TO BE REMOVED AND THE ROUTING OF SUCH EQUIPMENT WITH THE AVAILABLE MEANS AND SITE CONDITIONS.

4. THE CONTRACTOR SHALL REMOVE ALL EXISTING ELECTRICAL EQUIPMENT AND ASSOCIATED ACCESSORIES WHETHER SPECIFICALLY INDICATED OR NOT, THAT ARE NO LONGER REQUIRED. ANY EQUIPMENT WHICH MUST REMAIN AS PART OF AN ACTIVE SYSTEM AND IS IN CONFLICT WITH THE PROPOSED WORK SHALL BE RELOCATED AT NO ADDITIONAL EXPENSE. THERE SHALL BE NO ADDITIONAL EXPENSE TO THE OWNER FOR THIS TYPE OF DEMOLITION WORK, UNLESS, IN THE ARCHITECT'S AND OWNER'S OPINION, IT IS BEYOND THE SCOPE AND INTENT OF THE CONTRACT DOCUMENTS.

5. COOPERATE AND COORDINATE DEMOLITION OF DIVISION 16 SYSTEMS AS REQUIRED WITH ALL OF OTHER TRADES. THE CONTRACTOR SHALL SUPERVISE AND ASSIST IN THE REMOVING AND REPLACING OF EXISTING MATERIALS FOR INSTALLATION OF ELECTRICAL ITEMS AND ITEMS RELATED TO ALL OTHER TRADES.

6. NORMAL FUNCTIONS OF OCCUPIED AREAS MUST CONTINUE DURING THE CONSTRUCTION PHASES. EVERY EFFORT SHALL BE MADE TO INSURE SUCH FUNCTIONS ARE NOT DISTURBED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE INSTALLATION AND REMOVAL OF TEMPORARY SYSTEMS AS REQUIRED TO MAINTAIN THE FUNCTIONS OF OCCUPIED AREAS. THE CONTRACTOR SHALL SCHEDULE ANY WORK WHICH MAY BE REQUIRED IN OCCUPIED AREAS DURING UNOCCUPIED HOURS.

7. WHERE REQUIRED BY APPLICABLE HEALTH AND SAFETY REGULATIONS, THE CONTRACTOR SHALL FURNISH AND MAINTAIN SAFETY AND DUST BARRIERS.

8. DEMOLITION SHALL BE CARRIED OUT WITH CAUTION TO ASSURE THAT EXISTING CONDITIONS TO REMAIN WILL BE UNDAUNTED. EXISTING CONDITIONS TO REMAIN THAT ARE DAMAGED OR DEFACE BY WORK UNDER THIS CONTRACT SHALL BE RESTORED OR REPLACED EQUAL TO THE CONDITIONS AT THE TIME OF AWARD OF THE CONTRACT.

9. CUT, PATCH, AND RESTORE ALL EXISTING SURFACES NOT RECEIVING NEW FINISHES THAT HAVE BEEN DISTURBED DURING EXECUTION OF THIS CONTRACT. MATERIALS AND FINISHES USED SHALL BE SIMILAR, IN ALL RESPECTS, TO ADJACENT SURFACES.

10. EXISTING CONDUIT AND WIRING WHICH ARE TO REMAIN AS PART OF AN EXISTING OR PROPOSED ACTIVE SYSTEM THAT THE CONTRACTOR DETERMINES TO BE DEFECTIVE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

11. EXISTING EQUIPMENT TO BE REMOVED SHALL BE CLEANED, REPAIRED, AND REUSED AT THE DISCRETION OF THE ENGINEER WHEREVER APPLICABLE.

12. CONNECTIONS TO EXISTING WORK SHALL BE SIMILAR, IN ALL RESPECTS, TO THE EXISTING SYSTEM AND CONDITIONS UNLESS OTHERWISE INDICATED. EXISTING WORK SHALL BE ALTERED AND/OR TEMPORARILY REMOVED AND REPLACED AS REQUIRED FOR COMPLETION OF REQUIREMENTS OF THE PROJECT.

13. THE OWNER ASSUMES NO RESPONSIBILITY FOR LOSS OR DAMAGE TO MATERIALS OR STRUCTURES ON SITE FOR THE SALVAGE VALUE OF EQUIPMENT WHICH THE CONTRACTOR MAY HAVE REFLECTED IN HIS BID.

14. REMOVE FROM JOB SITE AND PROPERLY DISPOSE ALL EXISTING ELECTRICAL EQUIPMENT, CONDUIT AND WIRING REMOVED DURING CONSTRUCTION NO LONGER REQUIRED AS PART OF AN ACTIVE SYSTEM AND NOT TO BE REUSED.

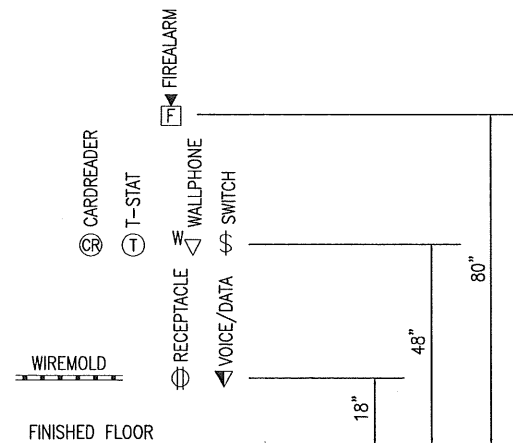
15. CLEAR AWAY ALL DEBRIS AND DEMOLISHED MATERIAL AT FREQUENT INTERVALS. THE CONTRACTOR SHALL DO NOT ALLOW DEBRIS TO ACCUMULATE TO THE EXTENT THAT IT WILL INTERFERE WITH WORK, PASSAGE OF THE WORKMEN, AND THE OPERATION OF THE EXISTING OCCUPIED AREAS.

16. IT IS THE INTENT OF THIS SPECIFICATION THAT ALL WORK, INCLUDING THE INSIDE OF EQUIPMENT, BE LEFT IN A CLEAN CONDITION. ALL CONSTRUCTION DIRT AND DEBRIS SHALL BE REMOVED FROM MATERIAL AND EQUIPMENT.

17. PROVIDE A DETAILED INVENTORY OF ALL EXISTING ELECTRICAL EQUIPMENT INCLUDING SWITCHBOARDS, DISCONNECTS, PANELBOARDS MOTOR STARTERS, ETC. TO BE STORED FOR LATER REUSE. INVENTORY SHALL INCLUDE TYPE, SIZE, CAPACITIES AND QUANTITIES OF EACH ITEM OR PIECE OF EQUIPMENT.

18. EQUIPMENT TESTING: EXISTING EQUIPMENT, INSTRUMENTS, AND ACCESSORIES TO REMAIN SHALL BE TESTED FOR DEFECTS AND SHALL BE ADJUSTED, REPAIRED OR REPLACED WHERE REQUIRED. CONDITIONS, QUALIFICATIONS, AND PROCEDURES REGARDING ADJUSTMENTS, REPAIRATIONS, OR REPLACEMENT OF EXISTING EQUIPMENT AS DEEMED NECESSARY BY THE CONTRACTOR SHALL BE SUBMITTED TO THE ARCHITECT FOR APPROVAL. THE CONTRACTOR SHALL NOT PROCEED WITH EQUIPMENT REPLACEMENT WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECT. THE ARCHITECT SHALL DETERMINE WHETHER REPLACEMENT IS REQUIRED AND SHALL SPECIFY THE REPLACEMENT EQUIPMENT TO BE USED.

19. ADDITIONAL REQUIREMENTS: FOR BUSWAY, CONDUCTORS, PANELBOARDS, SWITCHBOARDS, ETC., REFER TO THE APPROPRIATE SPECIFICATION SECTION FOR TESTING REQUIREMENTS AND ADDITIONAL REQUIREMENTS OF EXISTING EQUIPMENT AND SYSTEMS TO BE A PART OF THE NEW ACTIVE SYSTEMS.



1
E0-3 NONE
TYPICAL MOUNTING HEIGHTS



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ELECTRICAL SPECIFICATIONS

Sheet Title:	
Proj. No.:	09.00924.80_1221
Drawn By:	PLP
Checked By:	JRM
P.M.:	JRM

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ALL DIMENSIONS AND CONDITIONS MUST BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND SUB-CONTRACTORS. THE PROJECT MANAGER SHALL BE NOTIFIED IN WRITING OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH THE WORK.

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ABBREVIATIONS

(NOT ALL ABBREVIATIONS ARE USED.)

A	AMPERE(S)
AC	ALTERNATING CURRENT
ADA	AMERICANS WITH DISABILITIES ACT
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY (SYMMETRICAL ROOT MEAN SQUARE)
AWG	AMERICAN WIRE GAGE
BFC	BELOW FINISHED CEILING
BLDG	BUILDING
C	CONDUIT
CB	CIRCUIT BREAKER
CLG	CEILING
DWG	DRAWING
ECB	ENCLOSED CIRCUIT BREAKER
EF	EXHAUST FAN
EGS	ENGINE-GENERATOR SET
EMERG	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
EQUIP	EQUIPMENT
EWG	ELECTRIC WATER COOLER
EX	EXISTING
F	FUSE OR FUSIBLE
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FLA	FULL LOAD CURRENT
FMC	FLEXIBLE METAL CONDUIT
FSS	FUSIBLE SAFETY SWITCH
FT	FOOT OR FEET
FVNR	FULL-VOLTAGE, NON-REVERSING
FVR	FULL-VOLTAGE, REVERSING
G	GROUND, GROUNDED, OR GROUNDING
GFI	GROUND FAULT CIRCUIT INTERRUPTER/INTERRUPTING
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
IG	ISOLATED GROUND
KCMIL	THOUSANDS OF CIRCULAR MILS
KV	KILOVOLTS
KVA	KILOVOLT-AMPERE(S)
KVAR	KILOVOLT-AMPERE(S) REACTIVE
KW	KILOWATT(S)
LSI	LONG-TIME, SHORT-TIME, INSTANTANEOUS
LSIG	LONG-TIME, SHORT-TIME, INSTANTANEOUS, GROUND FAULT
LTFMC	LIQUID-TIGHT FLEXIBLE METAL CONDUIT
LTG	LIGHTING
LX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFSS	NON-FUSIBLE SAFETY SWITCH
NO	NORMALLY OPEN
P	POLE(S)
PA	PUBLIC ADDRESS
PNLBD	PANELBOARD
PVC	POLYVINYL CHLORIDE
PWR	POWER
REC	RECEPTACLE(S)
REQD	REQUIRED
RGS	RIGID GALVANIZED STEEL
RTU	ROOFTOP UNIT
RVSS	REDUCED VOLTAGE, SOLID-STATE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TA	TRIP AMPERES
TYP	TYPICAL
UH	UNIT HEATER
UG	UNDERGROUND
UNO	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT(S) OR VOLTAGE
VA	VOLT-AMPERE(S)
VFD	VARIABLE FREQUENCY DRIVE
W	WATT(S) OR WATTAGE
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER

GENERAL NOTES

- GENERAL NOTES APPLY TO ENTIRE ELECTRICAL DRAWING SET. DRAWING NOTES APPLY TO ASSOCIATED DRAWINGS. PLAN KEYED NOTES APPLY WHERE INDICATED.
- DO NOT SCALE OR DIMENSION FROM THESE DRAWINGS.
- *FURNISH* SHALL MEAN TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION AND SIMILAR OPERATION. *INSTALL* SHALL MEAN OPERATIONS AT PROJECT SITE, INCLUDING UNLOADING, TEMPORARY STORING, UNPACKING, ASSEMBLING, ERECTING, PLACING, ANCHORING, WORKING TO DIMENSION, FINISHING, PROTECTING, CLEANING, AND SIMILAR OPERATION. *PROVIDE* SHALL MEAN TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.
- REFER TO ARCHITECTURAL, ELECTRICAL, AND MECHANICAL PLANS, ELEVATIONS, AND DETAILS FOR LOCATIONS OF CEILING ELEMENTS (LIGHTING FIXTURES, DIFFUSERS, ETC.) AND WALL MOUNTED DEVICES. IF LOCATION FOR ITEM IS NOT SHOWN ON ABOVE LISTED DRAWINGS, VERIFY CRITICAL AREAS WITH FIELD PROJECT MANAGER.
- ELECTRICAL SYSTEMS INDICATED ON DRAWINGS ARE DIAGRAMMATIC AND ADDITIONAL WORK, INCLUDING NECESSARY CIRCUITRY, SHALL BE PROVIDED TO MAKE SYSTEMS COMPLETE AND IN SAFE WORKING ORDER. COORDINATE WORK WITH OTHER TRADES.
- INDICATED CIRCUIT RUNS ARE DIAGRAMMATIC. SIZE AND LOCATE PULL BOXES PER NATIONAL ELECTRICAL CODE AND COORDINATE WITH OTHER DISCIPLINES. BUILDING CONDITIONS SHALL DETERMINE ACTUAL CONDUIT RUNS.
- UNLESS OTHERWISE INDICATED, BRACH CIRCUITS SHALL BE 2#12G, 3/4".
- 120-VOLT CIRCUIT WIRING INSTALLED OVER 65 FEET LONG SHALL BE 10 AWG. 120-VOLT CIRCUIT WIRING INSTALLED OVER 110 FEET LONG SHALL BE 8 AWG. 277-VOLT CIRCUIT WIRING INSTALLED OVER 150 FEET LONG SHALL BE 10 AWG. 277-VOLT CIRCUIT WIRING INSTALLED OVER 250 FEET LONG SHALL BE 8 AWG. SIZE RACEWAY ACCORDING TO NATIONAL ELECTRICAL CODE.
- INDIVIDUALLY MOUNTED CIRCUIT BREAKERS IN NEMA ENCLOSURES, FUSIBLE OR NON-FUSIBLE DISCONNECTS SWITCHES, MOTOR STARTERS AND RELATED CONTROLS COMPONENTS SHALL BE MOUNTED 48 INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED. COORDINATE LOCATION AND ELEVATION OF EACH ITEM OF EQUIPMENT WITH WORK OF OTHER DIVISIONS BEFORE ROUGH-IN.
- OUTLETS SHALL NOT BE MOUNTED BACK-TO-BACK. MINIMUM OF ONE STUD-WIDTH SHALL BE MAINTAINED BETWEEN OUTLETS.
- EQUIPMENT REMOVED THAT IS NOT BEING REUSED SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE STORED OR DISPOSED OF AS DIRECTED.
- UNLESS NOTED OTHERWISE, ALL EXISTING ELECTRICAL WORK WHICH WILL NOT BE RENDERED OBSOLETE AND WHICH MAY BE DISTURBED DUE TO ANY CHANGES REQUIRED UNDER THE CONTRACT, SHALL BE RESTORED TO ITS ORIGINAL OPERATING CONDITION. ELECTRICAL WORK/ MATERIALS RENDERED OBSOLETE, AND OLD UNUSED WIRING AND DEVICES SHALL BE REMOVED BACK TO SOURCE. OUTLETS SHALL BE PROVIDED WITH BLANK COVERS.
- WHERE EXISTING ELECTRICAL INSTALLATIONS INTERFERE WITH NEW WORK AND WHERE SUCH INSTALLATIONS ARE TO REMAIN IN USE, THE NEW INSTALLATIONS SHALL BE DISCONTINUED AND/ OR RECONNECTED TO COORDINATE WITH THE WORK INDICATED ON THE CONTRACT DRAWINGS AND AS SPECIFIED.
- OUTLET BOXES OR J-BOXES NOT BEING REUSED SHALL BE PROVIDED WITH A BLANK COVER PLATE.
- EXISTING RACEWAYS AND/OR WIRING MAY BE REUSED WHERE PRACTICAL, EXCEPT AS OTHERWISE INDICATED. PANELBOARD CABINETS SHALL NOT BE USED FOR OTHER PURPOSES THAN CIRCUIT PROTECTION AND DISTRIBUTION POINTS AND SHALL NOT BE USED AS JUNCTION OR PULL BOXES.
- ALL WORK SHALL BE PERFORMED IN SUCH A MANNER TO CREATE MINIMAL POWER OUTAGES FOR THE OWNER. ALL SUCH OUTAGES SHALL BE CAREFULLY COORDINATED WITH THE OWNER SO THAT POWER TO ESSENTIAL SERVICES CAN BE MAINTAINED.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL EXISTING ELECTRICAL EQUIPMENT NOT REUSED OR NOT NECESSARY FOR THE COMPLETION OF THIS PROJECT.
- ALL EQUIPMENT INDICATED TO REMAIN IN PLACE SHALL REMAIN IN NORMAL OPERATION AT ALL TIMES DURING CONSTRUCTION. IF ANY BRANCH CIRCUIT WIRING FEEDING THIS EQUIPMENT IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL REPLACE WITH NEW BRANCH CIRCUIT WIRING OF THE SAME SIZE AND TYPE AS EXISTING AT NO COST TO THE OWNER. IF ANY EQUIPMENT TO REMAIN IS DAMAGED DURING CONSTRUCTION, IT SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO OWNER.
- UPON JOB COMPLETION, PROVIDE ACCURATE, LEGIBLE PANEL SCHEDULES WITH AS-BUILT DRAWINGS TO THE CBRE PROJECT MANAGER. ALSO VERIFY EXACT LOCATIONS OF PANELBOARDS AND MARK THEM ON THE AS-BUILT DRAWINGS.
- REFER TO ARCHITECTURAL PLANS FOR LIMITS OF WORK.
- PROVIDE AS-BUILT DRAWINGS TO THE CLIENT PROJECT MANAGER FOR THE PROJECT ACCURATELY DEPICTING FINAL INSTALLATION.

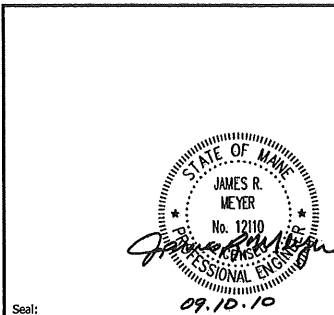
ELECTRICAL SYMBOLS
NOT ALL SYMBOLS APPEAR ON DOCUMENTS

SYMBOL	DESCRIPTION	MOUNTING HT. UNO	SYMBOL	DESCRIPTION	MOUNTING HT. UNO
LIGHTING FIXTURES					
○	FLUORESCENT FIXTURE, 2'x4'	SEE FIX. SCH.	FACP	FIRE ALARM CONTROL PANEL	-
□	FLUORESCENT FIXTURE, 2X4 WITH BATTERY BACK-UP	SEE FIX. SCH.	FAAP	FIRE ALARM ANNUNCIATOR PANEL	-
○ a,b	FLUORESCENT FIXTURE W/INNER LAMPS ON ONE SWITCH AND OUTER LAMPS ON ANOTHER, 2'x4'	SEE FIX. SCH.	F	FIRE ALARM PULL STATION	48" AFF
□	FLUORESCENT FIXTURE, 1'x4'	SEE FIX. SCH.	FV	FIRE ALARM VISUAL SIGNAL - NOTE 2	80" AFF
□	FLUORESCENT FIXTURE, 1'x4' WITH BATTERY BACK-UP	SEE FIX. SCH.	FV	FIRE ALARM AUDIBLE SIGNAL - NOTE 2	80" AFF
○	PENDANT FIXTURE SUSPENDED	SEE FIX. SCH.	FV	FIRE ALARM AUDIBLE VISUAL SIGNAL - NOTE 2	80" AFF
□	PENDANT FIXTURE - SUSPENDED WITH BATTERY BACK-UP	SEE FIX. SCH.	FS	FIRE ALARM SPRINKLER FLOW SWITCH	-
□	FLUORESCENT FIXTURE, 2'x2' WITH BATTERY BACK-UP	SEE FIX. SCH.	FS	FIRE ALARM SPRINKLER TAMPERS SWITCH	-
○	FLUORESCENT FIXTURE, 2'x2'	SEE FIX. SCH.	FS	FIRE ALARM SPRINKLER PRESSURE SWITCH	-
—	FLUORESCENT FIXTURE, STRIP	SEE FIX. SCH.	(S) H(S)	SMOKE DETECTOR, CEILING OR WALL MOUNTED	12" BFC
○	WALL WASHER LIGHT FIXTURE CEILING MTD.	SEE FIX. SCH.	(S) P	SMOKE DETECTOR - PATIENT SLEEPING ROOM	-
○	DOWN LIGHT FIXTURES CLG. OR WALL MTD.	SEE FIX. SCH.	(H) H(H)	HEAT DETECTOR, CEILING OR WALL MOUNTED	12" BFC
⊗	DOWN LIGHT FIXTURES ON EMERGENCY CIRCUIT CEILING OR WALL MOUNTED.	SEE FIX. SCH.	(S) D	DUCT SMOKE DETECTOR	-
⊗	EXIT LIGHT CEILING OR WALL MTD., SHADING INDICATING SINGLE OR DOUBLE FACE, DIRECTION AS INDICATED	9" BFC	(F)	FIRE ALARM AUDIBLE & VISUAL, CEILING MOUNTED	9" BFC
⊗	OCCUPANCY/MOTION SENSOR	CEILING	■	SMOKE DOOR HOLDER	-
WIRING DEVICES					
\$	WALL SWITCH SPST	48" AFF	CLOCKS, TELEVISION, INTERCOM/PAGING		
\$²	DOUBLE POLE TOGGLE SWITCH	48" AFF	⊖	CLOCK HANGER OUTLET RECEPTACLE	80"
\$³	3-WAY WALL SWITCH	48" AFF	⊖	SECONDARY CLOCK	80"
\$⁴	4-WAY WALL SWITCH	48" AFF	⊖	ELAPSE TIME CLOCK	80"
\$⁰	WALL DIMMER SWITCH, WATTAGE AS REQUIRED	48" AFF	⊖	TELEVISION SYSTEM OUTLET	18" AFF
\$ᵀ	KEY OPERATED WALL SWITCH	48" AFF	⊖	MICROPHONE OUTLET	18" AFF
\$ᵀ	WALL SWITCH WITH PILOT LIGHT	48" AFF	⊖	INTERCOM OUTLET	48" AFF
⊖	SIMPLEX RECEPTACLE	AS NOTED	⊖	P.A. SPEAKER, CEILING OR WALL MOUNTED	9" B.F.C
⊖	DUPLEX RECEPTACLE	18" AFF	DISCONNECTS AND MOTORS		
⊖EM	DUPLEX RECEPTACLE ON EMERGENCY CIRCUIT,	18" AFF	□ 30/-/3	DISCONNECT SWITCH - 30/-/3 INDICATES 30A., 3-POLE, NONFUSED; 30/30/3 INDICATES 30A., 3-POLE, 30A. FUSE	AS REQD.
⊖GFI	DUPLEX RECEPTACLE, GFI	AS NOTED	□ CB 30/-/3	CIRCUIT BREAKER DISCONNECT SWITCH - THERMAL MAGNETIC CB IN NEMA 1 ENCLOSURE; AMPS/POLES AS INDICATED	AS REQD.
⊖	QUADREPLEX RECEPTACLE (TWO DUPLEX RCPTS. UNDER ONE COVERPLATE)	18" AFF	□ 2	MOTOR STARTER FVNR UNO; NUMBER INDICATES NEMA SIZE	AS REQD.
⊖	QUAD. RECEPTACLE DEDICATED CIRCUIT. (TWO DUPLEX RCPTS. UNDER ONE COVERPLATE) NEMA 5-20R	-	□ CB	COMBINATION MOTOR CONTROLLER/DISCONNECT SWITCH	AS REQD.
⊖	DUPLEX RECEPTACLE DEDICATED CIRCUIT, NEMA 5-20	-	□ \$ᵀ	MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD AND PILOT LIGHT	48" AFF
⊖EM	DUPLEX RECEPTACLE DEDICATED CIRCUIT ON EMERGENCY CIRCUIT (RED IN COLOR)	18" AFF	○	MOTOR	-
○	FLOOR MTD. DUPLEX RECEPTACLE, FLUSH MTD. UNO	-	MISCELLANEOUS		
⊖	SPECIAL PURPOSE RECEPTACLE (NEMA NO. AS INDICATED)	AS NOTED	▬	120/208V PANELBOARD	-
⊖	JUNCTION BOX - SIZE & MOUNTING AS REQUIRED	AS REQD.	▬	277/480V PANELBOARD	-
▬	MULTIOUTLET ASSEMBLY - LENGTH AND OUTLET SPACING AS INDICATED	AS NOTED	⊥	GROUND ROD	-
⊖	PUSHBUTTON - NOTE 3	48" AFF	—	EQUIPMENT CONNECTION	-
⊖	CARD READER - NOTE 3	48" AFF	⊥	CIRCUIT CONDUCTOR INDICATING (NEUTRAL, PHASE EQUIPMENT GROUND, ISOLATED GROUND, SWITCH LEG) (NO INDICATION REPRESENTS 2#12, 1#12G, 3/4". UNO)	-
⊖	GROUND BAR	AS NOTED	x,x,x	THREE SINGLE POLE DEVICE CIRCUIT NUMBERS	-
TELEPHONE AND DATA SYSTEM					
◁	DATA OUTLET, NOTE 1	18" AFF	x/x/x	MULTI-POLE DEVICE CIRCUIT NUMBERS	-
◁	COMBINATION TELEPHONE/DATA OUTLET, NOTE 1	18" AFF			
⊖	FLOOR MOUNTED DATA OUTLET (TYPE AS NOTED, FLUSH MOUNTED UNO.) - NOTE 1	18" AFF			
◁	TELEPHONE OUTLET, WALL MOUNTED - NOTE 1	18" AFF			
◁	TELEPHONE OUTLET, WALL MOUNTED - NOTE 1	48" AFF			
⊖	TELEPHONE OUTLET, FLOOR MOUNTED, (FLUSH MOUNTED UNO.) - NOTE 1	-			
◁	PAY TELEPHONE OUTLET, WALL MOUNTED. STUB 3/4" FROM OUTLET TO ACCESSIBLE CLG - NOTE 1	48" AFF			
⊖	WIRELESS IN ROOM INDICATED, WI-FI CONNECTION	IN CEILING SPACE			
NOTES					
1. PROVIDE 1". FROM TELEPHONE AND DATA OUTLETS TO ABOVE NEAREST ACCESSIBLE LAY-IN CEILING.					
2. MOUNT FIRE ALARM AUDIBLE/VISUAL AND VISUAL ONLY DEVICES ON THE CEILING UNLESS OTHERWISE REQUIRED BY AMERICANS WITH DISABILITIES ACT REQUIREMENTS.					
3. SINGLE GANG BOX WITH A 3/4" EMT TO ABOVE NEAREST ACCESSIBLE CEILING SPACE.					



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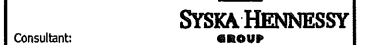


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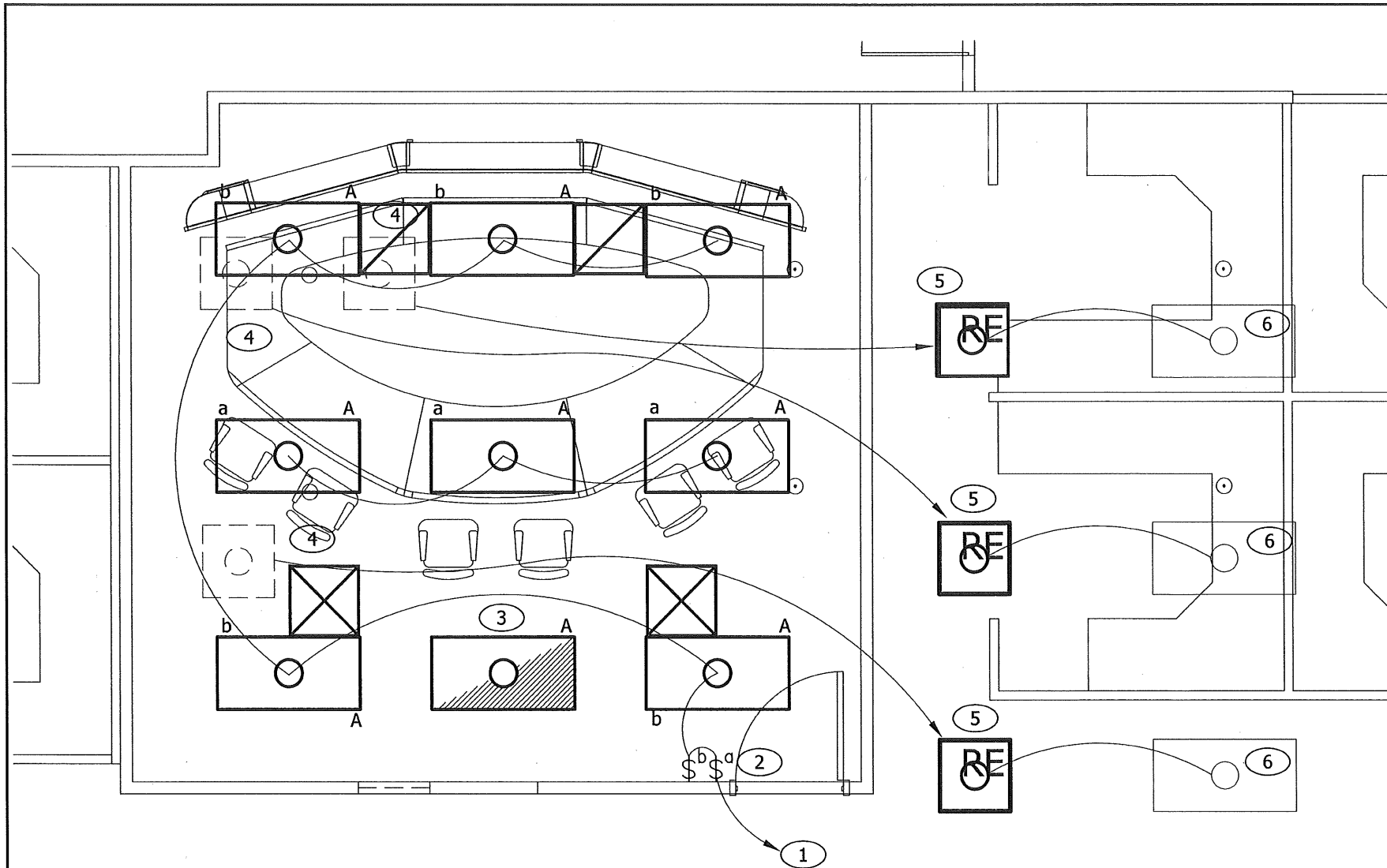
Floor 02
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Portland, ME 04101
Project Title & Address:

ELECTRICAL SPECIFICATION SHEET 4 OF 4

Sheet Title:
Proj. No.:
Drawn By: 09.00924.80_1221
Checked By: PLP
P.M.: JRM

E0-4

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KEYED NOTES:

- ① CONNECT TO EXISTING LIGHTING CIRCUIT CURRENTLY FEEDING THIS ROOM, PROVIDE NEW SWITCHING AS REQUIRED.
- ② PROVIDE DUAL SWITCHING PER IECC REQUIREMENTS.
- ③ EMERGENCY EGRESS FIXTURE, CONNECT TO NEAREST EGRESS LIGHTING CIRCUIT SERVING THIS AREA.
- ④ EXISTING 2X2 FIXTURE TO BE RELOCATED AS INDICATED.
- ⑤ CONNECT RELOCATED FIXTURE TO EXISTING LIGHTING CIRCUIT AND CONTROLS.
- ⑥ EXISTING FIXTURE TO RWMAIN.

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TELEPRESENCE ROOM - ME1-504-02-E0A5
 Floor 02
 100 Middle St.
 Portland, ME 04101
 Project Title & Address:

LIGHTING PLAN
 Sheet Title:
 Proj. No.: 09.00924.80_1221
 Drawn By: PLP
 Checked By: JRM
 P.M.: JRM
E2-1
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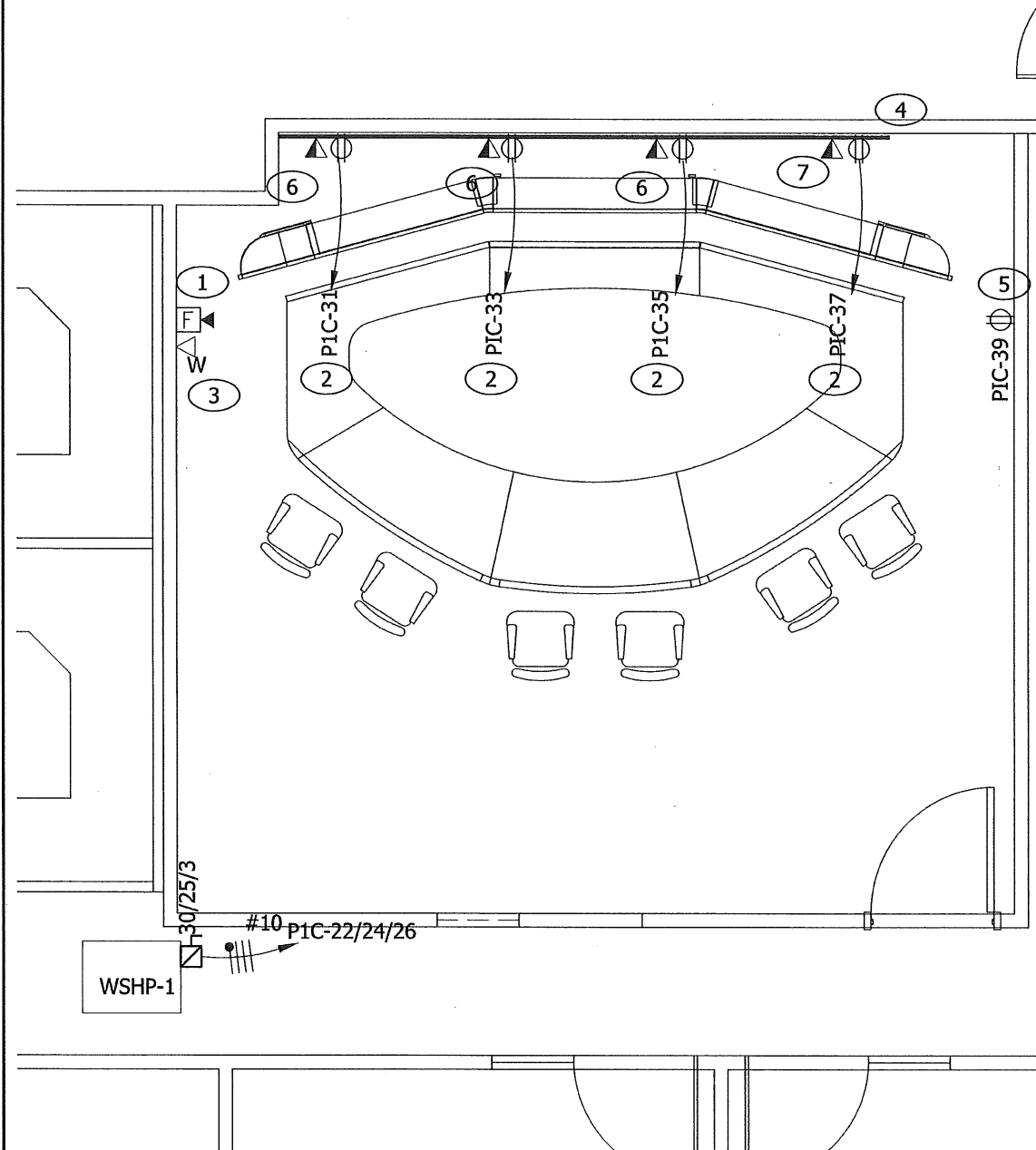
1 LIGHTING PLAN
 E2-1 1/2"=1'-0"

LIGHTING FIXTURE SCHEDULE					
TYPE	MOUNTING	MANUFACTURER	CATALOG NUMBER	VOLT	REMARKS
A	RECESSED	ZUMTOBEL RCF	RCFU-24-2285-P-W-U	UNIV	2X4 INDIRECT LAMPS SHALL BE 4100 KELVIN WITH 82 CRI ELECTRONIC BALLAST

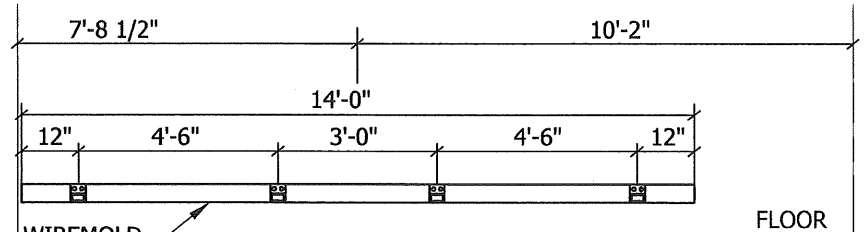
NOTE: NEC 410 - PROVIDE BALLAST DISCONNECTING MEANS IN FLUORESCENT FIXTURES AND OTHER FIXTURES THAT CONTAIN BALLAST(S).

GENERAL NOTES:

- 1. DESIGN INTENT IS TO REUSE AS MUCH OF THE EXISTING LIGHTING AND CONTROLS AS POSSIBLE. VERIFY AND DOCUMENT EXISTING CONDITIONS.
- 2. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF CEILING MOUNTED LIGHT FIXTURES.
- 3. REFER TO E0-4 & E4-1 FOR PANEL SCHEDULES, ELECTRICAL LEGEND, & ELECTRICAL RISER.
- 4. SWITCH(ES) IN ROOM CONTROL FIXTURES IN ROOM UNLESS NOTED OTHERWISE.
- 5. NEW CIRCUIT BREAKERS INSTALLED IN EXISTING PANELS SHALL MATCH EXISTING PANEL MANUFACTURER AND AIC RATING. UPDATE PANELBOARD CIRCUIT DIRECTORIES TO REFLECT CHANGES.
- 6. LOWER CASE LETTER ADJACENT TO FIXTURE INDICATES SWITCH DESIGNATION.
- 7. ALL LIGHT SWITCHES SHALL BE LABELED WITH CIRCUIT NUMBER ON BACK OF COVER PLATE WITH A TYPED LABEL. LOCATIONS THAT REQUIRE MULTIPLE SWITCHES SHALL BE GROUPED IN ONE BOX UNDER A COMMON SWITCHPLATE. BOX SHALL BE DIVIDED AS NEC REQUIRES.
- 8. ALL WIREMOLD AND LIGHT FIXTURES SHALL BE PURCHASED THROUGH EDI - ELECTRICAL DISTRIBUTOR, INC. OFFICE PHONE: 704-372-3040 FAX: 704-377-6975 CONTACTS: MARTY JACKSON, DAVID BUDNICK, SEAN RICHARD



1
E3-1
POWER/SYSTEM PLAN
1/2"=1'-0"



WIREMOLD
6000 SERIES
GREY IN
COLOR

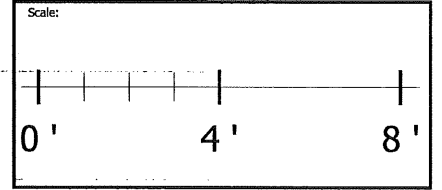
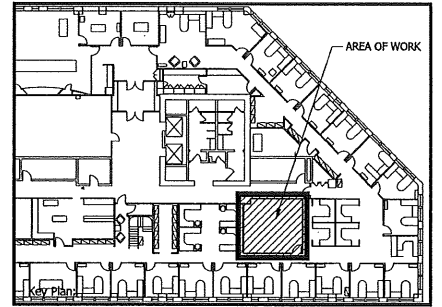
2
E3-1
WIREMOLD DETAIL

GENERAL NOTES:

1. REFER TO KEYED NOTES FOR ADDITIONAL INFORMATION.
2. REFER TO DRAWINGS E0.4, AND E4.1 FOR GENERAL NOTES, ELECTRICAL SYMBOLS, DETAILS, PANELBOARD SCHEDULES, AND RISER DIAGRAM.
3. REFER TO E0.3 FOR TYPICAL MOUNTING HEIGHTS OF DEVICES.
4. ALL LIGHT FIXTURES SHALL BE PURCHASED THROUGH EDI – ELECTRICAL DISTRIBUTOR, INC. OFFICE PHONE: 704-372-3040 FAX: 704-377-6975 CONTACTS: MARTY JACKSON, DAVID BUDNICK, SEAN RICHARD.

KEYED NOTES:

- 1 NEW FIRE ALARM DEVICE TO MATCH BUILDING STANDARD.
- 2 CONNECT TO EXISTING PANEL 'PIC' LOCATED IN ELECTRICAL ROOM.
- 3 NEW WALL MOUNTED PHONE AT 48" AFF.
- 4 WIREMOLD 6000 SERIES WALL MOUNTED RACEWAY, GREY IN COLOR, WITH DEVICES AS INDICATED. PROVIDE 1 1/4" CONDUIT FROM ABOVE ACCESSIBLE CEILING WITH PULL STRING FOR DATA CONNECTIONS. REFER TO 02/E3-1.
- 5 NEW RECEPTACLE, PROVIDE GREY DEVICE AND FACE PLATE.
- 6 PROVIDE (2) CAT 6 CABLES TO THIS LOCATION.
- 7 PROVIDE (1) CAT 6 CABLE TO THIS LOCATION.



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POWER/SYSTEMS PLAN
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E3-1
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EXISTING
PANEL
"P1C"
208Y/120V
225A

2ND FLOOR

NOTE: ALL EQUIPMENT SHOWN IS EXISTING.

1 RISER DIAGRAM
SCALE: NONE

PANELBOARD NO: P1C															
SECTION: 1 OF 1															
MOUNTING: SURFACE															
POLES: 42															
LOCATION:															
VOLTAGE: 208Y/120V															
PHASES: 3															
WIRE: 4															
INTERRUPTING RATING: 10 KAIR															
BUS: 225A															
MATERIAL: M.L.O.															
200% NEUTRAL: NO															
ELECTRONIC GRADE PANEL: NO															
GROUND BUS: YES															
ISOLATED GROUND BUS: NO															
THRU FEED LOADS: YES															
SUB FEED LOADS: NO															
CRT NO.	DESCRIPTION	LOAD (VA)				CIRCUIT BREAKER				LOAD (VA)				CRT NO.	
		LTS	REC	MECH	MISC	AMPS	POLES			LTS	REC	MECH	MISC		
1	EXISTING					20	1	A	20	1					EXISTING
2	EXISTING					20	1	B	20	1					EXISTING
3	EXISTING					20	1	C	20	1					EXISTING
4	EXISTING					20	1	A	20	1					EXISTING
5	EXISTING					20	1	B	20	1					EXISTING
6	EXISTING					20	1	C	20	1					EXISTING
7	EXISTING					20	1	A	20	1					EXISTING
8	EXISTING					20	1	B	20	1					EXISTING
9	EXISTING					20	1	C	20	1					EXISTING
10	EXISTING					20	1	A	20	1					EXISTING
11	EXISTING					20	1	B	20	1					EXISTING
12	EXISTING					20	1	C	20	1					EXISTING
13	EXISTING					20	1	A	20	1					EXISTING
14	EXISTING					20	1	B	20	1					EXISTING
15	EXISTING					20	1	C	20	1					EXISTING
16	EXISTING					20	1	A	20	1					EXISTING
17	EXISTING					20	1	B	20	1					EXISTING
18	EXISTING					20	1	C	20	1					EXISTING
19	EXISTING					20	1	A	20	1					EXISTING
20	EXISTING					20	1	B	20	1					EXISTING
21	EXISTING					20	1	C	20	1					EXISTING
22	EXISTING					20	1	A	20	1					EXISTING
23	EXISTING					20	1	B	20	1					EXISTING
24	EXISTING					20	1	C	20	1					EXISTING
25	EXISTING					20	1	A	20	1					EXISTING
26	EXISTING					20	1	B	20	1					EXISTING
27	EXISTING					20	1	C	20	1					EXISTING
28	EXISTING					20	1	A	20	1					EXISTING
29	EXISTING					20	1	B	20	1					EXISTING
30	EXISTING					20	1	C	20	1					EXISTING
31	CISCO EQUIP				1000	20	1	A	20	1					SPACE
32	CISCO EQUIP				1000	20	1	B	20	1					SPACE
33	CISCO EQUIP				720	20	1	C	20	1					SPACE
34	CISCO EQUIP				720	20	1	A	20	1					SPACE
35	RECEPTACLE				100	20	1	B	20	1					SPACE
36	SPACE					20	1	C	20	1					SPACE
37	SPACE					20	1	A	20	1					SPACE
38	SPACE					20	1	B	20	1					SPACE
39	SPACE					20	1	C	20	1					SPACE
40	SPACE					20	1	A	20	1					SPACE
41	SPACE					20	1	B	20	1					SPACE
42	SPACE					20	1	C	20	1					SPACE

PANELBOARD NO: P1C													
SUBTOTAL CONNECTED KVA		0.0	3.8	0.0	0.0	0.0	0.0	6.1	0.0	SUBTOTAL CONNECTED KVA			
		0.0	3.8	0.0	0.0	0.0	3.8	6.1	0.0	SUBTOTAL CONNECTED KVA			

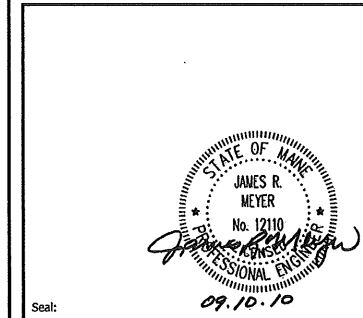
PHASE BALANCE													
LTS	REC	MECH	MISC	TOTAL	% DF								
PHASE A CONNECTED KVA	0.0	1.6	2.0	0.0	3.8								
PHASE B CONNECTED KVA	0.0	1.3	2.0	0.0	3.3								
PHASE C CONNECTED KVA	0.0	0.7	2.0	0.0	2.8								
AVERAGE PHASE CONNECTED KVA					3.3								

LOAD SUMMARY & FEEDER CALCULATION													
LTS	REC	MECH	MISC	DEMAND	SPRNG	TOTAL							
0.0	3.8	6.1	0.0	9.9	0	9.9							
1.0	3.1	1.0	1.0	5.1	0	5.1							
0.0	3.8	6.1	0.0	9.9	0	9.9							
DEMAND AMPS													
27.5													
CORR. NON-COHT FACTOR													
1.0													
COR. FACTOR (SEE TABLE 310-14)													
1.00													
CORR. FACTOR (OTHER THAN 30 DEG C)													
1.00													
33.0 MIN. OVERCURRENT DEVICE AMPS													
33.0													
33.0 MIN. OVERCURRENT DEVICE RATING													
33.0													
33.0 MIN. OVERCURRENT DEVICE RATING													
33.0													

2 PANEL SCHEDULE
SCALE: NONE

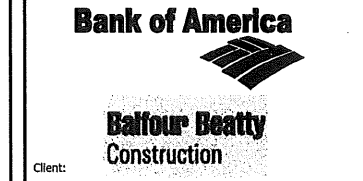


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ELECTRICAL RISER AND PANEL SCHEDULE

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