1355 MARKET STREET
SAN FRANCISCO, CA



Construction Standards

JUNE 28, 2021

SHORENSTEIN REALTY SERVICES, L.P.

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The following construction procedures, requirements, conditions and standards (these "Tenant Construction Standards) are applicable to the building referenced above (the "Building", which term shall include any garage located in, under or adjacent to such building, the parcel(s) of land on which the building and/or garage are located, and any other improvements on such land, including any plaza areas). Any Vendor, subvendor, architect, designer, or consultant ("Vendor") that performs any work or service in, upon or about the Building, and any tenant, subtenant, licensee or other occupant of the Building ("Tenant") that shall engage any Vendor to perform any such work or service (the "work" or the "project", which terms shall include, without limitation, alterations, additions, improvements, renovations, retrofits and other construction or construction related services), shall upon receipt of these Tenant Construction Standards be deemed to have agreed to the provisions hereof. Any breach of these Tenant Construction Standards shall be deemed a breach under Vendor's agreement with the Building owner ("Landlord") and/or a breach under Tenant's lease or other occupancy agreement with Landlord, as the case may be. These Tenant Construction Standards shall be interpreted to the maximum extent possible consistent with the terms of Tenant's lease, license, or other occupancy agreement with Landlord ("Lease", which term shall include Landlord's written Consent to Sublease, in the case of a subtenant), but in the case of any irreconcilable conflict between the Lease and these Tenant Construction Standards, the provisions of the Lease shall control. These Tenant Construction Standards shall be interpreted to the maximum extent possible consistent with the terms of Vendors construction contract, service agreement or work order with Landlord ("Vendor Contract"), but in the case of any irreconcilable conflict between the Construction Contract and these Tenant Construction Standards, the provisions of these Tenant Construction Standards shall control. Shorenstein Realty Services, L.P. or Shorenstein Realty Services East LLC for New York City properties ("SRS") is Landlord's agent for purposes of these Tenant Construction Standards, and all rights and remedies of Landlord hereunder may be exercised by Landlord through SRS as Landlord's agent.

A. Field verification is required for all scopes of work. Vendor to verify field conditions including, but not limited to any sound/noise and electrical/harmonic conditions throughout leased premises in regards to design/location of offices, quiet rooms, conference room, etc.

B. Any building engineering, security, elevator, dumpster or maintenance costs related to the project shall be the joint responsibility of Vendor and Tenant and is to be paid at Landlord's prevailing rate for labor and materials.

C. Tenant shall reimburse Landlord for the costs of Landlord's and Landlord's consultants' (including architects, engineers and other construction professionals), review of the project, including, without limitation, review of the plans and specifications for the project and the MEP, fire and life safety, HVAC and structural components thereof.

D. Tenant shall pay Landlord an alterations /operations fee as provided in Tenant's Lease.

E. All new, existing, and relocated equipment and devices must be easily accessible (i.e., not blocked by new or existing construction). Re-use of MEP equipment is not recommended, and should be considered in "as is" condition.

F. All abandoned equipment, building materials, wiring, conduits, duct work, paging speaker, framing track, and supports not being reused, shall be removed back to the source.

G. Tenant shall provide Property Manager with their final project accounting showing total costs of the project.

PRE CONSTRUCTION

A. Prior to the commencement of any work, Vendor shall supply three (3) sets of complete, coordinated and comprehensive, sealed and signed drawings and specifications including all relevant architectural (demolition and construction), engineering drawings (and/or structural), full MEP's including life safety, and emergency/exit lighting for Landlord's review and approval.

B. Landlord's approval of Tenant's drawings represents only Landlord's consent to the design intent shown in the plans. It does not constitute any agreement or representation by Landlord that the work called for in the plans complies with Lease requirements, applicable laws, building codes, ordinances, rules or other governmental regulations, nor does such approval relieve Tenant from its obligations to comply with the same. Landlord reserves the right to require corrections of the plans where errors are subsequently discovered. To prevent the use of imported asbestos containing materials, Landlord requires the following domestically manufactured materials to be used and installed. These materials include, but are not limited to: gypsum drywall, drywall joint compound ("mud"), acoustic ceiling tiles, resilient floor tiles, flooring or wall glues, spray-on fireproofing, and other cementitious materials (concrete, etc.).

C. Landlord must be notified during preliminary stages in the planning of any work which may involve installation through adjacent tenant spaces and or

common areas of the building, such as floor coring, piping, cables, etc. No work of this nature will be permitted unless absolutely necessary and will only be permitted with the prior written consent of Landlord. Landlord's decision to refuse such consent shall be final. Landlord may require a security guard to be with the Vendor while in the adjacent tenant's space and the cost thereof shall be the joint and several liability of Tenant and Vendor. When and if permitted, the work shall be performed only after normal business hours or on weekends agreeable to the adjacent tenant and Landlord.

D. All work shall be done in a neat and orderly manner. Vendor shall be responsible for replacing disturbed materials back to their original form. The work shall only be done by tradesperson experienced and skilled for the work involved. Tenant spaces must be restored to initial condition prior to 7a.m. the next working day, unless the tenant's occupancy requires an earlier business day start up.

E. Vendor shall protect all existing finished areas from damage. The flooring, walls, ceiling, lighting, furnishings, etc. shall be protected from dust and debris. If materials are transported during the course of construction flooring shall be properly protected.

F. Vendor shall arrange a pre-job walk-thru with Landlord. Landlord must approve all on site staging areas.

G. Throughout the area of alterations, Vendor shall provide and ensure reasonable access to all HVAC equipment (i.e. fire dampers, control devices, valves, filters) and other items that may require inspection, service or maintenance.

H. Prior to commencing any work, Vendor shall provide to Landlord documentation evidencing Vendor's substantial experience in this Locality/Municipality and building type, and with the type of work proposed.

I. Prior to commencing any work, Vendor shall provide to Landlord evidence of a current valid license recognized for the municipality where the work will be performed.

J. Prior to commencing any work, Vendor shall provide to Landlord evidence of the Vendor's ability to obtain performance and payment bonds for the project.

K. Prior to commencing any work, Vendor shall provide to Landlord a copy of all applicable permits required by the city, county, state or federal agencies. Procurement and payment for all permits are at the Tenant's and Vendor's joint and several expense. At the completion of construction, the original permit card of all approved final inspections shall be delivered to Landlord.

L. Prior to commencing any Work, Vendor shall provide to Landlord an insurance certificate and additional insured endorsement certifying that the insurance coverages required by Landlord in connection with the Work are

in force at Vendor's sole cost and expense. Tenant shall maintain insurance coverages as required by its Lease. If Tenant contracts directly with the Architect and General Contractor for the Work, prior to commencing any Work, the Architect and General Contractor will execute a Letter Agreement for Landlord which contains an indemnity and waiver and insurance coverages required by Landlord. The Architect and General Contractor shall also provide insurance certificates and additional insured endorsements certifying that the insurance coverages required are in force prior to commencing any Work (see attached Architect or General Contractor Form of Indemnity/ Insurance Letter).

M. Vendor to provide: List for Landlord's review and approval of all Vendor's and Sub-Contactor's personnel, including 24-hour emergency contact numbers for key personnel.

N. Vendor to provide: Letters from locals to verify Union affiliation for Vendor, including its respective subvendors (when requested by Landlord).

O. Vendor to provide: An accurate and comprehensive schedule of all work, including phasing, if applicable, from project start through completion. Prior to commencing work, a pre-work conference is to be scheduled with representatives of Landlord and Vendor to discuss the project scope and schedule.

P. Vendor shall provide and retain on the job site Material Safety Data Sheets (MSDS) for all materials being used and provide copies to Landlord. Deliveries of hazardous materials require prior written approval from Landlord.

Q. Vendor shall ensure that all utility services (electrical, HVAC, etc.) to each suite will be provided specifically for the suite. No shared services will be accepted. When splitting an existing electrical service, the Vendor must restore electrical service to the adjacent suite. Separate metering must be provided

R. All work on the base building's fire/life safety panel (final tie-ins) will be performed by *Siemens* and coordinated with Landlord. Only *Siemens* components can be utilized and plans must be approved in advance with *Siemens*. Vendor and Tenant are jointly and severally liable for all costs.

S. No work shall be performed that would alter the building's exterior appearance or common areas without Landlords approval.

T. No changes to the perimeter window treatment will be accepted unless otherwise noted and approved by Landlord in its sole discretion.

REQUIREMENTS DURING CONSTRUCTION

A. No work shall commence without Landlord's prior written approval. Work performed at a time other than during normal business hours of the Building

requires 48-hour prior written notice by Vendor. Security and/or engineering charges for operation of elevators outside of normal business hours of the Building shall be charged to Tenant and Vendor, jointly and severally, at Landlord's prevailing labor and material rate. The Building's normal business hours are 8:00 a.m. to 7:00 p.m. (*Itemize days for normal business week for building)*.

B. Work performed by Vendor shall be performed in a first-class manner. Materials and workmanship shall be equal to or better quality and grade than that used for existing improvements.

C. Weekly progress meetings must be held. Vendor is to conduct and issue minutes for weekly progress meetings, which may be attended by Landlord's representatives.

D. At Landlord's sole discretion, any work that does not meet Building standards may be ordered removed and redone at Vendor's and Tenant's joint and several expense.

E. Work performed shall not interrupt or disturb building operations, or prevent tenant's quiet enjoyment of their premises. All work including but not limited to core drilling, roto-hammering, installation of tack strips or construction that may cause excessive noise shall be done before or after normal business hours of the Building unless special arrangements are made in writing with Landlord.

F. Landlord at its sole discretion, reserves the right to refuse entrance to employees of Vendor who cannot meet and maintain the requisite standard of workmanship and/or who violate any or all of the terms enumerated herein.

G. If Hazardous Materials are present, the related work shall be performed in accordance with recommendations of the National Institute of Occupational/Safety and Health (NIOSH), the requirements of the Occupational Safety and Health Administration (OSHA) asbestos standard, and Landlord's Hazardous Materials Operations and Maintenance Manual. Unless approved by Landlord in writing, all asbestos-related work shall be done before or after the Building's normal business hours, achieving clean air prior to commencement of the Building's normal business hours.

H. Maintain cleanliness throughout: Public areas are to be kept clean at all times. Vendor shall not clutter or block hallways, exits, service elevator lobbies or electrical closets. Vendor shall provide walk-off mats at the entrance to construction areas, as well as the entrance to all elevators. Clean up is to be maintained at a satisfactory level. Failure to do so will result in Landlord's clean up at Tenant's and Vendor's joint and several cost.

I. Vendor shall properly protect all traffic areas within the tenant's leased premises and on all common building traffic areas, including freight areas, for the duration of the project.

J. Vendor shall vacuum, and/or broom clean, or mop daily, occupied tenant areas and the building common areas that are affected by project construction.

K. Vendor shall provide a separate receptacle for food and wet waste. Receptacle shall be emptied daily. No food or drink products shall be added to construction debris piles or receptacles that are not removed daily.

L. Any opening between the common building corridor or lobby and the project site is to be temporarily enclosed by means acceptable to Landlord at Vendor's and Tenant's joint and several cost until the permanent installation is completed.

M. Loading and unloading of material and/or debris boxes at loading dock or within property boundaries is to be coordinated and approved in writing by Landlord.

N. Vendor shall not touch, secure or start any mechanical, electrical, plumbing, life safety, or other building automation systems without prior written approval of Landlord. Vendor shall not enter electrical, telephone/data or riser closets without written approval from Landlord and if applicable Landlord's Riser Manager. All work is to be performed in accordance with Landlord's Policies and Procedures for Communications Riser Management.

O. Vendor shall not secure or open any domestic water, condenser water, chilled water, hot water heating, and domestic hot water or steam system without prior written approval of Landlord and the Building's Chief Engineer.

P. Vendor shall submit a request in writing to the Building's management office 48 hours in advance if any system is required to be shutdown. Landlord's approval is required prior to any system shutdown. Certain shut downs i.e. electrical shut downs that affect other tenants, will require at least one week advance written notification.

Q. Vendor shall not secure, enable or test any life safety system without prior written approval of Landlord. The Life safety system shall be operational 24 hours per day.

R. All MEP work will be inspected by the Building's Engineer. A preliminary inspection of the HVAC work shall be scheduled through Landlord prior to the installation or re-installation of the ceiling grid.

S. Vendor shall inform Landlord and shall take special measures to prevent false alarms when performing the following, but not limited to:

1. Welding/torching.
2. Soldering.
3. Seaming carpets with hot iron.

4. Painting with lacquers, and spray painting.

T. Hot Work: Hot work is any work that involves an open flame and/or creates hot metal debris. The Contractor is responsible for managing the hot work process and providing hot work permits to the Building's Engineering.

1. Hot work cannot occur simultaneously with fire protection impairment in the same area.
2. Permits can last no longer than 1 shift.
3. Permits are to be issued before work starts.
4. Open permits are to be posted in the area of the hot work.
5. Provide adequate fire extinguisher(s) in the work area(s).
6. Provide basic training for employees engaged in hot work activities.
7. Provide dedicated fire watch "spotter" personal as needed.
   a) Spotter is required when workers field of vision is limited.
   b) Spotter is required when work is occurring high above the floor.
   c) Spotter is required when hot slag is falling to floor level below.
8. Check the work area for any smoldering materials following work activities.

U. At Landlord's sole discretion any work that will produce noxious fumes and/or compromise building air quality (i.e.: painting, wall covering installation, carpet and base installation, minor refinishing of existing millwork) shall be performed after the Building's normal business hours beginning at such time as Landlord shall direct.

V. Vendor shall ensure that fire extinguishers and all other safety measures are available to prevent fire. Vendor may request to have smoke detectors in the area of work to be temporarily disabled. Vendor shall immediately notify Landlord when the applicable work is complete so that the fire detection systems may be brought back on line as soon as possible. Any Life Safety devices that are protected or disabled for the purpose of construction are to be returned to fully operational status at the end of every workday.

W. In case of an accident, involving personnel or property, Vendor and Tenant shall give immediate oral (followed by written) notice thereof to Landlord. Notification shall state the location of the accident, and any actions taken.

X. The use of any gasoline driven equipment within the Building is prohibited.

Y. Radios, CD players or similar pieces of equipment are not allowed. There will be no smoking or tobacco products, alcohol, drugs or seeds permitted in or about the building. Smoking is explicitly prohibited inside the building and

within 25 feet of any building entrance, outside air intake, and operable windows. Smoking is only allowed in designated outside smoking areas.

Z. Elevators Usage: Vendor's personnel shall use only freight elevators to access project sites. Freight elevator use is restricted: Its use shall be coordinated with Landlord.

1. Roof hatches in freight elevators will not be opened without:

   (i) A hold-harmless agreement in form acceptable to Landlord, signed by each Vendor who will work in or around such elevator, and

   (ii) The presence of the elevator maintenance company at Tenant's and Vendor's joint and several expense.

2. Landlord may require Vendor to directly contract with elevator maintenance Vendor for elevator related work. Vendor should arrange with elevator maintenance Vendor at least 72 hours in advance.

3. Use of freight elevators after normal Building Hours shall be at Tenant's and Vendor's joint and several cost. Any damage to any elevator shall be repaired at Tenant's and Vendor's joint and several cost. If operators are required for elevators other than the freight elevator and/or on premium time, the cost shall be charged to Tenant and Vendor, jointly and severally, at Landlord's prevailing labor and material rate.

AA. Vendor is to use specified restrooms only. Use of restrooms on tenant occupied floors is not allowed. Vendor is responsible for stocking and maintaining restrooms designated for their use.

BB. Vendor's use of tenant equipment, lunchrooms, vending machines, copiers telephones, etc. is not allowed.

CC. Vendor shall be required to x-ray slabs prior to coring, drilling, or installation of anchors or bolts as required by Landlord. Vendor to verify all slab conditions prior to work.

DD. Floor Coring: The Contractor shall follow the following floor coring and utility installation requirements for any below floor work:

1. All core locations are to be pre-scanned and cores shall be located to prevent cutting of existing slab rebar.

2. The proposed layout for conduit and plumbing pathways shall be submitted to the Building Management Office for review and approval.

3. Building Management Office approval is needed when conduit or plumbing installations impact the aesthetics of building architectural elements.

4. All cable and wiring shall be installed in Electrical Metallic Tubing (EMT).

5. All conduit and plumbing shall be installed at right angles to exterior walls. Diagonal runs are not permitted.

6. Conduit shall run as tight to the deck as possible, with bottom of conduit no lower than 4" from deck.

7. Conduit and plumbing shall be painted to match existing conditions, when applicable.

EE. All abandoned or unused floor cores, or penetrations shall be capped and back filled with concrete.

FF. All Vendors, and subvendors shall wear company supplied identification and may be required to wear building supplied building passes.

GG. All pay applications must have all required conditional lien releases, signed and on letterhead from all vendors, subvendors, material suppliers, and laborers requesting payments for all progress billings and unconditional lien

releases, signed and on letterhead from all vendors, subvendors, material suppliers, and laborers for all previously paid work.

CLOSEOUT

A. Vendor and Tenant shall ensure that the following procedures are followed:

1. All life safety devices and systems installed in the premises shall be tested, including alarms, smoke detectors, speakers, manual pull stations, water flow, trouble alarms and strobe lights. All testing is to be coordinated with Landlord and completed before or after the Building's normal business hours. The manufacturer of the Building's life safety system must certify the test results.

2. Upon the completion of the project Vendor may be required by Landlord, as needed, to paint electrical, mechanical rooms, freight lobbies and common corridors. Floors and walls are to be patched and painted to address gauges, scratches, and graffiti etc., which may occur during the course of the project construction.

3. Electric panel covers shall be replaced with directory schedules updated.

4. Copies of all warranties, guarantees, operating and maintenance manuals shall be delivered to Landlord.

5. Vendor shall instruct Landlord's Building engineers in the operation and maintenance of all equipment and systems installed.

B. As-Built Drawings: Vendor shall provide Landlord with complete and accurate sets of as-built drawings at completion of the project. These shall include, but not be limited to:

1. Architect Floor plans at 1/8" = 1'0" scale showing all partitions, location of glass, doors, built-ins, millwork and cabinets, sinks and plumbing locations and any other generally applicable information.

2. Electrical plans at 1/8" = 1'0" scale showing all electrical outlets, telephone outlets, panel schedules and special outlets (CRT's, dedicated circuits, etc.).

3. Life Safety plans at 1/8" = 1'0" scale showing all Life Safety devices (smoke detectors, strobes, pull stations, wire runs, and the location of the end of line resistors for speakers and strobes).

4. Reflected ceiling plans at 1/8" = 1'0" scale showing the HVAC system (duct runs, troffers, mixing boxes, special units, etc.) and sprinkler locations.

C. Architectural drawings shall be CAD-generated in AUTOCAD Release, most current version, (with no third party software), shall be submitted in one (1) hard copy and two (2) on disk. MEP drawings shall be (1) hard copy redlined as built plan(s). All shall comply with reasonable standards established by Landlord from time to time. As-builts shall include all "X-REF" drawings necessary.

   a. As-builts shall show new work as well as previous conditions that remain. Notation of any unique or special circumstances pertaining to construction shall be made.

D. HVAC testing and balancing is to be performed by an independent Vendor. Approved by Landlord upon satisfactory completion of balance and operation test, three sets of tenant HVAC drawings and three air balance reports, according to the AABC standards, shall be submitted to Landlord.

E. At the completion of construction, Vendor shall submit to Landlord:

   1. A Conditional Waiver and Release of Lien from the Vendor and each of its subvendors, material suppliers and laborers, containing the appropriate provisions, as reasonably determined by the Landlord. (Additionally, upon final payment, based on legal documents specific to the property, an Unconditional Waiver and Release of Lien from the Vendor and each of its subvendors, material suppliers and laborers, containing the appropriate provisions, is required by the Landlord.)

   2. Perform a post-construction cleaning of each work area to include, but not limited to, cleaning of all windowsills, blinds, inside of perimeter windows, light diffusers, HVAC grilles, cabinets, sinks, carpet, resilient floors, perimeter induction units, and doors.

   3. Signed off permit and drawings.

   4. City Recycling Summary Report, if applicable.

   5. Certificate of Occupancy, if applicable.

   6. Completion and signoff of applicable punch lists.

   7. Tenant shall provide Property Manager with their final project accounting showing total costs of the project.

AMENDMENT

These Tenant Construction Standards may be amended or otherwise modified, or amended and restated or otherwise superseded, by Landlord upon prior written notice to Tenant. Tenant shall be responsible for delivery of any such amendments, modifications, or restatements to its Vendors, and delivery of the same by Landlord to Tenant shall constitute Landlord's delivery thereof to Tenant's Vendor.

ARCHITECT OR GENERAL CONTRACTOR FORM OF INDEMNITY/ INSURANCE LETTER

[SHORENSTEIN LETTERHEAD]

Date:

[**NAME OF GC OR ARCHITECT**]
Street Address
City, State, Zip

Re: [**General Contractor**] [**Architectural**] services being provided by [**LEGAL NAME OF GC OR ARCHITECT**] ("Contractor") to [**TENANT NAME**] ("Tenant") for Tenant's leased premises at [**NAME AND ADDRESS OF BUILDING**] (the "Building") which Building is owned by **[FULL LEGAL NAME OF OWNERSHIP ENTITY]** ("Owner")

Gentlemen and Ladies:

Owner hereby consents to Contractor performing the above referenced work/services (the "Work") at the Building, subject to the terms of this letter agreement.

1. Waiver and Indemnity. Owner, Shorenstein Realty Services, L.P., Shorenstein Properties LLC, Shorenstein Company LLC, Shorenstein Management LLC, Shorenstein MB Inc., and their respective partners, managers, members, subsidiaries and affiliates and the officers, directors, agents, members, managers employees, clients, successors and assigns and authorized representatives of all the foregoing (collectively, the "Indemnified Parties"), shall not be liable to Contractor, and Contractor hereby waives all claims against such Indemnified Parties for, and releases such Indemnified Parties from liability for, any loss, injury or other damage to person or property in, on or about the work site or the Building, provided that the foregoing waiver shall be inapplicable to any loss, injury or damage resulting directly from the gross negligence or willful misconduct of the Indemnified Party seeking to enforce the waiver. Contractor shall hold the Indemnified Parties harmless from and indemnify and defend the Indemnified Parties against any and all claims, liabilities, damages, costs and expenses, including, without limitation, reasonable attorneys' fees and costs incurred in defending against the same (collectively, "Claims"), whether arising before or after completion of the Work and in any manner directly or indirectly caused, occasioned by or contributed to by (a) the acts or omissions of Contractor or any agents, employees, subcontractors, licensees, material suppliers, guests or invitees of Contractor (collectively with Contractor, "Contractor Parties") in, on or about the Building, or (b) any construction or other work undertaken by or on behalf of any Contractor Party in, on or about the Building, or (c) any accident, injury or damage, howsoever and by whomsoever caused, to any person or property,

occurring in, on or about the Work site, except to the extent such Claims are caused directly by the negligence or willful misconduct of such Indemnified Party. The release, waiver, and covenant to indemnify, defend and hold harmless provisions set forth above shall apply to the fullest extent permitted by law.

2. Insurance. Prior to commencing any Work at the Building, Contractor shall deliver to Owner an insurance certificate evidencing that Contractor maintains the insurance coverages set forth in Exhibit A attached to this letter agreement with regard to the Work. (The parties acknowledge that Tenant is required to maintain certain insurance coverages under its lease at the Building and that this agreement does not release Tenant from such obligation under the lease.) At all times during the performance of the Work, Contractor shall maintain (and Tenant is required under its lease to cause Contractor to maintain) such coverages in force, at its sole cost, from companies reasonably acceptable to Owner's agent, Shorenstein Realty Services, L.P. Owner reserves the right to reasonably modify the coverages in attached Exhibit A and Contractor shall comply with such reasonable modifications upon written notice from Owner of such modifications. In addition, Contractor shall cause all subcontractors, suppliers and any other person or party acting under Contractor's direction or control or on its behalf in connection with the performance of the Work ("Subcontractors") to maintain in force, from companies reasonably acceptable to Shorenstein Realty Services, L.P., the types of insurance in Exhibit A that are applicable to their work or service and with limits of liability in the greater of (i) the amounts customarily maintained by such Subcontractors in accordance with industry standards or (ii) the amounts, if any, to be maintained by such Subcontractors as set forth in a written notice by Owner. As more specifically provided in Exhibit A, Contractor and all Subcontractors shall name Tenant, Owner and the other Indemnified Parties as additional insureds for ongoing and completed operations.

3. Attorneys' Fees; Miscellaneous. In the event of any action or proceeding between Owner and Contractor to enforce any provision of this Agreement, the losing party shall pay to the prevailing party all costs and expenses, including, without limitation, reasonable attorneys' fees and expenses, incurred in such action. Notwithstanding any other provision of this Agreement, the liability of Owner for its obligations hereunder is limited solely to Owner's interest in the Building as the same may from time to time be encumbered, and no personal liability shall at any time be asserted or enforceable against any other assets of Owner. In no event shall either party be liable to the other party for consequential or remote damages.

The permission granted Contractor to perform the Work in the Building is conditioned upon Contractor's delivery to Owner of an original of this letter duly signed by Contractor and the insurance certificate(s) required to be maintained by Contractor under Exhibit A. Nothing herein relieves Contractor from its obligation to comply with Owner's construction standards, procedures, conditions and requirements for the Building as in effect from time to time, a copy of which shall be provided by Owner to Contractor upon request.

(continued on next page)

Please evidence your agreement with the above by signing and returning to us a duplicate copy of this letter.

Very truly yours,

[**OWNER ENTITY**] a Delaware limited liability company

By Shorenstein Realty Services, L.P., a
Delaware limited partnership, its managing agent

By_____

Name_____

Title_____

The undersigned agrees to the terms above:

[**ARCHITECT OR GC LEGAL NAME**]

By_____

Name_____

Title_____

EXHIBITS
Exhibit A – Insurance Requirements

EXHIBIT A

Insurance Requirements

- Commercial General Liability: including blanket contractual liability coverage sufficiently broad to cover the indemnification obligations above; with limits of not less than $1,000,000 Each Occurrence; $2,000,000 General Aggregate; $2,000,000 Products/Completed Operations Aggregate; $1,000,000 Personal & Advertising Injury and including coverage for broad form property damage and independent contractors. Such insurance shall be at least as broad as Insurance Services Office ("ISO") Form CG 00 01. Contractor agrees to maintain this coverage for a minimum of three (3) years following the completion of its work and to name the Indemnities as additional insureds for the entire three (3) year period. Self-insured retention, including costs of defense, shall not exceed $25,000.
- Automobile Liability Insurance, including coverage for owned, hired and non-owned vehicles, with bodily injury and property damage combined single limits of not less than $1,000,000.
- Umbrella Liability Insurance, with limits of not less than $10,000,000 per occurrence and aggregate. For exterior work at the Building, or work that affects the Building's structure, the minimum limits for Umbrella Liability shall be between $10,000,000 and $100,000,000 per Occurrence/Aggregate, which shall be specified in a written notice by Owner.
- Workers' Compensation and Employer's Liability Insurance in compliance with applicable Federal and State laws with Employer's Liability limits in the amount, if any, required by law but in no event less than $1,000,000 Bodily Injury for Each Accident; $1,000,000 Bodily Injury for Each Employee; and $1,000,000 Bodily Injury Disease Aggregate.
- Contractor's Pollution Liability Insurance, for Contractors that present a pollution exposure (i.e. hydraulic elevators, environmental contracts, construction projects where asbestos, lead paint, etc. is present), with limits of not less than $5,000,000 per claim and aggregate.
- Professional Liability (Errors & Omissions) Insurance, for Contractors that provide professional services, with limits of not less than $2,000,000 per claim and aggregate. For exterior work at the Building, or work that affects the Building's structure, the minimum limits for Professional Liability shall be $5,000,000 per claim and aggregate.
- Per-project Aggregate Limit, the general aggregate limit in the Commercial General Liability policy shall apply on a "per project" basis instead of a "per

policy" basis. A copy of the actual endorsement as broad as Insurance Services Office ("ISO") form CG 2503 is required.

1) Additional Insured Parties: All insurance policies other than Workers' Compensation, Employer's Liability and if required Professional Liability (Errors & Omissions) shall name SRI Nine Market Square LLC, J.P Morgan Investment Management Inc., Barclays Bank PLC, Shorenstein Realty Services, L.P. , Shorenstein Properties LLC, Shorenstein Company LLC, Shorenstein MB Inc., Shorenstein Management, Inc. and their respective Members, Managers, Partners, Officers, Directors, Affiliates, Agents, Employees and Successors, and any other party specified by Landlord at any time and from time to time as additional insureds with respect to the Work. A copy of the actual additional insured endorsement as broad as Insurance Services Office (ISO) form CG2010 1185 must accompany the certificate.

- Primary Insurance: The Commercial General Liability Policy shall provide that such insurance is primary to and non-contributory with any liability insurance carried by Owner, Shorenstein Realty Services, L.P. and the other Indemnified Parties and provide a severability of interests clause.
- Occurrence Basis of Coverage; Exceptions: All insurance policies carried by Contractor or otherwise affording coverage with respect to Contractor's Work in the Building, shall provide coverage on an "occurrence" rather than a "claims made" basis. Professional Liability (Errors & Omissions) and Contractor's Pollution Liability (if required) may be provided on a "claims-made" basis so long as coverage remains in force for three (3) years after completion of the Work.
- Certificates of Insurance: Prior to beginning any Work, Contractor shall furnish to Owner insurance certificates completed by a duly authorized representative of their insurer certifying that at least the minimum insurance coverages required are in effect together with copies or originals of all required endorsements. Contractor shall give Owner not less than thirty (30) days' written notice prior to any cancellation or material change in coverage.
- Waiver of Subrogation, Etc.: Contractor shall cause all liability and Workers' Compensation insurance policies to provide that the insurance company waives all rights of recovery by way of subrogation against Owner, Shorenstein Realty Services, L.P. and the other Indemnified Parties, in connection with any matter covered by such policy. Contractor hereby waives any right of recovery against Owner, Shorenstein Realty Services, L.P. and the other Indemnified Parties, for any Claims for personal injury or property damage arising out of, related to or in connection with the Work and for any Claims that are caused or result from risks insured against (or required to be insured against) by Contractor pursuant to the foregoing provisions.

Financial and Business Standing of Insurance Carrier(s): All policies of insurance affording coverage with respect to Contractor's Work in the Building shall be carried by insurers which are authorized to do business in the state where the Building is located and which are rated by AM Best not lower than A-VIII.

CONSTRUCTION PROJECT CLOSEOUT CHECKLIST

SHORENSTEIN

Construction Project Closeout

Checklist

MANDATORY – Documents to collect prior to or with the final application for payment for all construction projects. All documentation should be kept in the project file unless specifically called out differently:

1. Final As-Built Architectural Plans (CAD) – to be forwarded to our plan Archivist	☐
2. Final As-Built Mechanical Electrical Plans – to be forwarded to your Chief Engineer	☐
3. Final As-Built Fire Sprinkler Plans – to be forwarded to your Chief Engineer	☐
4. Final As-Built Life Safety Plans – to be forwarded to your Chief Engineer	☐
5. Completely signed off Permit Card showing completion of project and/or allowing Occupancy	☐
6. Permit set of plans (usually delivered with the signed off Permit Card	☐
7. Completed and signed off Punch List	☐
8. All Operations and Maintenance Manuals	☐
9. All equipment, material and workmanship warranties	☐
10. Final Pay Application including Conditional Lien release or Waiver from the General / Prime Contractor	☐
11. ***AFTER FINAL PAYMENT*** – Within three (3) business days of Final Payment you should receive a Final Unconditional Lien Release or Waiver from the General / Prime Contractor	☐

12. Forward completed Construction Pricing information per each project as per the following procedures: Go to the SHWEB/ Property Management & Construction Department / PM&C Library / Construction - Chapter 9 / Resources and Forms and choose one of the appropriate Construction Templates (not all types of jobs are listed or currently required to have a Template completed). Save the appropriate Template to your drive so you can input the required project information. Forward the completed Template to the "Construction Pricing Team" internal; e-mail address. If there are any questions on the completed Template the Construction Pricing Team will contact you. The Templates have drop down menus for individual cells on the form. Always (only) use the Construction Templates from the SHWEB for this task	☐

LIEN RELEASE FORMS

PART 1 - GENERAL

1.1 SUMMARY

A. Lien release forms are State specific. Property Manager to provide appropriate lien release forms.

END OF SECTION

GENERAL BUILDING INFORMATION

1.1 PROJECT DIRECTORY

A. Building Owner:

SRI Nine Market Square LLC
c/o Shorenstein Realty Services, L.P.
ADDRESS: 1355 Market Street
San Francisco, CA 94103
Phone # (415)437-7100

B. Building Manager:

Shorenstein Realty Services, L.P.
ADDRESS: 1355 Market Street
San Francisco, CA 94103
Phone # (415)437-7100 FAX # (415) 522-1002
Contact: Lindsay Goldstone, Property Manager
Thermond Adams, Chief Engineer

C. Leasing:

Shorenstein Realty Services, L.P.
ADDRESS: 235 Montgomery Street, Suite 1600
San Francisco, CA 94104
Phone # (415)772-7000

D. Building Consulting Mechanical/Electrical/Plumbing:

FIRM USED: Amit Wadhwa & Associates
ADDRESS: 870 Market Street
San Francisco, CA 94102
Phone # (415) 788-999 FAX # (415) 617-0076
CONTACTS: Amit Wadhwa

1.0 MULTI-TENANT ELEVATOR LOBBIES, RESTROOMS AND PUBLIC CORRIDORS

A. Passenger elevator lobbies are constructed and finished according to building standards at the discretion of the Landlord.

1. Modifications desired by Tenant shall be submitted for review and approval by Landlord (3 copies to be submitted for review and approval).

2. Design of elevator lobby shall comply with applicable codes.

3. Ceilings, vanities, fixtures, trim, lighting and mechanical services are to be constructed and inspected by agencies with jurisdiction and approved to comply with applicable code requirements at time work is done.

B. Tenant entry doors shall conform to building standards unless otherwise approved by Landlord.

2.0 TENANT RECEPTION AREAS AND SIGNAGE

A. Plans and specifications indicating finishes, graphics, artwork, lighting and furnishings to be used in tenant reception area, if visible from building common public area, shall be submitted to Landlord for review and approval.

B. Tenants on multi-tenant floors shall use building standard entry identification graphics system provided by Landlord unless otherwise approved by Landlord.

1. Multi-floor tenants shall contact Landlord regarding correct spelling of company's name for entry signage before Substantial Completion of buildout.

2. Temporary signage will be provided in event that permanent signage is unavailable at move-in date

3. Tenants will be required to give final approval and sign-off on graphics text before Landlord will be able to order entry signage.

C. Landlord will supply, install, and maintain a building standard tenant directory on multi-tenant floors.

D. Identification signage and emergency evacuation signage on floors occupied by full-floor tenant are Tenant's responsibility and shall comply with code requirements. Signage to be submitted for Landlord review and approval, after approval by the fire department.

3.0 TENANT DESIGN AND ENGINEERING

A. Tenant's Design and Engineering proposed improvements are to be submitted to Landlord for review and approval prior to starting any work.

B. Office planners shall coordinate the placement of partitions, light fixtures and other interior systems in relation to the base building MEP systems.

1. Three (3) sets of plans and specifications shall be submitted to Landlord for review and approval.

2. Adequate clearance for light fixtures, MEP fixtures, etc., shall be maintained below mechanical ducts.

3. Access panels shall be provided where required to service all above-ceiling mechanical and electrical, but not limited to equipment, valves and connection points, as indicated by Landlord.

4. All above ceiling equipment shall be installed to allow adequate access for service and maintenance.

5. The following is to be included on all plans and specifications: To prevent the use of imported asbestos containing materials, Landlord requires the following domestically manufactured materials to be used and installed. These materials include, but are not limited to: gypsum drywall, drywall joint compound ("mud"), acoustic ceiling tiles, resilient floor tiles, flooring or wall glues, spray-on fireproofing, and other cementitious materials (concrete, etc.).

C. Where slab-to-slab partitions are specified, transfer ducts shall be installed to reduce interference with functioning of above-ceiling return-air plenum.

D. Tenant's keying and proximity card access systems shall be approved by Landlord and coordinated with Landlord keying schedule

E. Electronic security and access control systems that are used in the path of egress for life safety emergencies shall be designed fail-safe and shall comply with applicable codes and shall be integrated with Building Life Safety. Alternative communication devices shall be submitted to Landlord for review and approval.

F. Modifications to base building HVAC or electrical systems shall be submitted for Landlord's review and approval. Special use areas within Tenant's premises, such as kitchens or computer rooms may require supplemental cooling and venting that shall be installed and maintained at Tenant's sole expense. There will be an additional fee for connecting to building systems. Supplemental units shall have metering device and shall be metered 24/7.

G. Tenants shall maintain clear access to any base building mechanical or electrical closet within Tenant's premises.

H. Improvements visible from common and public areas are to be identified in submittal and require Landlords review and approval.

I. Base Building Alterations: Plans and specifications for cut-outs in floor slab necessary for stairs, private elevators, or chases are to be identified and structural calculations are to be submitted to Landlord for review and approval.

J. Excess Floor Loading: Excess and unusual floor loading requirements, such as for high-density filing systems, library shelving, moveable partitions, storage areas, equipment rooms, generators, stairways, etc., are to be identified and structural calculations are to be submitted to Landlord for review and approval.

K. At Shorenstein's sole discretion, any work that does not meet Building Standards and was not properly submitted for approval may be ordered removed and redone at Vendor's cost.

L. Alterations that effect building fire life safety systems and smoke control shall be pre-approved by Fire Department and Landlord.

M. Coring requires approval of structural engineer. Scanning is required to locate core.

N. When plumbing impacts the ceiling of the tenant space below, layout must be provided to the Owner for review and approval. Plumbing must be painted to match the existing conditions of the tenant space below.

O. Conduit routing

   a. All visible conduits shall be Electrical Metallic Tubing (EMT). Flexible Metal Conduit will not be allowed.

   b. Layout of exposed conduit in the ceiling of tenant space below must be provided in a drawing for Owner review and approval.

   c. Owner requires that conduit shall be installed at right angles to the exterior walls. Diagonal runs are not allowed. Conduit shall run as tight to the deck as possible, with bottom of conduit no lower than 4" from the deck.

   d. Paint conduit to match existing conditions.

   e. Owner approval is required when conduit impacts the aesthetics of architectural elements of the space below.

P. Data Centers: Data Centers within Tenant's premises shall be metered such that energy usage data can be collected: 1) at a point downstream from any and all uninterruptible power supplies (UPS), and 2) for all IT equipment, and IT equipment only, in the data center. Metering system shall meet the U.S. Environmental Protection Agency ENERGY STAR Portfolio Manager requirements for Data Center benchmarking. Metering system shall conform to Landlord's Design Criteria as specified in this document under Electrical Section 1.3.B.13. Data Center shall be defined as any demised space of more than 500 square feet that is dedicated to high-density computing functions (e.g., server racks) and may, but not necessarily, include a raised floor, dedicated supplemental cooling system, and one or more UPS.

END OF SECTION

"GREEN" BUILDING CONSTRUCTION STANDARDS

1.0 SUMMARY

A. This section includes requirements for environmental "green" building construction standards. Adopting "green" building standards in tenant improvement projects helps to reduce the negative environmental impact of resource usage typically associated with commercial construction projects. Additionally, "green" building standards helps to minimize the comfort and health effects created during the construction process and commonly occurring following the installation of new building products. This section includes both mandatory requirements and voluntary guidelines as delineated below.

B. Where the requirements refer to Leadership in Energy and Environmental Design ("LEED"), the U.S. Green Building Council LEED-Commercial Interiors Rating System ("LEED CI") or LEED-Operation and Maintenance Rating System ("LEED O+M") is the referenced document. It will be the responsibility of Vendor to identify and implement the most current Rating System version that applies to the Project.

2.0 MANDATORY GREEN BUILDING STANDARDS

A. Waste Management

1. Adhere to LEED O+M, MR Credit, Solid Waste Management - Facility Maintenance and Renovation, including but not limited to:

   a. At least 70% of non-hazardous demolition and construction waste, by weight or volume, will be recycled for all projects.

   b. Vendor will provide documentation of performance toward this goal as part of Close Out Package.

2. Vendor will establish a project waste management plan that includes the following components: a waste diversion goal (70%), the materials for diversion, the volume of waste anticipated, safe storage location, appropriate waste removal procedures, and diversion strategies to be used.

3. Comply with all local jurisdiction construction waste management requirements.

B. Indoor Air Quality (IAQ)

1. Ventilation System Design: Adhere to LEED CI, EQ Prerequisite, Minimum Indoor Air Quality Performance.

2. Ventilation System Construction: Adhere to LEED O+M, MR Prerequisite, Facility Maintenance and Renovation Policy, including but not limited to:

   a. Meet or exceed the control measures of the Sheet Metal and Air Conditioning National Vendors Association (SMACNA) "IAQ Guideline for Occupied Buildings Under Construction," 2007 (2nd edition), Chapter 3, as it may be amended, supplemented or replaced from time to time.
   b. Isolate work areas to prevent contamination of clean or occupied areas.
   c. Clean the construction area daily.
   d. Seal air registers during construction.
   e. Shut down the return side of HVAC systems if possible.

f. If air handlers must be used during construction, filtration media with a minimum MERV 8 rating must be used at each return air grill, as determined by most current version of the ASHRAE 52.2 standard.
g. Replace filters on HVAC units with filtration media as specified in the final design prior to occupancy.
h. The construction space and affected ventilation ducts shall be thoroughly cleaned of all waste, dust, residues, and particles after construction has ended.
i. Flush-Out: Vendor shall determine whether, following installation of all interior finishes and completion of all construction but before occupancy, a flush-out or air quality testing is needed. If any materials containing VOCs or formaldehyde were used in construction, flush-out shall be required until no detectible odor remains in the space.
j. Vendor shall notify the building's engineer at least two full business days prior to commencement of extremely dusty work (sheet rock cutting, sanding, extensive sweeping, etc.) so arrangements can be made for additional filtering capacity on the affected HVAC equipment. Failure to make such notification will result in Vendor absorbing the costs to return the equipment to its proper condition. Vendor will not proceed with work until filter installation has been completed. Failure to wait for notification of filter installation prior to commencing work will result in Vendor absorbing the costs to return the equipment to its proper condition. All recessed lights must be covered during high dust construction due to plenum return air systems.

C. Sustainable Purchasing

1. Adhere to LEED O+M, MR Credit, Purchasing – Facility Maintenance and Renovation, including but not limited to:

a. Products and Materials: At least 50%, by cost, of the base building construction materials purchased will meet the LEED purchasing criteria for LEED O+M, MR Credit, Purchasing – Facility Maintenance and Renovation.

b. Furniture and Furnishings: To the extent reasonably possible, furniture and furnishings will meet the LEED purchasing criteria for LEED O+M, MR Credit, Purchasing – Facility Maintenance and Renovation.

c. Vendor shall provide documentation of the quantity, unity cost, and sustainability attributes of each material being procured.

D. Mechanical, Electrical, and Plumbing Requirements

All building specific information including model numbers, etc. are located in the Mechanical and Electrical sections of this document.

1. Adhere to LEED CI, EA Prerequisite, Minimum Energy Performance.

2. Lighting Motion Sensors: Occupancy Sensors with manual override are mandatory for all construction. Daylight responsive controls shall be located as per local code. Sensor standards are:

a. Lutron Pico Wireless Control Wall Sensor.

b. Lutron Power Saver Occupancy/Vacancy Sensor.

c. Lutron Power Saver Wireless Daylight Sensor

d. Exit Lights Lighting source is to be Light Emitting Diodes (LED). Follow building standards for model and style of LED Exit signs.

3. Heating, Ventilating, Air Conditioning and Refrigeration Equipment

a. Adhere to LEED CI, EA Prerequisite, Fundamental Refrigerant Management.

b. Adhere to LEED O+M, EA Prerequisite, Fundamental Refrigerant Management, including but not limited to:

i. Heating, ventilating, air conditioning and refrigeration (HVAC&R) equipment shall not contain CFC. When reusing existing HVAC&R equipment, complete a phase-out of CFC or demonstrate that phase-out would result in more than a 10-year payback period

c. Once-through, potable water cooling systems shall not be used.

4. Magnetic Lighting Ballasts

a. Magnetic lighting ballasts are not allowed. Use only electronic ballasts. Energy savings electronic type, suitable for lamps specified, 120-277 volts match luminary voltage, class P, UL listed, non-PCB and RFI limited, sound rating A, crest factor 1.6 or less, high frequency (20 kHz or greater), maximum total harmonic distortion (THD) less than or equal to 10%, minimum true power factor 0.97, 3 year written warranty against mechanical or electrical defects under normal conditions of use.

5. Lamps and Ballasts

a. Lamps and ballasts, including manufacturer, type, watts and mercury content shall meet lighting power density established by ASHRAE/IESNA Standard 90.1 – 2010. All lamps shall be certified by the U.S. Environmental Protection Agency's ENERGY STAR program.

6. Variable Air Volume (VAV) boxes

a. When installing new VAV boxes, use Direct Digital Control (DDC). DDC boxes should be installed as "stand alone" units in buildings that do not currently have a DDC backbone to connect to. If the job is in a property where more than 75% of the VAV boxes are pneumatic, this requirement may be waived with Building Management approval.

7. Faucets

a. Adhere to LEED CI, WE Prerequisite, Indoor Water Use Reduction, or local standard if more stringent, for all restroom sinks, kitchen sinks, and shower heads.

i. Where available, Vendor shall install products certified by the U.S. Environmental Protection Agency's Water Sense program, it being understood that flow requirements stated above shall still be required of the Water Sense-certified products.

8. Low Flow Fixtures

a. Adhere to LEED CI, WE Prerequisite, Indoor Water Use Reduction, or local standard if more stringent, for all toilets and urinals.

i. Where available, Vendor shall install products certified by the U.S. Environmental Protection Agency's Water Sense program, it being understood that flow requirements stated above shall still be required of the Water Sense-certified products.

9. Commissioning Process

a. Adhere to LEED CI, EA Prerequisite, Fundamental Commissioning and Verification.

E. Equipment and Appliances

1. Vendor shall install products certified by the U.S. Environmental Protection Agency's ENERGY STAR program for electric powered equipment:

   a. Audiovisual equipment

   b. Kitchen, Break Room and Food service equipment

F. Water and Energy-Efficient Construction Practices

1. Vendor shall use resource-efficient construction practices including, without limitation, water conservation, turning off lights and turning off or adjusting heating, ventilating and air conditioning systems that are in use during the project.

END OF SECTION

HAZARDOUS MATERIALS

1.1 SUMMARY

A. Section Includes: Hazardous materials special procedures.

1. The Vendor shall comply with Title 8 of the California Code of Regulations California-OSHA and Title 29 of the Code of Federal Regulations (OSHA) for all safety and labor requirements. The Vendor shall comply with Title 27 of the California Code of Regulation (California–EPA) and Title 40 of the Code of Federal Regulations (EPA). The Vendor shall also have a current copy of the Shorenstein's California Hazardous Materials and Conditions Operations and Maintenance Program Manual and comply with additional requirements of Shorenstein's Manual.

    a. Obtain copy from Landlord.

END OF SECTION

GENERAL QUALITY REQUIREMENTS

GENERAL QUALITY REQUIREMENTS

1.1 SUMMARY

A. This section describes general quality control requirements.

1. Quality control. general
2. Manufacturers' field services.
3. Mock-ups.
4. Testing laboratory services.

B. Related Requirements:

1. Refer to applicable codes and Specifications sections for test requirements.

1.2 QUALITY CONTROL, GENERAL

A. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

1.3 MANUFACTURER'S FIELD SERVICES

A. When specified in respective Specification sections, require manufacturer or supplier to have qualified personnel provide on-site observations and recommendations.

1. Observe field conditions, including conditions of surfaces and installation.
2. Observe quality of workmanship.
3. Provide recommendations to assure acceptable installation and workmanship.
4. Where required, start, test, and adjust equipment as applicable.

B. Representative shall submit written report to Landlord, Tenant and Architect listing observations and recommendations.

1.4 MOCK-UPS

A. Erect field samples and field mock-ups at locations on site as approved in advance and in accordance with requirements where included in Specifications section.

1. Test mock-ups requiring special equipment may be erected at location having access to necessary equipment; coordinate with Landlord, Tenant and Architect.

B. Field samples and mock-ups not approved and not capable of being acceptably revised shall be removed from site.

C. Approved field samples and mock-ups may be used as part of Project.

1.5 TESTING LABORATORY SERVICES

A. An independent testing laboratory shall perform inspections, tests, and other services required by applicable codes and various Specification sections.

1. Landlord, Tenant, or Architect may also require independent testing of items where doubt exists that product or system does not conform to Contract Documents.

2. Vendor shall employ and pay for testing laboratory unless Landlord or Tenant has agreed to pay.

    a. Testing laboratory shall be approved by Landlord prior to beginning testing.

B. Services shall be performed in accordance with requirements of governing authorities and with specified standards.

C. Reports shall be submitted to Landlord in duplicate giving observations and results of tests, indicating compliance or non-compliance with specified standards and with Contract Documents.

    1. Where required, testing laboratory will submit copy of test results directly to enforcing agency.

D. Vendor shall cooperate with testing laboratory personnel; furnish tools, samples of materials, design mix, equipment, storage and assistance as requested.

    1. Notify Landlord, Tenant, Architect, and testing laboratory sufficiently in advance of expected time for operations requiring testing services.

END OF SECTION

TEMPORARY FACILITIES AND CONTROLS

1.1 SUMMARY

A. This section describes temporary construction facilities and temporary controls, all of the following to be coordinated and approved by Landlord.

1. Electricity and lighting
2. Heat and ventilation
3. Water and sanitary facilities
4. Construction aids
5. Temporary enclosures
6. Barriers
7. Cleaning during construction
8. Project identification
9. Field offices, telephone service, and storage
10. Removal
11. Project Access
12. Emergency Response

B. Provide temporary construction facilities and temporary controls as required to conform to applicable authorities and as required to complete Project in accordance with Contract Documents.

1. Authorities: Contact governing authorities to establish extent of temporary facilities and temporary controls required by authorities.

2. Contact Landlord to establish extent of temporary facilities and temporary controls required by Landlord.

1.2 ELECTRICITY AND LIGHTING

A. Provide electrical service required for construction operations, with branch wiring and distribution boxes located to allow service and lighting by means of construction-type power cords.

1. Connection to existing electrical service is permitted and to be coordinated with Landlord. Use of power or outlets outside of project area prohibited unless otherwise approved.

B. Provide lighting for construction operations.

1. Permanent lighting may be used during construction; maintain lighting and make routine repairs.

1.3 HEAT AND VENTILATION

A. Provide heat and ventilation as required to maintain specified Tenant Construction Standards operation, to protect materials and finishes from damage due to temperature and humidity.

1. All returns and exhaust air shall be protected with filtration prior to start of work. Location, install and method of filtration to be reviewed and approved with Chief Engineer.

B. Coordinate use of existing facilities with Landlord.

1. Supplement with temporary units as required to maintain specified Tenant Construction Standards operations, and to protect materials and finishes from damage due to temperature or humidity.

1.4 WATER AND SANITARY FACILITIES

A. Provide water service required for construction operations; extend branch piping with outlets located so water is available by use of hoses.

1. Connection to existing facilities is permitted but must be coordinated with Chief Engineer.

B. Provide and maintain required sanitary facilities and enclosures.

1. Designated existing facilities may be used during construction operations, as approved by Landlord; maintain in sanitary condition. Failure to maintain assigned facilities in acceptable condition will result in the revoking of such privileges and the use of portable facilities at the loading dock.

2. Additional required sanitary cleaning may be charged back during project if facilities are not maintained.

1.5 CONSTRUCTION AIDS

A. Noise, Dust Pollution Control, First Aid and Safety: Provide materials and equipment necessary to comply with local requirements for noise, dust pollution control, First Aid and Safety.

B. Fire Protection: Maintain on-site fire protection facilities as required by applicable authorities and insurance requirements.

C. Use of Existing Facilities:

1. Existing stairs shall not be used.

2. Designated freight elevator may be used, coordinate use with Landlord; provide protective coverings for finish surfaces of elevator cars and entrances.

D. Protection Requirements:

1. Protect all corridors, freight elevators, and lobby doors to project site.

2. Protect all glazing, mullions, window coverings, and doors in project site.

1.6 TEMPORARY ENCLOSURES

A. Provide temporary partitions as required to separate work areas from occupied areas, to prevent penetration of dust and moisture into occupied areas, and to prevent damage to existing areas and equipment.

1. Construction: Framing and sheet materials with closed joints and sealed edges at intersections with existing surfaces; Flame Spread Rating of 25 in accordance with ASTM E84 unless otherwise approved by Landlord.

2. Paint surfaces exposed to view in occupied areas, in accordance with Landlord's Corporate Sign Standards.

1.7 BARRIERS

A. Provide barriers as required to prevent public entry to construction areas and to protect adjacent properties from damage from construction operations.

B. Provide barricades as required by Landlord's Corporate Sign Standards.

1.8 CLEANING DURING CONSTRUCTION

A. Control accumulation of waste materials and rubbish; recycle or dispose of off-site.

B. Clean interior areas prior to start of finish work, maintain areas free of dust and other contaminants during finishing operations.

C. Provide separate containers for food waste. Food waste to be removed daily.

1.9 PROJECT IDENTIFICATION

A. Signs: Subject to approval of Landlord; not typically permitted.

1.10 FIELD OFFICES, TELEPHONE SERVICE, AND STORAGE

A. Office: Maintain field office within Project space, with lighting, electrical outlets, data outlets, heating, and ventilating equipment, and equipped with furniture.

1. Telephone Service: Maintain telephone service to field office.

B. Storage for Tools, Materials, and Equipment: Limit on-site storage to Project area; provide weather-tight storage, with heat and ventilation for products requiring controlled conditions.

1. Maintain adequate space for organized storage and access.

2. Provide lighting for inspection of stored materials.

1.11 REMOVAL

A. Remove temporary materials, equipment, services, and construction prior to Substantial Completion Inspection.

B. Clean and repair damage caused by installation or use of temporary facilities.

C. Restore existing facilities used during construction to specified or original condition.

1.12 PROJECT ACCESS

A. All access and deliveries to project site shall be through the loading dock and freight elevators. Passenger elevators shall not be used.

B. Access or deliveries requiring special access through common areas and main lobby, shall be by Landlord approval only.

1.13 EMERGENCY RESPONSE

PREP information TBD

END OF SECTION

METALS

METAL FABRICATIONS

1.1 REFERENCES – American Welding Society (AWS): D1.1, Structural Welding Code.

1.2 MATERIALS

A. Steel Shapes, Plates and Bars: ASTM A36.

B. Structural Steel Sheet: Hot rolled, ASTM A570; or cold rolled, ASTM A611, Class 1; of grade required for design loading.

C. Steel Pipe: ASTM A53, Type S seamless, grade as selected by fabricator and as required for design loading; minimum standard weight, STD or Schedule 40.

D. Steel Tubing: Cold formed ASTM A500; or hot rolled, ASTM A501; minimum Grade B; seamless where exposed.

E. Castings: Gray iron, ASTM A48, Class 30; malleable iron, ASTM A47.

F. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron ASTM A47, or cast steel ASTM A27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A153.

G. Grout: Non-shrink meeting ASTM C1107, non-metallic, pre-mixed, factory-packaged, non-staining, non-corrosive; type specifically recommended by manufacturer as applicable to job condition.

H. Fasteners and Rough Hardware: Type required for specific usage; provide zinc-coated fasteners for exterior use or where built into exterior walls.

I. Welding Materials: AWS D1.1, type required for materials being welded.

J. Paint: Provide primers as recommended by paint manufacturers for substrates and paints specified in Section 09900 – Paints and Coatings.

1.3 FABRICATION.

A. Handrails: When tested according to ASTM E935, handrails to be capable of withstanding following:

1. Concentrated loads (e.g. of 200 foot-pounds) per code applied at any point in any direction.

2. Uniform loads of (e.g. 50 foot-pounds) per code per linear foot applied in any direction.

3. Uniform and concentrated loads are not to be assumed to act concurrently.

B. Guardrails: Design, fabricate, and install top rails at guardrail locations that, when tested according to ASTM E935, are capable of withstanding following:

1. Concentrated loads of (e.g. 300 foot-pounds) per code applied at any point in any direction.

2. Uniform loads (e.g.of 100 foot-pounds) per code per linear foot applied in any direction.

3. Uniform and concentrated loads are not to be assumed to act concurrently.

4. Erection: Perform field welding in accordance with AWS D1.1.

END OF SECTION

WOOD AND PLASTICS

ARCHITECTURAL WOODWORK

1.1 CERTIFICATION

A. Certification: Provide WIC Certified Compliance Label on shop drawings.

B. General: Before delivery to jobsite, provide WIC Certified Compliance Certificate indicating grade of millwork products to be furnished and certify WIC requirements for specified grades shall be met.

C. Casework:

1. Each unit to bear Woodwork Institute of California (WIC) Certified Compliance Label.

2. Forest Stewardship Council (FSC) certified.

3. No added urea-formaldehyde resins.

D. Plastic Laminate Countertop:

1. Each unit to bear WIC Certified Compliance Label.

2. No added urea-formaldehyde resins.

E. Installation: Provide WIC Certified Compliance Certificate for Installation.

1.2 QUALITY ASSURANCE

A. Fabricator Qualifications: Member of WIC with minimum five years successful experience fabricating architectural woodwork similar to that required for project.

B. Standards: Perform architectural woodwork in accordance with recommendations WIC Manual of Millwork.

1. Installation Certification Program: Install work in this section as specified in the WIC Manual of Millwork, and provide WIC Certified Compliance Certificate for installation at completion of Project installation.

2. Vendor Option: Perform architectural woodwork in accordance with Architectural Woodwork Institute (AWI) “Quality Standards, Guide Specifications and Certification Program.”

a. Millwork Cabinetry is to be AWI 400, Premium Grade.

b. Other Millwork shall be AWI 1700 Premium Grade.

c. Standing and Running Trim are to be AWI 300 Premium Grade.

d. Frames are to be AWI 900 Premium Grade.

e. Paint Grade Shelving is to be AWI 600 Custom Grade.

C. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication where possible; do not delay job progress, allow for trimming and fitting.

D. Wood Blocking: Fire retardant treated, conforming to AWPA C20 for lumber and AWPA C22 for plywood, and meeting UL FR-5 rating.

1.3 FINISHES

A. Transparent Finished Woodwork: Shop finish architectural woodwork.

1. Transparent Finish: WIC/Premium Grade clear finish producing a dull rubbed effect, as approved by Architect.

2. AWI Finish: "Wood veneer" and "stained wood veneer" items to receive transparent finish equal to AWI Finish System No. 2, Transparent Catalyzed Lacquer, sheen and color to match Architect's sample as approved by Landlord and to match approved submittals.

B. Opaque Finished Casework: Shop finish.

1. Opaque Finish: WIC/Premium Grade opaque "lacquer" finish producing a semi-gloss effect, as approved by Architect.

2. AWI Finish: "Paint grade" items to receive shop painted finish equal to AWI Finish System No. 10, Conversion Varnish, color to match Architect's sample as approved by Landlord and to match approved submittals.

END OF SECTION

BUILDING INSULATION

1.1 MATERIALS

A. Thermal Batt Insulation: Preformed slag mineral or glass fiber with thermosetting resin binders conforming to ASTM C665.

B. Thickness/R-Value: Fill space to receive insulation; minimum R-13 at walls, R-19 at horizontal surfaces, unless otherwise approved by Landlord.

C. Flame Spread/Smoke Density Rating: Maximum 25/450, ASTM E84.

END OF SECTION

THERMAL AND MOISTURE PROTECTION

PATCHING EXISTING FIREPROOFING AND ACOUSTICAL INSULATION

1.1 GENERAL: Comply with all of the Contract Documents.

1.2 SCOPE OF WORK: Refer to “Division Scope of Work” in architectural plans or similar.

1.3 QUALITY ASSURANCE

A. Fireproofing work shall be performed by a firm certified acceptable to the sprayed fireproofing material manufacturer.

B. Products, execution and fireproofing thickness shall conform to the applicable code requirements for the fire-resistance ratings called for.

1.4 REFERENCES

A. ASTM Standards

1. E84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

2. E119 – Standard Methods of Fire Test of Building Construction and Materials.

3. E605 – Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material Applied to Structure Members.

4. E736 – Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Material Applied to Structural Members.

5. E759 – Standards Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.

6. E760 – Standard Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members.

7. E761 – Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members.

8. E859 – Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.

9. E937 – Standard Test Method for Corrosion of Steel by Sprayed Fire-Resistive Material Applied to Structural Members.

B. Test Methods for abrasion and impact resistance developed by the City of San Francisco Bureau of Building Inspection.

C. Underwriter’s Laboratories, Inc. (UL) Fire Resistance Directory (Latest Edition).

D. Uniform Building Code Standard No. 43-8: Thickness and Density Determination for Spray-Applied Fireproofing.

E. AWCI Publication: Inspection Procedure for Field Applied Sprayed Fire Protection Materials.

1.5 SUBMITTALS

A. Manufacturers' Data: Submit manufacturer's instructions for proper application of sprayed fireproofing. The Vendor will research the W.R. Grace website to find the most up to date version of the specification http://www.na.graceconstruction.com/. The Vendor shall comply with all manufactures recommendations and procedures.

B. Test Data: Laboratory test results for fireproofing shall be submitted for the following performance criteria specified, upon request:

1. Bond Strength per ASTM E736.
2. Compressible Strength per ASTM E761.
3. Deflection per ASTM E759.
4. Bond Impact per ASTM E760.
5. Air Erosion per ASTM E859.
6. Corrosion Resistance per ASTM E937.
7. Abrasion Resistance per City of San Francisco, Bureau of Building Inspection Test Method. Again why SF specific, we need to have a document that is usable in all parts of country
8. Impact Penetration per City of San Francisco, Bureau of Building Inspection Test Method.

1.6 DELIVERY, STORAGE AND HANDLING

A. Material shall be delivered in original unopened packages, fully identified as to manufacturer, brand or other identifying data, and bearing the proper Underwriters' Laboratories, Inc. labels for fire hazard and fire-resistance classification.

B. Material shall be stored (above ground), under cover and in a dry location until ready for use. All bags that have been exposed to water before use shall be found unsuitable for use and discarded. Stock of material is to be rotated and used prior to its expiration date.

1.7 PROJECT/SITE CONDITIONS

A. An air and substrate temperature above 40 degrees F (4.4 C) must be maintained for 24 hours before, during and for 24 hours after application of the sprayed fireproofing. If necessary for job progress, General Vendor shall provide enclosures with heat to maintain temperatures.

B. General Vendor shall provide ventilation to allow for proper drying of the fireproofing during and subsequent to its application. In poorly ventilated areas lacking natural ventilation, forced air circulation will be required. Further detail is in section 11.

1.8 MATERIALS

A. The sprayed fireproofing material shall be cementitious fireproofing, as manufactured by the Construction Products Davison of W.R. Grace & Co., or its processing distributors, formulated without asbestos or approved equal as determined by Architect.

B. Materials shall be “WR Grace Retro Guard” factory-blended cementitious fireproofing with blue color added from the manufacture or in the field, applied to provide compliance with all drawings, specifications and the following performance test criteria.

1. Dry Density: The field density shall be measured, in accordance with ASTM STANDARD E605. Minimum average density shall be 15 pcf, and minimum individual density shall be 14 pcf, unless otherwise required by the authority having jurisdiction.

2. Deflection: Material shall not crack or delaminate from the surface to which it is applied when tested in accordance with ASTM E759.

3. Bond Impact: Material subject to impact tests in accordance with ASTM E760 shall not crack or delaminate from the surface to which it is applied.

4. Bond Strength: Fireproofing, when tested in accordance with ASTM E736, shall have minimum bond strength of 200 psf.

5. Air Erosion: Maximum allowable weight loss of the fireproofing material shall be 0.005 gm/ft^2 when tested in accordance with ASTM E859.

6. Compressive Strength: The fireproofing shall not deform more than 10 percent when subjected to compressive forces of 1200 psf when tested in accordance with ASTM E761.

7. Corrosion Resistance: Steel with applied fireproofing shall be tested in accordance with ASTM E937 without evidence of corrosion of the steel.

8. Abrasion Resistance: No more than 15 cm^3 shall be abraded or removed from the fireproofing substrate when tested in accordance with test methods developed by the City of San Francisco, Bureau of Building Inspection, and required by the U.S. Navy (NAVFAC).

9. Impact Penetration: The fireproofing material shall not show a loss of more than 6 cm^3 when subjected to impact penetration tests in accordance with the test methods developed by the City of San Francisco, Bureau of Building Inspection, and required by the U.S. Navy (NAVFAC).

10. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84:

Flame Spread	-0
Smoke Development	-0

C. The sprayed fireproofing material shall have been tested and reported by Underwriter's Laboratories, Inc. in accordance with the procedures of ASTM E119.

D. Mixing water shall be clean, fresh and suitable for domestic consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material.

1.9 WORKMANSHIP

A. All surfaces to receive sprayed fireproofing shall be free of oil, grease, paints/primers, loose mill scale, dirt or other foreign substances which may impair proper adhesion of the fireproofing to the substrate. Where necessary, cleaning of surfaces to receive fireproofing shall be the responsibility of the Structural Steel Erector, or General Vendor, as outlined in the structural steel or steel deck section.

B. Confirm compatibility of surfaces to receive sprayed fireproofing material:

1. The project architect shall determine whether the painted/primed steel substrates have been tested in accordance with ASTM E119, with specified sprayed fireproofing material, to provide the required fire-resistance rating.

2. Painted or primed steel surfaces may require a fire-proofing bond test to determine if the paint formulation will impair proper adhesion. Determination of the compatibility of paint or primer with the sprayed fire-proofing shall be the responsibility of the paint or primer manufacturer.

3. Rolling compounds or lubricants are commonly used in the manufacture of steel decking. The compounds may impair proper adhesion of fireproofing to the substrate. Steel deck specification section shall call for the deck manufacturer to supply decking free of amounts of these compounds or oils which would significantly impair the adherence of the fireproofing.

C. Prior to application of fireproofing, clips, hangers, support sleeves and other attachments required to penetrate the fireproofing shall be in place. These locations must be scraped clean in preparation for attachment.

D. Ducts, piping, equipment or other suspended matter which would interfere with application of fireproofing materials shall not be positioned until fireproofing work is complete.

E. Prior to application of the fireproofing to the underside of steel decking, concrete work above shall be complete.

F. On roof decks without a concrete cover, complete all roofing applications and roof mounted equipment installation prior to application of the fireproofing to the underside of roof decking and supporting beams and joists. Prohibit all roof traffic upon commencement of the fireproofing and until the fireproofing material is dry.

G. Provide masking, drop cloths or other satisfactory coverings so as to prevent over-spray of sprayed fireproofing. If asbestos is present, the masking and plastic used during the asbestos removal shall not be used for re-spray activities and shall be removed prior to any re-spray activities.

H. Application of sprayed fireproofing shall not begin until the design consultant, General Vendor and the Fireproofing Applicator has inspected the surfaces to receive fireproofing to determine if surfaces are acceptable to receive the fireproofing material.

I. Equipment and application procedure shall conform to the material manufacturer's application instructions.

J. All patching and repairing of sprayed fireproofing, due to damage by other trades, shall be performed under this section and paid for by the trade(s) responsible for the damage.

1.10 QUALITY CONTROL

A. Architect may select, and will pay an independent testing laboratory to sample and verify the thickness and density of the fireproofing in accordance with provisions of ASTM E605. "Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members", the "Inspection Procedure for Field Applied Sprayed Fire Protection Materials" as published by the AWCI, or Uniform Building Code Standard No. 43-8 entitled "Thickness and Density Determination for Spray-Applied Fireproofing."

B. The results of the above tests shall be made available to all parties at the completion of floor.

Mechanical Drying of Fireproofing

A. Mechanical Drying of the fire proofing shall be designed and engineered with the following minimal standards taking into account site conditions.
B. When connecting the mechanical drying equipment to the building power the following must be followed:
Temporary equipment connections, to building electric distribution.

480-volt connections.

All temporary equipment connections to the building electrical distribution will be made via the use of a properly sized, UL approved, fault rated, circuit breaker device. An approved electrical Vendor, under the supervision of the building engineers, will make all connections.

A branch circuit load analysis will be performed to verify that the temporary equipment load requirements, will not overload existing load distribution equipment, prior to any connections being made.

120/208-volt connections.

All temporary equipment connections to the building electrical distribution will be made via the use of a properly sized, UL approved, fault rated, ground fault interrupting circuit breaker device. An approved electrical Vendor, under the supervision of the building engineers, will make all connections.

A branch circuit load analysis will be performed to verify that the temporary equipment load requirements, will not overload existing load distribution equipment, prior to any connections being made.

C. Within 24 hours of starting the application of the re-spray fireproofing mechanical drying shall start.

D. When 50 % of the re-spray application is completed when the construction involves more than 10,000 square feet the Vendor shall partition off with plastic (fire resistant) the completed 50% of the total area and provide mechanical drying at 50% of the total engineered design.

E. When 75% of the re-spray application is completed 100% of the mechanical drying machines shall be placed in service.

F. The fire resistant plastic partition shall remain until the there is 100% completion of re-spray application. The 100% complete re-spray does not include the minor application activities associated with spot re-spray after the assessments for thicknesses.

G. All mechanical drying shall be of desiccant dehumidification and deliver at least less than 30% Relative humidity air at greater than 85 degrees Fahrenheit.

H. Within 72 hours of 100% completion of re-spray application the relative humidity in the construction area shall average below 60% relative humidity measured in all zones.

I. The Vendor “shall place fans on all of the columns”, so if there are 40 columns throughout the space the Vendor will place 40 fans during the mechanical drying process and additional fans shall be placed to create air flow in one direction.

J. The Vendor shall remove all water condensation from all of the windows to keep windows free from condensation using wet dry vacuums. The condensation removal shall be done a t a minimum of at least daily or more depending on the site conditions.

K. The Vendor shall monitor the relative humidity and temperature to calculate the dew point to ensure that the mechanical drying system is able to remove moisture from the construction space and prevent condensation on surfaces.

L. The Vendor shall take measurements of the moisture concentrations of the fireproofing using a moisture meter calibrated for concrete and plaster. The readings shall be taken in all areas that represent the different thicknesses of application less than 2 inches and greater than 2 inches. The fireproofing shall be considered dry when the all of the representative samples are below 15% moisture concentration.

M. The Vendor shall submit records of the measurements after the completion of the work and request approval from the owner or owner representative that the mechanical drying is complete. The owner shall provide the Vendor with a letter

of acceptance of the drying and concur that the mechanical drying system can be removed.

1.11 CLEANING

A. After the completion of fireproofing work, application equipment shall be removed, and other surfaces not to be sprayed shall be cleaned of any applied fireproofing material. Overspray

1.12 FIRE-RESISTIVE RATING

A. Fire resistive rating shall be:
- hours for Slab
- hours for Girders
- hours for Columns

1.13 GUARANTEES

A. Guarantee all items of work furnished and installed under this Section for (1) one year, in addition to manufacturer's standard warranties. All guarantees to be from the date, when **Final Certificate of Occupancy** is issued from Department of Buildings.

END OF SECTION

FIRESTOPPING & JOINT SEALERS

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

A. Design Requirements: Provide materials tested in accordance with following standards, unless otherwise specified.

1. American Society for Testing and Materials (ASTM) Publications:

a. ASTM E84, Surface Burning Characteristics of Building Materials.
b. ASTM E119, Fire Tests of Building Construction and Materials.
c. ASTM E814, Fire Tests of Through-Penetration Fire Stops.

B. Firestop all new penetrations and joints within work area.

C. Firestop all existing penetrations and joints within area of work.

1.2 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with local City and State Building Codes, Uniform Building Code Chapter 7 requirements for firestopping, including both F Ratings and T Ratings as applicable.

PART 2 - PRODUCTS

2.1 MATERIALS - FIRESTOPPING

A. Penetration Test: Furnish materials passing ASTM E814 for penetration fire stopping indicating maintenance of time-rated adjacent assemblies.

1. Additional Tests: Where required by applicable authorities, provide materials passing ASTM E119 time-temperature fire conditions for fire ratings for assemblies.

2. Flame Spread: ASTM E84 flame spread rating of 25 or less.

3. Smoke Developed: ASTM E84 smoke developed rating of 450 or less.

B. Firestopping: Maintain fire rating of assembly in which firestopping is installed, such as floor, partition, or wall, in accordance with ASTM E119 tests.

2.2 MATERIALS – JOINT SEALERS

A. Elastomeric Sealants:

1. Mildew-Resistant Silicone Rubber Sealant: ASTM C920, Type S, Grade NS, Class 25, compounded with fungicide, specifically for mildew resistance and recommended for interior joints in wet areas.

B. Non-Elastomeric Sealants:

1. Acrylic-Emulsion Sealant: ASTM C834 acrylic or latex-rubber-modified acrylic sealant, permanently flexible, nonstaining and nonbleeding; recommended for general interior exposure.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare joint surfaces in accordance with ASTM C1193 and as recommended by joint sealer manufacturer.

3.2 INSTALLATION

A. Comply with manufacturer's printed instructions and ASTM C1193, except where more stringent requirements are shown or specified.

END OF SECTION

DOORS AND WINDOWS

WOOD DOORS

PART 1 - GENERAL

1.1 References

A. Existing doors being reused are to be refinished as necessary

B. National Wood Window and Door Association (NWWDA): I.S.1 Series Industry Standard for Wood Flush Doors.

C. Quality Marking: Provide quality marking on each door certifying compliance with applicable requirements of NWWDA I.S. 1, or provide certification of compliance.

PART 2 - PRODUCTS

2.1 MATERIALS

A Solid Core Flush Wood Doors: WIC/Premium Grade, Type A, 1-3/4" thick solid wood framed glued block or particleboard core five ply construction.

1. Forest Stewardship Council (FSC) certified.

2. NWWDA I.S.1: In addition to WIC, conform to requirements of NWWDA I.S.1; where conflicts occur, comply with most restrictive requirement.

3. Transparent Finished Door Face Veneers: WIC/Premium Grade Rift Cut, vertical grain Walnut veneers for stained finish; minimum 1/30” (0.033” thick) before sanding; match building standard doors.

4. Opaque Painted Face Veneers: WIC/Premium Grade White Birch veneers for opaque pain finish; minimum 1/30” (0.333” thick) before sanding; match building standard doors.

5. Edges: Stile edges to match face veneer, minimum 1-1/8" thick after trim.

6. Core: Bond stiles and rails to core and sand prior to assembly of face veneers.

7. Bond Type: Type II Bond, interior.

8. Size: 3’-0” by Full Height at areas with lay in ceiling. 3’ -0” by 9’-0” at areas with open ceilings. (Field verify height) each leaf.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install fire rated wood doors in accordance with requirements for specified fire label and requirements of NFPA 80.

1. Field cutting of fire rated doors shall not be acceptable.

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.1 REFERENCES

A. Steel Door Institute (SDI): SDI-100 - Recommended Specifications - Standard Steel Doors and Frames.

B. National Association of Architectural Metal Manufacture. (NAAMM): Hollow Metal Manual.

C. Underwriters Laboratories: Standards as applicable to fire rated doors and frames.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Frames: Conform to SDI-100 and NAAMM Hollow Metal Manual.

B. Fire Rated Units: In addition to SDI and NAAMM, construct in accordance with requirements for fire rating, UBC Standard 7-2, and NFPA 80.

2.2 FABRICATION

A. Conform to requirements of SDI or NAAMM.

B. Provide jamb anchors per SDI-100 and NAAMM; weld floor jamb anchors in place.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install doors and frames in accordance with SDI-100 and SDI-105 or NAAMM "Hollow Metal Manual" and with manufacturer's recommendations and installation instructions.

INTERIOR ALUMINUM FRAMES

PART 1 - GENERAL

1.1 REFERENCES

A. International Conference of Building Officials (ICBO): Research Recommendations for Fire Rated Aluminum Frames and UBC Standard 7-2.

B. Underwriters Laboratories Inc. (UL): Building Materials Directory.

1. Materials tested, labeled and inspected by Warnock Hersey International are acceptable upon approval of authorities.

C. National Association of Architectural Metal Manufacturer (NAAMM): Metal Finishes Manual.

PART 2 - MATERIALS

A. Composed of at least 75% recycled aluminum, or as available.

B. Manufactured regionally within a radius of 500 miles, if available.

C. Type: Knock-down (field assembled) door frames; extruded aluminum, ASTM B221, 6063-T5 alloy, profile as directed by Architect.

D. Fire Rated Frames: Provide fire rated frames as approved by California State Fire Marshal and ICBO.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install aluminum frames in accordance with recommendations of manufacturer.

B. Comply with NFPA 80 for fire rated frame installation.

ACCESS DOORS AND PANELS

1.1 SUMMARY

A. Provide access doors set in finished surfaces.

1. Provide access doors and panels as required for access to controls and valves behind finished surfaces including any equipment requiring maintenance, such as heat pumps, VAV boxes, fan coils, exhaust fans, etc.

2. Coordinate with various trades for controls and valves that may be concealed.

3. Provide steel access doors and panels in gypsum board walls and drop-in fiber reinforced gypsum access panels at hard ceiling surfaces as required to service new and existing plumbing, mechanical, and electrical equipment at locations indicated by Landlord.

4. Concealed access panels (doors) shall be used at all public corridors and lobbies.

1.2 SYSTEM DESCRIPTION

A. Fire-Resistance Ratings: Where required provide access door assembly from manufacturer listed in Underwriter's Laboratories, Inc. "Classified Building Materials Index" for rating shown.

1. Provide UL label on each rated access door.

2. Materials tested, labeled and inspected by Warnock Hersey International are acceptable upon approval of authorities.

HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

A. General Requirements for Electrically Controlled Hardware.

1. Fire Rated Doors: If retrofitting an existing rated door, assembly conditions to be maintained. Re-rating of door is required.

a. Electrical strikes are not permitted at rated door assemblies.

2. Mortised or cylinder locksets provided with electrified hinges, also requiring building standard keyway override and not in public corridors or lobbies, shall be maintained by Tenant at Tenant's expense.

a. Non-electrified locking devices shall be provided with building standard override keyway, and not in public corridor or lobbies.

3. Electrically controlled hardware shall be approved by City Fire Department, and be fail-safe.

B. Vendor is to coordinate all hardware requirements with any security devices. Vendor is to coordinate installation for proper operation, interface and connection with any security devices and/or security system.

1.2 SYSTEM DESCRIPTION

A. Fire Rated Doors: Comply with requirements of Uniform Building Code Standard 7-2, NFPA 80 and applicable codes for fire rated door hardware; provide hardware bearing Underwriters Laboratory (UL) labels.

1.3 SUBMITTALS

A. Keying Schedule: Coordinate directly with Landlord.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All door lock hardware to be Schlage model 20-740, large format interchangeable key core. Permanent keys, including Grand Master keys, Master keys, change keys and shut-out keys, are to be hand-delivered directly to Tenant and Landlord, as applicable.

B. All secured door locks, including electrified, to have a key override feature.

1.1 SUMMARY

A. Section Includes: This section provides information regarding door and hardware.

1. Locksets shall have interchangeable cores and building standard keyways.

a. Core, Exterior, and Suite Entry Doors: Schlage model 20-740 large format interchangeable key core.

2. Suite Entry Door Assembly:

a. Door: 3’ wide by 9’ high by 1-3/4" thick solid core, contact Property Manager for finish.

b. Double Doors: Matched pair with rating.

c. Frame: Painted hollow metal, fire rated one hour assembly.

d. Hardware: Single Leaf Door:

1) Latch set: L9010; contact Property Manager for finish.

2) Lockset: L9050, contact Property Manager for finish.

3) Hinges: McKinney T2714 4-½” x 4-½”; contact Property Manager for finish.

4) Door Stop: Ives FS436 x FS435

5) Closer LCN 4040 Series, contact Property Manager for finish. Pair of closers to be used for pair of doors.

e. Hardware: Matched Pair Doors:

1) Lockset: Schlage L9050; contract Property Manager for finish.

2) Hinges: McKinney T2714 4-½” x 4-½”; contact Property Manager for finish.

3) Closer: LCN 4040 Series; contact Property Manager for finish. Pair of closers to be used for pair of doors.

4) Door Stop: Ives FS436 x FS435 with required riser and door mutes,

5) Flush Bolts: Automatically operated, edge-mounted flush bolts, DCI Series 940; contact Property Manager for finish.

6) Dust Proof Floor Strike: DCI 80; contact Property Manager for finish.

7) Astragal: Metal, finish to match door.

8) Coordinator: DCI Series 600; contact Property Manager for finish.

3. Tenant Interior Door Assembly:

a. Door: 3’ wide by full height at areas with ceilings and 3’x9’ at areas with open ceiling high by 1-3/4" thick solid core; contact Property Manager for finish or veneer stained per tenant’s specifications.

b. Double Doors: Matched pair.

c. Frame:

1) Factory painted clear aluminum or painted hollow metal, color per plans and specifications.

2) Frame: Factory applied thermosetting paint finish or anodized aluminum, color per plans and specifications.

d. Sidelights: 2” anodized aluminum frame painted per tenant’s specifications with 1” mini-blinds installed within frame. Color of mini-blinds per tenant’s specifications.

e. Hardware: Single Leaf Door:

1) Latchset: Schalge mortise passage latchset L9010. Finish and lever style handle to be per tenant’s specifications.

2) Lockset: Schlage mortise office lockset L9050, Finish and lever style to be per tenant’s specifications.

3) Hinges: Butt hinges McKinney T2714, 4-1/2” by 4-1/2” (or equivalent Hager). Finish to be per tenant’s specifications.

4) Door Stop: Ives FS436 x FS435 (or equivalent product by Hager or quality) with required riser and door mutes. Finish to be per tenant’s specifications.

f. Hardware: Matched Pair Doors:

1) Latchset: Schalge mortise passage latchset L9010. Finish and lever style to be per tenant’s specifications.

2) Lockset: Schlage mortise office lockset L9050 lever handle. Finish and lever style to be per tenant’s specifications.

3) Closer: LCN series 4000. Pair of closers to be used for pair of doors.

4) Hinges: Butt hinges, McKinney 1B2714 (or equivalent Hager) , 4-1/2” by 4-1/2”. Finish to be per tenant’s specifications.

5) Door Stop: Ives FS436 x FS425 (or equivalent product by Hager or quality) with required riser and door mutes. Finish to be per tenant’s specifications.

6) Flush Bolts: Automatically operated, edge-mounted flush bolts, DCI series 940 for WD doors; DCI series 840 for HM doors.

7) Dust Proof Floor Strike: DCI 80.

8) Coordinator: DCI Series 600 finish to match door frame, flush bolt #FB8, at 20 minute rated doors only.

4. Building Core Door Assembly:

   a. Door: 3’ wide by typical height high by 1-3/4" thick solid core, one hour rated assembly door, or as required, solid core, paint grade, building standard door is to be painted to match adjacent wall.

   b. Double Doors: Matched pair.

   c. Frame: Hollow metal, painted to match adjacent walls.

   d. Hardware: Match building standard.

END OF SECTION

GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Glazing is required to be fully tempered and certified by SGCC or another recognized certification agency acceptable to authorities having jurisdiction and is to comply with requirements of CPSC 16 CFR, Part 1201.

1.2 REFERENCES

A. Glass Association of North America (GANA): Glazing Manual and Sealant Manual.

1.3 SYSTEM DESCRIPTION

A. Safety Glass Standard: CPSC 16 CFR 1201, ANSI Z97.1, and Uniform Building Code Chapter 24 and Standard 24-2.

B. Fire Rated Glass: Provide glass identical to glass tested per ASTM E163, labeled and listed by UL or other testing and inspection agency acceptable to applicable authorities.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Tempered Glass: Select glazing quality, clear float glass, fully tempered, meeting ASTM C1048, Kind FT; minimum thickness 1/4"; safety glass.

B. Fire Rated Wired Glass: Glazing quality, wired glass, polished both surfaces; square steel mesh, conforming with ASTM C1036; minimum thickness 1/4"; UL listed fire rated glass.

C. Clear Fire Rated Glass: Glazing quality, clear fire rated glass, polished both surfaces; nominal thickness 1/4"; UL listed clear fire rated glass.

D. Laminated Glass: ASTM C1172, Kind LA, two sheets of clear float glass laminated with a film of polyvinyl buteral; safety glass; laminated layers shall be free of air pockets and foreign substances.

E. Frameless Mirrors: Mirror quality q1 or q2, clear float glass; 1/4" thick; full silver coating, copper coating and organic coating; arrised edges; factory treated and sealed after cutting and finishing.

F. Glazing Sealant: ASTM C920, Type S, Grade NS, elastomeric one-component silicone glazing sealants as recommended by sealant manufacturer for application involved.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with GANA Glazing Manual and Sealant Manual and glazing manufacturer instructions.

1. Comply with NFPA 80 for glass in fire rated openings.

B. Frameless Mirror Attachment: Attach mirrors in accordance with mirror manufacturer's recommendations and to provide ventilation to coating; set or trim felt to face of mirror.

END OF SECTION

FINISHES

GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide gypsum board systems including light gage metal framing, suspension system for gypsum board systems, joint treatment, acoustical accessories, and general accessories for complete installation.

1.2 REFERENCES

A. ASTM C754: Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard, Backing Board, or Water-Resistant Backing Board.

B. ASTM C840: Application and Finishing of Gypsum Board.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Perform gypsum board systems work in accordance with recommendations of ASTM C754 and ASTM C840 unless otherwise specified.

1. Loads: Comply with applicable requirements of CITY: San Francisco and STATE: California. Building Codes for design of metal framing for gypsum board systems.

2. Vertical Dimensions: Typical slab-to-slab heights are as follows.

a. Floor

	Main Building	9th Street Addition
BSMT	13’1”	13’0”
1st	14’4”	15’10”
2nd	10’8”	10’8”
3rd	14’0”	14’1”
4th	10’8”	10’8”
5th	10’8”	10’9”
6th	10’8”	10’8”
7th	10’8”	10’9”
8th	10’9”	10’9”
9th	10’8”	10’11”
10th	10’10”	10’10”
11th	N/A	10’8”

*Measured from top of finished floor to low point in ceiling above.

3. Seismic Requirements: Comply with code requirements for seismic bracing.

B. Fire-Rated Assemblies: Listed by Underwriter's Laboratory, Gypsum Association (GA) File No's in GA-600 Fire Resistance Design Manual, or other listing approved by applicable authorities.

1.4 PROJECT CONDITIONS

A. Maintain areas to receive gypsum board at minimum 50 degree F for 48 hours prior to application and continuously after application until drying of joint compound is complete; comply with ASTM C840.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Framing Materials: Comply with ASTM C754; provide gauges as recommended by manufacturer for spans and maximum deflections specified and as required by applicable codes.

1. Studs: ASTM C645, screw-type Cee-shaped.

a. Provide minimum 25-gauge studs.

b. Provide heavier than 25-gauge as required to comply with performance requirements (deflections).

c. Composed of at least 40% recycled content, or as available.

d. Manufactured regionally within a radius of 500 miles, if available.

2. Runners: Match studs.

3. Furring Members: ASTM C645, screw-type, hat-shaped.

a. Sound Rated Assemblies: Provide resilient channels where required to provide required sound transmission classifications.

4. Channels: ASTM C754.

5. Hangers: ASTM A641, Class 1 wire, not less than sizes in Table No. 5 of ASTM C754 and as required by applicable codes; hanger rods, flat hangers, and angle-type hangers as required.

6. Fasteners and Anchorages: As recommended by gypsum board system manufacturer.

7. Suspension System: ASTM C645, suspension system composed of main beams and cross furring members interlocking to form supporting network; recommended by gypsum board system manufacturer.

B. Gypsum Board: Comply with ASTM C840; maximum permissible lengths; ends square cut, tapered edges on boards to be finished

1. Typical: ASTM C1396, Type X, fire rated gypsum board.

2. Thickness: Minimum 5/8” thickness; 1/4” thick facing board is to be used to proved smooth uniform surface at curved drywall construction.

3. Manufactured regionally within a radius of 500 miles, if available.

C. Gypsum Board Accessories: Comply with ASTM C840.

1. Provide protective coated steel corner beads and edge trim; type designed to be concealed in finished construction by tape and joint compound.

2. Corner Beads: Manufacturer's standard metal beads.

3. Edge Trim: "L", "LK", or "LC" casing beads.

4. Reinforcing Tape, Joint Compound, Adhesive, Water, Fasteners: Types recommended by system manufacturer and conforming with ASTM C475.

a. Typical Joint Compound: Chemical hardening type for bedding and filling, ready-mixed or powder vinyl type for topping.

5. Control Joints: Back to back casing beads.

a. Back control joints with 4 mil thick polyethylene air seal.

6. Metal top tract shall be used at all ceiling height partitions.

D. Acoustical Accessories:

1. Acoustical Insulation: Preformed mineral fiber, ASTM C665, Type I; friction fit type without integral vapor barrier; as required to meet STC ratings as directed by Architect, or of thickness as directed by Architect.

2. Acoustical Sealant: ASTM C919, type recommended for use in conjunction with gypsum board.

a. Type: Paintable, non-shrinking and non-cracking where exposed, nondrying, nonskinning, nonstaining, and nonbleeding where concealed.

PART 3 – EXECUTION

3.1 INSTALLATION

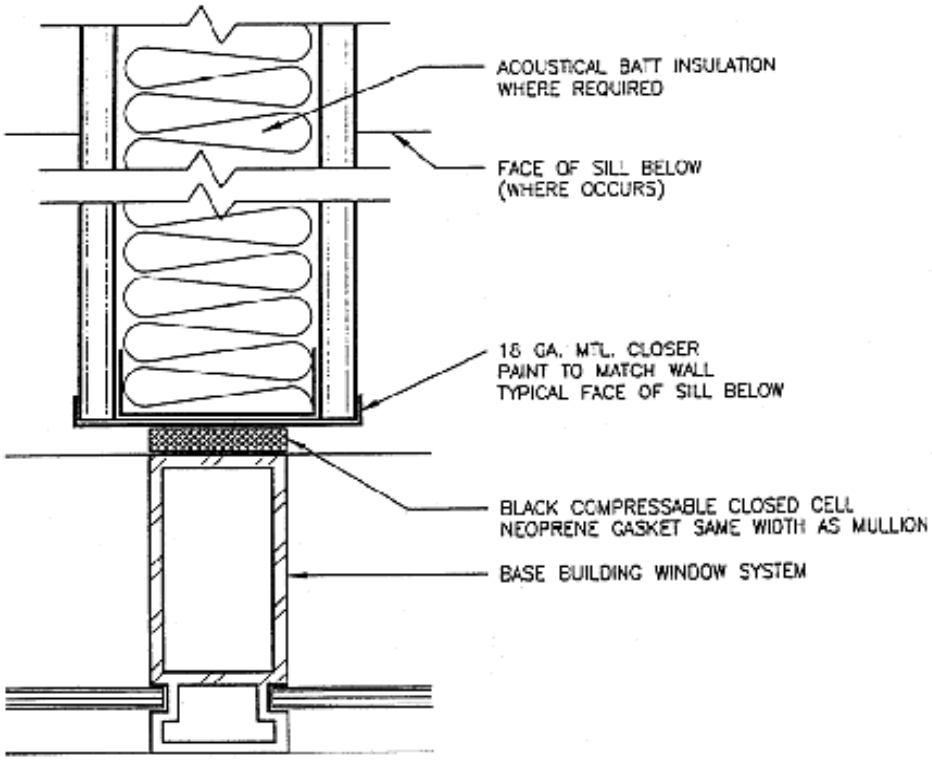
A. Metal Framing Erection: Erect metal framing in accordance with ASTM C754 and manufacturer's recommendations.

B. Ceiling Framing Installation: Erect in accordance with ASTM C754 and manufacturer's recommendations.

C. Gypsum Board Installation: Install in accordance with ASTM C840 and manufacturer's recommendations.

END OF SECTION

ATTACHMENT:



WALL TO WINDOW MULLION

P–16F SCALE: N.T.S.

PART 1 - GENERAL

1.1 SUMMARY

A. Provide acoustical ceiling systems, with suspended metal grid system, trim, and accessories as required for complete finished installation.

1. Survey space to determine variation of floor slabs from level. Identify high and low points, and coordinate with Architect in field to establish datum for laying out each ceiling area.

    a. Ceiling Height in Tenant areas and corridors to be 8' ½" unless otherwise approved by Landlord.

2. Coordinate layout and installation of acoustical ceiling units, suspension system components and accessories with other work supported by, or penetrating through ceilings, including but not limited to:

    a. Light fixtures.
    b. Fire and smoke-detection system components.
    c. HVAC equipment.
    d. Fire-suppression system components.
    e. Partitions.

3. Attempt grid layout to align with corridor or existing layout.

1.2 SYSTEM DESCRIPTION

A. Seismic Design Requirements: Comply with code requirements for seismic bracing of ceiling suspension system, and with ASTM E580.

1. Ceiling Struts: Provide struts as detailed on Drawings and as required by code.

2. Slack Wires: Provide safety slack wires, two per fluorescent fixture on diagonally opposite corners and a single wire for each recessed down light.

B. Fire Performance Characteristics: Provide products listed by Underwriters Laboratories (UL) or other independent testing laboratory acceptable to applicable authorities.

1. Flame Spread/Smoke Density: Provide products meeting code requirements for maximum 25 flame spread and maximum 25 smoke density.

2. Fire Rated Assemblies: Provide systems rated as part of acoustical material and suspension systems for Floor-Ceiling Assemblies.

1.3 REFERENCES

A. ASTM C635: Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. ASTM C636: Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

C. ASTM E580: Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Suspension System: Comply with ASTM C635, as applicable to type of suspension system required for type of ceiling units.

1. Exposed Grid Systems: Direct hung, steel “T” exposed grid system, standard 9/16” width, with ¼” reveal. (Field verification required when matching a specific suite.)

a. Provide Suspended Ceiling Grid Armstrong 9/16”, or substitute.

2. Attachment Devices: Size for 5 times design load in ASTM C635, Table 1, Direct Hung.

3. Hanger Wires: Galvanized carbon steel, ASTM A641, soft temper, prestretched, yield-stress load of at least three times design load, but not less than 10 gauge.

4. Straps, Tubes and Angles: Provide galvanized steel as required to meet state and local requirements for seismic design loads.

5. Structural Class: Minimum intermediate-duty system.

6. Edge Molding: Manufacturer's standard angle molding for edges and penetrations of ceiling, with single flange of molding exposed.

7. Finish of Exposed Items: Manufacturer's standard white baked enamel.

8. Maximum Allowable Deflection: L/360.

B. Acoustical Panels: ASTM E1264 type and form.

1. Panels: Optima Tile with 2” high Axiom trim, or substitute.

2. Sizes: 2’ x 2’.

3. Finish: Standard white painted finish.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment and partition systems.

3.2 INSTALLATION

A. Install acoustical ceiling systems in accordance with manufacturer's recommendations and ASTM C636.

1. Finished Ceilings: True to lines and levels and free from warped, soiled or damaged grid or acoustical units.

B. Install ceiling suspension system to resist seismic loads as required by state and local codes, including extra hanger wires and compression supports for ceilings and light fixtures.

END OF SECTION

TILE

PART 1 – GENERAL

1.1 REFERENCES

A. ANSI A108.5: Installation of Tile with Latex-Portland Cement Mortar.

B. ANSI A108.10: Installation of Grout in Tilework.

C. ANSI A108.11: Interior Installation of Cementitious Backer Units.

D. Tile Council of America (TCA): Handbook for Ceramic Tile Installation.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Floor Tile: Provide non-slip units with minimum wet and dry value of 0.60 coefficient of friction when tested in accordance with ASTM C1028.

B. Latex Thin Set: Thinset bond coat, consisting of latex-cementitious mortar conforming to ANSI A118.4.

C. Latex-Cement Grout: ANSI A118.7, latex-cementitious type, uniform in color, resistant to shrinkage.

D. Cementitious Backer Units: ANSI A118.9 aggregated Portland cement with woven glass-fiber mesh on both faces; approximately 1/2" thick; UL fire rated as required to maintain integrity of fire rated assemblies.

2.2 MIXES

A. Mix and proportion cementitious materials for site-made leveling coats, setting beds and grout as recommended by the TCA Handbook for Ceramic Tile Installation. Cementitious Backer Units: Install units in accordance with ANSI A108.11, manufacturer's recommendations, and as required for fire ratings.

B. Mix and proportion pre-mixed setting beds and grout materials in accordance with manufacturer's recommendations.

PART 3 – EXECUTION

3.1 INSTALLATION

C. Install tile in accordance with referenced ANSI Standards and TCA recommendations for type of substrate and setting method.

1. Latex-Cement Thin Set Floors over Waterproof Membrane: TCA F122.

2. Latex-Cement Thin Set Wall Tile over Cementitious Backer Units: TCA W244.

3. Granite Highlight Band Latex-Cement Thin Set Floors over Concrete: TCA F113.

D. Locate expansion joints, control joints, contraction joints, and isolation joints where recommended by TCA Handbook and as approved by Architect.

E. Install membranes for restroom, shower rooms, kitchens and anywhere floor drains are installed.

END OF SECTION

RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

A. Flammability: Provide materials tested under ASTM E648, Flooring Radiant Panel Test, with results of 0.45 watts/sq.cm. or higher.

B. Slip Resistance: Provide materials tested under ASTM D2047, James Slip Test with minimum 0.6 rating for floors.

1.2 PROJECT CONDITIONS

A. Ensure floor surfaces are smooth and flat with maximum variation that meets industry standards and local codes.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Resilient Tile: 12" by 12" by 1/8" thick; vinyl composition tile conforming to ASTM F1066, Composition 1.

1. FloorScore Certified.

2. Color and Pattern: As selected by Landlord or Architect from manufacturer's full range of available colors.

B. Resilient Base: 1/8” x 4” x 48” Rubber Wall Base Type III Commercial. Provide coved base at hard floor surfaces.

1. FloorScore Certified.

2. Color: As selected by Architect from manufacturer's full range of available colors.

C. Edge Strips – “1” homogeneous vinyl or rubber, tapered or bullnose edge.

1. Provide longest lengths possible. Pieces less than 24” long shall not be permitted.

2. Color as selected by Architect from manufacturer’s full range of standard colors.

D. Adhesives and Sealants:

1. VOC limits less than SCAQMD Rule #1168

2.2 PREPARATION

A. Conform with manufacturer's recommendations for preparation and with ASTM F710.

END OF SECTION

CARPET

PART 1 - GENERAL

1.1 Flammability: Provide carpet and underlay having passed following tests.
- A. DOC-FF-1-70: Pass.
- B. NFPA 258 (Smoke Density): 450 or less.
- C. ASTM E648 (Flooring Radiant Panel Test): 0.45 or higher.

1.2 Certificate of Compliance: Provide manufacturer's certificate of compliance stating each material delivered conforms to Specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Carpet & Rug Institute (CRI) Green Label Plus.

B. Tenant Carpet: As directed by Architect and approved by Landlord.
1. Construction: Level Loop
2. Yarn System: Dupont Type 6.6 Continuous Filament Nylon
3. Secondary Backing: Wear Performance
4. Yarn Weight: 26 oz minimum
5. Maximum Allowance for fully furnished and installed price:
   a. Direct Glue $30/sq. yd.
   b. Over Pad $35/sq. yd.

C. Pad:

1. Product: Reliance “Diamond bond II” or accepted equal
2. Density (lbs. Per cu foot); 7.0
3. Thickness: 3/8” (approximate)
4. Tear Strength (A.S.T.M. 2262): 28 lbs.
5. Insulation “R” Factor (A.S.T.M. C518-76): 2.12

D. Base: 1/8” x 4” x 48” Rubber Wall Base Type III Commercial Colors.

E. Adhesives and Sealants:

1. VOC limits less than SCAQMD Rule #1168

F. Seaming diagrams shall be provided with product submittals.

NOTE: (Buildings with Trench Systems only.) Provide carpet tile matching Building Standard Carpet at trench headers adjacent to building core, as directed by Architect and approved by Landlord.

2.2 PREPARATION

A. Ensure floors are level, with maximum surface variation that meets industry standards and all local codes.

PART 3 – EXECUTION

3.1 INSTALLATION

B. Install carpet in accordance with manufacturer recommendations and installation instructions.

1. Maintain pile lay and weave in same direction shown.

END OF SECTION

VINYL WALL COVERING

PART 1 - GENERAL

1.1 REFERENCES

A. Federal Specification CCC-W-408: Wall Covering, Vinyl Coated.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Vinyl Wall Covering: Conform with CCC-W-408 Type II, medium duty quality; Class 2 mildew resistant, with cloth backing; paper backing is not acceptable.

1. Maximum Flame Spread/Smoke Developed: ASTM E84, 25/50.

END OF SECTION

WALL FABRICS

1.1 MATERIALS

A. Maximum Flame Spread/Smoke Developed ASTM E84: 25/450.

END OF SECTION

PAINTS AND COATINGS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Certificates: Furnish certificates from each manufacturer stating materials are top quality lines and suitable for intended use on this Project.

PART 2 - PRODUCTS

2.1 MATERIALS

B. Paints: Provide paints comparable to following unless otherwise directed by Architect and approved by Landlord.

1. Gypsum Board:

   a. Green Seal Standard GS-11 certified.
   b. First Coat: Vinyl Latex Primer Sealer.
   c. Finish Coats: Latex Eggshell Enamel to cover.

2. Metal:

   a. Green Seal Standard GS-03 Certified.
   b. Primer: Rust Inhibitive Paint.
   c. Finish Coats: Latex Semigloss Enamel to cover.

3. Wood, Opaque Paint:

   a. Meets the requirements of South Coast Air Quality Management District (SCAQMD) Rule #1113.
   b. First Coat: Vinyl Latex Enamel Underbody.
   c. Finish Coats: Latex Semigloss Enamel to cover.

4. Wood, Stained Finish:

   a. Meets the requirements of South Coast Air Quality Management District (SCAQMD) Rule #1113.
   b. First Coat: Stain to match existing.
   c. Finish Coats: AWI System No. TR-2 transparent catalyzed lacquer or equivalent per AWI 1500, premium grade.

   NOTE: Refer to Division 6, Section 6400 – Architectural Woodwork, 2.3 Finishes, for Transparent Finished Woodwork and Opaque Finished Casework.

5. Sheens: Comply with ASTM D523, reflectance of paint.

6. Elevator doors shall be submitted and approved by Property Manager.

C. Volatile Organic Compound (VOC) Emissions: Select materials that generate least amount of pollution; consider pollution and volatile organic compound (VOC) emissions generated during manufacturing, transport, installation, use, and disposal.

1. Avoid materials that contain ozone depleting chemicals and that emit potentially harmful volatile organic compound (VOC) emissions.

2. Avoid materials that can leach harmful chemicals into ground water; do not allow potentially harmful chemicals to enter sewers nor storm drains.

3. Select materials that can be reused or recycled and materials with significant percentage of recycled content; set specific recycled content percentages for individual materials; avoid materials difficult to recycle.

2.2 PREPARATION

A. Measure adhesion of existing paints using ASTM D3359 tape test; remove existing coatings not achieving minimum ratings of 9 to 10.

END OF SECTION

SPECIALTIES

FIRE EXTINGUISHERS AND CABINETS

PART 1 - PRODUCTS

1.1 MATERIALS

A. Fire Extinguishers:

1. Typical: Badger Fire Protection Company/Standard Model 10MB-8H, 10 lbs ABC dry chemical fire extinguishers typical.

   Original - Typical: Provide 2A-10BC multi-purpose dry chemical type fire extinguisher.
2. Hazardous Areas: Provide 2A- 10BC multi-purpose dry chemical type fire extinguisher at locations designated (*by Fire Marshal)* as hazardous.

B. Fire Extinguisher Cabinets:

1. Cabinet Depth: Provide cabinets designed for space available in walls with fire extinguisher cabinets, and of sufficient depth to house 2A-10BC multi-purpose dry chemical type fire extinguisher.

   a. Hazardous Areas: Provide cabinets designed to house 4A-60BC multi-purpose dry chemical type fire extinguisher at locations designated as hazardous.

2. Frame: Trimless, recessed, door frame flush with finish wall.

3. Metal Gauges: Manufacturer's standard for series specified.

4. Box: Provide manufacturer's standard box with white baked enamel interior finish and baked enamel exterior finish.

5. Doors & Cabinets: Steel, full flush metal panel, with catch; provide thermosetting primer compatible with factory finish white paint.

6. Door Hardware: Continuous type hinge permitting door to open 180 degrees; provide either lever handle with cam action latch, or door pull and friction latch, suitable for use by persons with disabilities.

7. Identification: After installation and finishing is completed, silk-screen or apply decal letters spelling "FIRE EXTINGUISHER" as applicable.

   a. Letter size, style and location as selected by Architect.

8. Fully recessed in corridors and common areas. Semi recessed in tenant spaces.

END OF SECTION

FURNISHINGS

PERIMETER LOUVER BLINDS AND WINDOW COVERINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide window shades and window covering systems with operating hardware, attachments, and accessories as required for complete finished operational installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: MechoShade Systems, Inc.; 42-03 35th Street, Long Island City, NY 11101. ASD. Tel: (718) 729-2020; Fax: (718)729-2941. Email: info@mechoshade.com; www.mechoshade.com.Substitutions: Not permitted unless otherwise approved by Landlord.

2.2 MATERIALS

A. EuroTwill Reversible Broken Weave, 6450 Series, 3% open.

1. Finish: Fabric #: 6471

2. Lift Cords: Manufacturer's standard two-ply polyester cord filler and braided polyester jacket with minimum 175 lb. breaking strength.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install louvered blinds in window sash in accordance with blinds manufacturer's recommendations and installation instructions.

1. Provide templates where necessary for preparation of sash for installation of blinds.

B. Secure in place with flush countersunk mechanical fasteners.

C. Adjust parts for smooth operation.

END OF SECTION

SOLAR-CONTROL FILM (OPTIONAL)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Provide solar-control film at exterior windows where required, with accessories as required for complete finished operational installation.

1. Window film is to be applied to exterior windows only with prior written approval from Landlord.

1.2 QUALITY ASSURANCE

A. Mock-Up: Provide complete full size solar-control film installation in actual window unit; approved mock-up may be incorporated into Project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Contact Property Manager

2.2 MATERIALS

A. Solar-Control Film: *3M/Scotchtint Sun Control Film #RE35NEAR, medium performance neutra*l.

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean glass surfaces to receive solar-control film just prior to application.

B. Remove dirt, tape, and film substances as required to achieve substrate suitable for application of solar-control film as recommended by solar-control film manufacturer.

3.2 INSTALLATION

A. Install solar-control film in accordance with manufacturer's recommendations and installation instructions.

B. Apply solar-control film smooth, clean, and without wrinkles, gaps or overlaps; eliminate air pockets and ensure full bond to wall surface.

C. Use single sheets of film. Where size of glass exceeds available size of film, install seams at locations as approved on shop drawings, butt edges tightly without gaps or overlaps.

1. Horizontal seams are not permitted at line of sight areas located between 36” above floor to 78” above floor.

END OF SECTION

SPECIAL CONSTRUCTION

ROOF ANTENNAS AND SATELLITE DISHES

(If allowable per Lease)

PART 1 - GENERAL

1.1 SUMMARY

A. New and relocated roof antennas shall be structurally mounted; satellite dish mounting shall be structurally engineered and permanently mounted to building, no sleds permitted.

1.2 SYSTEM DESCRIPTION

A. Design Requirements: Design structural supports for antenna and satellite dishes in accordance with applicable state and local code requirements.

B. All cabling related to the installation or relocation of roof antennas, satellite dishes and receiver/transmitters, to be enclosed in conduit and routing of such to be reviewed and approved by Landlord. Conduit to be painted to match adjacent surfaces.

END OF SECTION

CONVEYING SYSTEMS

ELEVATOR INFORMATION

Contact Property Management Office for specific elevator information.

END OF SECTION

MECHANICAL

FIRE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Fire Protection system, which shall be pre-engineered or handled as "design-build" contract.

1. Vendor/Design Engineer is completely responsible for verification of design criteria, design, installation and performance of system.

2. Installation Vendor shall have a Class C-16 Fire Protection Vendor's License.

3. Extent of base building upgrade fire protection work shall depend upon Tenant criteria, City Fire Marshal and risk insurer's requirements; all of which shall be taken into account.

a. Where no special Tenant criteria exists and existing system complies with City Fire Marshal requirements, no upgrade other than sprinkler head relocation shall be required.

4. Design piping and layout of sprinklers for full coverage of tenant improvement area, and verify proper operation of flow and tamper switches serving area.

5. Coordinate with Landlord, Chief Engineer, and with Division 16 for supervision, testing, remote alarm, and trouble monitoring.

6. Include incidental work that can be reasonably inferred and necessary to provide systems described.

7. Coordinate work schedule with Landlord and Building Engineer.

8. No mechanical "T's" shall be installed.

9. All sprinkler work will be required to have a hydrostatic test with water from the fire riser. Testing is to be coordinated with the Building Engineer.

10. Existing base building sprinkler test and drain piping arrangement at fire water riser or stand pipe riser area shall remain unaltered.

B. Related Sections:

1. Life safety system.

1.2 SYSTEM DESCRIPTION

A. Design Criteria: Verify following design criteria, available pressure and apply latest NFPA 13 and all local and State Code and Regulation.

1. Occupancy: Type 1, High Rise, B Occupancy, 11 Stories.

2. Hazard: Light hazard.
3. Construction: Non-combustible.
4. Zoning: Verify.
5. Hose Streams: Verify.
6. Existing Application Rate: Verify.
7. Existing Area of Application: Verify.
8. Comply with State Building Code, State Fire Code, State Fire Marshal requirements, applicable City codes and requirements, and applicable National Fire Protection Association standards and pamphlets.

B. Existing fire protection system is such that each floor is divided into two zones.

1. One zone consists of the Main Building area of a floor (approximately 50k sqft) and other zone consists of the 9th Street Addition area of a floor (approximately 30k sqft).

2. There is one combination wet riser for the Main Building fire protection systems; located in evacuation Stairway #2. And one combination riser wet riser for the 9th Street Addition fire protection systems; located in evacuation Stairway #4.

3. Each zone on each floor has a dedicated fire protection control valve.

4. Approval Calculations: Prepare hydraulic calculations of fire protection system.

a. Submit to Owner's insurance company and City Fire Department.

b. Submit one approved copy from each to Landlord, bearing stamp and/or signature of City Fire Department before proceeding with installations.

1.3 SUBMITTALS

A. Sprinkler plans and specifications shall be submitted to landlord for review and approval prior to commencement of work.

B. Certificate of Installation: Submit certificate upon completion of fire protection piping that indicates work has been tested in accordance with NFPA 13, and that system is operational, complete and has no defects.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Piping: Piping and related fittings shall be manufactured domestically and Fire Marshal (FM) and UL approved and stamped.

1. Pipe shall be black steel, Schedule 40 domestic seamless, conforming to ASTM standard applicable to the required pressure class.

a. No Schedule 10 piping shall be allowed.

2. Fittings are to be threaded Ductile iron conforming to ANSI standards applicable to required pressure class.

3. Pipe Supports: Install pipe supports, braces and anchors per NFPA 13 and as required by all local and State Code and Regulation.

    a. Powder driven concrete inserts shall not be allowed.

4. All sprinkler piping earthquake bracing must adhere to “FM Global Property Loss Prevention” specifications.

    a. FM Global Property Loss Prevention Data Sheets:

        1) 2.2.1.1 - Sway Bracing Locations for Steel Piping (refer to last 4 pages of this document for FM Global requirements)

B. Piping Specialties:

1. Gauges are to be Marsh No. 8, 3-1/2" Dial, 0-300 psi scale, UL listed and approved, 1/4" bottom connection stainless steel bezel.

2. Flow Switches: Vane tape with adjustable time delays, UL listed, each with two contacts for local and remote alarms. Coordinate with Life Safety System provider for each building.

C. Sprinkler Heads:

1. Manufacturer: To match building standards and the requirements of the Owner’s insurance carrier.

2. Sprinkler heads shall match building standard at 155 degrees F, quick response, UL listed, FM listed, plated with factory painted white enamel escutcheon plate.

3. For hard ceiling installations where concealed heads are specified, sprinkler heads shall match building standard, quick response concealed sprinkler heads. Concealed Heads: shall match building standard and the requirements of the Owner’s insurance carrier;165 degree F ½ inch Quick Response FM Approved with factory painted white cover.

4. Newly installed and relocated sprinkler heads are to be placed in center of tile.

D. Preaction System: Preaction system shall be UL listed and FM approved with battery backup.

1. Provide required test connection and drain. Test drain shall be connected to main sprinkler drain.

2. All pre-action systems shall be monitored by building fire life safety system.

E. Fire Suppression System: FM-200 Fire Extinguishing System.

1. FM-200 Fire Extinguishing system shall be approved by Landlord prior to installation.

2. All suppression systems shall be monitored by building fire life safety system.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Piping: Install pipe, fittings and hangers in accordance with latest NFPA 13 pamphlet and City Fire Marshal requirements, including seismic sway and uplift bracing.

1. Reducers: Make reductions in pipe sizes with one piece reducing fitting. Bushings are not acceptable.

2. Except where length of the pipe exceeds 20 feet, do not use couplings.

3. Sprinkler head clearance between deflectors and walls or ceiling shall be in accordance with requirements of latest NFPA Pamphlet No. 13.

4. Vendor to contact Landlord for impairing water supply to existing sprinkler system. Vendor to notify City Fire Department to determine fire safety precautions to be observed during sprinkler impairment, such as fire watches, charged hose lines, etc.

a. Vendor shall be responsible for precautions during entire impairment.

b. Vendor to contact Landlord to restore system.

c. When system is fully restored to normal working order Vendor shall verify control valves are fully opened.

d. Sprinkler system impairment shall not involve more than one floor at a time.

B. Coring requires approval of structural engineering. Scanning is required to locate core.

3.2 CLEANING

A. After fire sprinkler piping installation has been completed, flush system under pressure as required by NFPA 13.

3.3 FIELD QUALITY CONTROL

A. Site Tests: Test installation in accordance with following requirements and applicable codes

1. Notify Building Engineer and Landlord in writing at least three days in advance of any test.

2. Perform testing in presence of following persons:

a. City Fire Department Inspector.
b. Fire Marshall.
c. Chief Engineer.
d. Life Safety subVendor's representative.

3. Test piping at no less than 200 psig pressure or 50 psig above system static operating pressure, whichever is greater.

4. Perform operational and alarm test under simulated service conditions.

5. Coordinate testing procedures with Building Engineer.

B. Tests Certificates and Approvals: Submit to Landlord certificates, in triplicate, indicating approval of Work, performance of tests, and final inspection issued by Fire Marshal before final acceptance of sprinkler system.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Plumbing work is to depend upon actual alterations and improvements that have to be performed. However, a minimum scope of work for a typical tenant is to include all functions listed below:

1. Prepare design drawings based upon proposed tenant layout.

    a. Obtain building permit for construction using design drawings.

2. Reroute existing and provide new piping as required.

    a. Provide seismic restraints required by Code, or this Specification, for all equipment, pipe and materials furnished under this Section.

    b. Vendor is responsible for design of restraints and for proof of adequacy of restraints.

3. Add, relocate or remove existing plumbing fixtures. Plumbing to be capped shall have water, vent, and waste lines at floor below removed back to source.

    a. Install plumbing fixtures per State Code of Regulations, (e.g. Title 24, Part 2, Chapter 11 B) requirements for access for persons with disabilities.

4. Provide metering for all gas installations.

5. Provide metering for all water usage in excess of standard office requirements.

6. Notify Building Engineer prior to any core drilling, and X-ray floor if requested by Landlord. All coring and x-raying shall be performed after hours or as directed by Landlord.

7. A burn permit card shall be obtained from the Building Engineers office prior to commencement of soldering.

8. Tenant Data Closets – All Tenants with water-cooled air conditioning systems within their space are to furnish and install a building standard leak detection sensor(s) that is connected to the building's leak detection system AND provide manual shut-off valves to be able to stop the water flow to their individual system(s). The shut-off valves are to be easily accessible without a ladder. Cross reference HVAC Section 3.3 BEMS INTERFACE Section.

9. Tenant Kitchen Equipment – All Tenants are to furnish and install a building standard leak detection sensor in locations within the kitchen that will sense leaks that occur from any source that uses water which includes but is not limited to; refrigerators, dishwashers, coffee makers, filters systems, etc. Consult Chief Engineer for sensor specifications and where sensors should be located. Cross reference HVAC Section 3.3 BEMS INTERFACE Section.

10. Private Restrooms – All Tenants are to furnish and install building standard leak detection sensor (s) in any private restrooms within their space. Each sensor shall be connected to the building leak detection system for monitoring. Consult Chief Engineer for sensor specifications and where sensors should be located. Cross reference HVAC Section 3.3 BEMS INTERFACE Section.

11. Review drawings with Landlord and Chief Engineer prior to construction.

12. Arrange for necessary inspections, pay fees for inspections, and turn over copies of inspection reports and certificates to Landlord.

B. Submit request and schedule for disruptions to Landlord and Engineering at least 48 hours in advance.

1.2 SYSTEM DESCRIPTION

A. Building is provided with waste, vent and domestic cold water stub outs at each floor.

1. Domestic water is distributed within building:

a. Floors 5 and below; by City supplied pressure.

b. Floors 6 and above; by domestic water booster duplex pump system located in the basement.

2. Water piping serving core area shall not be tapped into for tenants' use.

B. Building provides cold and hot water to public restrooms and janitorial closets only. If Tenant requires hot water, provide instantaneous electric type tankless water heaters for hot water within Tenant kitchen/break room at point-of-use.

C. Design Criteria:

1. Soil, Waste and Vent System shall be per California Plumbing Code, Latest Edition and applicable local regulations.

2. Water Piping: Size piping per California Plumbing Code, Latest Edition. Limit velocities 5 feet per second and friction loss to no more than 8 feet per 100 feet.

3. Gas Piping: Size per California Plumbing Code, Latest Edition.

4. Plumbing design drawings and calculations shall be signed by a competent registered mechanical engineer in the State of California.

D. Restroom Standards to match building standards.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Piping: Pipes and fittings are to be domestically manufactured.

1. Sanitary, waste/soil and vent piping aboveground, is to be cast iron, standard weight, no-hub joint, with neoprene sleeve and stainless steel band.

2. Domestic water piping is to be Type “L” hard copper throughout.

B. Piping Accessories:

1. Clean-Outs:

a. No-hub cast iron pipe cleanouts are to be permitted in horizontal drainage piping.

b. Provide wall or floor covers for cleanouts in concealed piping.

c. Provide polished chrome-plated escutcheons in finished rooms, and polished brass in other areas.

2. Fittings:

a. Fittings for use with sanitary waste/soil and vent piping are to be coated, cast iron, no-hub type with mechanical joints of stainless steel band with neoprene sleeve.

b. Fittings for use with domestic water piping are to be wrought copper solder joint ANSI B16.22.

c. Brass screwed fittings are to be Schedule 40, flat band, IPS with no plain couplings permitted.

d. Make joints in brass pipes without the use of lamp wick or filler except “utility compound” or Permacel Teflon tape may be applied to male threads only. All are to be reamed.

e. All pipe and fittings are to be domestically manufactured.

C. Valves: Valves and valve construction shall be suitable for the pressure, temperature, and fluid quality of the service in which they are to be used. Valves shall be domestically manufactured.

1. Cold and Tempered Water Valves: ½"-3" Stockham, NRS Gate, Bronze, union bonnet, threaded, figure B-130.

2. Ball Valves: 1/2”-2” Stockham, two-piece, threaded, figure S-214-BR-R-T-T.

3. Vacuum Breakers: Watts No. 800.

D. Water Heaters:

1. Tankless water heaters
   a. Chronomite Model SR-30-277V or Model E-46LLP

2. Tank water heaters

   Building Standard - Automated water leak detection system – Flood Stopper™ www.thefloodstopper.com or Equal.

   a. Sensor to be located in water heater containment pan or other potential problem areas. Locations to be approved by Chief Engineer.

      i. Wireless or hardwired is acceptable.

   b. Location of control panel to be approved by Chief Engineer.

   c. Shut-off valve to be located on supply line for water heater.

   d. Local alarm to be provided.

   e. Provide a pan or other form of containment under the water heater.

   f. Installation to be inspected and approved by Chief Engineer prior to acceptance.

E. Insulation:

1. Materials shall have flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84, NFPA 255 and UL 723. Thickness shall be in accordance with Title 24 energy regulations.

   a. Domestic tempered water and refrigerated water mains and branches are to be fiberglass, rigid molded, non-combustible.

2. Insulation Jackets: Domestic tempered and refrigerated water pipes are to be all service 24 ASJ/SSL, fire retarding vapor barrier, factory applied, stapled.

3. Pipe Protection Saddles are to be Insul-coustic Div., Insul-Shield Model 704 or Pipe Shields, Inc., Model A1000 or A2000.

4. Pipe Protection Saddles are to be Insul-coustic Div., Insul-Shield Model 704 or Pipe Shields, Inc., Model A1000 or A2000.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Contractor shall provide “Base Building Systems Shutdown” document, in accordance with established Building procedures, at least 72 hours prior to major impacts to the existing Plumbing systems.

B. A hot work permit card, approved in advance by the Chief Engineer, shall be issued by the General Contractor. Hot work permits will not be issued for longer than a single

work shift. Contractor is responsible for providing portable fire extinguishers during hot work.

C. Contractor shall not open valves to Base Building systems, but shall contact Building Management to arrange for valve opening.

D. Pipe fittings and joints shall not be installed directly above, or within 1' on either side, of electrical bus duct, and piping shall not be installed parallel over bus duct or parallel within 1' of bus duct.

E. Rough-In and Final Connection: Vendor is to provide rough-in and final connection for all fixtures and equipment requirements.

1. Contract Drawings are to indicate general arrangement of required rough-in, however, details and dimensions are to be determined from information obtained from supplier of item.

2. Requirements apply equally to equipment furnished by Tenant or other Vendors.

3. Fasten plumbing fixtures securely to required supports or building structure; and ensure that fixtures are level and plumb.

4. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement.

5. Support piping independent of wall construction.

6. Waste water line from a dishwasher shall pass through the code required listed air gap and shall terminate to an industrial grade in-sink garbage disposal unit. Submit to the Landlord disposal unit submittal data for approval.

F. Contractor shall provide for draining vent stack before tie-in at 2nd floor and below.

G. Spare ports on angle stops shall be properly capped.

H. Coring requires approval of structural engineer. Scanning is required to locate core with Chief Engineer's presence/approval.

1. Any floor coring required to support piping installations will require mechanical seals.

I. Piping: Conceal piping in walls, furred spaces, pipe spaces or above suspended ceilings as shown on Drawings.

1. Group piping wherever practical and install uniformly in straight parallel lines, squarely with building lines.

2. When plumbing impacts the ceiling of the tenant space below, layout must be provided to the Owner for review and approval. Plumbing must be painted to match the existing conditions of the tenant space below.

3. Vendor is to support horizontal piping with pipe hangers. Do not use perforated metal tape. Install and secure piping so that tempered and cold lines and lines of dissimilar metal are not in contact.

4. Vendor is to verify equipment dimensions and requirements for rough-in work. Bending or offsetting of finished piping connections and “cocking” of fittings or trim will not be acceptable. Do not support any piping weight from equipment.

5. Vendor is to install sanitary piping according to the following guidelines:

    a. Install piping at the uniform grade, making all joints close and square.

    b. Maintain a minimum 1/4" fall per foot on all waste lines.

    c. All waste lines and fittings are to be no less than 17-gauge brass or chrome-plated tubing material.

    d. Acid or chemicals of any nature are not to be dumped into the Sanitary System.

6. All potable water piping is to have copper joints with 95-5 Tin-Antimony or other non-lead solder.

7. All piping, fittings, escutcheons, valves, supports, hangers, etc. where installed in conjunction with plumbing fixtures or benchwork-containing items requiring plumbing connections, are to be chrome-plated where exposed to view.

    a. The term “exposed to view” is to apply to all piping from the point that it leaves the wall, ceiling or floor construction to the point of final connection to the fixture.

    b. Piping built into fixed benchwork with concealing doors is not considered exposed.

8. Vendor is to provide 12"- long air chambers (full pipe size) or Nibco Model 620L on all hot and cold water connections to fixtures.

9. Vendor is to install a set of shut-off ball valves whenever making connections into wet columns. Valve future outlets are to be left no less than full size of tee coming off said riser.

    a. Piping is not to be permitted to be up sized after connecting to wet column.

    b. All waste lines are to have no less than full-size futures.

10. Copper piping will be used for all domestic water lines to Tenant owned appliances, such as water filters, coffee machines, icemakers, refrigerators, etc.

J. Hangers and Supports

1. Vendor is to use Superstrut or Grinnell hangers and structural attachments. Install properly braced for seismic restraint and spaced as follows:

    a. ½" – ¾” for 5'-3/8” minimum rod size
    b. 1" – 1 ¼” for 6’-3/8" minimum rod size
    c. 1 ½" - 2" for 8'-3/8" minimum rod size
    d. 2 ½" - 3" for8’-1/2" minimum rod size
    e. 4” for 8’-5/8” minimum rod size

2. Vendor is to use cadmium plated or galvanized hangers, attachments, rods, nuts, bolts, etc.

3. Vendor is not to burn or weld structural members without Landlord's approval.

4. Provide Mechanical Seals for all piping going through fire rated walls, floors or concrete slabs. Any other method requires Chief Engineer's prior approval.

5. Vendor is to support hangers by attaching hangers to existing steel beam, or where such is lacking, by providing auxiliary structural support consisting of channels, angles or Unistruts. Do not use expansion shields. The rods on all hangers are to be of adequate size to support the load they carry.

6. Vendor is to support no-hub cast iron pipe with a minimum of two hangers per each length of pipe.

    a. Hangers are to be installed on each side of joint. Where an excessive number of fittings are installed between hangers, provide additional hangers.

    b. Securely anchor fittings to building construction at changes of direction to eliminate horizontal movement.

K. Insulation:

1. For cold service, longitudinal laps and 4" vapor barrier strip at butt joints shall be sealed with BP 85-20, white and seal off ends of pipe insulation at valves, fittings and flanges and at 21' of continuous runs with BF 85-20 or IC-225.

2. Seal vapor barriers and make continuous through hangers, sleeves, etc.

3. Domestic Tempered Water Service: Use pre-molded glass fiber covers on all fittings and valves. Insulate fittings with OC 110 insulation cement to a thickness equal to the adjoining insulation.

4. Vendor is to finish fittings and valves with open-weave glass cloth applied with BF 30-36 adhesive on hot service.

5. For Cold Service (Domestic Refrigerated Water) Vendor is to install a vapor barrier on fittings and valves consisting of open-weave glass cloth applied with BF 30-35 adhesive and finished with a flooding brush coat of the same adhesive.

6. Fasten insulation with aluminum bands on approximately 18" centers at all fittings and valves.

7. Protect insulation on tempered pipes from hangers and guides by pipe protection saddle soldered to the pipe and filled with pipe insulation of insulating cement. Saddles are not to be welded to pipe hanger or support.

8. Protect insulation on cold pipes from hangers and guides by 180 degrees galvanized steel saddle on outside of insulation and vapor barrier.

L. Vacuum Breakers: Install pressure vacuum breakers 12" above the highest outlet they are protecting.

1. Install accessibility for periodic testing and assure unit will not become inoperative if subjected to long periods under pressure.

2. Vacuum breakers are to render positive protection against back-siphonage and incorporate a check valve and vacuum relief with inlet discharge shut-offs and field-testing cocks in one assembly.

3. Vacuum breakers are to be rated to 150 PSI working pressure and are to withstand water temperatures of 170 degrees Fahrenheit.

4. Check, gate and globe valves, nipples and other fittings are to conform to piping material in which they are installed.

5. Vacuum relief valves are to be of brass construction with spring-loaded diaphragm member to assure positive opening of air inlet when back-siphonage occurs.

6. Plumbing fixtures are to have their own sets of shut-off valves.

3.2 FIELD QUALITY CONTROL

A. Site Tests: Vendor shall test all systems in accordance with applicable codes, regulations, and ordinances.

1. Test drains, waste and vent piping as follows:

   a. Test system to hydrostatic pressure equivalent to at least 10' head of water.

   b. After filling, shut off water supply and allow water to stand two hours under test, during which time there is to be no loss or leakage.

2. Test water distribution systems to pressure of at least 50 PSIG higher than their normal operating static or street main pressure; minimum test 150 PSIG. Run test for two hours with no loss in pressure.

3. If any test shows work to be defective in any way or at variance with specification requirements, make necessary changes and remedy defects.

4. Test piping systems after installation and prior to being put to use, covered or concealed by insulation or building construction.

5. Provide results of testing to Landlord.

6. Plumber is to furnish and pay for all devices, materials supplies and labor required in connection with tests.

   a. Plumber is to make tests in presence and to satisfaction of Landlord, Plumbing Engineer and other inspectors of the City, applicable insurance association and public utilities inspectors having jurisdiction.

   b. Plumber is to notify Landlord and Chief Engineer at least 48 hours in advance of making required tests so arrangements may be made for their presence to witness tests.

B. Inspection by Chief Engineer: Vendor is to notify the Landlord at least 48 hours in advance of completion of construction.

1. A walk-through and punch list is to be scheduled for Landlord and/or Chief Engineer to review installation for conformance with approved construction documents and Tenant Construction Standards.

2. All floors are to be x-rayed and approved by Landlord prior to any core drilling.

3.3 CLEANING

A. Vendor is to thoroughly blow out, rod out or wash out piping at least twice before final connections are made and before operation of equipment and piping.

B. Method is to be in manner as directed and/or approved by Chief Engineer to remove accumulation of dirt, chips or other harmful material.

C. Vendor is to snake out existing waste lines back to stack.

3.4 STERILIZATION OF PIPES

A. After preliminary purging, cleaning, and flushing of the system, chlorinate entire potable domestic water system in accordance with current recommendations of American Water Works Association and in accordance with pertinent state and local health codes and regulations.

1. Chlorinate only when prescheduled and provide proper warning signs at outlets.

2. Upon completion of sterilization, thoroughly flush entire potable water system and immediately fill system.

3. When sterilization and flushing are complete, arrange with pertinent agencies for required tests on piping system.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Scope of HVAC work for tenant shall depend upon actual alterations and improvements to be performed. However, minimum scope of work for typical tenant shall include functions outlined below.

1. Design and Drawings: Calculate HVAC loads and prepare new design drawings based upon proposed tenant layout.

2. Use available air quantities from base building system.

3. Provide copy of professional engineer licensed in California Stamped plans to Landlord for review and approval.

4. Obtain building permit for construction for same approved scope of work.

5. Coordinate demolition with Landlord and/or Chief Engineer (or designee) to maintain integrity of building systems.

    a. Costs for repair of damage to building systems and unauthorized interruption of building services shall be charged to Tenant/Vendor as applicable.

    b. Contact Chief Engineer or designee to examine parts before disposal.

    c. Demolish and remove from premises items not to be reused in new design.

    d. Prior to the demolition of any wall, which contains an existing thermostat, contact the Chief Engineer for the procedure to safe-off thermostat and associated wiring.

6. Reroute existing and provide new duct runs as required for Project.

7. Provide acoustically lined transfer air duct boot with ends turned up to create proper return air path in areas enclosed by full height (slab to slab) walls. Transfer air boot shall be sized at no more than 500 FPM air velocity.

8. Add new heating water piping if needed to serve Tenant space.

    a. Add new condenser water piping if needed to serve Tenant space. Extend new futures of equal size and install isolation valves in manner that allows dedicated shutdown without the interruption of existing tenants.

9. Add, relocate and remove air outlets.

10. Provide new thermostats and controls as required to meet current building standards.

11. Provide new VAV boxes if new layout requires additional HVAC zones complete with heating water reheat coil (where required for perimeter zones) and necessary controls.

a. HVAC zones are not to be split between two suites.

12. Adjust and balance air and water system to obtain designed performance and provide independent written report.

    a. Submit copy of field hand written report to Landlord and Engineering Department prior to technician leaving premises after conducting balance.

13. Odor producing activities including but not limited to photo processing, printing, copying, food preparation or storage shall have adequate ventilation and exhaust to prohibit odors or elevated levels of contaminants from entering other tenant spaces, public spaces, non-public spaces, and adjacent properties.

    a. Special ventilation, exhaust and pollution control equipment may be necessary.

B. Exhaust from tenant space terminating to outside of building shall be approved by Landlord.

    1. Plans showing complete exhaust duct routing and termination point shall be bsubmitted to Landlord office for approval.

1.2 SYSTEM DESCRIPTION

A. Air Systems: Base building air system consists of floor-by-floor water cooled VAV units located in perimeter mechanical rooms. On floors 2 through 8 there are three mechanical rooms. On floors 9 through 11 there are two mechanical rooms per floor. Each air handler has a design capacity of 17,000 cfm. Air system distribution on floor is through medium pressure primary air duct mains to variable air volume (VAV) terminal units and then to air distribution. Return air on the floor is through return air transfer ducts at each mechanical room. Enclosed spaces will need to have accommodations for a return air path back to the respective mechanical room.

    (1) Interior zones are cooling only.

    (2) Exterior zones are fitted with heating hot water coils.

    (3) Air volume and water flow are modulated by the Building Management System

    (4) All TECs report to a Floor Level Network Controller (FLNC) via a Local Area Network (LAN). Communication to BEMS network is via FLNC.

B. Heating System: Natural gas fired Condensing hydronic boilers provide the heat energy for the comfort heating hot water system.

C. Heat rejection Systems: There are open loop condenser water risers at each mechanical room. There is one (1) closed-loop condenser water riser located roughly in the center of a floor plate. Utilization of the closed-loop requires approval from Building management. Tenants can set heat exchangers that tie into base building open loop condenser water risers upon approval from Owner; for the purpose of creating their own closed loop condenser water system. The Tenant closed loop condenser water shall be metered by a BTU meter and shall have Owner’s standard water treatment system components.

1.3 DESIGN PARAMETERS

A. The following are design temperatures upon which the shell and core HVAC system was designed. Tenant systems shall be designed in a manner that is compatible with shell and core systems.

Design Temperatures	**Heating**	**Cooling**
Outside air drybulb temperature	38ºF	80ºF
Inside air drybulb temperature interior spaces		72ºF
Inside air drybulb temperature perimeter spaces	70ºF	75ºF
Design supply air temperature perimeter spaces	90ºF	55ºF
Design supply air temperature interior spaces (Note 1)	80ºF	60ºF
Design hot water supply temperature	140ºF	
Design open circuit condenser water supply temperature		80ºF
Design open circuit condenser water return temperature		95ºF
Design closed circuit condenser water supply temperature	60ºF	85ºF
Design closed circuit condenser water return temperature		97.7ºF

Notes:
1. Interior zones shall be sized for the warmer supply air temperature indicated to allow the supply air temperature to be reset in cold weather.

B. The following design parameters shall be used for heating and cooling load calculations.

1. Heat Transfer Conductances of Building Envelope (Btu/ft²/hr/ºF).

Component	**Winter**	**Summer**
Walls (un-insulated)	0.50	0.48
Roofs (with R-11)	0.09	0.08
Existing operable windows (single with metal frame)	1.27	1.13
Existing fixed windows (single with metal frame)	1.13	1.08
New glass (low E with metal frame)	0.55	0.50

2. Window Shading Coefficients. Ignore shading devices (drapes or blinds) in load calculations for windows with shading coefficient less than 0.5.

	Without Blinds	**With Shades**
Existing windows (single clear)	0.88	0.68
New windows	0.33	

3. Sound and Vibration Control. Vibration in walls and floors shall not be perceivable to the touch in any occupied space. The maximum NC level shall be as follows:

Area	**NC Level**
Offices	35
Conference rooms	30
Storage, copy	45
Open office plans	40
Reception plans	35
Retail	40

1.4 ZONING

A. All areas of the building shall be zoned as required to prevent non-uniform temperatures in a space due to variable heat gain from outdoor exposure, variation in people density, etc. Each zone shall have its own temperature sensor. The following zoning criteria shall be followed:

1. Perimeter and interior spaces shall be separately zoned.

2. Spaces with different exposures shall be separately zoned.

3. All enclosed corner rooms shall be separately zoned.

4. Temperature sensors shall not be installed in open areas with dual exposures; unless corner open area is separately zoned.

5. Rooms shall be grouped onto the same zone only if space functions are similar.

6. Each conference room shall be separately zoned.

7. No more than 4 private perimeter offices shall be served by a single zone.

8. No more than 5 private interior offices shall be served by a single zone.

9. Private offices shall be zoned separately from open offices.

10. Copy/coffee kitchenette area shall be served by separate zones.

11. Corridors, storage, and non-critical spaces may be served by any adjacent zone.

12. No zone shall serve more than approximately 1,500 square feet of conditioned space (excluding non-critical spaces such as corridors and storage rooms).

B. VAV terminal unit Type

1. The following are tenant standards and shall be followed unless permission is given otherwise by the Owner.

2. Perimeter zones.

    a. VAV Reheat terminal units with 2-row reheat coils.

3. Interior zones.

    a. Open offices (open to perimeter zones): Cooling-Only VAV terminal units.

    b. Enclosed offices: VAV Reheat terminal units with 1-row reheat coils.

    c. Copy rooms, equipment rooms and other high heat load rooms: Cooling Only VAV terminal units.

4. Interior Conference rooms shall be considered as higher occupancy enclosed offices.

C. VAV terminal unit Set points.

1. Maximum primary airflow set points shall be determined from cooling load calculations. Note: Interior zones shall be sized for the fully reset supply air temperature (see interior zone supply air temperature above) so that they are not under-cooled in winter operation.

2. Minimum primary airflow set points shall be the largest of the following:

    a. Cooling-Only VAV terminal units.

    b. 0 cfm (based on usage described under VAV terminal unit Type above, ventilation minimums are not required for these boxes.

    c. VAV Reheat terminal units.

    d. 15 cfm/person.

    e. 0.15 cfm/ft².

3. Heating maximum airflow set point shall be the largest of the following:

    a. Minimum airflow set point as determined above.

    b. 30% of the zone maximum cooling airflow rate.

    c. As required to provide 90ºF to the space at design steady-state heating load but no larger than 50% of the maximum cooling air flow.

4. Select air terminal units to meet noise criteria and for no greater than 0.5 inches total pressure drop (total pressure drop is static pressure drop plus velocity pressure drop).

    a. The following are suggested maximum primary air flow rates (cfm) for each air terminal unit size (based on Titus, NC 30, 0.5” ATP).

Inlet Size	Cooling Only &	Reheat (2-row)

	Fan-Powered	
6”	415	370
8”	785	655
10”	1200	980
12”	1500	1380
14”	2325	1920
16”	3000	2400

D. Auxiliary/supplemental units.

1. Air cooled units shall not be installed.

2. Use of closed circuit condenser water system requires approval by Owner. Supplemental units are subject to monthly charges for electrical, water, and chemical treatment consumption. All supplemental units shall be separately metered for electrical usage unless equipment load is already metered upstream by Tenant electrical distribution system sub-meter.

3. All auxiliary/supplemental units shall have BTU meters for heat rejection.

4. Provide hydronic heat pumps or water-cooled AC units connected to the condenser water system in the following cases:

   a. Calculated loads to base building condenser water system shall be provided to Owner, and approved by Owner; prior to installing equipment.

   b. For spaces requiring air conditioning during hours other than normal offices hours (e.g. 24-hour computer rooms).

   c. If floor cooling loads exceed the maximum VAV system design capacity, auxiliary water-cooled AC units or heat pumps shall be provided to supplement the AC units if average internal loads on AC unit exceed the loads generated from the following base building design parameters. Cooling load calculations shall be provided to the Owner to verify base building VAV system capacity is adequate to meet tenant design loads.

      1) Occupancy: 150ft²/person.

      2) Office equipment: 1.5 w/ft².

      3) Lights: 1.2 w/ft², 25% to return air plenum.

      4) Total floor load shall not exceed 20 tons for areas served by AC unit without approval of Owner.

   d. Units shall be sized to operate with MERV 13 rated air filters with a 2” filter rack.

   e. Condensate drains shall be trapped per equipment manufacturer’s instructions and have wide radius fittings.

E. Maintenance Access.

1. Space shall be provided around all equipment for routine maintenance, inspection, and repair in strict accordance with recommendations of the manufacturer. Where these requirements are not met, equipment shall be relocated at no cost to the Owner prior to system acceptance.

2. VAV terminal units and AC units/heat pumps.

    a. Equipment shall be located where readily accessed for maintenance, not over light fixtures, ceiling height partitions, or large, difficult-to-move furniture such as cabinets and desks. Tenant Improvement design shall strive to locate air terminal units in corridors or over entry doors to rooms where it is assured no furniture will be located below.

    b. Do not locate over inaccessible ceilings unless there are no practical options. Approval must be gained from Owner if it is felt that there are no practical options. If required, access doors shall be provided to allow for complete and ready access to filters, valves, controllers, sensors, and all components requiring routine maintenance.

    c. Service and maintenance access and access doors shall not be blocked by conduit, sprinkler lines, cable trays, ceiling hangers, etc.

    d. Access to valves and other devices shall not be blocked or restricted by conduit, sprinkler lines, cable trays, hangers, supports, etc. Access is to be provided to allow for future replacement of any valves and other devices.

    e. VAV on-board ΔP sensing pneumatic tubing shall have “tee” fittings installed such that a manometer can easily be connected. The open port on each “tee” fitting shall be capped with a soft cap.

3. Installations of new equipment shall be reviewed and approved by Chief Engineer prior to closing up ceilings.

F. Air System Design.

1. Primary-air ductwork upstream of VAV terminal units:

    a. All taps into primary-air duct to VAV terminal units shall be conical or at 45 degree.

    b. No flexible duct is allowed upstream of VAV terminal units. Duct sizing for duct from taps of mains to VAV terminal units shall be as follows:

        1) For runs less than 5 equivalent feet in length, primary-air ducts to VAV terminal unit inlet shall be the VAV terminal unit inlet size.

        2) For longer runs, primary-air ducts shall be sized at no more than 0.25” per 100 feet friction rate. Where primary-air duct supply to VAV terminal unit is larger than VAV inlet, provide sheet metal transition with taper at inlet with maximum 15 degree angles, minimum 18” long.

2. VAV terminal unit supply-air Ductwork and fan-coils and all return air and exhaust air ducts:

    a. Flexible duct shall insulated and be limited to 6 feet in length.

    b. Duct sizing:

        1) Sheet metal ducts shall be sized for average friction rates below 0.1" per 100 feet.

        2) Lined ducts and flex ducts shall be sized for no more than an equivalent of 0.08" per 100 feet friction rate (i.e., select size assuming a smooth duct using a ductilator at 0.08"/100 ft; actual pressure drop will be higher due to roughness.)

3. Air outlet balancing shall be through volume dampers located at the upstream end of the flex duct connection to the outlet or duct/plenum tap or at spin-ins at VAV terminal unit plenum. Where dampers are inaccessible, such as at drywall ceilings, use remote operated balance dampers control devices as approved by Owner; such as Young's Regulator model 270-301EZ concealed ceiling control.

4. Diffusers and return air grilles.

    a. Either perforated face, round, or flow bar.

    b. All zones:

        1) For supply-air use Titus models: PSS-DF, OMNI-AA, R-OMNI, 300FS, 300RS; or Owner approved equal.

        2) For return-air use Titus models: PDR, 350RL, 350FL, 300FS, 300RS; or Owner approved equal.

    c. Interior zones:

        1) In open interior offices, supply air shall be distributed evenly using no more than approximately 200 CFM per outlet.

        2) Return air grilles shall be provided in suspended ceilings in enclosed rooms to ensure that return air has an adequate path back to the respective mechanical room. Door undercuts shall not be used when considering that return air paths are adequate.

        3) Return air through full height (slab-to-slab) partitions. Transfer ducts shall be provided to ensure return air paths remain open from each space to the main return air transfer ducts at each mechanical room. Return-air grilles and transfer ducts cannot be obstructed by other ducts, piping, conduits, hangers, etc.

    d. Acoustical partitions: Provide lined transfer ducts or boots.

    e. Rated corridors: Extend return air duct over corridor without openings so no fire/smoke dampers are required.

f. Velocity through un-ducted plenum return/transfer elements shall not exceed 300fpm.

1.5 Hydronic System Design

A. Heating Hot water system.

1. Heating hot water risers are located in each floor mechanical room.

2. Hot water system shall be variable flow using two-way modulating control valves. Three-way valves are not allowed except a single valve per riser on the 2nd floor at the farthest point of each mechanical room's floor loop.

3. Reheat coils flow rates shall be selected based on design temperatures above.

B. Closed Circuit Condenser Water system.

1. Tenant shall provide Owner with calculated loads on base building condenser water system; and obtain Owner approval to tie into condenser water system prior to connecting additional loads.

2. Open circuit condenser water risers are located in each floor mechanical room. One closed loop condenser water riser is located in the center of the building. At tenant's option, open circuit condenser water systems may be converted to closed circuit with tenant supplied heat exchanger(s), pump(s), and water treatment system including make-up water connection with approved backflow preventer and usage meter, chemical bypass feeder, and coupon rack with 5GPM automatic flow restrictor located in a floor mechanical room.

a. The closed loop condenser water system provides approximately 20 Tons of cooling capacity per floor for Tenant supplemental cooling. Consult with Building Management for existing available capacity.

b. The open loop condenser water system provides approximately 20 Tons of cooling capacity per each mechanical room. Consult with Building Management for existing available capacity.

c. Tenant installed closed-loop heat exchangers shall have Owner approved BTU meter installed on open loop condenser piping.

d. Contractor shall provide and integrate BTU meter into base building ALC BMS.

e. Contractor shall create BMS reporting capability for BTU meter data as approved by Owner.

f. Condenser water flow rates shall be selected based on design temperatures above.

g. All equipment that is directly connected to the open loop condenser water system shall have a strainer installed in the equipment's condenser water

supply piping. Strainers shall have blowdown connection including ball valve, hose connection, and cap chained to valve.

h. Piping shall be sized as follows:

Size	Max GPM
½"	1.5
¾"	4.6
1"	8.9
1¼"	15
1½"	24
2	51

C. Routing.

1. Piping shall not be run over server rooms, telecomm rooms, etc. where leaks can damage electronic equipment.

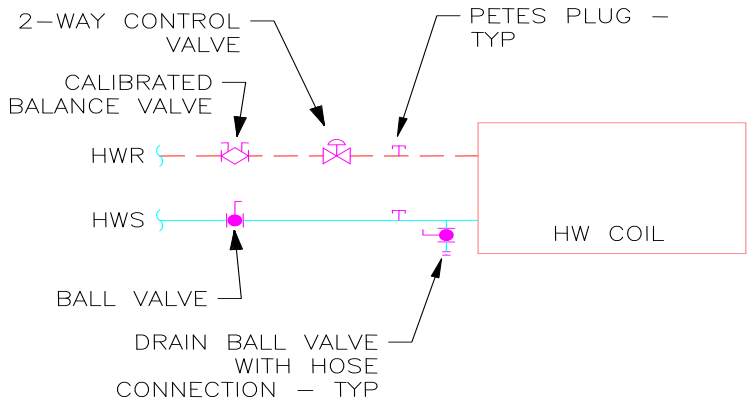
2. Piping shall not be run through electrical rooms even where above ceilings.

3. Piping shall not block service access, equipment components, or electrical clearances to equipment and shall not run under equipment or electrical junction boxes.

4. Flexible stainless steel hose kits shall be used on water-cooled AC units/heat pumps for vibration isolation. Hose kits are not allowed on VAV terminal unit hot water coil connections.

5. Piping details shall be as shown in figures below unless otherwise authorized by Owner.

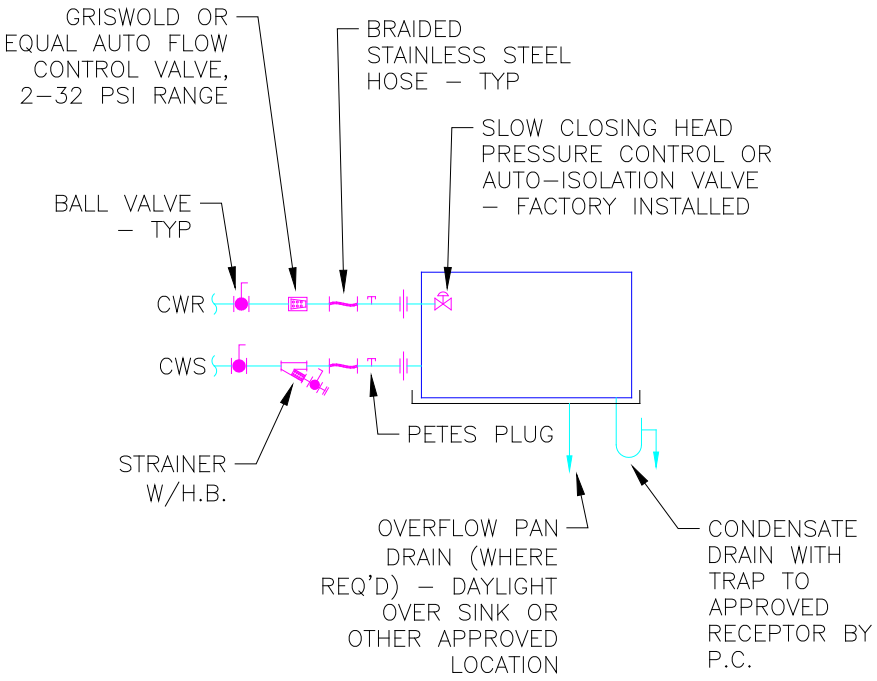
a. HW reheat coil piping:



1) It is allowed to use a combination valve assembly such as the Flow Design Inc. model UA or UB with included NPT union connections and optional pressure/temperature ports, and manual air vent on the return water side. Model UA or UB with included NPT union connections and optional

pressure/temperature ports, and hose end drain on the supply water side. Approval by Owner is required prior to installation.

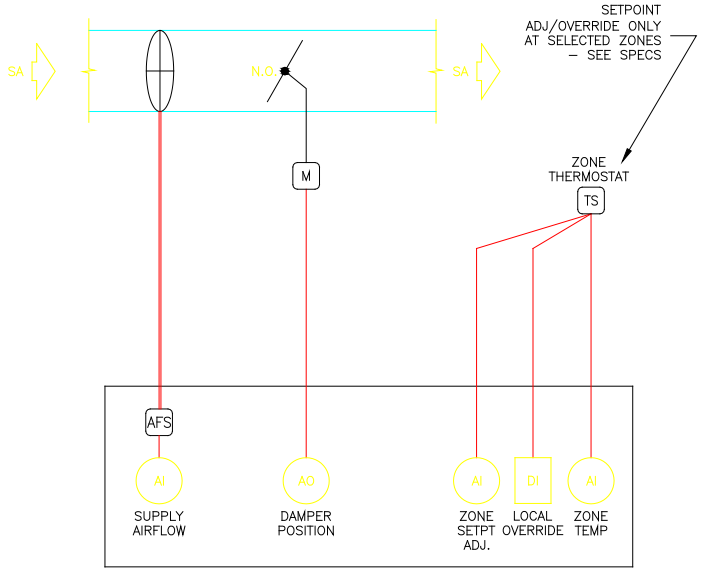
b. Supplemental AC unit/heat pump piping:



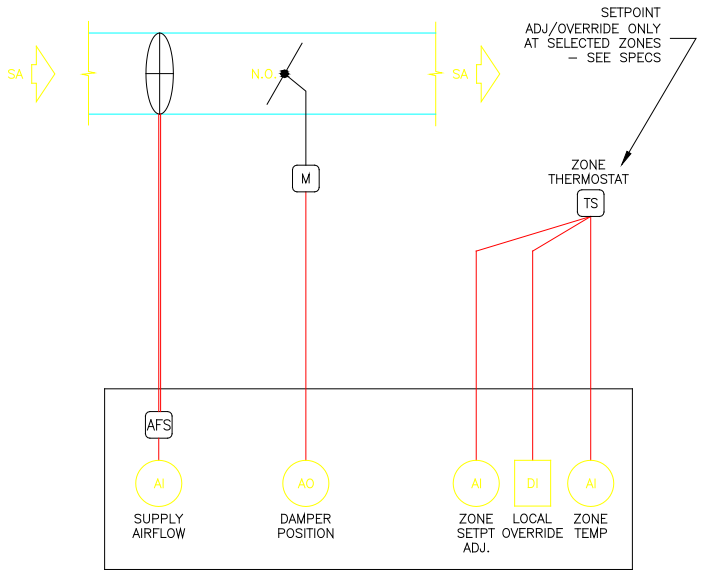
D. Digital Controls.

1. Minimum control points shall be as indicated in the following schematics:

a. VAV cooling only terminal unit:



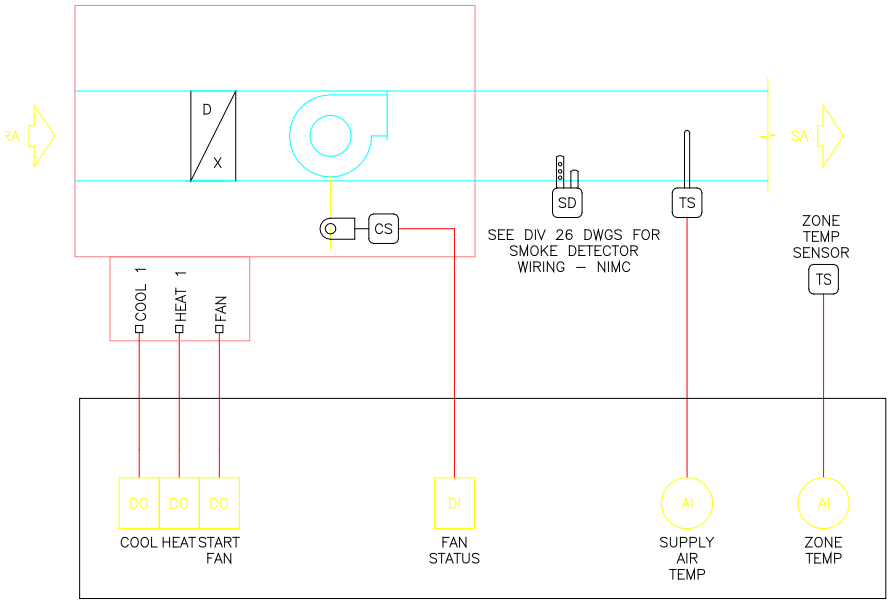
b. VAV reheat terminal unit:



1) BMS DDC controls to include supply-air temperature sensor located in the downstream supply-air plenum of the VAV air terminal unit, a minimum 4' downstream of reheat coils.

2) A CO2 sensor shall be installed and connected to VAV box controller for demand controlled ventilation in all rooms with occupancy 25 people or more per 1000 ft² (40 ft² per person) except rooms with 6 or fewer people.

c. Hydronic heat pump or supplemental AC unit:



2. Contractor shall identify, by air terminal unit ID, the worst case zone in need of mechanical heating and the worst case zone in need of mechanical cooling; for each isolation zone. This information is to be displayed on a graphic page. An isolation zone is defined as all of the air terminal units served by one McQuay floor unit.

3. Contractor shall exclude from program logic all program logic strings that are not actively utilized by the equipment that they reference. As an example; a cooling-only VAV air terminal unit will not have any reference to mechanical heating logic in its programming logic.

4. Zone Temperature sensors shall have:

    a. Communications port for field service.

    b. Button for after-hours override capability. See after-hours HVAC override control sequences described in part 3 of this Division

    c. No temperature display, no local control in public areas and open offices.

    d. No Temperature display, set point adjustment (limited), in conference rooms

    e. Insulation shall be installed on backside of temperature sensor housing when installed on bare or painted concrete.

1.6 SUBMITTALS

A. Prior to commencing work, mechanical Vendor shall assist General Vendor in submitting to Landlord required documentation including following.

    1. Landlord approved construction documents.

    2. Construction permit.

    3. Include City and Fire Department variations granted for Project.

B. Mechanical Vendor shall submit a written request and schedule for disruptions to buildings services no less than 72 hours in advance.

C. Vendor shall review equipment and material submittals prepared by suppliers, verify compliance with Construction Standards, mark copies as acceptable, and submit to Architect. After Architect's approval, submit three (3) sets of approved documents to Landlord and Engineering Department.

D. Project Closeout Submittals: Prior to Landlord final inspection and acceptance of construction, Vendor shall be required to provide following documentation to Landlord.

    1. Two complete sets of operating, maintenance and installation manuals.

    2. One set of complete, reproducible as-built (and CD with latest CAD version) drawings including control and wiring diagram: Drawings shall contain key map of

floor with tenant location and summary of CFM and GPM used from base building systems.

3. Two (2) bound air and water balance reports approved and stamped by Mechanical Engineers. Balance reports shall include:
   a. Variable air volume box address for reference.
   b. Detailed readings for each outlet for each VAV balanced including design and actual readings (both minimum and maximum).
   c. The size and flow coefficient of each VAV box.
   d. Supply and return water temperatures and flow rates.
   e. Where applicable, heating hot water flow and discharge air temperature at maximum heating.
   f. Floor plan of space balanced showing box and outlet locations.
4. All equipment including, but not limited to, heat pumps, VAV boxes, exhaust fans, etc. shall be labeled consistent with existing label system.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Ductwork:

1. General: Ductwork shall be low pressure (0.06" per 100') galvanized sheet metal in accordance with latest edition of the SMACNA duct manual and ASHRAE guide.
   a. Seal transverse and longitudinal joints of ductwork to comply with SMACNA
   b. Seal duct joints using hard cost PS-S tape or DT tape and HD-20 adhesive as recommended by manufacturer.
2. Flexible Ducts: Thermaflex or Genflex flexible sound absorbing ducts with outer plastic liner, R-4 insulation, helical support wire and scrim cloth inner liner. Liner shall be black.
   a. Flexible ducts shall be UL Class I air ducts shall comply with UL-181, NFPA 90A and 90B, and shall be approved by the City of San Francisco maximum flexible duct length shall be 6'-0" and no more than one long radius 90 degree elbows shall be allowed.
   b. Flexible duct may be used at end of runs only.
3. Seismic Flexible Duct: Same as flexible ducts. Provide at round duct crossing building seismic joints. Length of duct to be determined by the seismic joint displacement.
4. Kitchen Hood Exhaust Ducts: Grease ducts serving a Type I hood shall be No. 16 gauge steel or No. 18 gage stainless steel as required by duct size in accordance with San Francisco codes and California Mechanical code.
   a. Continuously weld longitudinal joints.

b. Weld all transverse joints and reinforcing angles.

c. Do not cross-break bottom panels of duct.

B. Air Terminal Units:

1. Single Duct, Variable Air Volume Terminal Units:

a. Manufacturer:

1) (e.g. Titus Model ESV-3000) or approved equal.

b. Casing: Minimum 22 gage galvanized steel, internally lined with 1" thick dual density glass fiber insulation that complies with UL 181, NFPA 90A, and ASTM G21 and G22.

1) Casing Air Leakage: Not more than 2% at 3" W.G. static pressure.

c. Damper: Heavy gage steel with shaft rotating in Delrin or bronze oilite self-lubricating bearings.

1) Shaft shall be clearly marked on end to indicate damper position.

2) Damper shall have mechanical stops to prevent overstroking, and synthetic seal to limit close-off air leakage to maximum of 3% at 3" W.G. static pressure.

3) Terminal units shall be capable of normal operation at minimum of 0.75" static pressure.

d. Due to building capacity and systems, use or reuse of installed building VAV's must be coordinated with Chief Engineer.

e. Provide 8 feet minimum acoustically lined (1" duct liner) plenum downstream of all VAV terminal units.

2. Actuators and Controls: Provide digital electronic actuators, flow analyzers and controls as required.

a. Units shall be field adjustable.

b. Temperature sensors shall have communications port for field service, no temperature display, no local control, and compatible with existing control system.

c. All building automation system work to be performed by Sunbelt Controls to match operations and graphic interface of existing building. Contact:

Vendor Name: Sunbelt Controls
Street Address: 1133 Aladdin Avenue
City, State, Zip: San Leandro, CA 94577
Telephone #: (510) 346-4300

3. Communication wiring to be routed to match existing. All new VAV terminal unit installations require a connection to an existing or new LAN trunk as well as a

control power circuit. Field verify existing conditions and design to meet Tenant requirements.

4. Reheat Coils: Reheat coils shall be made of seamless copper tube with aluminum fins mechanically bonded to coils and shall be rated for required working pressure at floor on which they are installed. (Minimum 2 row coil is required).

    a. Install to meet manufacturer's recommendations.

C. Air Outlets:

1. Supply Air Outlets: New air outlets shall be 24" by 24" perforated face ceiling diffusers with square neck and integral dampers.

    a. Provide round to square transitions if round duct is used.

    b. Manufacturer:

        1) Titus PSS-DF or Building Standard for narrow tee ceiling system.

        2) Titus R-OMNI, 300FS, 300RS or building standard for open ceiling areas.

    a. New linear slot diffusers shall be Titus FlowBar 300FS, 300RS; or Landloard approved equal.

    c. or Building Standard with 1" slot for narrow tee ceiling system.

2. Return Air Outlets: New return air outlets shall be 24" by 24" perforated face ceiling grille with 22" by 22" neck.

    a. Manufacturers:

        1) Titus PDR, PXP-DF; or Owner approved tee ceiling system.

        2) Titus 350RL, 350Fl; or Owner approved equal for return-air grille

    b. New and reused perforated face grilles shall be provided with flex duct.

    c. Interior of diffuser to be black.

3. Kitchen Air Outlets: New supply, return and exhaust air outlets located within kitchen area shall be constructed of aluminum of same types as noted above.

D. Duct Specialties:

1. Flexible duct connections are to be Vent-Glas by Vent-Fabrics, Inc. Install at AC units or ceiling fans to maintain not less than 2" metal to metal separation.

2. Turning vanes are to be Double thickness, air foil type.

3. Duct Access Doors are to have Ruskin/Model ADH 22.

4. Concealed Damper Regulators are to be Ventlock Model 677 with miter gears and rod attachment, as required.

E. Dampers:

1. Balancing Dampers shall be as follows:

   a. Provide single or multi-blade balancing dampers constructed per SMACNA/ASHRAE recommendations.

   b. Provide hand locking quadrant and install where required for proper operation. Provide ribbon at each damper for easy identification.

2. Fire Dampers to be UL listed and California Fire Marshal approved and shall comply with the latest UL and Fire Marshal testing criteria.

   a. For supply Air, Fire Damper shall be (e.g. Ruskin DIBD2 style B, 100% free air) or approved equal.

   b. For Return Air, Fire Damper shall be (e.g. Ruskin DIBD2 style B, 100% free air) or approved equal.

3. Combination Fire/Smoke Dampers (FSD) are to be as follows:

   a. California Fire Marshal approved, UL listed per UL 555 and UL 555S leakage Class I and 350°F elevated temperature rating.

   b. Heavy 13 gauge equivalent frame construction.

   c. Low pressure drop airfoil blades.

   d. Firestat.

   e. Damper electric actuator, power open – fail close type, heavy duty, low noise and non-stall type.

   f. Manufacturers:

      1) (e.g. Ruskin FSD60) or approved equal.

   g. FSD shall be installed with remote position indicating contacts wired to report back to Life Safety Panel.

F. Water Source Heat Pump Units:

1. Manufacturer

   a. Florida Heat Pump: EC Series R-410A.

   b. Liebert Mini-Mate2, to be used only for computer room supplemental cooling.

   c. Or Building Approved model.

2. Units shall be horizontal mounted, 277/480v.s

3. Factory assembled packages to be completely piped, wired and charged with refrigerant requiring only power, control, and piping connections.

   a. Heat Pumps shall be of extended range model for 45 - 90 degrees F entering condenser water.

b. Unit shall include a sound insulating liner around entire unit with 1 ½ inch thick sectional panels for access. To meet all codes for fire rating.

4. Ratings: UL Listed, ARI certified, to meet (e.g. Title 24) or to code energy regulations.

5. Sound Power Levels: Selected to conform to ASHRAE guidelines for office occupancy.

6. Thermostat: Match building standard

7. Pressure rating shall be as required by location.

8. Provide secondary drain pan with connection routed to conspicuous location. Pipe primary drain to nearest condensate drain riser, coordinate routing with Chief Engineer or designee. Provide condensate pump for primary drain and condensate overflow switch kit as part of manufacturer's package when location of unit does not allow proper drainage to Risers.

   a. Coordinate pump location with Chief Engineer or designee.

   b. Overflow secondary drain shall be white with escutcheon where it penetrates ceiling.

G. Fans: Cook, Greenheck, or Penn-Zephyr ceiling exhaust fans with electronic volume regulator.

1. Sound power levels shall be selected to conform to ASHRAE guidelines for office occupancy.

2. Kitchen Hood Exhaust: UL 762 listed for grease removal. Provide drain connection with grease trap and vented roof curb.

H. Pipe and Pipe Fittings: Piping shall conform to ASTM and be free of defects. Pipes and pipe fittings shall be manufactured domestically.

1. For Condenser and Heating Water Use: Type “L” hard drawn pressure pipe copper with 95/5 or other lead free solder and wrought copper fittings.

2. For Condensate Drain Pipe Use: Copper type M, ASTM B88, wrought copper fittings, soldered joints.

I. Valve and Piping Specialties

1. Dielectric Nipples and Unions:

   a. (e.g. Epco) or approved equal, rated for minimum 210 °F temperature.

2. Valves: The use of gate valves is not permitted.

   a. Manufacturers:

      1) NIBCO.
      2) Crane.

3) Stockham
4) Grinnell.

b. Hand valves 1/2" through 2" are to be full port ball valve, threaded, 2-1/2" and above are to be butterfly, lug type with infinite throttling and memory stop handle.

c. Balance valves 1/2" through 2" are to be Ball valves, 2-1/2" and above are to be plug valves.

d. Flow Balancing Device is to be (e.g. Bell & Gossett) or Building Standard circuit setter. (Pressure rating as required.)

e. Condenser water loop shall be equipped with (e.g. Griswold) or Building Standard pressure independent flow control valves.

f. Thermometers and Wells are to be (e.g.Weksler Model 5AA, 5”) or Building Standard diameter, with appropriate temperature scale according to application. (Pressure rating as required.)

g. Pressure gauges are to be (e.g. Weksler EA14 or equal, 4-1/2") or Building Standard diameter. (Pressure rating as required.)

h. For Temperature and Pressure Test Station use Peterson Engineering Company, 1/4" or 1/2" MPT "Pete's Plug" with solid brass fitting cap. (Pressure rating as required.)

i. Air Vents are to be (e.g. Lunkenheimer #1778 - 3/8") or Building Standard manual. (Pressure rating as required.

j. Strainers are to be (e.g. Muessco, Armstrong "Y”) or Building Standard pattern with blow-off hose valve and hose adapter. (Pressure rating as required.)

k. Seismic Fittings: (e.g. MetraFlex/MetraLoop) or Building Standard with copper sweat end fittings. Provide at pipe crossing building seismic joints. Model number to be determined by seismic joint displacement.

J. Pipe and Ductwork Insulation:

1. General: Comply with State Code of Regulations, (e.g. Title 24) or code energy regulations.

2. Manufacturers:

a. Owens-Corning Fiberglass.
b. Knauf.
c. Manville.
d. Certain-Teed.

3. Ductwork Insulation: Glass fiber, flexible, non-combustible blanket with vapor barrier jacket bonded to aluminized foil.

4. Ductwork Liner: Glass fiber liner, flexible, non-combustible blanket with permacote coating, ASTM G21 and G22.

5. Pipe: Fiberglass, rigid and pre-molded, non-combustible, with all-service jacket with self-sealing longitudinal laps and butt strips.

6. Pipe Insulation Protection Shield: Waterproofed hydrous calcium silicate insulation impregnated with silicon solution, incased in a 360 degree, 18 gauge by 6" long galvanized sheet metal shield.

K. Identification:

1. Self-Adhesive Markers: W. H. Brady Co. or Westline Products.

2. Semi-Rigid Plastic Markers: Seton Name Plate Company.

3. Or Building Approved model.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Duct Installation: Install ductwork and dampers according to SMACNA standards. Ductwork shall be routed as tight to structure as possible. Provide ribbon at each manual balancing damper for easy identification.

1. Provide supports and seismic bracing per latest SMACNA Manual "Guidelines for Seismic Restraints of Mechanical Systems".

2. Combination Fire/Smoke damper shall be installed as required by City of San Francisco.

3. Fire dampers and Fire/Smoke dampers shall be installed according to California State Fire Marshal and City of San Francisco Fire Marshal and exactly as tested by UL to develop fire ratings.

a. Provide 18” by 12” minimum access doors in ductwork and furring.

4. Internal linings, flex ducts and adhesives shall be labeled in accordance with UL 181 Standard for Safety.

5. Provide return air grilles to allow free passage of return air above ceiling to mechanical room or return air shaft.

a. Strategically place return grilles to promote cross ventilation, even temperature distribution, and compensate for solar load. Coordinate locations with Chief Engineer or designee.

6. Provide return air openings using acoustically lined (1” duct liner) transfer air boots with ends turned up (with Fire Dampers, Fire/Smoke dampers, if required) in Tenant demising partitions.

7. Install air system to conform to ASHRAE recommended noise criteria for private offices. Noise criteria shall be based upon finishes of actual furnishings in Tenant space (partition, floor, furniture type).

8. Maximum flexible duct length shall be 6'-0" and no more than one radius 90° elbow shall be allowed. Flexible duct is only permitted for end runs.

9. Extend make up air ducts for electrical rooms so that they are ducted to a return grill inside the tenant space.

10. Extend make up air duct from restrooms so that it is tied to interior VAV box and a return grill inside tenant space. Balance distribution of air so that it does not create an excessive negative pressure condition in public restrooms.

11. Kitchen Hood Exhaust Duct:

    a. Installation shall be in accordance with latest versions of State of California Mechanical Code, NFPA, and City of San Francisco requirements.

    b. Provide access doors at each change in direction and at intervals to provide for adequate inspection and cleaning.

    c. Slope duct minimum 1/4" per foot down toward hood. For horizontal duct exceeding 75 feet in length, slope duct a minimum 1" per foot down toward hood or an approved grease reservoir.

    d. Duct from point of penetration of ceiling, wall or floor to outside air shall have a fire-rated enclosure to be provided by the General Vendor.

    e. Seal duct enclosure around duct and vent to outside through weather protected openings.

    f. Separate enclosure from duct by at least 3” and not more than 12”. Enclosure shall serve single grease exhaust system.

B. Piping Installation: Piping, joints, valves, piping specialties, pump casings, AC unit coils, etc. shall be suitable for the building pressure zone at floor on which they are installed.

1. Vendor is to use superstrut or Grinnell hangers and structural attachments. Install properly braced for seismic restraint and spaced as follows:

    a. ½" – ¾” for 5'-3/8” minimum rod size
    b. 1" – 1 ¼” for 6’-3/8" minimum rod size
    c. 1 ½" - 2" for 8'-3/8" minimum rod size
    d. 2 ½" - 3" for8’-1/2" minimum rod size

2. Use cadmium plated or galvanized hangers, attachments, rods, nuts, bolts, etc.

3. Do not burn or weld structural members without Chief Engineer’s approval.

4. Provide Mechanical Seals for all piping going through fire rated walls, floors or concrete slabs. Any other method requires Chief Engineer’s prior approval.

C. Duct and Piping Insulation: Wrap unlined sheet metal supply and return air ducts with 1-1/2" thick duct wrap with reinforced foil facing, fiberglass RFK 75 insulation. Owens Corning, Mansville, or Certain Teed.

1. Provide acoustical 1" lining 10' minimum downstream of all AC units and 5' upstream and downstream of conference exhaust fans.

2. Insulate condensate drain lines with 1" premolded fiberglass with ASJ.

3. Insulate condenser water lines above computer and other critical areas.

4. Insulate heating water pipes in accordance with Title 24 requirements.

D. A. C. Unit and Heat Pump Installation: See Diagram 4.01 for details.

1. Air conditioning units and heat pumps shall be installed above non-critical areas and above readily accessible ceilings (storage rooms, etc.).

2. Provide adequate access for filter removal, inspection of moving parts, and controls.

3. AC units and heat pumps shall be supported with vibration isolation hangers and shall be seismically braced. (Use Building Standard, Vibration Isolators, size as required.)

4. Pipe condensate drain line, with vent, to nearest condensate riser as directed by Chief Engineer or designee. Do not trap pumped condensate lines.

5. Provide ducted return for all AC units for all server or equipment rooms.

6. All Supplemental HVAC and/or heat pump shall be metered separately for 24/7 metering.

E. Access Requirements: Provide and coordinate installation of access panels required for maintenance and inspection of all valves, dampers and equipment (including base building).

1. Provide access panels for all items of equipment.

2. Coordinate exact location and type of access door/panel with Chief Engineer.

3. Color code with building standard color labels all HVAC access location ceiling tiles.

F. Controls:

1. Air conditioning units and heat pumps shall be started/stopped by building standard programmable thermostats provided by installing Vendor.

2. VAV terminal units shall be controlled by Automated Control Logic (Or compatible equivalent) thermostats, to match existing.

   a. Do not locate interior zone thermostats in conference rooms, computer rooms or other rooms with unusual heat gain patterns unless these rooms are served by their own dedicated VAV terminal unit.

   b. Locate thermostats 4'-0" above finished floor.

1. Thermostats shall comply with (e.g.Title 24 or California requirements) and Shall be an element contained within a ventilated cover, suitable for wall mounting, with insulated base.

1) Sensor shall be hard wired. Wireless sensors are not permitted.

2) ZS Standard: Blank faceplate.

3) ZS Plus: Override button and temperature set point slider adjustment.

c. Coordinate thermostat location with Chief Engineer or designee.

d. Communication cabling (LAN Trunk) shall contain no T-Taps**.** All terminal unit communication lines will be connected in parallel (daisy chained) up to a maximum of 33 TECs per LAN trunk (3 LANS per FLNC per floor).

e. When terminal units are added or relocated, communication trunk and control wiring will be rerouted to match existing installation (atop branch duct, back to medium pressure loop and back out to new branch). No spider webbing is allowed.

f. Control Power to be fed from transformer panel at electrical closet. Limit of six (6) TECs per transformer. Match existing installation.

g. Consult with engineering Department for clarification. Failure to match building standard installation will result in rewiring at Vendor's expense.

3. Select control valves for VAV terminal units based upon maximum pressure drop available for branch piping at branch tees.

4. Duct smoke detectors shall be provided by Siemens. Wiring to be provided by Division 16 supervised by Life Safety System representative. Coordinate installation and connection with Life Safety System representative and Division 16.

a. AC units and heat pumps handling 2,000 cfm or more shall have a smoke detector in supply air duct. Upon smoke detection, smoke detector shall turn AC unit or heat pump off and annunciate at fire alarm panel.

b. AC units and heat pumps handling less than 2,000 cfm shall be automatically shut off upon floor alarm. Restart sequence shall be automatic upon reset of alarm device.

5. New fire/smoke dampers shall not interfere with Life/Safety Smoke Control System Operation.

G. Inspection by Engineering Department: Vendor shall notify Landlord in writing at least one week in advance of completion of construction.

1. A walk-through and punch list shall be scheduled for Chief Engineer to review installation for conformance with approved construction documents and Tenant Construction Standards Prior to ceiling close.

3.2 ADJUSTING AND BALANCING

A. Testing and balancing shall be performed by an independent third party balancing Vendor and shall be in accordance with AABC and NEBB Standards.

1. Balancing Vendor shall bring equipment including hand tools, ladders, hardware, and software, and make connections to properly balance electronic VAV controls.

2. Balancing Vendor to check in the Chief Engineer prior to commencing any balance work.

3. Balancing Vendor shall also coordinate with Chief Engineer to enter set points and balancing values into Building Energy Management System (BEMS).

4. Balancing Vendor to notify BEMS Vendor that values are entered and complete so that changes can be backed up and saved permanently.

B. After systems are complete and operating, Vendor shall submit to Chief Engineer preliminary air and water balancing report indicating CFM and GPM at connections to the base building systems, and gross CFM and GPM at main duct branches, reheat coils, AC units, and heat pumps.

1. Quantities shall be marked on reduced size Construction Document Drawing. At Chief Engineer's request, Vendor shall submit other preliminary measurements required.

C. Before final air and water balancing, Mechanical Vendor shall complete following tasks:

1. Complete water pressure testing for leakage.

2. Complete all "punch list" items.

a. Install dampers and other balancing devices.

b. Check AC units, heat pumps, and VAV terminal units.

c. Set manual balancing dampers, valves, and balancing valves at 100%, open position. Verify combination fire/smoke and fire dampers to be open.

d. Clean ducts and install filters.

e. Calibrate control systems.

3. Balance air to following tolerance:

a. Each Outlet: ±10%

b. Each Room with Multiple Outlets: 0% to ±10%

c. Each system: 0% to ±10% of system CFM.

4. Upon completion of balancing of new work and existing portions of system, provide to Chief Engineer a copy of handwritten test data to be used for final report. Copy is to be delivered to Chief Engineer prior to Balancing Vendor leaving premises.

a. Balancing Vendor is to review report with Engineering Department representative and point out discrepancies found while conducting test and balance. Copy is to be delivered to Chief Engineer prior to Balancing Vendor leaving premises.

b. Work to be accomplished per above criteria and AABC and NEBB Standards.

5. Upon satisfactory completion of balance and operation test, submit two sets of reports to Chief Engineer on final readings (bound 8-1/2" by 11" AABC format). Balance report is to include, but not be limited to:

a. Variable air volume box address for reference.

b. Detailed readings for each outlet for each VAV balanced, including design and actual readings (both minimum and maximum).

c. The size and flow coefficient of each VAV box.

d. Where applicable, heating hot water flow and discharge air temperature at maximum heating.

e. Floor plan of space balanced showing box and outlet locations.

D. Identification:

1. Equipment Identification: Identify AC units, heat pumps, exhaust fans and other mechanical equipment by attachment of approved nameplates with respective functional names and symbols as used in Drawings and Schedules.

a. Permanent ink markers are not allowed for identifying equipment. Permanent ink markings on equipment shall be removed before requesting Owner acceptance.

b. Identification tags are to be black plastic with engraved white lettering. Tags are to be mechanically fastened to equipment. Lettering is to be a minimum of ½". On air terminal units the ID tags are to be located on unit next to BMS controller; or as Chief Engineer approves.

c. Coordinate identification (tags and nomenclature) with Chief Engineer.

d. Coordinate identification numbers with Chief Engineer or designee for new and relocated VAV boxes.

2. Piping Identification: Identify content and direction of pipelines and branches (except hose in accessible spaces).

a. Use either self-adhesive markers or semi-rigid plastic (snap-on) markers equal to "Setmark" pipe markers.

b. Apply legends, bands and arrows at intervals of not over 50 feet.

c. Apply within 5 feet of each side of wall, slab and ceiling penetrations and within 5 feet of valves and changes in direction.

d. Coordinate identification (colors and nomenclature) with Chief Engineer.

3.3 BEMS INTERFACE

A. Building Energy Management System (BEMS) Vendor shall commission all Terminal boxes and other related equipment included in Tenant Construction.

1. Upon completion of air and water balance, BEMS technician will conduct upload from all new Controllers to the Main Control Module (MCM) so that entered data is backed up and reloadable in case of TEC failure or memory loss.

2. Tenant Data Closets – All Tenants with water-cooled air conditioning systems within their space are to furnish and install a building standard leak detection sensor(s) that is connected to the building's leak detection system AND provide

manual shut-off valves to be able to stop the flow to their individual system(s). The shut-off valves are to be easily accessible without a ladder. Cross-reference Plumbing Section 1.1 Summary.

3. Tenant Kitchen Equipment – All Tenants are to furnish and install a building standard leak detection sensor in locations within the kitchen that will sense leaks that occur from any source that uses water which includes but is not limited to; refrigerators, dishwashers, coffee makers, filter systems, etc. Consult Chief Engineer for sensor specifications and where sensors should be located. Cross-reference Plumbing Section 1.1 Summary.

4. Private Restrooms – All Tenants are to furnish and install a building standard leak detection sensor(s) in any private restrooms within their space. Each sensor shall be connected to the building leak detection system for monitoring. Consult Chief Engineer for sensor specifications and where sensors should be located. Cross-reference Plumbing Section 1.1 Summary.

5. BEMS technician will check communication to all new equipment and verify proper application, operation and equipment designation number. BEMS addresses for Controllers are to match number assignment on the field and field labels.

6. A floor graphic interface shall be amended or developed showing area serviced by new equipment on the floor in which it is located. Match design of existing BEMS graphics.

    a. Use architectural CAD drawing of Tenant Construction Space as a background.

    b. Floor graphic shall have a link back to the Main Directory Graphic at upper left corner.

    c. Floor graphic shall have links to a graphic for each Controller on the floor. All Controller links are to be labeled to match equipment designation number.

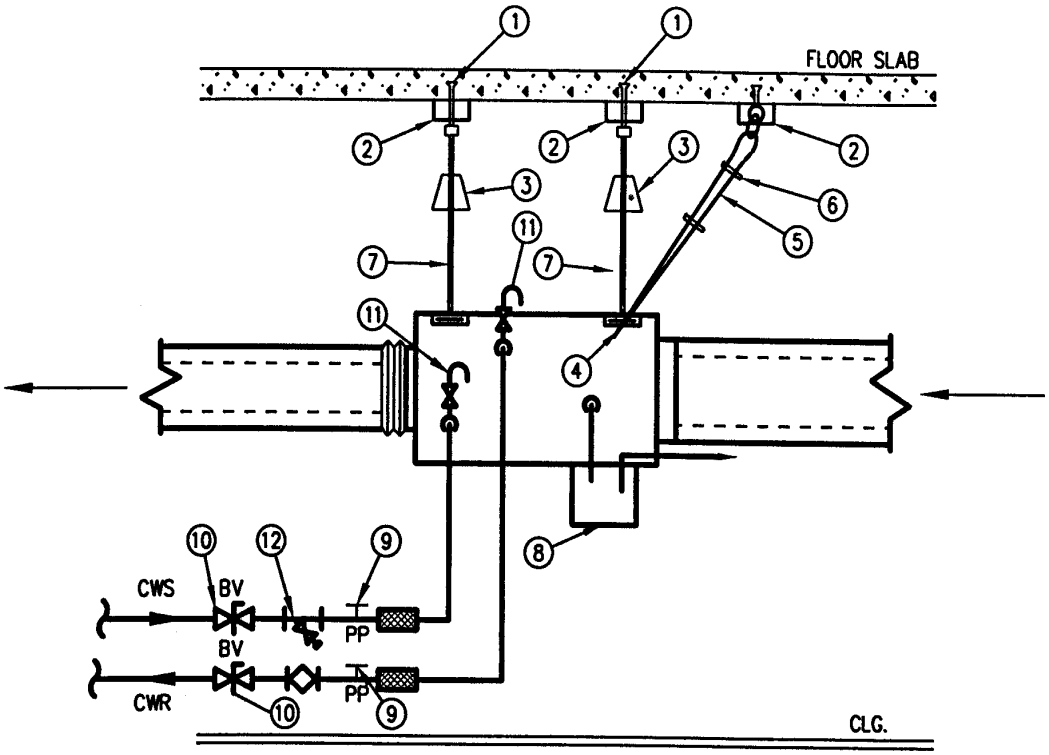
    d. Use contrasting colors to better depict demarcation lines for each area served on floor by Controllers.

    e. Graphics interface to be completed and operational by Tenant move-in date.

    f. Coordinate access to BEMS front end and graphics installation with Building Chief Engineer or designee.

END OF SECTION

4.01 – AC UNIT/HEAT PUMP INSTALLATION DETAIL



4.01 – AC UNIT/HEAT PUMP INSTALLATION DETAIL

NOTE: ALL SUPPORT COMPONENT SIZES AND MINIMUM BOLT EMBEDMENT SHALL BE BY MANUFACTURERS INSTRUCTIONS OR CALCULATED BY A REGISTERED STRUCTURAL ENGINEER BASED ON UNIT WEIGHT.

1. HILTI KWIK-BOLT
2. UNISTRUT OR "L" ANGLE IRON
3. MASON VIBRATION ISOLATORS
4. "Z" SHAPED BRACKET
5. SEISMIC BRACE CABLE (TENSION CABLE ONLY TO REMOVE SLACK)(TYPICAL OF 4)
6. U-BOLT CLIPS
7. THREADED ROD (TYPICAL OF 4)
8. CONDENSATE PUMP
9. P.P. – PETE'S PLUG
10. B.V. – BALL VALVE
11. AIR VENTS AT SUPPLY AND RETURN HIGH POINTS
12. STRAINER WITH BLOWDOWN VALVE AND HOSE ADAPTER WITH CAP

ELECTRICAL

Electrical

PART 1 - GENERAL

1.1 SUMMARY

A. Electrical work for Tenant; work shall depend upon actual alterations and improvements to be performed. However, a minimum scope of work for a typical tenant shall include functions specified in this section.

1. Demolish and remove from premises all equipment, wire and raceway that are not to be reused in the new design. Wiring demolition shall be taken back to panelboard and removed, including neutrals.

2. Extend existing and provide new branch circuit wiring with conduit and/or wiring, manufactured wiring system, or a combination of both.

3. Re-label breaker panel circuit directories at end of Project to indicate what each breaker serves.

a. Directories shall be typed or computer generated. Hand written directories are not acceptable.

b. Directories shall be specific to areas served. Description to be specific to the use of the room and also state the architectural room number.

4. Excessive power usage, such as welding and dehumidifying, is to be metered and charged to the construction project; coordinate with Landlord.

B. Related Sections:

1. Life safety system.

1.2 DEMOLITION

A. Clean existing materials and equipment that are to be reused. Report damage or defects to the Building Engineer.

B. Luminaires: Remove existing luminaries for cleaning. Use mild detergent to clean all exterior and interior surfaces, rinse with clean water and wipe dry. Replace lamps, ballasts and broken electrical parts.

C. Disconnect and remove all abandoned conduit wiring and equipment. Floor monuments that are capped shall have associated conduits, pull boxes, and wiring at floor below removed back to source.

D. Disconnect and remove all abandoned conduit, telephone/data cabling. Floor monuments that are capped shall have associated conduits, pull boxes, and cabling at floor below removed back to source.

E. Disconnect and remove abandoned panelboards and J-boxes.

1.3 SYSTEM DESCRIPTION

A. Base Building Systems: Building is served by PG&E from underground utility power via 12kV feeders brought to the (2) PG&E transformer vaults in the basement. The electrical distribution within the building consists of the following:

1. The main 480V service switchgear in the basement distributes (5) circuits in the basement. Three of these 480V services are for office loads on floors 2 through 11, one 480V service for ground level retail, and one 480V service for the electric fire pump in the basement. Each of the (4) 480V services for office and retail spaces has a dedicated bus duct system.

2. Each of the (3) office space 480V services contains a 4000 amp power circuit breaker that feeds a busway extending from the basement to the upper most floor of the building via the east, central and west electrical rooms. Busway is 4000 amp rated at 277/480 volt, 3-phase, 4-wire. The one retail 480V service contains a 4000 amp power circuit breaker that feeds an adjacent distribution section with three 800 amp circuit breakers. Each of these breakers extends service to retail distribution boards in the ground level east, central and west electrical rooms. Distribution boards are each 800 amp rated at 277/480 volt, 3-phase, 4-wire.

3. On floors 2 through 11 the busway is tapped at 400 amps in each of the three electrical rooms (west room only extends top 8th floor). The electrical rooms divide each floor into approximately 25,000 square foot zones. Each tap feeds a 42 circuits, 400 amp, 277/480 volt, 3-phase, 4-wire panel board for use in tenant lighting branch circuitry. Panels also contain one 200 amp, 3 pole circuit breaker for service to HVAC equipment in same zone and one 125 amp, 3 pole circuit breaker for service to 75 kVA K rated step-down transformer in same room. Each 480V bus duct disconnect switch shall be sub metered by an approved EMON DMON kWh sub-meter. Each EMON DMON sub-meter shall be linked to the base building EMON DMON sub-metering network.

4. The 75 kVA K rated transformers each serve 42 circuit, 250 amp, 120/208 volt, 3-phase, 4-wire panelboard with a 250 amp main circuit breaker. Panels contain throughfeed lugs and adjacent wall space for Tenants to add 2 to 3 more sections on same panel.

5. At the 3 electrical rooms on the Ground Level there is an 800 amps, 277/480 volt, 3-phase, 4-wire distribution board for service to retail Tenants. Each Tenant will be required to size their own service, add a circuit breaker to distribution board, extend a feeder from distribution board to their individual space, and install panelboards and transformers as required to accommodate the fit out within their space. Each service switch shall be sub metered by an approved EMON DMON kWh sub-meter. Each EMON DMON sub-meter shall be linked to the base building EMON DMON sub-metering network

6. For the emergency egress lighting and fire alarm/life safety system power required for Tenants, the core/shell has included a 42 circuit, 100 amp, 277/480 volt, 3-phase, 4-wire panel with 15 kVA stepdown transformer and a 42 circuit, 100 amp, 120/208 volt, 3-phase, 4-wire panel with 50 amp main circuit breaker, located in the 3 electrical rooms per floor, on floors 1, 4, 7 and 10 only. Each of these setups will serve the floor above and the floor below within their zones. This equipment is

tied to the building emergency generator for backup power. The base building emergency power generator is not available for Tenant stand-by power usage.

7. If the Tenant requires additional power from that described above, such as server rooms or commercial kitchens, the busway risers do have spare capacity. These increased load requirements should be reviewed with the Owner. If approved by the Owner, the bus way could be tapped and feeder extended to area of increased loads. Each 480V bus duct disconnect switch shall be sub metered by an approved EMON DMON kWh sub-meter. Each EMON DMON sub-meter shall be linked to the base building EMON DMON sub-metering network.

B. Design Criteria:

1. If Tenant needs more power than what the base building has distributed at 277/480 volts, the Tenant has the option of adding additional 480V switchgear, at their own expense. If planned loads exceed the allowable limit the Tenant has option to make necessary service equipment modifications as required and coordinate all requirements with the Owner and with PG&E.

2. Design and Drawings: Calculate electrical requirements and prepare new design drawings and California Title 24 energy efficiency calculations based upon proposed Tenant layout. Use available power from base building system. Coordinate floor power distribution with Landlord and Chief Engineer or designee.

    a. Provide a key map on each drawing. Include electrical load schedules and load summary.

    b. Obtain building permit for construction using design drawings.

3. Do not use Base Building emergency power for other than Fire Life Safety and emergency lighting.

4. Do not distribute power from one floor to feed loads on another (e.g.: Do not install a bus duct switch on the 7th floor to feed a new panel on the 6th floor).

    a. Power distribution shall be done from electrical closet and services to correspond with floor at which work is being completed.

5. Do not connect more than 6 general-purpose outlets on any 120-volt branch circuit.

6. Provide dedicated neutral for all 120-volt branch circuits feeding electronic equipment (computers, copiers, fax machines, printers, etc.).

7. Provide dedicated neutral for each 120-volt dedicated branch circuit.

8. Perform required core drilling during non-business hours. Vendor is to x-ray slabs and obtain authorization from Landlord prior to any core drilling.

    a. Coordinate with Chief Engineer.

9. Plenum rated cable may be used for telephone and data cabling only.

    a. Cable shall be installed as specified under Data Cabling section.

b. Routing path shall be via corridors and other spaces permitting access to cable with minimum interference to tenants during cable changes.

10. Provide wall mounted telephone and data outlets with corresponding outlet box and appropriately sized conduit stub-up into nearest accessible ceiling space.

11. Provide emergency lighting to maintain a minimum of 0.5 foot- candles. Verify capacity on emergency riser with Electrical Engineer of record prior to increasing emergency lighting load.

12. Verify transformer locations with Landlord prior to installation.

    a. Transformer size may require installation of Fire Smoke Dampers at electrical room ventilation ducts as well as supplemental cooling.

    b. Weight of transformer may require Structural Engineering coordination.

13. For 120/208 volt, 3-phase, 4 wire feeders serving branch circuit panelboards and computer distribution equipment, the neutral conductor shall have calculated ampacity of not less than 150% of phase conductor ampacity.

    a. Neutral conductor shall be considered current carrying conductor for purposes of determining NEC derating factors.

14. As required by Landlord, Energy Consumption Metering, by EMON DMON, with e.g. RS-485 Data link for BacNET connection to Building EMON DMON sub-metering network, shall be provided by Tenant. Installation shall be coordinated with Landlord and Chief Engineer.

15. Maximum design load for new 120/208 volt panelboards: 200 amps for 250 amp rated panels.

16. Data Centers: Data Centers within Tenant's premises shall be metered such that energy usage data can be collected: 1) at a point downstream from any and all uninterruptible power supplies (UPS), and 2) for all IT equipment, and IT equipment only, in the data center. Metering system shall meet the U.S. Environmental Protection Agency ENERGY STAR Portfolio Manager requirements for Data Center benchmarking. Metering system shall conform to Landlord's Design Criteria as specified in this document under Electrical Section 1.3.B.13. Data Center shall be defined as any demised space of more than 500 square feet that is dedicated to high-density computing functions (e.g., server racks) and may, but not necessarily, include a raised floor, dedicated supplemental cooling system, and one or more UPS.

C. Tapping on Hot Bus Prohibited: Whenever bus tap is to be made, bus has to be de-energized.

    1. Coordinate with Chief Engineer for shutdown window allotment.

    2. Schedule activity for after-hours or weekends.

1.4 SUBMITTALS

A. Prior to commencing any work, electrical Vendor shall assist general Vendor in submitting to Landlord required documentation:

1. Approved construction documents and construction permit.

B. Provide copy of professional engineer stamped plans to Landlord for review and approval.

C. Electrical Vendor shall submit a written request and schedule for disruptions to building services no less than 72 hours in advance and a minimum of ten working days when shutdown affects other tenants.

D. Vendor shall review all equipment and material submittals prepared by suppliers, verify compliance with Construction standards, mark copies as acceptable to him, and submit to the Architect. After Architect's approval submit one copy to the Landlord and Engineering Department.

E. Project Closeout Submittals: Prior to Landlord final inspection and acceptance of construction, Vendor shall be required to provide following documentation to Landlord:

1. Two complete sets of operating and maintenance.

2. One set of complete, reproducible as-built drawings and CAD files. As-built drawings shall contain key map of floor with Tenant location and load summary of electrical power used from base building systems.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Conduit:

1. Electrical Metallic Tubing (EMT):

a. Description: ANSI C80.3; zinc-coated tubing with protective enamel coating on inside.

b. Fittings and Conduit Bodies:

1) ANSI/NEMA FB 1.

2) Concrete-tight steel or malleable iron, or pressure-cast body with steel or malleable iron nuts.

3) Use compression type for 2 inch trade size and smaller, use compression or set-screw type for 2-1/2 inch trade size and larger.

2. Metal Conduit: Use in exposed dry and damp locations below switch height where conduit may be exposed to physical damage.

a. Rigid Steel Conduit: ANSI C80.1; threaded, hot-dipped galvanized, including threads, with protective coating on inside and outside.

b. Fittings and Conduit Bodies:

1) ANSI/NEMA FB 1.

2) Rigid Steel Conduit: Use threaded steel or malleable iron fittings.

3. Flexible Metal Conduit: Use for connections to lighting fixtures in accessible ceiling spaces, connections to equipment in dry systems and dry locations. Do not use under raised computer room floors.

a. Description: Zinc-coated, interlocked steel construction.

b. Fittings: ANSI/NEMA FB 1; steel or malleable iron clamp or squeeze type, or pressure cast screw-in type. Do not use die-cast, set-screw, or sheet metal screw-in type on flexible metal conduit.

4. Liquid Tight Flexible Metal Conduit: Use for connections to equipment in damp and wet locations.

a. Description: Galvanized interlocked steel construction with PVC jacket.

b. Fittings: ANSI/NEMA FB 1; steel or malleable iron, watertight type.

B. Poke Through Service Fittings:

1. Manufacturer:

a. Wiremold Walker Flush Poke Through Series.

b. Hubble Flush Poke Through Series.

2. Description: Assembly comprising service fitting, poke through component, firestops and smoke barriers, and junction box for conduit termination.

3. Fire Rating: 2 Hours.

4. Flush Profile: No above floor pedestals permitted.

a. Provide triple service capability, power, voice, and data (P/V/D).

b. Provide complete assembled unit, including finish flange, in color as selected.

c. Provide conduit adapter with closure plugs where required.

C. Firestopping: Comply with local City and State requirements.

1. Description: U.L. Approved firestop material for cable and conduit penetrations.

2. Fire Rating: Re-establish rating of penetrated barrier.

D. Building Wire and Cable:

1. Description: Single conductor, insulated wire.

2. Conductor: Copper.

3. Insulation Voltage Rating: 600 volts.

4. Insulations ANSI/NFPA 70, Type THHN/THWN for sizes 2 and smaller, Type THHN for sizes #1 and larger.

5. New wiring shall be in conduit with following exceptions.

    a. MC cabling is acceptable in existing walls and for vertical drops for outlets and switches in ceiling spaces with access tiles.

    b. Do not use MC cabling for exposed work in non-accessible ceiling spaces.

    c. MC cabling may also be used for light fixture connections with an eight-foot maximum length.

E. Wiring Connectors:

1. Spring Wire Connectors: Corrosion-resistant, live-action spring in insulated shell, rated 105-degrees C.

2. Compression Connectors and Lugs: Circumferential (non-indenter) type.

F. Boxes:

1. Device, Luminaire and Equipment Supporting Boxes:

    a. Sheet Metal Outlet Box: ANSI/NEMA OS1, galvanized steel. Minimum 4-inch square and 1-1/2 inches deep; rated for weight of equipment supported; include 1/2-inch male fixture studs where required.

2. Pull and Junction Boxes: Sheet metal box, NEMA OS 1, screw cover, minimum 4-inch square and 1-1/2 inches deep galvanized steel or gray baked enamel finish.

G. Manufactured Wiring Systems:

1. Description: An integrated electrical branch wiring system for lighting that is pre-manufactured and supplied in accordance with NEC Article 604 and UL Standard #183.

2. Wires: #12 AWG copper with 600V, 90 degree C insulation in color-coding per NEC and building standards.

3. Integration: Capability of 5 wires, including #12 AWG copper ground wire, within flexible steel conduits with cable end heads and approved connectors keyed for proper interconnection.

4. Voltage: Select proper 120V or 277V system, as applicable, and ensure that system components are keyed to prevent back feeding and interconnection between different voltage systems.

5. Manufacturer:

    a. Lithonia RELOC wiring systems.

    b. Thomas Industries Electro/Connect.

H. Wiring Devices: Smooth white plastic.

1. Wall Switches/Dimmers: Low voltage, momentary contact.

   a. Lutron Pico Wireless Control

3. Receptacles: Duplex Convenience Receptacle, Type 5-15R, Specification Grade. Use same manufacturer and series for receptacles and wall switches.

4. Wall Plates: Use same manufacturer and series as for receptacles and switches.

5. Occupancy Sensors: Ultrasonic switch sensor, suitable for the space application and compatible with the electronic ballast(s) they control. White finish.

   a. Lutron, Radio Powr Savr

I. Supporting Devices:

1. Support Channel: Galvanized or painted steel.

2. Hardware: Corrosion resistant.

J. Electrical Identification:

1. Nameplates: Engraved three-layer laminated plastic, white letters on a black background.

2. Wire and Cable Markers:

   a. Use color-coded conductors for branch circuit wiring.

   b. Use plastic impregnated cloth or epoxy film markers, split sleeve or tubing type for feeders.

3. Use colored tape to identify conduit systems. This labeling standard is required on all ceilings regardless of paint or spray on insulation.

4. All j-box covers shall have p-Touch, or approved equal, label identifying source panel & conductor circuit IDs. Label shall be installed on both sides of j-box cover. This labeling standard is required on all ceilings regardless of paint or spray on insulation.

   a. Labeling shall be black lettering on white tape for normal power.

   b. Labeling shall be red lettering on white tape for emergency power.

   c. Labeling shall be orange lettering on white tape for stand-by power.

5. All receptacle face plates shall have p-Touch, or approved equal, label identifying source panel & conductor circuit ID(s).

   a. Labeling shall be black lettering on white for normal power.

   b. Labeling shall be black lettering on red for emergency power.

c. Labeling shall be black lettering on orange for stand-by power.

6. Labeling shall be black lettering on white for low voltage, to include port numbering.

K. Enclosed Switches:

1. Manufacturers:

a. Eaton

2. Fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked opening front cover with switch in ON position. Handle lockable in OFF position.

3. Non-fusible Switch Assemblies: NEMA KS 1, Type HD load interrupter enclosed knife switch with externally operable handle interlocked opening front cover with switch in ON position. Handle lockable in OFF position.

4. Enclosures: NEMA KS 1, Type 1.

5. Shall have identification as noted in Section J – Electrical Identification

L. Dry Type Transformers:

1. Manufacturers:

a. Eaton

2. Dry Type Transformers: ANSI/NEMA ST 20; factory-assembled, air cooled dry type transformers; ratings as shown on the Drawings or as required for load served; designed for non-sinusoidal loads K-factor not less than thirteen (13). Derated standard transformers are not acceptable.

3. Insulation: UL Class 185 degrees C, 115 degree C rise. Transformers rated above 112.5KVA shall be UL Class 150 degree C, 80 degree C rise or shall be located in fire-rated room.

4. Winding Taps, Transformers Less than 15 KVA: Two 5 percent below rated voltage, full capacity taps on primary winding.

5. Winding Taps, Transformers 15 KVA and Larger: ANSI/NEMA ST 20.

6. Sound Levels: ANSI/NEMA ST 20.

7. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.

8. Mounting: Transformers 75 KVA and less shall be suitable for wall, floor, or trapeze mounting; transformers larger than 75 KVA shall be suitable for floor or trapeze mounting.

9. Coil Conductors: Continuous windings with terminations brazed or welded.

10. Enclosure: ANSI/NEMA ST 20; Type 1. Provide lifting eyes or brackets.

11. Isolate core and coil from enclosure using vibration-absorbing mounts.

12. Nameplate: Include transformer connection data, overload capacity based on rated allowable temperature rise, and inscription: "Suitable for non-sinusoidal current load with K-factor not to exceed 13".

13. Transformer to be Energy Star rated.

14. Shall have identification as noted in Section J – Electrical Identification.

M. Panelboards:

1. Manufacturers:

   a. Eaton

2. Enclosure: NEMA PB-1; Type 1.

3. Cabinet Size: 6 inches deep; 20 inches wide.

4. Provide flush or surface cabinet front with concealed trim clamps, concealed hinge and flush lock all keyed alike. Finish in manufacturer's standard gray enamel.

5. Provide panelboards with copper bus, extending full height of panel. Provide copper ground bus in all panelboards. Provide neutral bus with terminals for each circuit in the panel, including future circuits.

6. Minimum Short Circuit Rating: Refer to the building ARC Flash study and provide a panelboard that exceeds the available fault current at the location. If no ARC Flash study is available, consult with Chief Engineer for direction.

7. Molded Case Circuit Breakers: Bolt-on type ambient-compensated thermal magnetic trip circuit breakers, with factory assembled common trip handle for multiple pole units. Provide circuit breakers UL listed as Type SWD for lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where required.

8. Provide lugs with approved connectors for size of conductors feeding panel. Provide double lugs and extra gutter space for parallel feeder conductors.

9. Shall have identification as noted in Section J – Electrical Identification

N. Enclosed Circuit Breakers:

1. Manufacturers:

   a. Eaton

2. Molded Case Circuit Breakers: NEMA AB 1.

3. Enclosure: NEMA AB 1, Type 1. Fabricate enclosure from steel, finish with manufacturer's standard enamel finish, gray color. Include provisions for padlocking.

O. Exit Lighting Fixtures:

1. Building standard exit sign will be connected to emergency power distribution system.

   a. Emergi-Lite; Prestige DX series; LED Exit sign

P. Ballasts:

1. Fluorescent Ballasts: Energy savings electronic type, suitable for lamps specified, 120-277 volts match luminary voltage, Class P, UL listed, non-PCB and RFI limited, sound rating A, crest factor 1.6 or less, high frequency (20 kHz or greater), maximum total harmonic distortion (THD) less than or equal to 10%, minimum true power factor 0.97, 3 year written warranty against mechanical or electrical defects under normal conditions of use.
    a. Lutron, or Electronic Ballast Technology (EBT), compatible with Building Standard Lutron Quantum system.

Q. Lamps:

1. Color:
    a. Lamp color shall be 3500K
2. Type:
    a. T5, LED, CFL, and T8 acceptable upon Owner approval.
        1) 54W T5 or 32W T8 are considered “Building Standard”
    b. No lamp shall be longer than 48”
    c. Incandescent lamps shall not be used.

R. Central Lighting Control (CLC) System:

1. The lighting control system shall be Building Standard Lutron with Quantum software.
2. Lighting control shall follow standards and sequences.
3. Task Tuning.
    a. Lighting system shall support task tuning of lights, via dimming, capable of setting an initial starting point of 80%, and shall be continuously adjustable down to 20%.
4. Demand Response.
    a. Lighting system shall support the capability of manual and/or automated demand response reduction.
5. Daylight Harvesting.
    a. Lighting system shall support daylight harvesting. The system shall allow a continuous reduction of lighting levels between 100% and 0% to maintain the chosen foot-candles at workspaces.
    b. Daylight harvesting shall operate based upon a closed loop control scheme.
6. Sequence of Operation.
    a. Manual dimming: Wall switches may be used to dim the lights. Owner shall be provided the ability to dim lights via computer or other electronic method. In

daylight harvesting zones the act of manual dimming will lower the target light level.

b. Top trimming: Lighting system shall have the ability to program all dimmable ballasts to reduced lighting levels.

a. Occupancy zones: Control of Open Office areas shall be optimized by dividing the space into smaller occupancy zones. Occupancy zones shall be limited to a 5,000sf maximum, controlling multiple vacancy sensors.

b. Occupancy timeout:

1) Business Operating hours: Not to exceed 15 minutes.

2) After hours: Not to exceed 5 minutes. Shall be initiated by override switch.

3) Pathway lighting: Not less than 15 minutes.

4) Transition timeout: At expiration of the occupancy timeout, lights may transition to 20% light level to warn the occupants, or turn off. The lights may remain at the transition level for 1 minute and then turn off.

c. Open Office Lighting, not Pathway Lighting

1) Vacancy sensors: Lighting shall be controlled by vacancy sensors.

2) Manual switching: Override switching, aligned with occupancy zones, shall be used.

d. Pathway Lighting

1) Business Operating Hours: Pathway lights shall turn on according to an automatic schedule, which shall be adjustable, and will remain on for the duration of the schedule.

2) Non Business Operating Hours: Pathway lights shall remain off except when occupant is detected. If occupancy is detected in any occupancy zone the Pathway lights for all zones shall turn on

e. Emergency Lighting

1) Emergency lights light shall turn on according to an automatic schedule but must turn on when the building switches to emergency power. If applicable, lighting controls shall be bypassed.

f. Non-open Office lighting.

1) Manual switching: Lighting shall be manually switched.

2) Vacancy sensors: Lighting shall be controlled by vacancy sensors.

7. System access.

a. Lighting system shall be integrated into the Base Building Lutron system.

a. Floor graphics shall be provided with system access.

8. Contractor shall be responsible for proper commissioning of installed lighting controls prior to occupancy.

   a. Contractor shall include in their scope of work “fine tuning” of the installed lighting controls following commissioning. “Fine tuning” to occur no sooner than 30 days after Tenant move-in and no later than 60 days after Tenant move-in.

S. Power Metering Devices:

1. Base Building has provided a MMU8 cabinet adjacent to each 277/480 volt panelboard for installation of EMON DMON kWh sub-meters by Tenants. An IDR (Interval Data Recorder) is required at each location for interface with BacNET and EMCS.

   EMON DMON
   1856 3rd Street
   Concord, CA 94519-2668
   (510) 407-8085
   Contact: Sim Gurewitz

2. Order meter to be install in Multiple Meter Unit (include suffix “M”, for example: E20-208100-MKIT).

T. Chief Engineer will program Base Building EMON DMON systems to coordinate with their newly installed meters.

U. Surveillance Cameras:

1. PELCO (Mini Dome) Series (or per building specifications).

2. Color to be approved by Landlord.

PART 3 - EXECUTION

3.1 PREPARATION

1. Examine panelboards and distribution equipment affected by Work for defective conditions and report such conditions to Landlord.

2. Provide temporary wiring and connections to maintain existing systems in service during construction.

3. Existing Telephone System: Maintain existing system in service until new system is accepted. Disable system only to make switchovers and connections. Notify Chief Engineer and Telephone Utility Company at least 48 hours before partially or completely disabling system. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area. Notify Landlord/Building Engineer.

4. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.

5. Clean existing materials and equipment that are to be reused. Report damage or defects to Chief Engineer.

6. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts, and broken electrical parts.

7. Disconnect and remove all abandoned conduit wiring and equipment. Floor monuments that are capped shall have associated conduits, pull boxes, and wiring at floor below removed back to source.

8. Disconnect and remove abandoned panelboards and J boxes.

3.2 INSTALLATION

A. Conduit: install conduit in accordance with NECA "Standard of Installation".

1. Conduit Supports:

   a. Arrange supports to prevent misalignment during wiring installation.

   b. Support individual conduits using spring steel clips, coated steel or malleable iron straps, lay-in adjustable hangers, clevis hangers, and split hangers. Use spring steel clips attached to #10 hanger wires installed for the specific purpose of supporting conduits. Fasten wire at both ends. Limit use of spring-steel-clip-and-wire supports so that no conduits are supported solely by this method and so that no conduit run contains more than two consecutive supports of this type.

   c. Group related conduits; support using conduit rack. Construct rack using steel channel.

   d. Fasten conduit supports to building structure and surfaces.

   e. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports

   f. Do not attach conduit to ceiling support wires.

2. Arrange conduit to maintain headroom and present neat appearance.

3. Conduit Routing:

   a. Routing exposed conduit and conduit installed above accessible ceilings parallel and perpendicular to walls.

   b. Route conduits to clear access openings.

   c. Route conduits parallel and at right angles to building grid lines.

4. Conduit Routing (within tenant space below):

    a. All visible conduits shall be Electrical Metallic Tubing (EMT). Flexible Metal Conduit will not be allowed.

    b. Layout of exposed conduit in the ceiling of tenant space below must be provided in a drawing for Owner review and approval.

    c. Owner requires that conduit shall be installed at right angles to the exterior walls. Diagonal runs are not allowed. Conduit shall run as tight to the deck as possible, with bottom of conduit no lower than 4” from the deck.

    d. Paint conduit to match existing conditions.

    e. Owner approval is required when conduit impacts the aesthetics of architectural elements of the space below.

5. Maintain 6 inches of clearance between conduit and piping.

6. Maintain 12 inches of clearance between conduit and surfaces with temperatures exceeding 104° F (40° C).

7. Cut conduit square using saw or pipecutter; de-burr cut ends.

8. Bring conduit to shoulder of fittings; fasten securely.

9. Bends:

    a. Install no more than equivalent of four 90-degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams.

    b. Metal Conduit Larger than 2 inch Trade Size: Use factory elbows or fabricate bends with hydraulic one-shot bender.

10. Provide suitable fittings to accommodate expansion and deflection where conduit crosses seismic, control and expansion joints.

11. Provide suitable pull line in each empty conduit except sleeves and nipples.

12. Provide insulated equipment ground conductor in flexible conduit.

13. Provide chromium-plated escutcheons on each exposed conduit-penetrating floor, wall or ceiling in finished spaces.

14. Termination of Conduit Stubs:

    a. Above Floor and in Ceiling Spaces: Use conduit bushing.

    b. Install conduit to preserve fire resistance rating of partitions and other elements, per NFPA.

B. Service Fittings: Install all new products in accordance with the manufacturers' instructions.

1. Provide components, accessories, and adapters to correspond with existing floor distribution system.

C. Firestopping: Comply with local City and State requirements.

1. Install firestopping at fire rated wall and through slab penetrations.

    a. Additional waterproofing will be required for slab penetrations near sources of water (i.e. Dish washing room, restrooms, showers or kitchens)

2. Apply materials in accordance with manufacturer's instructions.

3. Install backing materials to arrest liquid material leakage.

4. Protect adjacent surfaces from damage by material installation.

5. Clean adjacent surfaces of firestopping material.

D. Building Wire and Cable:

1. Install products in accordance with manufacturer’s instructions.

2. Use solid conductor for feeders and branch circuits 10 AWG and smaller.

3. Use conductor not smaller than 12 AWG for power and lighting circuits.

4. Pull all conductors into raceway at same time. Do not use mechanical means to pull conductors #8 AWG and smaller.

5. Use suitable wire pulling lubricant for building wire 4 AWG and larger.

6. Neatly train and lace wiring inside boxes, equipment, and panelboards.

7. Clean conductor surfaces before installing lugs and connectors.

8. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

9. MC Cabling: Tie off and support per code. Run in parallel lines to grid and to maintain clear symmetrical installation.

10. Phone/Data cabling shall be properly supported to comply with NEC and Shorenstein cabling specifications.

E. Wiring Connectors:

1. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.

2. Use compression connectors for copper conductor splices and taps, 6 AWG and larger. Use compression tool designed for the size and type of connector being compressed.

3. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 8 AWG and smaller.

F. Boxes:

1. Install electrical boxes as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.
2. Install electrical boxes to maintain headroom and to present neat mechanical appearance.
3. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.
4. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.
5. Install boxes to preserve fire resistance rating of partitions and other elements; arrange boxes to meet regulatory requirements and use materials and methods per National Electric Code and NFPA. Where 3-gang or larger openings are required, re-establish rated construction around boxes.
6. Align adjacent wall-mounted outlet boxes for switches, thermostats, and similar devices with each other.
7. Use flush mounting outlet boxes in finished areas.
8. Do not use through-walls boxes or install flush mounting boxes back-to-back in walls; provide minimum 6 inch separation. Provide minimum 24 inches separation in acoustic rated walls.
9. Secure flush mounting box to interior wall and partition studs. Accurately position to allow for surface finish thickness.
10. Use stamped steel bridges or bar hanger assemblies to fasten flush mounting outlet box between studs.
11. Install flush mounting box without damaging wall insulation or reducing its effectiveness.
12. Use adjustable steel channel fasteners for hung ceiling outlet box.
13. Do not fasten boxes to ceiling support wires.
14. Support sheet metal boxes independently of conduit.
15. Use gang box where more than one device is mounted together, including floor boxes. Do not use sectional box.
16. Use Plaster Rings for all concealed work; depth of rings shall be as required to reach finished surfaces.
17. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes per NEC and NFPA codes.
18. Coordinate trimming of openings for outlet boxes in partitions to achieve neat, closely-fitting openings.
19. Adjust flush-mounting outlets to make front flush with finished wall material.
20. Install knockout closure in unused box openings.

G. Wiring Devices:

1. Install products in accordance with manufacturer's instructions.

2. Install devices plumb, level, and rigidly in place.

3. Install switches with OFF position down, 2 inches to 8 inches from trim on the strike side of door.

4. Install wall dimmers to achieve power rating required for load shown on Drawings.

5. Use dedicated neutral conductor on dimmer circuits.

6. Install receptacles with grounding pole on top.

7. Connect wiring device grounding terminal to outlet box with bonding jumper.

8. Install switched receptacles with top half switched.

9. Install decorative plates on switch, receptacle, and blank outlets in finished areas. Use multi-gang plates for multiple devices.

10. Connect wiring devices by wrapping conductor around screw terminal.

11. Install protective rings on active flush cover service fittings.

12. Install isolated ground receptacle so that ground conductor is isolated from metallic raceway.

13. Inspect each wiring device for defects.

14. Operate each wall switch with circuit energized and verify proper operation.

15. Verify that each receptacle device is energized.

16. Test each receptacle device for proper polarity and integrity of ground connection.

17. Test each GFCI receptacle device for proper operation.

18. Adjust devices and wall plates to be flush and level.

19. Breakers rated 50A and greater shall be tested, and the testing documented, in accordance with Owner established base building practices. Contractor shall provide to Owner (2) copies of test reports.

H. Supporting Devices:

1. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors and beam clamps.

2. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws or spring steel bar retainer clips in sheet metal studs; and wood screws in wood construction.

3. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.

4. Do not use powder-actuated anchors without specific permission from Landlord.

5. Do not drill structural steel members without specific permission from Landlord.

6. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

7. Install surface-mounted cabinets and panel-boards with minimum of four anchors. Provide steel channel supports to stand cabinet one inch off wall.

8. Bridge studs top and bottom with channels to support flush-mounted cabinets and panel-boards in stud walls.

I. Electrical Identification

1. Degrease and clean surfaces to receive nameplates.

2. Install nameplates parallel to equipment lines. Label building electrical equipment to match existing.

3. Secure nameplates to equipment fronts using screws or rivets. Secure nameplate to inside face of recessed panel-board doors in finished locations.

4. Embossed tape will not be permitted for any application.

5. Wire Identification:

   a. Provide wire markers on each conductor in panel-board gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number. Identify control wire with number as indicated on schematic and interconnection diagrams equipment manufacturer's shop drawings for control wiring. If more than one neutral conductor is present, mark each with related circuit numbers.

   b. Color code all secondary branch circuit and feeder conductors as follows:

Conductor	120/208 Volt	277/480 Volt
Phase A	Black	Brown
Phase B	Red	Orange
Phase C	Blue	Yellow
Neutral	White	Grey
Ground	Green	Green
Switch leg	Phase color	Phase color

   c. Use green color for any conductor intended solely for equipment grounding, unless it is bare.

   d. Use wire with insulation of required color. For sizes of wire which may not be available in specified colors use self-adhesive wrap around, markers of solid colors to color code conductors.

   e. Color code conductors at accessible locations.

f. Make color-coding for signal system such as life safety, intercommunication, etc., in accordance with programs or schedules prepared by the equipment manufacturer.

g. Use same color throughout a given system for any signal or control wires performing the same function.

6. Nameplate Engraving:

a. Panel-boards: 3/4 inch; identify equipment designation. 1/2 inch; identify voltage rating and source.

b. Individual Circuit Breakers, Enclosed Switches, and Motor Starters: 3/16 inch; identify load served and source of supply.

c. Transformers: 3/4 inch; identify equipment designation. 1/2 inch; identify primary and secondary voltages, primary source, and secondary load and location.

d. Special Purpose Power Receptacles: 1/4 inch; identify voltage, phase and source of supply.

e. Light Switches Not in Sight of Fixtures They Control: 1/4 inch; identify location of light fixtures controlled.

f. Engraving on device plates with black enamel filled lettering is acceptable in lieu of separate nameplates.

g. Equipment Disconnect Switches and VFD's: 1/2 inch; identify load served (equipment ID) and electrical power source (panel & circuit ID's).

7. Conduit Color Coding Schedule:

a. Except for life safety conduit, use colored tape to identify conduit by system. Apply tape to each length of conduit installed above grade so that at least one marker is located between any 2 couplings.

b. 480 Volt, Three-Phase System: Black.

c. 208 Volt, Single and Three-Phase System: Dark Blue.

d. Life Safety System: Red.

e. Telephone System: Grey.

f. Data System: White

g. Grounding: Green

h. Emergency Power: Yellow.

8. Outlet and Junction Box Marking: Mark outside of cover plates of junction boxes installed in exposed or accessible ceilings to identify circuits present. For signal systems, identify system by name. Use p-Touch label or approved equivalent.

9. Affix label to pull rope identifying termination point.

10. Concealed Equipment: Identify location of electrical equipment installed above suspended ceiling by placing a black thumbtack in the nearest ceiling tile. Equipment to be identified includes: junction boxes, disconnect switches, low voltage lighting equipment, pull boxes, and any special equipment. For life safety system, use a red thumbtack.

J. Enclosed Switches:

1. Install disconnect switches where indicated.

2. Install fuses in fusible disconnect switches.

3. Provide adhesive label on inside door of each switch indicating UL fuse class and size for replacement.

K. Dry Type Transformers:

1. Set transformer plumb and level.

2. Use flexible conduit, 2 feet (0.6 m) length, for connections to transformer case. Make conduit connections to side panel of enclosure.

3. Mount transformers on vibration isolating pads suitable for isolating the transformer vibration from the building structure.

4. Provide seismic restraints.

5. Set taps on transformers to 118 to 122 volts for 120 volt nominal systems, and proportionately equivalent values for higher voltage systems.

L. Panelboards:

1. Install panelboards plumb. Install flush mounted panel-boards flush with wall finishes.

2. Height shall be 6’-6” (2.0m) to top of panel.

3. Provide filler plates for unused spaces in panelboards.

4. Provide typed circuit directory in plastic holder for each branch circuit panelboard.

a. Hand written directories shall not be accepted.

5. Out of each recessed panel-board, stub a one inch conduit into the accessible ceiling space above for each 3 spares or spaces in the panel-board.

M. Enclosed Circuit Breaker:

1. All circuit breakers larger than 225amp shall undergo primary injection testing prior to installation.

2. Install enclosed circuit breakers plumb.

3. Height shall be 6 feet 7 inches to operating handle.

4. Inspect each circuit breaker visually.

5. Perform several mechanical ON-OFF operations on each circuit breaker.

6. Adjust trip settings so that circuit breakers coordinate with other overcurrent protective devices in circuit.

N. Lighting Fixtures:

1. Install in accordance with manufacturer's instructions.

2. Verify ceiling construction; coordinate with luminaire trim and accessories.

3. Install suspended luminaires using pendants supported from swivel hangers. Provide pendant length required to suspend luminaire at indicated height.

4. Support luminaires larger than 2 x 4 foot size independent of ceiling framing.

5. Install surface mounted luminaires plumb and adjust to align with building lines and with each other. Secure to prohibit movement.

6. Suspended Grid Ceilings: Support 2x4 foot and smaller recessed luminaires in grid ceiling by installing #12 (minimum) hanger at each corner of the affected ceiling grid. Provide 2 additional hanger wires directly from the structure above to the fixture housing. Install appropriate seismic bracing.

7. Install recessed luminaires to permit removal from below.

8. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating.

9. Install clips to secure recessed grid-supported luminaires in place.

10. Install accessories furnished with each luminaire.

11. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.

12. Bond products and metal accessories to branch circuit equipment grounding conductor.

13. Install specified lamps in each luminaire.

14. Aim and adjust luminaires as directed.

15. Adjust exit sign directional arrows as indicated.

16. Clean electrical parts to remove conductive and deleterious materials.

17. Remove dirt and debris from enclosure.

18. Clean photometric control surfaces as recommended by manufacturer.

19. Clean finishes and touch up damage.

O. Ballasts:

1. Install in accordance with manufacturers' instructions.

P. Lamps:

1. Install in accordance with manufacturers' instructions.

2. Relamp any failed lamps at substantial completion.

Q. Each Tenant shall have sub meters. Contact Building Engineer for proper meter configuration and wiring for relay interface with Building Automation System.

R. Data Cabling:

1. All installations are to be conducted by a BICSI certified Vendor.

2. All Cabling is to be suspended by dedicated hangers manufactured to meet the specifications of the installation. Cabling is to be hung as tight to the overhead slab as possible so that it does not conflict with other MEPFS installations and does not obstruct the access of building personnel via ceiling tiles. The use of existing hangers, i.e. electrical, plumbing, ceiling, etc. is prohibited. Field manufactured hangers are not acceptable.

3. All cabling runs are to be bundled neatly and run in parallel lines to the ceiling grid. Cabling is to have home runs with branches maintaining perpendicular zone distribution. Spider webbing (i.e. diagonal runs) of cable is not acceptable.

4. All cabling routed to poke through outlets will be hard piped when entering a space other than that of the tenant’s premises. Routing of conduit is to follow the building’s parallel lines and run tight to the overhead slab to minimize the possibility of future conflict with MEPFS installations in other tenant’s premises.

5. On multi-floor tenant applications, all tenant cabling is to be routed within the leased premises via a strategically placed cored and fire sealed penetration. The routing of cabling from floor to floor for the specific and dedicated use of a tenant cannot be by means of the building’s telecommunications riser without specific written consent from Property Management and Lease Document.

6. The building’s telecommunications infrastructure was installed following TIA/EIA-568-A Commercial Building Cabling Standards. Any and all modifications and/or additions to such system are to be submitted for Property Management’s written approval and installed to maintain and follow said standard.

NOTE: It is not the intent of Property Management or the Engineering Department to dictate the type of equipment, system or cabling that are to be used. The type of system and equipment will be selected by the tenant to fit their needs. The cabling installation standards are set to make the identification and differentiation of cabling systems easier and to assure that they will not interfere with any other systems as installed. Should any questions arise with regard to cable installation in a tenant’s premises, it is the responsibility of the tenant and/or Vendor to obtain clarification

and approval from Property Management. Failure to comply with said standards may result in removal of substandard installation and reinstallation at the tenant and/or Vendor's expense.

END OF SECTION

LIFE SAFETY SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Contact Landlord for Life Safety Representative's phone number.

1. Contract with Building Life Safety Vendor to: provide, program, supervise connections, and assist in testing life safety components.

2. Current life safety system service and maintenance Vendor (CLSSSMC) is testing and maintenance Vendor for life safety systems installed in building.

a. If CLSSSMC is not Vendor for the life safety systems, a final test (with no failures) shall be scheduled with both life system Vendor and CLSSSMC.

b. This test is required to ensure equipment is operating as required prior to incorporation into building testing and maintenance Vendor schedule.

B. Related Sections:

1. Electrical work including: conduit, wire, and identification.

1.2 SYSTEM DESCRIPTION

A. Base Building System:

1. Life Safety System: Siemens Building Technologies, Inc.

2. System Components:

a. Fire Control Center (FCC/status command center) is located on Ground Level just off Main Historic Lobby.

b. Life safety terminal panel and power supply are located in each of three telecommunication rooms on floors 1 through 8 and each of two telecommunication rooms on floors 9 through 11.

c. Remote enunciator panel is located on Ground Level just off Main Historic Lobby.

B. Design Criteria:

1. Fans 2,000 cfm and larger shall have smoke detector in supply air duct, airflow switch, and connection to corresponding life safety system including status.

a. Fan and associated dampers shall automatically shut down upon actuation of duct smoke detector.

2. Provide smoke detectors, speaker/strobe devices, tamper switches, water flow switches, and pull stations in locations as specified in NFPA and by Authority Having Jurisdiction (AHJ).

3. Special fire protection systems and Emergency Power Off (EPO) switches, shall report to corresponding life safety system. Coordinate with appropriate trade.

4. Do not overload life safety device loops. Count devices and verify and provide load capacity calculations.

5. Tenant alterations and improvements that exceed standard device and point quantities per floor, which require a base building system upgrade, are the responsibility of the Tenant.

1.3 SUBMITTALS

A. Submit life safety system electrical installation drawings to Landlord for review and approval prior to submitting for permit.

1. General Vendor will supply to life safety system Vendor a floor plan or reflected ceiling plan showing all special use areas and other special tenant requirements (example: access card entry doors, etc.), and Mechanical Drawings on CAD.

2. Life safety Vendor to provide life safety and associated wiring diagrams including layout and location of alarm and signaling, devices, life safety power supplies and connections to existing life safety system to Landlord for review and approval prior to submitting for permit.

a. Include layout and location of alarm and signaling and life safety module panels for power connections to life safety system.

b. Show location and connection to other devices and equipment included in complete operation of life safety system.

c. Show conduit runs, risers, wire counts, and device wiring order.

d. Drawings to be stamped by professional engineer licensed in California and completed within five days of receipt of drawings by life safety Vendor.

3. Life safety Vendor shall submit life safety drawings to General Vendor. General Vendor shall submit plans to Landlord for review and approval

a. Upon approval by Landlord and General Vendor, life safety Vendor shall submit plans to City Fire Department, unless otherwise directed.

b. Certification by life safety Vendor shall be made to building safety vendor upon final testing and approval.

B. Project Closeout Submittals:

1. Provide evidence of Life Safety Vendor approval of life safety system.

2. Provide Landlord with notification, punch list, and as-built drawings.

3. General Vendor shall coordinate testing with San Francisco Fire Prevention Bureau, Landlord, and life safety Vendor.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Initiating Devices to Correspond with Building System:

1. Smoke Detector: Siemens HFP-11 detector (photoelectric type) with DB-11 base.

2. Duct Smoke Detector: Siemens HFP-11 detector (photoelectric type) with AD2-XHR housing and ST series sampling tube.

3. Heat Detector: Siemens HFPT-11 detector with DB-11 base.

4. Monitoring Module: Siemens HTRI-S single input and HTRI-D dual input.

5. Control Relay: Siemens HTRI-R.

B. Signaling Devices to Correspond with Building System:

1. Alarm Speaker/Strobe: SEF-MC-W series for wall mounted and SEF-MC-CW series for ceiling mounted.

   a. Wall mounted combination devices are to be used where possible.

2. Strobe Light: ZR-MC-W series for wall mounted and ZR-MC-CW for ceiling mounted.

C. Auxiliary Devices

1. Door Release: Magnetic door holders are to be as specified as part of the Door Hardware, but powered and controlled by life safety system. Comply with NFPA 72 for local smoke detection requirements for control of door holders.

2. Airflow switch: Airflow switch for fan status is to be as specified by appropriate system manufacturer, connected to fans as specified in this section.

3. Fan Starter: Fan starter as specified by appropriate system manufacturer.

4. Tamper and Flow Switches: Sprinkler tamper and flow switches are to match existing.

5. Smoke/Fire Damper Actuator: Actuator to control dampers is to match existing.

6. Smoke/Fire Damper End Switch: Smoke/Fire damper end switch for both open and closed status is to match existing.

D. Wire and Cable: Use building wire as specified in Section 16100 – Electrical, #16AWG minimum.

1. Provide conductors with color coded insulation to match existing in corresponding building and for following life safety devices:

   a. Speaker Wiring.
   b. Strobes (Class A 4-wire loop).

c. Smoke Detection.
d. Manual Pull Station.
e. Sprinkler Flow Tamper.
f. Door Release.
g. Transmission Line.
h. Security Detection Device.

2. All Life Safety related wiring to be hard piped in EMT conduit.

PART 3 – EXECUTION

3.1 DEMOLITION

A. Existing Life Safety System: Make connections as directed by life safety Vendor. Maintain existing system in service until new system is accepted.

1. Disable system only to make switchovers and connections.
2. Notify Landlord, Building Engineer, manufacturer's representative and local fire service at least 48 hours before partially or completely disabling system.
3. Minimize outage duration. Make temporary connections to maintain service in areas adjacent to work area.
4. Provide fire watch when detection or signaling circuits are disabled.
5. System shall not be left in disabled state.
6. Demolition of all existing wiring and conduit shall be back to the source.

3.2 INSTALLATION – **As per Building's Life Safety Vendor Specifications and Instructions and in compliance with local codes:**

A. Field Connection to Existing Systems: Make connections as directed by life safety Vendor.

B. Life Safety Module Panel and Power Supply: Provide remote power supply adequate to power control panel and life safety modules, remote detectors, door holders, smoke dampers, relays, and alarm signaling devices.

1. Module and power supply will operate strobe lights, according to acceptable voltage drop calculations as calculated by life safety Vendor according to NFPA and Authority Having Jurisdiction (AHJ).

C. Initiating Devices: Install devices in accordance with appropriate system manufacturer's instructions.

1. Install manual station with operating handle per OSHA and ADA rules and regulations.

D. Signaling Devices: Install devices in accordance with appropriate system manufacturer instructions.

1. Provide additional signaling devices to meet audibility requirements: Minimum sound level of 75dba or 10dba above ambient noise level, with doors closed, whichever is greater.

2. Provide additional strobes to meet ADA and UL requirements.

3. Install audible and visual signal devices as per code above finished floor.

E. Auxiliary Devices: Install in accordance with appropriate system manufacturer's instructions.

1. Mount outlet box for electric door holder to withstand pulling force as per code.

2. Make conduit and wiring connections to door release devices, sprinkler flow switches, sprinkler, valve tamper switches, duct smoke detectors, and other devices as instructed by Life Safety Vendor.

3. Automatic Detector Installation: As per NFPA 72E.

F. Wire and Cable: Use #16 AWG minimum size conductors for fire alarm detection and #12 AWG for strobe signal circuit conductors.

1. Identify life safety system conduit with painted red stripe.

2. All life safety J-box covers to be painted red.

3. Route conduit through corridors to maximum practical extent.

4. Speaker wiring shall be in separate conduit from strobe wiring.

3.2 EXECUTION

A. Testing

1. All testing to be done before 7:00 am.

2. Any building engineering, security or maintenance costs related to Tenant's life safety system is to be paid by Tenant at Landlord's prevailing rate for labor and materials.

END OF SECTION