SPECIFICATIONS

FOR

UCLA Wilshire Center Suite 620 Reconfiguration

UNIVERSITY OF CALIFORNIA
LOS ANGELES CAMPUS
LOS ANGELES, CALIFORNIA

October 2019

SPECIFICATIONS TABLE OF CONTENTS

DIVISION 29 - 30 RESERVED
NOT USED

DIVISION 31 EARTHWORK
NOT USED

DIVISION 32 EXTERIOR IMPROVEMENTS
NOT USED

DIVISION 33 UTILITIES
NOT USED

DIVISION 34 TRANSPORTATION
NOT USED

DIVISION 35 WATERWAY AND MARINE CONSTRUCTION
NOT USED

DIVISION 36 - 39 RESERVED
NOT USED

DIVISION 40 PROCESS INTEGRATION
NOT USED

DIVISION 41 MATERIAL PROCESSING AND HANDLING EQUIPMENT
NOT USED

DIVISION 42 PROCESS HEATING, COOLING, AND DRYING EQUIPMENT
NOT USED

DIVISION 43 PROCESS GAS AND LIQUID HANDLING, PURIFICATION, AND STORAGE EQUIPMENT
NOT USED

DIVISION 44 POLLUTION CONTROL EQUIPMENT
NOT USED

DIVISION 45 INDUSTRY-SPECIFIC MANUFACTURING EQUIPMENT
NOT USED

DIVISION 46 - 47 RESERVED
NOT USED

DIVISION 48 ELECTRICAL POWER GENERATION
NOT USED

DIVISION 49 RESERVED
NOT USED

SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK REQUIRED BY CONTRACT DOCUMENTS

A. Provide all labor, materials, equipment, tools, transportation, insurance, and services to renovate the office or suite as shown per plans and specifications. The project to renovate existing Suite 620 (approximately 5,685 ASF) at Wilshire Center includes the following scope of work: Demolition, construction of new non-load-bearing interior partition walls, installation of new doors, new lighting, new ceiling system, new millwork, all new finishes, and alterations to existing mechanical, electrical, fire alarm and fire sprinkler systems. Suite 620 will be unoccupied during construction and work will be restricted to off-hours.

PART 1 - PRODUCTS (NOT USED)

PART 2 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 14 00

WORK RESTRICTIONS

10920 WILSHIRE BLVD

PART 1 - GENERAL

1.1 WORK HOURS

A. Work shall be All work shall be carried out after hours - Monday – Friday 6pm-6am (and weekends). Exceptions must be approved by The Building Office 72 hours in advance.

1.2 PROJECT PHASING

A. Not Used

1.3 CONTRACTOR'S USE OF PROJECT SITE

A. Use of the Project site for the Work and storage is restricted to the areas designated on the Drawings.

B. All workers performing work in adjacent tenant areas or entering adjacent tenant areas must be accompanied by an employee or agent of The Building Office.

C. All contractors, subcontractors, employees, and agents must work in harmony with, and shall not interfere with, any contractor or laborer employed by the University or by any other tenant or its contractors

D. The Building Office does **not** issue parking validations to workers or subcontractors. All Contractors staff and personnel and all Subcontractors and their personnel must pay for their own parking, no exceptions.

E. Contractors and their subcontractors must purchase parking passes at the Wilshire Center in advance. Cars parked after 10pm with no pass shall be towed. Passes can be purchased from the parking office in the garage, A1 level. There are no “in and outs”.

F. All work must be scheduled with The Building Office a minimum of 72 hours in advance..

G. For access to the building and/or construction site each contractor must submit a list of pre-approved subcontractors that will be working in the building a minimum of 48 hours prior to the arrival time of any worker. Submit this list to The Building Office.

H. Access to other adjacent suites, below or above for viewing or actual work requires no less than 72 hour notice. All work in suites adjacent shall be done after hours

I. Contractors may use the building restrooms on the floors they are working on as long as they are left clean and NOT used for construction related cleaning or material dumping.

J. Contractor shall follow all Building Rules and Regulations during construction.

K. All work shall be performed in accordance with Building Specifications.

L. Meetings with The Building Office representative, the Chief Engineer and general contractor’s supervisor are to be scheduled, as necessary, usually weekly.

M. Any contractor working in the building will provide The Building Office with a list of their personnel including sub contractors a minimum of 48 hours before any such person works in the building. This project list shall be in a format approved by the University and shall include firm, scope, contact name, email, office phone and cell phone number.

N. Certificates of insurance are mandatory before work is started. Insurance requirements are specified in the contract. Any contractor or vender working in the building will supply The Building

Office with a certificate of insurance at least 48 hours before beginning work in the building. Any contractor or material delivery person without proper notification or insurance will be denied access to the building.

O. All work schedules must be submitted to The Building Office so that all arrival dates and times can be put on the Security Calendar for access into the building. A two week look ahead schedule must be provided to management, clearly indicated work planned, trades involved and hours of work (am / pm). Changes to this must be provided promptly. Trades not shown in the look ahead schedule or added to the security calendar shall be denied access to the building.

P. All construction activity must be scheduled and approved by The Building Office before it can take place.

Q. Construction will not be allowed to interfere with the other tenants' reasonable right to the undisturbed use of their premises.

R. The use of power actuated tools, roto or demolition hammers or drills, or other unusually loud processes will not be allowed during the "Normal Business Hours" of Monday through Friday from 7:00 A.M. to 6:00 P.M, and on Saturday from 7:00 AM to 1:00 PM.

S. All core drilling and concrete cutting shall be performed between the hours of 6:00 PM and 6:00 AM.

T. The Building Office, Chief Engineer and the supervising contractor must be notified a minimum of 72 hours before coring in order to coordinate with any affected tenants. A Building Engineer must be on duty during coring.

U. All slab cores shall be x-rayed or similar method prior to any coring. Written requests to use other means must be submitted to the Building Chief Engineer. The Building Office must be notified 72 hours in advance prior to any x-ray scheduling. X-ray work shall be done after hours. Other methods of rebar / conduit identification, such as "radar", if allowed by CAL-OSHA and other agencies as non-hazardous, may, at the discretion of management, be carried out during normal hours.

V. Any noise complaints by tenants of adjacent space areas are to be remedied immediately by the contractor or alteration operations are to cease until said noise is abated. Noisy work or work determined to impact tenants must occur after hours.

W. All demolition shall be done between the hours of 6:00 PM and 6:00 AM Monday through Friday or on the weekend. All debris from demolition must be removed between 6:00 PM and 6:00 AM Monday through Friday, between 8:00 AM to 6:00 PM on Saturday, or all day on Sunday. (Refer to paragraph on Cleaning and Protection requirements listed below.)

X. There will be no use of lacquer based products or other noxious or irritating products without specific written approval by The Building Office.

Y. Any malodorous materials (such as clean-Sweep) are not to be present or noticeable during normal business hours.

Z. Oil-based products shall never be used during regular business hours.

AA. Carpet and rubber base glue shall not be used during regular business hours.

BB. Painting shall not be done during regular business hours.

CC. Consult the Building Office to schedule work using malodorous products.

1.4 SUBSTANTIAL COMPLETION

A. Substantial Completion shall be applicable to the entire Work.

1. In order to be designated substantially complete, all Work shall be in place and the project signed off by Capital Programs Inspectors and the suite to be in a condition that it can be used for its intended purpose.

1.5 PROTECTION OF PERSONNEL

A. University personnel will be occupying parts of the building during the construction period. Take proper precautions to ensure the safety of all persons during the construction period.

1.6 WORK SITE DECORUM

A. Loud conversation shall be avoided. The playing of audio devices shall be strictly prohibited. Noise, that in the sole opinion of the University's Representative is disturbing or disruptive to occupants adjacent to the area of work, shall be scheduled for periods when the adjacent area is not occupied.

B. Extreme care to limit noise shall be taken at all times that the building is occupied. Loud or unnecessary conversation shall be avoided. The playing of radios, audio devices shall be strictly prohibited. Noise, that in the sole opinion of the University's Representative is disturbing or disruptive to occupants adjacent to the area of work, shall be scheduled for periods when the building is not occupied.

C. Control the conduct of its employees so as to prevent unwanted interaction initiated by Contractor's employees with students, staff, or other individuals, adjacent to the Project site. Without limitation, unwanted interaction by Contractor's employees includes whistling at or initiating conversations with passersby. In the event that any Contractor's employee initiates such unwanted interaction, or utilizes profanity, Contractor shall, either upon request of University's Representative or on its own initiative, replace said employee with another of equivalent technical skill, at no additional cost to the University.

D. SMOKE AND TOBACCO-FREE ENVIRONMENT: The University of California is committed to a healthy campus and workplace culture and environment. The University of California is a Smoke and Tobacco-Free environment. Smoking and the use of smokeless tobacco products (e.g. e-cigarettes and other unregulated nicotine products) is strictly prohibited on all University of California controlled properties, owned or leased and regardless of location. This policy is intended to provide a healthier, safer, and productive work and learning environment for the entire University community. For more information on the Smoke/Tobacco-Free Policy, please visit http://uctobaccofree.com/.

E. Alcoholic beverages are prohibited on the University's Project site.

1.7 INTERRUPTION OF BUILDING SERVICES

A. Planned utility service shutdowns shall be accomplished during periods of minimum usage, either weekends or 7pm-5am as approved by the building Chief Engineer. At least 2 business days advance notice shall be given to the University's Representative before interruptions to utility service and other interferences with use of existing buildings and surrounding hardscape

B. Shutdowns critical to the completion of the project shall be listed as Milestones on the project schedule. Schedule the Work so that service will be restored in the minimum possible time, and shall cooperate with the University in reducing shutdowns of utility systems.

C. The University reserves the right to deny shutdown requests based on scheduled work load, research projects, and usage of surrounding buildings or other activities planned on campus.

D. University’s costs for initial planned utility service shutdowns shall be borne by the University. If repeat utility service shutdowns are required due to work necessary to correct defective work, mistakes in new work layout such as misalignment or installation conflicts with other new work, University’s costs for repeat shutdown(s) will be deducted from Contract Sum.

1.8 SITE INGRESS AND EGRESS

A. Contractor shall be restricted to enter and exit from the Project site via Wilshire or Ashton.

B. Take all necessary precautions to ensure the safety of the bicyclists and pedestrians both on site and walking in the public right of way.

1.9 LOADING DOCK / ACESS, PROTECTION AND MATERIALS

A. Contractor shall instruct their entire crew that they may not park in the building garage. If approved to park, they shall park on the west side, lower level of the outside visitor parking.

B. All freight elevator use must be pre-approved through The Building Office 48 hours in advance so that security can be scheduled to key access at the loading dock level. The call button will not light up in the freight elevator lobby unless security keys the elevator at the loading dock level.

C. Use of the loading dock is very limited and for short periods of time only. Storage bins, equipment and materials cannot be placed in the loading dock. Access shall be for drop off and pick ups only.

D. Deliveries/transportation of tools or construction materials shall use the designated freight elevator and not the passenger elevators.

E. No materials will be allowed to be delivered through the main lobby or stockpiled in public lobbies or corridors during delivery. While making any delivery of materials and during construction activities, the following protection must be supplied and used by delivery and construction personnel(s):

F. Glass Doors, Wood Doors, Elevator Doors and Marble Corners and Columns shall be wrapped and protected with cardboard or moving blankets during the delivery.

G. Masonite or an equal product will be placed on all flooring such as carpet, marble or granite floors along the path of travel before making delivery and shall be taped to allow safe passage by building occupants.

H. Storage of materials must be limited to the area under construction, unless other arrangements are made with The Building Office.

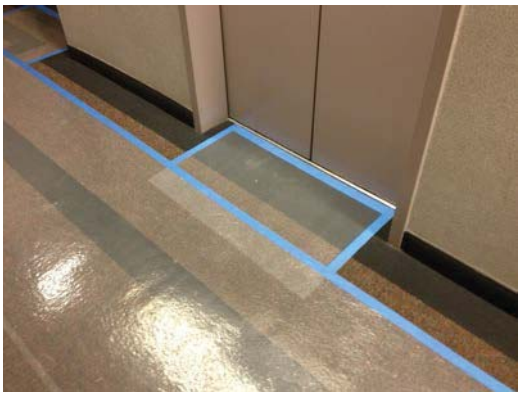
I. Projects on the ground floor that need to remove trash, ensure the lobby floor is protected.

J. Contractor shall not bring debris or material not related to this project to the Building.

K. Contractor shall submit a plan to Chief Engineer prior to any demolition activities.

L. Contractors working in the building shall provide a dust control mat both outside and inside the main entrances of any area that is under construction. These mats shall be a minimum of 3 feet by 4 feet in size. See below approved floor protection. Floor protection shall be replaced no less than twice per month and shall be maintained is excellent condition.

M. “Patching” is not acceptable.



N. During dusty periods of construction these mats shall be kept damp and shall be kept clean with periodic vacuuming by a wet and dry vacuum supplied by general contractor must be utilized to mitigate the spreading of dust and debris outside the suite. This is above and beyond plastic floor sheeting that must also be cleaned and maintained on a regular basis.

O. In addition the general or supervising contractor shall be responsible for the periodic cleaning (at least twice per Work day / night daily), of all public areas adjoining their construction area and within the suite if said suite is occupied and used for its daily function.

P. Occupied suites shall be fully cleaned at the end of each shift so that tenants can utilize their suite during working hours free of dust and debris and safety hazards.

Q. Prior to demolition, and during construction, Contractor shall be required to install a suitable filter or filter system on the return air dampers to prevent and mitigate spread of dust and other airborne particles into areas outside of construction. Contractor shall replace these filters as necessary during construction and shall remove the filters or system at completion of work and construction activities

R. Door jambs are to be protected, and fire marshal- approved plastic covering is to be placed over any wall covering.

S. Carpet must be properly covered to avoid footprints. A walk off mat or other dust controls are required within the suite.

T. All common area carpet and walls shall be protected accordingly. All protection must be maintained in suitable conditions and holes / tears must be fixed and / or materials replaced immediately. Floor covering shall be replaced no less than every two (2) weeks. It is mandatory that the protection looks professional and class A. Patching with an overlay barrier or masking.

U. Contractors will provide for and pay all costs and expenses for cleaning the construction area and for any clean-up required in adjacent areas as a result of the construction work.

V. Entry doors to construction areas will be kept closed at all times. Alterations to walls adjoining public areas shall not commence until new doors, frames and all other repair materials are on site. Once alterations are begun on Public Areas, they will be expeditiously completed with the drywall being applied and finished first to the side facing the Public Area so as to return that area to a finished condition as soon as possible.

W. Contractors shall not block or interfere with public corridors or lobbies.

X. In the event of discovery of [actual or suspected] lead or asbestos containing materials or substrate, Contractor shall advise the University and cease work in that area immediately.

Y. Power cords that must cross public areas shall be taped down or covered with mats similar to the dust mats described above.

Z. Tools, ladders, or construction materials will not be left unattended in any public area.

AA. Contractor shall ensure their safety manual and MSDS sheets are kept on site at ALL times. Failure to demonstrate it on site may result in the immediate cessation of work. This copy must be a bound copy. No construction may commence without the safety manual on site. No materials shall be permitted onsite without the product data and MSDS sheets.

1.10 WELDING / HOT WORK

A. Whenever any work involves torch cutting, welding, soldering or any other activity that involves flames or heat the following procedures are required:

B. Ensure workers have an active, certified (appropriate) fire extinguisher on hand and available at the work area at all times.

C. Ensure workers are trained to use the fire extinguisher.

D. Utilize Fire Marshal approved Fire Watch using Contractors staff.

E. Ensure workers have cell phones in case they need to call 911 or building engineer.

F. Ensure workers do NOT LEAVE the work area during the time when Fire Alarm System is on test as there is NO alarm coverage at that time.

G. Ensure workers do NOT LEAVE the work area for at least 30 minutes AFTER work is COMPLETE to verify there is no smoldering, smoke or fire issues.

H. Always check in with the Building Engineer when work is complete.

1.11 FIRE & LIFE SAFETY

A. Fire and life safety systems must remain active at all times during the project including during demolition. If it needs to be off line for more than 2 hours the contractor must arrange their own fire watch or other approved (by The Building Office) methods. Written documentation showing evidence that a fire watch was performed must be submitted to the University Representative and kept onsite at all times.

B. No sprinkler pipes are to be installed directly under proprietary / stand alone air conditioning units. No sprinkler lines are to be relocated or modified without prior approval by the Fire Marshall. All filling and draining of fire sprinkler lines or any fire/life safety procedures can start as early as 6:00 AM and must be completed by 5:00 PM weekdays. A Building Engineer must be present at any fire/life safety procedure. A charge will apply if a staff member has to come in early or work late. Building Management or the Chief engineer must be notified prior to any work or repair of this type. Smoke detectors must be covered during demolition and dusty work and uncovered and cleaned at the end of each work day so system is fully functional.

C. Simplex Grinnell is the required building approved fire alarm contractor for all system programing.

D. At ~75% and ~95% of design completion, fire alarm and fire sprinkler plans must be submitted to University Representative (Project Manager), Building Chief Engineer, and Design Team for review and coordination prior to submittal to the fire marshal for plan check.

E. All smoke detectors must **not** be covered / bagged prior to commencement of demolition or dusty procedures. Contractor must schedule a minimum of 72 hours in advance with The Building Office for the suite to be taken off line during these procedures.

F. Contractor must **not** leave the suite vacant with the fire alarm system off line. If this occurs, the University shall provide immediate fire watch and back charge the contractor accordingly.

G. Sprinkler lines must be filled by the end of each working day so as to keep the sprinkler system fully operational. If this is not possible, the contractor must arrange their own fire watch. No sprinkler lines are to be relocated or modified without prior approval by the Fire Marshal.

H. No sprinkler pipes are to be installed directly under proprietary / stand alone air conditioning units.

I. A Building Engineer must be present at any fire/life safety procedure. The Building Office or the Chief Engineer must be notified prior to any work or repair of this type.

J. A pre-test of fire/life safety must be performed with the Chief Engineer present before the actual test is scheduled. The test can start as early as 6:00 PM and must be completed by 7:00 AM. Notifications of pre-tests must be in writing a minimum of 72 hours prior to the proposed pre-test.

K. The fire/life safety test must be completely passed and finalized before keys are issued or the move-in occurs. **There are no exceptions**. The Chief Engineer must be present. The date and time of final test is determined by the availability of the Campus Fire Marshal.

L. All suite entry doors must remain closed at all the time and not wedged open. They must be locked upon completion of each work day.

M. Remove unused Fire Life Safety devices and wiring.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 ALTERNATES REQUIREMENTS

A. This Section identifies each Alternate and describes basic changes to the Work only when that Alternate is made a part of the Work by specific provision in the Agreement.

B. The Lump Sum Base Bid and Alternates shall include the costs of all supporting elements required, so that the combination of the Lump Sum Base Bid and any Alternates shall be complete. The scope of Work for all Alternates shall be in accordance with applicable Drawings and Specifications.

C. Except as otherwise specifically provided by University, the Work described in Alternates shall be completed with no increase in Contract Time.

D. This Section includes only the non-technical descriptions of the Alternates. Refer to the specific Sections of Divisions 2-33 of the Specifications for technical descriptions of the Alternates.

E. Coordinate related Work and modify surrounding Work as required to properly and completely integrate the Alternates into the Work.

1.2 DESCRIPTION OF ALTERNATES

A. Alternate 1:
In lieu of providing a new ceiling grid, provide alternate for leaving existing ceiling grid to remain (adjustments to existing grid will be required to accommodate new lighting layout and this work should be reflected in the deductive alternate); RE: REFLECTED CEILING PLAN & associated legend on A-3.0.
1. No extension of time will be granted if this Alternate is accepted.
2. University reserves the right to accept this Alternate within 15 calendar days after the date of the Agreement.

B. Alternate 2:
In lieu of providing filtered water at sink, provide alternate for eliminating glass filler, filtered water heater & chiller, water filter, & all associated piping and fittings (sink will still supply domestic hot/cold water); RE: 2/P-100, SINK PIPING DIAGRAM.
1. No extension of time will be granted if this Alternate is accepted.
2. University reserves the right to accept this Alternate within 15 calendar days after the date of the Agreement.

C. Alternate 3:
In lieu of leaving perimeter heat panels to remain, provide alternate for replacing all perimeter heat panels with new; RE: REFLECTED CEILING PLAN & associated legend on A-3.0.
1. No extension of time will be granted if this Alternate is accepted.
2. University reserves the right to accept this Alternate within 15 calendar days after the date of the Agreement.

D. Alternate 4:
In lieu of servicing/cleaning all window blinds within project area, provide alternate for demolishing existing and providing new window blinds at all exterior windows within project area; RE: FINISH PLAN GENERAL NOTE 6/A-2.0.
1. No extension of time will be granted if this Alternate is accepted.
2. University reserves the right to accept this Alternate within 15 calendar days after the date of the Agreement.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 GENERAL PROVISIONS REGARDING SPECIFICATION OF PRODUCTS, MATERIAL OR EQUIPMENT BY BRAND OR TRADE NAME

A. Products, material or equipment specified by both brand or trade name and model number are approved for use, provided that Contractor complies with all Contract requirements. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment can be used without modification, to meet the requirements of the plans and specifications; Contractor shall, at its sole cost, modify such products, material, or equipment so that they comply with all requirements of the plans and specifications.

B. The first-named product, material or equipment specified by brand or trade name and model number is the basis for the Project design and the use of any item other than the first-named one may require modifications of that design. If Contractor uses any product, material or equipment other than the first-named one, Contractor shall, at its sole cost:

1. Make all revisions and modifications to the design and construction of the Work necessitated by the use of the product, material or equipment.
2. Be responsible for all costs of any changes resulting from the use of the product, material or equipment including without limitation, costs or changes which affect other parts of the Work, the work of Separate Contractors, or any other property or operations of the University.

C. When a product, material or equipment specified by brand or trade name is followed by the words "or equal," a substitution may be permitted if the substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and if the substitution complies with all other requirements of the plans and specifications.

D. A product, material or equipment specified by brand or trade name followed by the words "or equal, no known equal," signifies that University does not have sufficient knowledge to specify a product, material or equipment, other than the one specified by brand or trade name, that is suitable for use on the Project. The use of the words "no known equal" is not intended to discourage substitution requests in accordance with the requirements specified herein.

E. When catalog numbers and specific brands or trade names not followed by the designation "or equal" are used in conjunction with a product, material or equipment required by the specifications, substitutions will not be allowed and the named product, material or equipment must be used.

F. Specification of a product, material or equipment by brand or trade name and model number is not a representation or warranty that the product, material or equipment is available; Contractor should confirm, prior to submitting its Bid, the availability of any product, material or equipment specified by brand or trade name and model number.

1.2 SPECIAL REQUIREMENTS FOR PRODUCTS, MATERIAL OR EQUIPMENT, OTHER THAN THE FIRST-NAMED PRODUCT, MATERIAL OR EQUIPMENT, SPECIFIED BY BOTH BRAND OR TRADE NAME AND MODEL NUMBER

A. In addition to complying with all other submittal requirements of the Contract, submit within 5 days after the date of commencement specified in the Notice to Proceed, for review and approval by the University's Representative, Contractor prepared specifications and drawings, including design and engineering calculations, prepared by an appropriate licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the product, material or equipment. If no revisions or modifications are necessary, submit within 5 days after the date of commencement specified in the Notice to Proceed, a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. Contractor shall utilize the first-named product, material or

equipment if Contractor fails to make the appropriate required submittal pursuant to this paragraph within the 5 day period.

B. A product, material or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number may be used if no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment. If such revisions or modifications are necessary, the product, material or equipment may be used only if the revisions or modifications are approved in writing by the University's Representative. Contractor has the burden of demonstrating, through the procedures specified herein, that any such revisions or modifications will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project. The University's Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility or appearance of the Project or any portion of the Project.

1.3 SPECIAL REQUIREMENTS FOR SUBSTITUTIONS

A. In addition to complying with all other submittal requirements of the Contract, submit written data demonstrating that the proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility, appearance, environmental performance criteria, and otherwise complies with all requirements of the plans and specifications, including:

1. Requests for substitutions will only be considered if Contractor completes and submits Material Substitutions Proposal Form and the following supporting data:

a. Complete technical data including drawings, performance specifications, samples, and test reports of the article proposed for substitution.
b. Statement by Contractor that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirements.
c. List of Subcontractors, if any, that may be affected by the substitution.
d. Contractor prepared specifications and drawings, including design and engineering calculations, prepared by an appropriately licensed professional, depicting all revisions and modifications to the design and construction of the Work necessitated by the use of the substitution. If no revisions or modifications are necessary, submit a written representation that no revisions or modifications to the design or construction of the Work are necessitated by the use of the product, material or equipment.

B. At the request of and within the timeframes specified by the University's Representative and as reasonable based on the actual Project duration:

1. Submit samples as deemed necessary by the University's Representative to evaluate the proposed substitution.
2. Submit proposed substitution to tests deemed necessary by the University's Representative to evaluate the proposed substitution. Such tests shall be made by an independent Testing Laboratory and at the sole expense of Contractor, after review and approval of the test procedures by University's Representative. If re-testing is deemed necessary by the University's Representative to evaluate the proposed substitution, such re-testing shall be made by an independent Testing Laboratory at the sole expense of the Contractor.
3. Provide any additional information deemed necessary by the University's Representative to evaluate the proposed substitution.

C. If University's Representative, in reviewing a proposed substitution, requires revisions or corrections to be made to previously accepted shop drawings and supplemental supporting data to be resubmitted, Contractor shall do so within the time period specified by the University's Representative. A proposed substitution may be rejected if Contractor fails to submit such revisions, corrections, or supplemental supporting data within the specified time period.

D. Except for products, material or equipment designated in the Bidding Documents for evaluation of substitutions prior to award, requests for substitution, including the data required by Paragraph

1.3.A, must be submitted to the University's Representative not later than 5 days after the date of commencement specified in the Notice to Proceed. No requests for substitutions of products, material or equipment subject to the 5 day deadline shall be considered unless the request and supporting data is submitted on or before the deadline, except those deemed, in University's Representative's sole opinion, to be necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.

E. If a product, material or equipment is designated in the Bidding Documents for evaluation of substitutions prior to award, then a request for substitution of the product, material or equipment, including the data required by Paragraph 1.3.A, must be submitted by the deadline specified in the Bidding Documents. Because of time constraints, only one submittal will be allowed for each such substitution request. Requests for substitutions of products, material or equipment designated for evaluation prior to award may not be made after the deadline specified in the Bidding Documents, and such requests be shall not be considered unless the request and supporting data is submitted on or before the deadline specified in the Bidding Documents. Notwithstanding the forgoing, the University may consider, after award of the Contract, requests for substitution of a product, material or equipment designated for evaluation prior to award where, in University's Representative's sole opinion, a substitution is necessary because (i) previously specified or approved manufactured products, material or equipment are no longer manufactured, (ii) of University initiated change orders, or (iii) it is in the best interest of University to accept such substitution.

F. In reviewing the supporting data submitted for substitutions, University's Representative will use, for purposes of comparison, all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications. If more than 2 submissions of supporting data are required, the cost of reviewing the additional supporting data shall be at Contractor's expense.

G. Contractor has the burden of demonstrating, through the procedures specified herein, that its proposed substitution is equal to or superior to the first-named product, material or equipment in quality, utility and appearance and complies with all other requirements of the plans and specifications. If revisions or modifications to the design or construction of the work are necessitated by the use of the substitution, Contractor also has the burden of demonstrating, through the procedures specified herein, that the use of the substitution will not be detrimental to the quality, utility or appearance of the Project or any portion of the Project.

H. The University's Representative may refuse to approve any requested substitution where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the proposed substitution is equal to, or superior to, the first-named product, material or equipment, in quality, utility and appearance and that the proposed substitution complies with all other requirements of the plans and specifications.

I. University's Representative may reject any substitution not proposed in the manner and within the time limits prescribed herein.

J. Substitutions are not allowed unless approved in writing by the University's Representative. Any such approval shall not relieve Contractor from the requirements of the Contract Documents.

K. The 5 day and 10 day submittal periods do not excuse Contractor from completing the Work within the Contract Time or excuse Contractor from paying liquidated damages if Final Completion is delayed.

L. If revisions or modifications to the design or construction of the Work are necessitated by the use of a substitution, the substitution may be used only if the revisions and modifications are approved in writing by the University's Representative. The University's Representative may refuse to approve any such proposed revisions or modifications where, in the reasonable opinion of the University's Representative, Contractor has failed to demonstrate, through the procedures specified herein, that the revisions or modifications are not detrimental to the quality, utility and appearance of the Project or any portion of the Project.

M. If a substitution request is finally rejected by the University Representative, Contractor shall furnish and install:

1. The first-named product, material, or equipment; or
2. A product, material, or equipment, other than the first-named product, material or equipment, specified by both brand or trade name and model number, provided Contractor complies with the submittal requirements (including deadlines) of this section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 26 13

REQUESTS FOR INFORMATION PROCEDURES

PART 1 - GENERAL

1.1 REQUESTS FOR CLARIFICATION OR ADDITIONAL INFORMATION (RFIs)

A. Submit a Request for Information (RFI) if one of the following conditions is discovered:

1. An unforeseen condition or circumstance that is not described in the Contract Documents.
2. An apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or is not reasonably inferred from the intent of the Contract Documents.
3. An omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.

B. Submit RFIs in a reasonable time frame so as not to affect the Contract Schedule and while allowing the full response time described below.

C. Form of Submission

1. Submit all requests for clarification or additional information in writing to the University's Representative using the Request for Information (RFI) form.
2. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "1." The resubmittal of RFI 1 with the same issue would be numbered "1.1". The second RFI would be "2."
3. Indicate specification section impacted.
4. Address impacts to schedule and cost.

D. Suggest possible solutions to fit field conditions, if appropriate. RFIs will not be recognized or accepted if, in the opinion of University's Representative, one of the following conditions exist:

1. Contractor submits the RFI as a request for substitution.
2. Contractor submits the RFI as a submittal.
3. Contractor submits the RFI under the pretense of a Contract Documents discrepancy or omission without thorough review of the Documents.
4. Contractor submits the RFI in a manner that suggests that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
5. Contractor submits an RFI in an untimely manner without proper coordination and scheduling of Work of related trades.

E. Response Time

1. University's Representative, or the delegate of the University’s Representative, shall resolve such questions and issue instructions to Contractor within a reasonable time frame. In most cases, RFIs will receive a response within 7 days. In some cases, this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed in writing.
2. Should Contractor proceed with the Work affected before receipt of a response from University's Representative within the response time described above, any portion of the Work that is not done in accordance with the University's Representative's interpretations, clarifications, instructions, or decisions is subject to removal or replacement and the Contractor shall be responsible for all resultant losses.
3. Failure to Agree: In the event of failure to agree as to the scope of the Contract requirements, Contractor shall follow procedures set forth in the General Conditions.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 13

PROJECT COORDINATION

PART 1 - GENERAL

1.1 COORDINATION REQUIREMENTS

A. Coordinate the Work and do not delegate responsibility for coordination to any Subcontractor.

B. Anticipate the interrelationship of all Subcontractors and their relationship with the Work.

C. Resolve differences or disputes between Subcontractors concerning coordination, interference, or extent of the Work between Sections.

D. Coordinate the Work of Subcontractors so that portions of the Work are performed in a manner that minimizes interference with the progress of the Work.

E. Do not obstruct spaces and installations that are required to be clear by Applicable Code Requirements.

F. Do not cover any piping, wiring, ducts, or other installations until they have been inspected and approved and required certificates of inspection have been issued.

G. Remove and replace all Work that does not comply with the Contract Documents. Repair or replace any other Work or property damaged by these operations at no additional cost to the University.

H. Coordinate all portions of the Work requiring careful coordination in order to fit in space available. Before commencing such portions of the Work, prepare supplementary Drawings for review by the University's Representative.

I. Ensure that anchorage, blocking, joining, and other detailing are provided as required.

J. Electrical and Mechanical Coordination

1. Routing and Coordination of HVAC, Mechanical, Fire Sprinkler, Plumbing and Electrical Installations
    a. Schedule and coordinate the Work of all Subcontractors having installation responsibilities [within the ceiling space] [of all the new and remodeled space]**,** with respect to the sequence of Work and the allocation of space among the trades. Contractor's approved construction schedule shall clearly indicate the planned sequence of Work in such areas and any proposed departure from it affecting or potentially affecting coordination of the overall installation shall be brought promptly, in writing, to the attention of the University's Representative.
    b. Prepare or have prepared detailed Shop Drawings in plan view, with cross-sections as necessary, indicating the proposed installation plan for all HVAC, mechanical, fire sprinkler, plumbing, and electrical installations within the area [of all the ceiling area] [of all the new and remodeled space]**.** These Drawings should depict actual elevations and linear dimensions, and all routing changes, transitions, and major offsets deemed necessary to accomplish the installation. Individual Shop Drawings may be prepared for each trade working within the designated space or area; however, the coordination of the consolidated installation shall remain the responsibility of the Contractor. These Shop Drawings shall be submitted to the University's Representative for review prior to commencement of installation, and shall be provided to each Subcontractor having Work in the area.
    c. Should unavoidable conflicts be encountered during the preparation or review of the Shop Drawings, or during construction, they shall be promptly brought to the attention of the University's Representative, in writing, for resolution.
    d. Where the Drawings are diagrammatic, showing only the general arrangement of the systems, Contractor shall have responsibility for the fitting of materials and equipment to other parts of the equipment and structure, and to make adjustments as necessary or required to resolve space problems, preserve service room, and avoid architectural and

structural elements and the Work of other trades. Contractor may be required to identify certain areas to relocate installations within the spaces depicted on the Drawings, e.g., ductwork may be shifted within the space shown to accommodate other systems. Such functional relocations shall not be deemed a change to the requirements of the Contract. In the event a major re-routing of a system appears necessary, Contractor shall prepare and submit for approval, Shop Drawings of the proposed rearrangement.

e. Because of the diagrammatic nature and small scale of the Drawings, all necessary offsets, adjustments, and transitions required for the complete installation are not shown. Contractor shall carefully investigate the structural and finish conditions affecting all the Work and shall arrange such Work accordingly, furnishing such fittings, equipment, valves, accessories, etc., as may be required to meet such conditions, at no additional cost to the University.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERALPRECONSTRUCTION CONFERENCE

A. Prior to commencement of Work, a preconstruction conference will be conducted by the University's Representative to discuss procedures that are to be followed during performance of the Work.

B. Location: As designated by University's Representative.

C. Attending shall be:

1. University's Representative.
2. University's Consultants and University's Representative's Consultants, as appropriate.
3. Contractor, Contractor’s Superintendent, Subcontractors, as appropriate.
4. Others, as appropriate.

D. Location: As designated by University's Representative.

1.2 PROGRESS MEETINGS

A. During the course of construction, weekly progress meetings will be held to discuss and resolve field problems. The duration and number of meetings will be determined by the University's Representative.

B. Location: A site designated by University's Representative that is convenient for all parties.

C. Attending shall be:

1. University's Representative.
2. University's Consultants and University's Representative's Consultants, as appropriate.
3. Contractor, Contractor's Superintendent, Subcontractors, as appropriate.
4. Others, as appropriate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SCOPE

A. Preliminary Contract Schedule, Contract Schedule, and updated Contract Schedules.

B. Graphical Reports

C. Computer Software Requirements

1.2 DEFINITIONS

A. Critical Work activities are defined as Work activities that, if delayed or extended, will cause a critical delay as defined in the General Conditions and Supplementary Conditions. All other Work activities are defined as non-critical Work activities and are considered to have float.

B. Float is defined as the time that a non-critical Work activity can be delayed or extended without causing a critical delay as defined in the General Conditions and Supplementary Conditions. Neither the Contractor nor the University shall have an exclusive right to the use of float. Float is a shared resource available to each party to the contract. The Contractor shall document the effect of the use of float on the updated Contract Schedule.

C. Preliminary Contract Schedule is defined as a practical schedule representing the Contractors plan for accomplishing the work within the Contract time showing all significant milestones for the Contract period as well as a detailed work plan for the first 60 days following the Notice to Proceed. The Preliminary Contract Schedule shall not include any actual dates or progress measured against any activities.

D. Contract Schedule is defined as a graphical representation of a practical plan to complete the Work within the Contract Time. The first Contract Schedule that shall be submitted to the University not later than [5] days after Notice to Proceed. The period covered by Contract Schedule shall be the Contract Time. The Contract Schedule shall incorporate the logic of the Preliminary Contract Schedule covering the first 60 days following the Notice to Proceed.

E. Look Ahead Schedule is defined as a schedule derived from the Contract Schedule (or the most current monthly update of the Contract Schedule) which indicates in detail all activities scheduled or worked on for the 2 prior weeks, and all activities scheduled to occur during the next 4 weeks.

1.3 SUBMITTALS REQUIRED

A. Submit the following in accordance with Section 01 33 23 Shop Drawings, Product Data, Samples

1. Preliminary Contract Schedule
2. Contract Schedule
3. Monthly Updates to Contract Schedule
4. Graphical Reports
5. Electronic Schedule Files
6. Look Ahead Schedules

B. Submit all submittals required by this specification (except preliminary schedule and look-ahead schedules) to the University’s Representative via electronic means. Submit 2 copies when transmitting via a diskette or CD-ROM.

PART 2 - PRODUCTS

2.1 SOFTWARE

A. Software Requirements

1. The Contractor shall use Microsoft Project, or equal to produce the schedule and all required graphical and tabular reports.

PART 3 - EXECUTION

3.1 PRELIMINARY CONTRACT SCHEDULE

A. Within 10 days after the notice of selection as the apparent lowest responsible bidder, Contractor shall submit a Preliminary Contract Schedule to the University's Representative for approval. This schedule shall account for use of the Contract Time and identify significant known constraints and milestones within the Contract Time. The Preliminary Contract Schedule shall provide a detailed work plan of all activities planned by the Contractor for the first 60 days of the project subsequent to the Notice to Proceed as well as all anticipated activities prior to the Notice to Proceed. The Preliminary Contract Schedule, including the logic contained therein, shall be incorporated into the Contractors proposed Contract Schedule. In addition to the detailed work plan, the Contractor shall identify in detail the following planned activities in the Preliminary Contract Schedule:

1. Preparation of equipment and material submittals for review.
2. Fabrication and delivery periods of long lead items.
3. Major milestones.
4. All holidays, campus finals weeks and non-working days.

B. Submission – The Contractor shall submit an electronic version (computer backup file) of the Preliminary Contract Schedule, as well as a Gantt chart of the Preliminary Contract Schedule to the University for approval as a condition precedent to being eligible for receipt of the first progress payment. The files shall be provided on CD-ROM prepared in MS Windows format.

C. Form – The Preliminary Contract Schedule shall reflect the Contractor’s actual plan of work for the first 60 days of the project. The Contractor’s progress shall be measured against the preliminary contract schedule until such time as the University approves the Contractor’s first Contract Schedule.

3.2 CONTRACT SCHEDULE

A. Within 5 days of the Notice to Proceed date, the Contractor shall submit its proposed Contract Schedule. The proposed Contract Schedule shall incorporate the Preliminary Contract Schedule, including the logic of the Preliminary Schedule, unless approval is granted by the University’s Representative to deviate from this requirement.

B. Form:

1. The proposed first contract schedule shall be produced using CPM (Critical Path Method) techniques, in the PDM (Precedence Diagram Method) method of scheduling.
2. When approved, the proposed first Contract Schedule shall become the Contract Schedule.
3. The Contract Schedule shall represent a practical plan to fully complete the Contract within the Contract Time.
4. The Contract Schedule shall identify all holidays, campus finals weeks and non-working days.
5. The Contract Schedule activities shall be coded with the following information applicable to each activity:
    a. Area of the project
    b. Identity of the party responsible for the activity (i.e., University, General Contractor, specific subcontractor…)
    c. Specification section applicable to activity
    d. Phase – The following phases shall be identified:
        1) Administrative
        2) Submittal and Review
        3) Fabrication
        4) Construction
        5) Inspection

C. Content:

1. The Contract Schedule shall identify all Work activities in correct sequence for the completion of the Work within the Contract Time. Work activities shall include the following:

a. Major Contractor-furnished equipment, materials, and building elements requiring submittals or University's Representative's prior approval.
   1) Show dates for the submission, review, and approval of each such submittal. Dates shall be shown for the procurement, fabrication, delivery, and installation of major equipment, materials, and building elements, and for scheduled activities designated by the University.
   2) A minimum of 5 days shall be allotted for University's Representative to review each submittal. The 5 days shall be measured starting with actual receipt by the University Representative of the submittal.
b. System test dates.
c. Dates Contractor requests designated workspaces, storage area, access, and other facilities to be provided by the University.
d. Dates Contractor requests orders and decisions from the University on designated items.
e. Dates Contractor requests University-furnished equipment.
f. Dates Contractor requests University-furnished utilities.
g. Planned dates for connection and relocation of existing utilities.
h. Planned dates for connecting to or penetrating existing structures.
i. Planned dates for scheduled inspections as required by Codes, or as otherwise specified.
j. Commissioning Sequence and activities for all Building Systems.
k. Punchlist and punchlist correction periods.
l. University Training periods.

2. The Contract Schedule shall include a complete sequence of construction, in adequate detail for the planning and coordination of the Work. Unless approved by the University's Representative, there shall be no activities shown with durations in excess of 3 business days.
3. The Contract Schedule shall be calculated using the Retained Logic method. Progress override calculations shall not be acceptable.

D. Submission

1. The Contractor shall submit an electronic version (computer backup file) of the Contract Schedule, as well as a Gantt chart of the Contract Schedule to the University. The files shall be provided on CD-ROM, prepared in MS Windows format.
2. Tabular Computer Reports
   a. As requested by the University, the Contractor shall submit various computer-generated tabular reports.

E. Acceptance

1. Upon receipt, the University's Representative shall review the proposed first Contract Schedule. Within 5 business days of the University’s receipt of the proposed first Contract Schedule, the University's Representative shall schedule a review meeting with the Contractor for the purpose of jointly reviewing the proposed first Contract Schedule. The meeting shall occur within 10 business days of the University’s receipt of the proposed first contract schedule.
2. If the proposed first Contract Schedule is accepted by the University's Representative, it shall become the Contract Schedule. Such acceptance shall not relieve Contractor from its responsibility to fully complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the Contract Schedule.
3. If the Contractor or the University's Representative determines the proposed first Contract Schedule to be in need of revision, within 5 business days following the joint review meeting, the Contractor shall revise and resubmit the proposed first Contract Schedule to the University's Representative for acceptance, and, upon acceptance thereof, it shall become the Contract Schedule. Such acceptance shall not relieve Contractor from its responsibility to fully complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the Contract Schedule. No progress payment beyond the second progress payment will be paid to the Contractor until such time as the University’s Representative has approved the Contractor’s first Contract Schedule.

3.3 MONTHLY UPDATES

A. After approval of the first proposed Contract Schedule, Contractor shall update the Contract Schedule monthly. The update shall reflect progress as of the end of each month. Contractor shall submit monthly schedule update to the University's Representative for approval by no later than the tenth day of the following month. The updates shall be made as follows:

1. The Monthly updates shall report progress based upon percent complete of each activity or remaining duration. Actual start dates shall be recorded for those activities that have started. Actual finish dates shall be recorded for those activities that are completed. Activities that are in progress shall reflect an actual start date and the percentage completion for the activity.
2. The updated Contract Schedule shall reflect an up-to-date status of the contract work as completed, and materials furnished and in permanent place that qualify for payment.
3. The updated Contract Schedule shall reflect Contract Time changes included in all processed change orders for the progress month and each preceding month

B. Within 5 business days after receipt of the updated Contract Schedule in conjunction with the Application for Payment, the University's Representative shall review both and determine which work and material pay items qualify for payment; the approved data will then be returned to the Contractor with comments. The Contractor and the University's Representative shall meet to review the Construction CPM Schedule and discuss any changes required.

C. The Contractor shall then revise and resubmit (if required) the Updated Contract Schedule and Application for Payment to the University's Representative for payment approval.

D. The monthly update shall be calculated using retained logic with a required finish date specified as the current contract completion date. Progress Override calculations shall not be acceptable.

E. No Applications for Payment will be processed nor shall any progress payments become due until updated Contract Schedules are accepted by University's Representative. The accepted, updated Contract Schedule shall be the Contract Schedule of record for the period it is current and shall be the basis for payment during that period. Acceptance of any updated Contract Schedules shall not relieve Contractor from its responsibility to fully complete the Contract within the Contract Time, nor shall it relieve Contractor from sole responsibility for any errors in the updated Contract Schedules.

F. Submission

1. The Contractor shall submit an electronic version (computer backup file) of the monthly update of the Contract Schedule, as well as a Gantt chart of the updated Contract Schedule to the University. The files shall be provided on CD-ROM produced in MS Windows format.

G. Obligation

1. Contractor shall perform the Work in accordance with the updated Contract Schedule. Contractor may change the Contract Schedule to modify the order or method of accomplishing the Work only with prior agreement by the University.

3.4 LOOKAHEAD SCHEDULES

A. Provide detailed lookahead schedules every 2 weeks indicating all activities planned during the next 2 or 3 weeks.

B. Submit in 11 inch by 17 inch Gantt chart format. Provide as many copies as requested by University’s representative. Also provide as PDF via email.

C. Lookahead schedule shall correlate to the then current Preliminary Contract Schedule, Contract Schedule, or updated Contract Schedule. Lookahead schedules shall be legible but may be hand written and drawn.

3.5 GANTT CHART REQUIREMENTS

A. Gantt Charts shall meet the following requirements

1. Prepared on 11 inch by 17 inch paper

2. Organized by Area and Phase
3. Sorted by Early Start dates, then Total Float
4. Bars shall be formatted in such a way that they are visually distinguishable through the use of graphical tools such as cross hatching (the use of color copies is encouraged)
5. Columns shall include at a minimum
   a. Activity ID
   b. Activity Description
   c. Original Durations
   d. Remaining Durations
   e. Early Start Dates
   f. Early Finish Dates
   g. Percent Complete
6. The critical path of paths shall be clearly identifiable.

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

A. Shop Drawings, Product Data, and Samples shall be submitted to the University's Representative. Product Data and Samples for proposed substitutions shall be submitted to University's Representative in accordance with Section 01 25 00 Substitution Procedures. Contractor shall be responsible for obtaining copies of Shop Drawings, Product Data, and Samples as it may require for its own use.

1.2 RELATED REQUIREMENTS

A. Definitions

1. The terms "Shop Drawings" and "Product Data" as used herein also include, but are not limited to fabrication, erection, layout and setting drawings, manufacturers' standard drawings, descriptive literature, catalogues, brochures, performance and test data, wiring and control diagrams. All other drawings and descriptive data pertaining to materials, equipment, piping, duct, conduit systems, and methods of construction as required to show that the materials, equipment, or systems and the positions thereof conform to the Contract Documents.
2. As used herein, the term "manufactured" applies to standard units usually mass-produced. The term "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements. Shop Drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relationship to adjoining Work, and amplify design details of mechanical and electrical equipment in proper relationship to physical spaces in the structure.

B. Manufacturer's Instructions

1. Where any item of Work is required by the Contract Documents to be furnished, installed, or performed in accordance with a specified product manufacturer's instructions, Contractor shall procure and distribute the necessary copies of such instructions to the University's Representative and the Contractor shall furnish, install, or perform the Work in strict accordance therewith.

C. Submittal Schedule

1.3 SUBMISSION AND REVIEW

A. Submit the required submittals to University’s Representative in a timely fashion to allow for adequate review and approval so that the Contract Schedule is not adversely impacted

1.4 COORDINATION

A. Coordinate Submittals with the proper sequencing of the Work so that the Contract Schedule can be maintained and University has reasonable time to review and comment.

1. The Contractor shall submit a schedule for submission of Shop Drawings, Product Data, and Samples (the "Submittal Schedule"). The schedule shall include the Contractor's time to process the submittal(s), and the time required for review by the University's Representative and University's Design Professional**.** The schedule shall be agreed upon by the University's Representative, the University's Design Professional, and the Contractor in order that submittals will be available when needed by the construction process and so that each party can plan its workload in an orderly manner. All required submittals shall be initially submitted no later than 2 weeks after the Notice to Proceed.
2. Contractor shall prepare the Submittal Schedule in the form contained in the Exhibits and coordinate it with the Contract Schedule. No submittals will be processed prior to the approval of the Submittal Schedule, unless an exception is made by the University's Representative.

3. Submit 2 copies of the Submittal Schedule after it is completed and each time it is updated by the Contractor.
4. In preparing the Submittal Schedule, the Contractor must first determine from the Contract Schedule the date the particular item is needed for the Work. Working backwards, the Contractor will add the required number of days for shipment, time for fabrication, and similar items to determine the date of the first submittal. Contractor shall be responsible for the impact to the schedule resulting from submittals that do not conform to contract requirements. Contractor shall provide time in the Submittal Schedule for the re-submittal of items that do not conform to contract requirements.
5. The Submittal Schedule shall be adjusted to meet the needs of the construction process and the Contract Schedule.
6. Review Time: The minimum time required by the University's Representative and the University's Design Professional to review and process Shop Drawings, Product Data and Samples shall be at least 5 working days after receipt, except the time to review submittals requiring review by State Fire Marshal (SFM), shall be at least 5 working days.
7. Resubmittal: After receipt, resubmittals shall require the same time for review as the initial submittals.
8. Submit items in a group or sequence which allows for review and coordination.
9. Submit submittals promptly in accordance with the Submittal Schedule to avoid delay in the Work or in the Work of any Separate Contractor.

1.5 SHOP DRAWINGS

A. Present information required on Shop Drawings in a clear and thorough manner. Identify details by reference to drawing and detail, schedule, room numbers shown and specified.

B. Direct copies of the Contract Documents are not acceptable as a submittal from the Contractor.

1.6 PRODUCT DATA

A. Preparation

1. Clearly mark each copy to identify pertinent products or models.
2. Show performance characteristics and capacities.
3. Show dimensions and clearances required.
4. Show wiring or piping diagrams and controls.

B. Manufacturer's standard schematic drawings and diagrams

1. Modify the standard schematic drawings and other diagrams to delete information that is not applicable to the Work.
2. Supplement standard information to provide information specifically applicable to the Work.
3. Clearly indicate manufacturer's model or part number intended for Project.

C. Material Safety Data Sheets

1. Material Safety Data Sheets (MSDS) shall be submitted for all hazardous substances so defined by the State of California. MSDS shall also be provided for all substances furnished under this Contract that are not available to the general public from retail outlets, e.g., paints, coatings, lacquers, varnishes, sealers, removers, thinners, solvents, adhesives, cleaners, acids, putty, fillers, disinfectants, fungicides, pesticides, gases, oils, lubricants, treatments, liquid-applied flooring, etc.

D. LEEDTM Product Data: Submit product data and information for documentation of credits for LEED certification. Comply with ASTM E 2129 Standard Practice for Data Collection for Sustainability Assessment of Building Products, and Project requirements. Where information must be specially prepared for submittal because standard product documentation does not contain the information required, prepare written statements on manufacturer's letterhead certifying the required product attributes. Refer to Section 01 60 00 Product Requirements for additional information.

1.7 SAMPLES

A. Samples shall be of sufficient size and quality to clearly illustrate the following:

1. Functional characteristics of the products with integrally related parts and attachment devices;
2. Full ranges of color, texture, and pattern;
3. Or as specified.

B. Field Samples and mock-ups (if required)

1. Erect at the Project site, at a location as directed by the University's Representative;
2. Size: As specified;
3. Fabricate each Sample and mock-up to be complete and fully finished;
4. Remove mock-ups at conclusion of the Work;
5. Or as specified.

C. Samples: Submit new samples in resubmittals as required for initial submittal.

1.8 CONTRACTOR'S REVIEW OF SUBMITTALS

A. Review, edit as appropriate, stamp and sign the Shop Drawings, Product Data, and Samples prior to submission. The Contractor's stamp shall include the language that the submittal has been reviewed by the Contractor per the requirements of of the General Conditions and Supplementary Conditions. Submittals that do not comply with this paragraph will not be reviewed.

B. Determine and verify

1. Field measurements.
2. Field construction criteria.
3. Catalog numbers and similar data.
4. Conformance with Contract Documents.

C. Coordinate each submittal with requirements of the Work and of the Contract Documents.

D. Specifically identify in the GC Comment field of the transmittal form any deviations of the submitted item from the Contract Documents.

1.9 SUBMITTAL REQUIREMENTS

A. A separate submittal is required for each specification section. The submittal items identified in a specification section shall be consolidated into a single submittal unless otherwise noted. Incomplete submittals shall be returned without review for re-submittal.

B. It is Contractor's responsibility to submit all submittals specified in each section of the specifications.

C. Submittals identified for record purposes will not be returned to the Contractor. Number of Submittals Required

1. Shop Drawings, Product Data and other submittals that can be converted into electronic format:
   a. Send electronic copies in .PDF format to the University’s Representative and the University’s Design Professional.
   b. 2 hard copies to the University's Representative and 1 hard copy to the University’s Design Professional.
   c. The University's Representative shall return 1 electronic copy with the review comments to the Contractor.
2. Samples and Non-reproducible Submittals:
   a. 3 hard copies to the University's Design Professional and 3 hard copies to the University's Representative.
   b. The University's Representative shall return 1 hard copy with review comments to the Contractor.

D. Some specification sections may require submittals to be submitted electronically on CD-ROM in most current version of AutoCAD.

E. Submittals shall contain

1. Date of submission and dates of any previous submissions.
2. Project name and number.
3. Contract identification.
4. The names of
   a. Contractor.
   b. Subcontractor.
   c. Supplier.
   d. Manufacturer.
5. Identification of the product with the Specification Section number.
6. Field dimensions clearly identified as such.
7. Relation to adjacent or critical features of the Work or materials.
8. Reference standards such as American Society for Testing and Materials (ASTM) or Federal Specification (FS) numbers.
9. Identification of changes from requirements of the Contract Documents.
10. Identification of revisions on resubmittals. Note any departures from the Contract Documents or changes in previously reviewed submittals that were not commented upon.
11. An 8 by 3 inch blank space for review stamps.
12. Contractor's stamp, initialed or signed, certifying to the review of the submittal; verification of materials field measurements and conditions; and compliance of the information within the submittal with requirements of the Work and of the Contract Documents.
13. Contractor shall submit submittal(s) with transmittal provided by the University's Representative.

F. Resubmission Requirements

1. Shop Drawings and Product Data
   a. Note any departures from the Contract Documents or changes in previously reviewed submittals that were not commented upon by the [University's Design Professional].
   b. [University's Design Professional] will review a total of 2 submittals for the same item at no cost to the Contractor. The cost for the review of more than 2 submittals of the same item shall be deducted from the Contract Sum.

G. Distribution

1. Reproduce and distribute copies of Shop Drawings and Product Data, that have been accepted by the University to the following locations:
   a. Contractor's Project site file.
   b. Record documents file maintained by the Contractor.
   c. Subcontractors.
   d. Supplier, manufacturer or fabricator.
2. Distribute Samples that have been accepted by the University to Subcontractors or suppliers that need samples for quality control and coordination.

H. University's Representative and University's Design Professional's Professional(s)] will review Contractor's submittals, such as Shop Drawings, Product Data and Samples, for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents.

I. Contractor shall submit data, including but not necessarily limited to, the Sections identified in Table of Submittals. It is Contractor's responsibility to submit all submittals specified in each section of the specifications.

TABLE OF SUBMITTALS									
Section	Shop Drawings	Data/List of Materials	MSDS	Color and/or Samples	Guarantee Over 1 Year	Mock-ups	As Builts	Certifications	Other
Schedule									
Two week look ahead schedule	X	X	X	X					
Material submittals (i.e. paint, tile, flooring, wall covering, ceiling tile, insulation etc.		X	X						
Mechanical submittals (HVAC, plumbing, sprinklers)	X	X							
Electrical submittals including lighting package and fire alarm	X	X							
Close-Out Package		X	X				X	X	X
Any other requested submittals									X

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 16

ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.1 SIGNAGE

A. No signs or advertisements will be permitted on the Project site, including company name and logos on job site trailers, except with the express permission of University's Representative.

B. For interior projects, install and maintain a project informational sign(s) provided by the University at a location(s) designated by the University's Representative.

C. At every door and barricade separating the project work and staging areas from areas not included in the project work area, the Contractor shall provide, install and continuously maintain a construction warning sign. The 11 inch by 17 inch construction warning sign shall be plastic laminated on heavy cardstock and shall be securely affixed at eye level to the door or barricade.

1.2 NOTIFICATION

A. Two days prior to entering occupied rooms, provide notice and schedule to each room occupant. The notice shall include work scope, date and hours of work. If schedule is changed, provide updates as soon as possible and obtain permission to enter prior to starting work.

1.3 INDOOR AIR QUALITY

A. These requirements are in addition to the requirements of Section 01 81 19 Indoor Air Quality Requirements Contractor shall be responsible for protection of the cleanliness of the existing air handling system at all times.

1. This protection shall include:
    a. During site Work or building demolition, prefilters shall be provided and maintained on all building outside air intakes at all times throughout the construction duration.
    b. Prior to starting any Work, the Contractor shall record and submit to the University's Representative, pressure readings across all existing air handler air filter banks before installation of new prefilters.
    c. During any interior Work that may create dust in the interior space and adjacent corridor/hallways, air filters shall be provided and maintained on all affected air return and exhaust grilles. Where air flow in or out of the space is not required, all air duct openings shall be temporarily blanked off with plywood or sheetmetal.
    d. Upon completion of all Work affecting existing air handling systems, the Contractor shall remove all temporary filters, covers and associated parts and restore the system to its original operating condition unless otherwise stated elsewhere in the Contract Documents.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 43

ENVIRONMENTAL PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS

A. The Environmental Mitigation requirements for this Project are recorded in this Specification Section. The mitigation measures may include, but are not limited to, procedures and standards to control:

1. Dust Palliation
   a. All unpaved construction areas shall be sprinkled with water or other acceptable Yolo-Solano Air Quality Management District (AQMD) dust control agents during dust generating activities to reduce dust emissions. Additional watering or acceptable AQMD dust control agents shall be applied during dry weather or windy days until dust emissions are not visible.
   b. Trucks hauling dirt and debris shall be covered to reduce wind-blown dust and spills.
   c. On dry days, dirt or debris spilled onto paved surfaces shall be swept up immediately to reduce resuspension of particulate matter caused by vehicle movement. Approach routes to the Project site shall be cleaned daily of construction related dirt in dry weather.
   d. On-site stockpiles of excavated material shall be covered. If stockpile is only needed for seven days or less, watering can be substituted for covering.
2. Noise
   a. Noise from job equipment and construction operations shall be kept to a minimum by use of adequate mufflers and other appropriate means.
   b. Comply with all City Los Angeles sound ordinances as required.
   c. Do not exceed 86 db at Project Site property boundary.
3. Odors: Work that causes excessive odors shall be performed only after coordination with the University's Representative. Contractor shall schedule work during off- hours or provide carbon-activated filtering of air intakes including those of adjacent building air handling units as may be needed to prevent odors and vapors from entering the buildings. Contractor shall provide 7 business days advance notice to the University's Representative in order for advance notices to be forwarded to building occupants. Work stoppage may occur if advance notification has not been coordinated or odors and vapors from the work are found to generate complaints from building occupants.
4. All paint, drywall mud and other activities with any odors, must be performed after hours. Verify with University Representative for other mitigation measures, such as building fans to be turned on or off.

1.2 ARCHAEOLOGICAL RESOURCES – Not Applicable

1.3 HAZARDOUS MATERIALS

A. [Reference Sections 02 82 00 Asbestos Remediation; 02 83 00 Lead Remediation; and 02 85 00 Mold Clean-Up

B. Except as otherwise specified, in the event Contractor encounters on the Project site material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), lead, or other hazardous substances that have not been identified or rendered harmless, Contractor shall immediately stop work in the area affected and report the condition to the University's Representative in writing. The work in the affected area shall not thereafter be resumed except by written agreement of University and Contractor if in fact the material is asbestos, PCB, lead, or other hazardous substances and has not been rendered harmless. The work in the affected area shall be resumed in the absence of asbestos, PCB, lead, other hazardous substances, or when such materials have been rendered harmless.

C. Disclose any unidentified hazardous substance or condition exposed during the work to the University's Representative for decision or remedy.

D. In no event, shall the Contractor install materials that contain asbestos, PCB, lead or other known hazardous materials unless prior approval is obtained from the University.

E. Disposal of lighting ballasts containing PCB's shall be accomplished by the University. Contractor shall be required to segregate waste ballasts that may contain PCBs. Ballasts labeled “NO PCBs” shall not be disposed of with PCB waste. The Contractor shall coordinate with the University's Representative regarding a date, location and time for delivery to a location on Campus to be designated.

1.4 ASBESTOS IN BUILDINGS NOTIFICATION

A. California Health and Safety Code, Section 25915, Chapter 10.4, Division 20 requires UC employees and contractors working for the campus to be notified of the presence of asbestos in buildings constructed prior to 1979.

B. It is important to note that the presence of asbestos does not mean you have been exposed to asbestos. Exposure strictly refers to the inhalation or ingestion of friable asbestos particles. Asbestos becomes friable through drilling, sanding or similar destructive processes usually associated with remodeling or demolition work. Intact, bonded, sealed and undisturbed asbestos does not pose a hazard.

C. For information about asbestos in specific buildings, contact the University's Representative.

D. Contractors who disturb or potentially disturb hazardous or non-hazardous asbestos must comply with all Federal State and Local rules and regulations regarding asbestos materials.

1.5 LEAD BASED PAINT IN BUILDINGS

A. The California Department of Health Services (DHS) certifies workers and supervisors performing lead related construction activities, as defined in Title 17, California Code of Regulations, Division 1, Chapter 8. Lead related construction work is defined in Title 17 as any construction, alteration, painting, demolition, salvage, renovation, repair, or maintenance of any residential or public building, including preparation and cleanup, that, by using or disturbing lead containing material or soil, may result in significant exposure of adults or children to lead.

B. Contractors shall utilize DHS certified workers and supervisors when performing activities that disturb painted/coated surfaces containing more than 600 ppm lead.

C. It is important to note that the presence of lead does not mean you have been exposed to lead. Exposure strictly refers to the inhalation or ingestion of lead dust. Lead becomes dust through drilling, sanding or similar destructive processes usually associated with remodeling or demolition work. Intact, bonded, sealed and undisturbed lead does not pose a hazard.

D. For information about lead in specific buildings, contact the University Representative.

E. Contractors who disturb or potentially disturb lead must comply with all Federal, State and Local rules and regulations regarding hazardous materials.

1.6 NOXIOUS OR TOXIC MATERIALS

A. No noxious or toxic materials shall be used in or around occupied buildings without prior approval of the University.

B. Store volatile wastes in covered metal containers and remove from premises daily.

C. Prevent accumulations of wastes that create hazardous conditions.

D. Provide adequate ventilation during use of volatile or noxious substances. Use such materials only after 48 hours previous notification to the University's Representative and preferably on weekends or "down" periods.

E. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

F. Do not allow or permit oil or fuel spillage during vehicle or equipment operations or maintenance. Any vehicle or equipment spills shall be cleaned up immediately and the soil disposed of properly. Provide secondary containment around any fuel or oil storage areas.

G. Train Superintendent in prevention and correction of spills.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 53

SECURITY PROCEDURES

PART 1 - GENERAL

1.1 PROJECT SITE SECURITY

A. Security of the Project site shall be strictly maintained. Contractor shall be responsible for keeping areas involved in this Work locked at all times when Work is not in progress.

B. Provide security and facilities to protect the Work, existing facilities, and University's operations from unauthorized entry, vandalism, or theft.

C. All work must be scheduled with The Building Office a minimum of 72 hours in advance.

D. For access to the building and/or construction site each contractor must submit a list of pre-approved subcontractors that will be working in the building a minimum of 48 hours prior to the arrival time of any worker. Submit this list to The Building Office.

E. For access to the building and/or construction site each contractor must submit a list of pre-approved subcontractors that will be working in the building a minimum of 48 hours prior to the arrival time of any worker. Submit this list to The Building Office.

F. All workers shall carry valid identification on their person at all times

G. All workers shall sign in and out at the security desk. Workers who do not sign in shall be asked to leave the building.

H. Workers shall remain on floors allocated to construction. Workers found on other floors shall be asked to leave the building.

I. Contractor shall provide a detailed list of contractors and their workers prior to commencing Work.

1.2 KEYS

A. Keys required for access to the Project will be issued by the Office of the Building to the Contractor only. It shall be Contractor's responsibility to open areas for Subcontractors. Certain types of Projects may require more than 1 set of keys. Additional keys will be issued to the Contractor, if requested.

B. At completion of the Project, all keys shall be returned to University's Representative. Failure to return keys will obligate Contractor for all costs incurred due to necessary rekeying.

C. If the contractor is in possession of suite keys, they shall not have them copied or given to non-authorized personnel.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 – GENERAL

1.1 CODES, AGENCIES, AND REFERENCES

A. The Work shall be performed in accordance with Applicable Code Requirements and applicable requirements of all other regulatory agencies, including, but not limited to, the following:

1. Americans with Disabilities Act - Title II.
2. California Environmental Quality Act.
3. California Health and Safety Code.
4. National Fire Protection Association (NFPA).
5. Federal Occupational Safety and Health Administration.
6. Federal Environmental Protection Agency – Clean Air Act.
7. Storm Water Pollution Prevention Act.
8. Local Air Quality Management District.

1.2 STANDARDS AND CODES

A. Applicable laws, codes, rules, regulations, ordinances and standards

1. California Code of Regulations (CCR)
    a. Title 8, Industrial Relations
    b. Title 17, Public Health
    c. Title 19, Public Safety
    d. Title 20, Public Utilities and Energy
    e. Title 21, Public Works
    f. Title 22, Environmental Health
    g. Title 24
        1) Part 2, California Building Code (2007)
        2) Part 3, California Electric Code (2001)
        3) Part 4, California Mechanical Code (2007)
        4) Part 5, California Plumbing Code (2007)
        5) Part 6, California Energy Code (2005)
        6) Part 7, California Elevator Safety Construction Code
        7) Part 9, California Fire Code (2007)
        8) Part 12, California State Reference Standards

1.3 REFERENCES

A. Unless otherwise specified, specific references to codes, regulations, standards, manufacturers' instructions, or requirements of regulatory agencies, when used to specify requirements for materials or design elements, shall mean the latest edition of each in effect at the date of submission of bids, or the date of the Change Order or Field Order, as applicable.

1.4 CONFLICTS

A. Unless otherwise directed by the University's Representative, if a conflict exists between referenced regulatory requirements and the Contract Documents, comply with the one establishing the more stringent requirements.

B. Nothing stated in this Section of the Specifications or other Sections of the Specifications, the other Contract Documents or the Bidding Documents or shown on the Drawings shall be construed as allowing Work that is not in strict compliance with all applicable Federal, State, regional, and local statutes, laws, regulations, rules, ordinances, codes and standards.

1.5 TRENCHING AND SHORING

A. All Work shall be in full accordance, but not necessarily limited to the following codes and regulations: Titles 8, 19, 21, 22, & 24, State of California, California Code of Regulations (CCR), California Occupational Safety and Health Administration (OSHA).

1. Pursuant to Labor Code 6707, the Contractor shall include in the bid all costs incident to the provisions of adequate sheeting, shoring, bracing or equivalent method for the protection of life or limb that shall conform to applicable Federal and State safety orders.
2. Before beginning any excavation 5 feet or more in depth, the Contractor shall submit to the University's Representative a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation. The proposed plan shall comply with the standards established by the State of California Construction Safety Orders, Title 8 and Title 24 of the California Code of Regulations (CCR). If the detailed plan varies from such shoring system standards, it shall be prepared by a registered civil or structural engineer whose name and registration number shall be indicated on the Drawing. If a dispute arises as to whether the plan must be prepared by a registered civil or structural engineer, the University's Representative's determination of the matter shall be final and conclusive on the Contractor. The cost of required engineering services shall be borne by the Contractor and shall be deemed to have been included in the Contract Sum for the Work as stated in the Agreement.
3. Neither the review nor approval of any plan showing the design of shoring, bracing, sloping, or other provisions for worker protection, shall relieve the Contractor from the obligation to comply with construction State of California Construction Safety Order and Title 24 of the California Code of Regulations (CCR) for the design and construction of such protective Work, and the Contractor shall indemnify the University and the University's Representative from any and all claims, liability, costs, actions and causes of action arising out of or related to the failure of such protective systems. The Contractor shall defend the University, its officers, employees and agents and the University's Representative in any litigation or proceeding brought with respect to the failure of such protective systems.
4. All Work including any temporary construction shall be in full compliance with the latest orders of the Division of Industrial Safety of the State of California and all codes and regulations as called for hereinafter in these specifications.

1.6 REGULATORY NOTIFICATIONS

A. Submit all required notifications to Federal, State of California, State in which disposal facility is located if not in California, regional, and local agencies with regulatory responsibilities associated with the Work activities that are included in the Contract. All notifications shall be served in writing, in the form required by the agency requiring notification, and in a timely manner so as not to negatively impact the Project schedule. Serve notifications at least 10 business days in advance (or earlier if required by agency) of activity requiring notice. The Contractor shall serve all required notifications in writing to all governmental and quasi-government agencies having notification requirements pertaining to any portion of the Work included in the Project.

B. Contractor shall file a Notice of Intent for coverage under State General Construction Activity Storm water Permit National Pollutant Discharge Eliminate System (NPDES). Contractor shall comply with applicable permit requirements including the project Storm Water Pollution Prevention Plan (prepared by the Contractor). Reference Section 01 57 01 Storm Water Pollution Prevention

C. The University owns many buildings throughout the state of California. The Contractor is responsible for contacting the local jurisdictional authority for AQMD in the area of work. Submit a written plan of intention for demolition of any building, removal of a load-bearing structure or removal of large stationary equipment and pay associated fees to the local Air Quality Management District (AQMD) in which the Work is to be performed. Comply with notification requirements established by the local AQMD. Notification shall be filed a minimum of 10 business days in advance of starting site work. Provide the University’s Representative with a copy of all notifications a minimum of 7 business days in advance of starting site work.

1.7 PERMITS, NOTIFICATIONS, CERTIFICATES AND UNIFORM HAZARDOUS WASTE MANIFEST

A. Permits

1. University will issue a University's building permit at no cost to Contractor prior to start of construction.

2. Contractor will [not] be required to obtain a [City] [specify other locations as necessary] building permit.

B. Fire Department

1. Contractor shall be responsible for coordinating the following notifications and obtaining the following permit(s) and posting of permit(s) on Project site prior to starting the Work. Permits are to be obtained through the University's Representative. Contractor shall allow for a minimum turnaround time of 4 business days. For permits involving fire alarm shutdowns allow a minimum of 7 business days. Contractor must follow the rules and regulations as written on or attached to the permit.
   a. Hazardous Condition Permit - Hot Work: must be coordinated before starting any hot work (welding, burning, or cutting, etc.) involving use of gas or electric welding equipment. The permit may be applicable to more than 1 building. Contractor is responsible for reporting to the UC Dispatch Center by telephone, at the beginning and 30 minutes prior to the end of each shift that such "hot" work takes place.
   b. Hazardous Conditions Permit-Asbestos / Lead: must be obtained before starting removal of asbestos containing materials, polychlorinated biphenyl (PCB), lead base paint or other hazardous materials found on Project site.
   c. Hazardous Condition Permit-Special Conditions: Coordinate in advance with the University Fire Department before restricting access to or blocking of any building exit or Work that will require the shutdown of building fire protection or alarm systems. In addition, Contractor must obtain a permit for the storage or use of any flammable liquid in excess of 10 gallons or in any confined area where vapors can be ignited. The Contractor is responsible for reporting to the UC Fire Dispatch Center by telephone at at the beginning and 30 minutes prior to the end of each shift that such work takes place.
   d. The Contractor must submit at the end of the Work Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Aboveground Piping and Automatic Sprinkler Systems-Contractor's Material and Test Certificate for Underground Piping for approval by the Campus Fire Department. The Automatic Sprinkler underground and aboveground will not be accepted until these certificates have been completed and submitted.

C. Underground Service Alert (USA) Notifications: Prior to commencing clearing, excavation and trenching, coordinate with Underground Service Alert (USA North/1-800-227-2600 or 811), in accordance with Section 01 71 33 Protection of Adjacent Construction.

D. Uniform Hazardous Waste: Contractor shall be responsible for coordination with the University's Representative for obtaining a Uniform Hazardous Waste Manifest prior to removal of asbestos containing materials, polychlorinated biphenyl (PCB), or other hazardous materials from the Project site.

E. Refrigerant Recovery/Use Notification and New Refrigerant Containing Equipment Input: Prior to University's release of final payment, Contractor shall submit a Refrigerant Recovery/Use Notification summary. The following work practices and information is required:

1. All Work has been performed in compliance with Federal Environment Protection Agency, Clean Air Act.
2. Only EPA certified technicians have added or recovered refrigerants while working on refrigerant containing equipment (EPA Section 608 – Refrigerant Recycling Rule, Technician Certification).
3. All work performed on refrigerant containing equipment (RCE) shall be documented and submitted. A separate form shall be submitted for each (RCE) unit per Section 608, Clean Air

Act, Refrigerant Recycling Rule. Contractor shall submit notification forms with project As-Built Documents.

4. Storage, labeling and disposal of refrigerants shall comply with EPA.
5. Decommissioned refrigerant containing equipment shall display a weather resistant label clearly noting the removal of all hazardous materials, e.g. refrigerant, coolant, used oil, or any other hazardous material removed from unit.
6. Disposal of decommissioned refrigerant containing equipment shall comply with all Federal, State and local regulations.

F. In no event, shall the Contractor install materials that contain asbestos, PCB, lead or other known hazardous materials unless prior approval is obtained from the University.

G. Regulated Carcinogens by Title 8 California Code of Regulations (CCR), Subchapter 7, Group 16 (Control of Hazardous Substances), Article 110 (Regulated Carcinogens).

1. Products containing chemicals regulated as carcinogens by the State of California are not allowed for use on University projects.
2. Case-by-case exceptions may be considered for products containing the following Cal/OSHA recognized carcinogens:
   a. Methylene Chloride, 5202
   b. Cadmium, 1532, 5207
   c. Inorganic Arsenic, 5214
   d. Formaldehyde, 5217
   e. Benzene, 5218
3. Case-by-case exceptions may only be made when suitable alternative products are not available. Such exceptions are subject to written approval by the University's Representative.
4. Exceptions require that the Contractor shall have an established carcinogen program as required by Cal/OSHA (§5203. Carcinogen Report of Use Requirements) and shall submit to University's Representative, a copy of the Cal/OSHA Confirmation of Report for Cal/OSHA carcinogens.
5. When exceptions are granted, the Contractor is responsible for providing to the University's Representative a copy of the semi-annual Confirmation of Report received from Cal/OSHA or, in lieu of that, a copy of the Contractor's semi-annual report as submitted to Cal/OSHA at periods not to exceed 6 months, or at project closeout, whichever occurs first.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 42 00
REFERENCES

PART 1 - GENERAL

1.1 ABBREVIATIONS

A. Abbreviations and Acronyms: Where abbreviations and acronyms are used in Specifications, they shall mean the recognized name of the entities in the following list:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers' Association
AAN	American Association of Nurserymen, Inc.
AASHTO	American Association of State Highway and Transportation Officials
ABAG	Association of Bay Area Governments
ABPA	Acoustical and Board Products Association
ABPTA	American Bearing Power Transmission Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ACPA	American Concrete Pipe Association
ADA	Americans with Disabilities Act of 1990
ADAAG	American with Disabilities Act Accessibility Guidelines
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers Association
AFI	Air Filter Institute
AGA	American Gas Association
AF&PA	American Forest and Paper Association
AGC	Associated General Contractors of America
AHA	American Hardboard Association
AI	The Asphalt Institute
AIA	American Institute of Architects
AIEE	American Institute of Electrical Engineers
AIMA	Acoustical and Insulation Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALSC	American Lumber Standards Committee
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
AOAC	Association of Official Analytical Chemists
APA	American Plywood Association
API	American Petroleum Institute
AQMD	Air Quality Management District
ARI	Air-Conditioning and Refrigeration Institute
ASA	American Standards Association
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers Association
ASTM	American Society for Testing and Materials
AWCI	Association of Wall and Ceiling Industries
AWG	American Wire Gauge

AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWPB	American Wood Preservers Bureau
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers' Association
BICSI	Building Industry Consulting Service International
BOCA	Building Officials and Code Administrators
CAC	California Administrative Code
Cal/OSHA	California Division of Occupational Safety and Health
CARB	California Air Resources Board
CBC	California Building Code
CBSC	California Building Standards Commission
CCR	California Code of Regulations
CCM	Certified Construction Manager
CDA	Copper Development Association, Inc.
CE	Corps of Engineers (U.S. Dept. of the Army)
CEC	California Electrical Code
CESO	California Elevator Safety Order
CGA	Compressed Gas Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturer's Institute
CLPA	California Lathing and Plastering Association
CMAA	Construction Management Association of America
CMC	California Mechanical Code
CMM	State of California, Business and Transportation Agency, Division of Highways “Materials Manual”
CPC	California Plumbing Code
CPSC	Consumer Product Safety Commission
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards of NBS (U.S. Dept. of Commerce)
CSS	State of California, Business and Transportation Agency, Department of Public Works, Division of Highways' “Standard Specifications”
CTI	Cooling Tower Institute
DCM	Design and Construction Management (UCD)
DHI	Door & Hardware Institute
DHS	California Department of Health Services
DSA	Division of State Architect
DSA/AC	Division of State Architect, Access Compliance Section
EIA	Electronic Industrial Alliance
EPA	Environmental Protection Agency
ESO	Electrical Safety Orders of Division of Industrial Safety, Title 8, CAC
ETL	Electrical Testing Laboratories
FCC	Federal Communications Commission
FFDA	Federal Food and Drug Administration
FGMA	Flat Glass Marketing Association
FIA	Factory Insurance Association
FM	Factory Mutual System, Factory Mutual Engineering Corporation
FS	Federal Specifications
GA	Gypsum Association
GFI	Ground Fault Interrupter
HEPA	High Efficiency Particulate Air
HI	Hydronics Institute

HMI	Hoists Manufacturers Institute
HMMA	Hollow Metal Manufacturers Association
HPMA	Hardwood Plywood Manufacturers Association
IAPMO	International Association of Plumbing and Mechanical Officials
IBEW	International Brothers of Electrical Workers
IBR	Institute of Boiler and Radiator Manufacturers
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineering Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
IPCEA	Insulated Power Cable Engineers' Association
ISA	Instrument Society of America
ISO	International Standards Organization
ITU	International Telecommunications Union
LIA	Lead Industries Association
LEED	Leadership in Energy and Environmental Design
MBMA	Metal Building Manufacturer's Association
MIA	Marble Institute of America
MIL	U.S. Government, Military Specification
MLSFA	Metal Lath/Steel Framing Association
MM	State of California, Business and Transportation Agency, Department of Public Works, Division of Highways' “Materials Manual”
MSS	Manufacturers Standardization Society of Valves and Fittings Industry
NAAB	National Association of Air Balance
NAAMM	The National Association of Architectural Metal Manufacturers
NACE	National Association of Corrosion Engineers
NBFU	National Board of Fire Underwriters
NBGQA	National Building Granite Quarries Association, Inc.
NBHA	National Builders' Hardware Association
NBS	National Bureau of Standards
NCMA	National Concrete Masonry Association
NCPWB	National Certified Pipe Welding Bureau
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	National Fire Protection Association
NHLA	National Hardwood Lumber Association
NIOSH	National Institute of Occupational Safety and Health
NPA	National Particleboard Association
NPDES	National Pollutant Discharge Eliminate System
NRC	Noise Reduction Coefficient
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	National Sanitation Foundation
NWMA	National Woodwork Manufacturers Association, Inc.
NWWDA	National Wood Window and Door Association
OSHA	Office of Safety and Health Act
OSHPD	Office of Statewide Health Planning and Development
PCA	Portland Cement Association
PCB	Polychlorinated Biphenyl
PCI	Precast/Prestressed Concrete Institute

PDI	Plumbing and Drainage Institute
PI	Perlite Institute
PS	Product Standard of United States Department of Commerce
RCSC	Research Council on Structural Connection
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RUS	U.S. Department of Agriculture, Rural Utilities Service
RWQCB	Regional Water Quality Control Board's
SAE	Society of Automotive Engineers
SBC	State Building Code
SBS	State Building Standards Electrical Code, Title 24, Part 3
SCAQMD	South Coast Air Quality Management District
SDI	Steel Door Institute
SFM	State of California, Office of State Fire Marshal
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal & Air Conditioning Contractors' National Association, Inc.
SPIB	Southern Pine Inspection Bureau (Grading Rules)
SPR	Simplified Practice Recommendation
SSPC	Society for Protective Coatings
STC	Sound Transmission Coefficient
SWI	Sealant and Waterproofers Institute
SWPPP	Storm Water Pollution Prevention Plan
TCA	Tile Council of America, Inc.
TIA	Telecommunications Industry Association
UBC	Uniform Building Code
UC	University of California
UCDCM	University of California Design and Construction Management
UCEH&S	University of California Environmental Health & Safety
UCFD	University of California Fire Department
UCFPB	University of California Fire Prevention Bureau
UCFM	University of California Facilities Management
UCTAPS	University of California Transportation and Parking Services
UFAS	Uniform Federal Accessibility Standards
UHMW	Ultra-High Molecular Weight
UL	Underwriters' Laboratories, Inc.
USA	Underground Service Alert
USDA	United States Department of Agriculture
USGBC	United States Green Building Council's
USS	United States Standards
USSG	United States Steel Gauge
WAPA	Western Area Power Authority
WCLIB	West Coast Lumber Inspection Bureau
WH	Warnock Hersey
WI	Woodwork Institute In 2003
WLPDIA	Western Lath/Plaster/Drywall Industries Association
WRSI	Western Concrete Reinforcing Steel Institute
WWPA	Western Wood Products Association
WWPOA	Western Wood Preserving Operators Association
WWTP	Waste Water Treatment Plant
AQMB	Air Quality Management Board

B. Additional abbreviations, used on the Drawings, are listed thereon.

1.2 SYMBOLS

A. Symbols, used only on the Drawings, are shown thereon.

1.3 DEFINITIONS

A. The following terms, when used on the Drawings or in the Specifications, shall have the following meanings:

1. AS DIRECTED - “As directed by the University's Representative.”
2. AS REQUIRED - “As required by Applicable Code Requirements; by good building practice; by the condition prevailing; by the Contract.”
3. AS SELECTED - “As selected by the University's Representative.”
4. BY OTHERS - Work on this Project that is outside the scope of Work to be performed by the Contractor under this Contract, but that will be performed by the University, Separate Contractors, or other means.
5. EQUAL - Of same quality, appearance, and utility to that specified, as determined by the University's Representative. The Contractor bears the burden of proof of quality.
6. EXPOSED - Exposed to view (interior and exterior); exposed to elements.
7. FABRICATED - Items specifically assembled or made out of selected materials to meet individual design requirements.
8. FURNISH - “Supply only, not install (unless required to be provided or installed elsewhere in the Contract Documents).”
9. INSTALL - “Install or apply only, not furnish.”
10. MANUFACTURED - Applies to standard units usually mass produced.
11. OFF SITE - Outside the Work area as shown on the Drawings or the property lines.
12. PROJECT SITE - Geographical location of the Project.
13. PROVIDE - “Furnish and install.”
14. SHOWN - “As indicated on the Drawings.”
15. SPECIFIED - “As written in the Contract Documents.”
16. SUBMIT - “Submit to University's Representative.”
17. UNIVERSITY-FURNISHED, CONTRACTOR INSTALLED - “To be furnished by University at its cost and installed by Contractor as part of the Work.”

PART 1 - PRODUCTS (NOT USED)

PART 2 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 43 00
QUALITY ASSURANCE

PART 1 - GENERAL

1.1 MOCKUPS

A. General mock-up requirements

1. Intent of mock-up is to ascertain element's designed fit into space provided and to provide Contractor with opportunity to coordinate Subcontractor Work.
2. Maintain quality control over Work of various Sections of Specifications, manufacturers, products, services, workmanship, and site conditions to produce mock-ups in accordance with the Contract Documents.
3. Mock-ups include, but are not necessarily limited to, the following:
   a. Carpet layout
   b. Tile layout
   c. OTHERS – Reasonable request by the University. Refer to plans and related technical specifications

B. Submittals: Complete required submittals prior to construction of mock-ups including but not limited to product data, samples and shop drawings as required.

C. Construction Schedule: Include mock-up activities including administrative and procedural submittals and materials ordering and assembly on Schedule per the requirements of 013200 Construction Progress Documentation. Identify every element required for each mock-up. Allow ample advance time for preparation and approval of mock-ups prior to placement of final orders for work without delay to progress or completion of the work.

D. Workmanship

1. Comply with standards specified. Provide qualified personnel to produce mock-up of specified quality.
2. Assemble and erect complete, with specified attachment and anchorage devices, flashings, seals and finishes. Secure mock-ups in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.
3. Provide finish to match approved samples. When required in individual Specification Sections, install full-scale mock-up of assembly at Project site at location acceptable to the University's Representative.

E. Approval

1. Maintain approved mock-ups as standard for evaluating Work until Work is completed and removal is approved by the University’s Representative.
2. Acceptable mock-ups shall not be retained in completed Work unless noted otherwise.
3. Remove unacceptable mock-ups. Mock-ups not incorporated into finished Work shall be removed from the site immediately as approved by the University’s Representative.
4. Mock-ups shall be approved by the University's Representative in writing, as a condition precedent to approval of shop drawings for work represented by the mock-up.

1.2 TESTING AND INSPECTION

A. Definitions

1. The term "University's Testing Laboratory" means a testing laboratory retained and paid for by University for the purpose of reviewing material and product reports and performing other services as determined by the University.
2. The term "Contractor's Testing Laboratory" means a testing laboratory retained and paid for by Contractor to perform the testing services required by the Contract Documents. Contractor's Testing Laboratory shall be an organization other than University's Testing Laboratory and

shall be acceptable to the University's Representative. It may be a commercial testing organization, the testing laboratory of a trade association, the certified laboratory of a supplier or manufacturer, Contractor's own forces, or other organization. Contractor's Testing Laboratory shall have performed testing of the type specified for at least 5 years.

3. The term "Geotechnical Engineer" means an engineer retained and paid for by the University for the purpose of performing inspection, testing, and observation functions specified by the University.

B. Contractor's Responsibilities Regarding University's Testing Laboratory

1. Secure and deliver to University's Testing Laboratory adequate quantities of representative samples of materials proposed for use as specified.
2. Submit to University's Testing Laboratory the preliminary design mixes proposed to be used for concrete and other materials that require review by University's Testing Laboratory.
3. Submit copies of product test reports as specified.
4. Furnish incidental equipment, labor and facilities:
   a. To provide University's Testing Laboratory access to the Work to be tested.
   b. To obtain and handle samples at the Project site or at the source of the product to be tested.
   c. To facilitate inspections and tests.
   d. For storage and curing of test samples.
5. Provide notice to University's Representative sufficiently in advance of operations to allow for University's Testing Laboratory assignment of personnel and scheduling of tests.
6. When tests or inspections are cancelled after such notice due to work not being ready for testing, Contractor shall reimburse University for University's Testing Laboratory personnel and travel expenses incurred.

C. Tests and Inspections

1. Tests, inspections, and acceptance of portions of the Work required by the Contract Documents or by Applicable Code Requirements shall be made at the appropriate times. Except as otherwise provided, Contractor shall make arrangements for such tests, inspections, and acceptances with Contractor's Testing Laboratory. Contractor shall give the University's Representative timely notice of when and where tests and inspections are to be made using the Inspection Request Exhibit.
2. If such procedures for testing, inspection, or acceptance reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the University's Representative's services and expenses.
3. If the University's Representative is to observe tests, inspections, or make acceptances required by the Contract Documents, University's Representative will do so promptly and, where practicable, at the normal place of testing.
4. Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.
5. Certain portions of the Work will be tested and inspected at various stages. Nothing in any prior acceptance or satisfactory test result shall govern, if at any subsequent time the Work, or portion thereof, is found not to conform to the requirements of the Contract Documents.

D. Additional Testing and Inspection

1. If initial tests or inspections made by University's Testing Laboratory or Geotechnical Engineer reveal that any portion of the Work does not comply with the Contract Documents, or if the University's Representative determines that any portion of the Work requires additional testing or inspection, additional tests and inspections shall be made as directed.
   a. If such additional tests or inspections establish that such portion of the Work complies with the Contract Documents, all costs of such additional tests or inspections shall be paid by the University.
   b. If such additional tests or inspections establish that such portion of the Work fails to comply with the Contract Documents, all costs of such additional tests and inspections,

and all other costs resulting from such failure, including compensation for the University's Representative and the University's consultants, shall be deducted from the Contract Sum.

E. Test Reports

1. University's Testing Laboratory and Contractor's Testing Laboratory shall submit 1 copy of all reports to University's Representative, indicating observations and results of tests and indicating compliance or non-compliance with the Contract Documents.
2. University's Representative will distribute 1 copy of the reports to the University, University's consultants, and Contractor.
3. The number of copies for the Contractor and supplier being tested will be determined upon commencement of the Contract.

F. Closing in Uninspected Work

1. Do not allow or cause Work to be covered or enclosed before it has been inspected and approved by the University's Representative. Should any Work be enclosed or covered before it has been approved, it shall be uncovered, inspected, approved or repaired, and covered. Make all repairs necessary to restore Work of others to the condition in which it was found at time of cutting, at no additional cost to the University.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 51 00
TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes provision of temporary utilities and includes administrative and procedural requirements.

1.2 REQUIREMENTS

A. Refer to applicable requirements specified in other divisions.

B. University will furnish, at no cost to Contractor, utilities used during the course of construction and commissioning; including water and electricity, until that portion of the work is accepted by the University through Beneficial Occupancy or Substantial Completion. Contractor shall install and maintain services during the Work. If the University's Representative determines, that the Contractor is not making reasonable efforts to conserve energy and water, it may terminate its permission for free access and impose partial or full charges for such services it provides to the Contractor effective from the date such determination is provided to the Contractor in writing.

C. University does not guarantee amounts of utilities available from existing University's sources, nor will the University be responsible for interruptions in service.

D. Contractor shall coordinate with the University's Representative prior to making any temporary utility connections at their cost.

E. Contractor shall submit to University's Representative for approval a small scale drawing detailing proposed points of connections, materials proposed for use and routes for temporary utilities. Contractor shall not proceed with connections, modifications or extension of utilities without written approval by the University's Representative.

F. Maintain and operate systems in conformance with industry standard, applicable codes and manufacturer guidelines to provide continuous service.

G. Contractor shall be responsible for costs for connection, modification or extension and disconnection of all temporary utilities; e.g. water, power and telephone.

H. Temporary materials may be new or used, but shall be adequate for the required purposes. Their use and methods of installation shall not create unsafe conditions or violate requirements of Applicable Codes and Standards.

I. Utility charges that are delinquent for more than 30 days shall be deducted from the Contractor’s Application for Payment.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

A. Install and use temporary utilities in accordance with the following:

1. California Electrical Code.
2. Federal, State, and local codes and regulations.
3. University Utility provider requirements.

1.4 SUBMITTALS

A. Contractor shall make all submittals in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.

B. Small scale drawing detailing points of connections, materials proposed for use and routes for temporary utilities.

C. Utility Service Initiation and Termination Form located in the Exhibits, one for each utility service, to request temporary or final utility service. Submit the form 14 days prior to the requested utility service start date.

D. Pay University for monthly usage of all permanent utilities used during construction and commissioning including gas, water, electricity, chilled water, steam, telephone and data.

E. At the conclusion of the work, remove all temporary services installed as a requirement of these Contract Documents and return the temporary meters to University. Restore temporary utilities to their original condition at the completion of Work.

F. Legally and properly dispose of all debris resulting from removal and reconditioning operations.

1.5 TEMPORARY ELECTRICITY AND WATER METERING

A. University will provide temporary water and electricity metering for temporary services. Contractor shall coordinate exact meter location with University's Representative prior to proceeding with work and provide adequate accessible location for University to install these meters.

B. The electrical meter will be housed in an approved NEMA 3 enclosure. Contractor shall provide an accessible location for this meter adjacent to the Contractor's main breaker. Contractor shall complete the necessary related work including conduit and provide two one-inch knockouts in their main breaker panel to allow University to extend and connect the meter to the breaker.

C. The water meter will be located adjacent to the Contractor’s approved reduced pressure backflow preventer. Contractor shall complete the necessary related work including piping and disinfection.

1.6 UTILITY RATES

A. Electricity, water, steam and chilled water may be taken from University's systems in such quantities and at such times as they are available. If this is done, provide all equipment, including, connections, transformers, and other materials necessary for extending the utility lines to where they will be used. Coordinate the installation with the University's Representative.

B. If construction power, water, chilled water, steam, or other related utilities are not available, Contractor shall be required to provide supplemental equipment such as generators to accommodate the construction needs.

C. Contractor will be billed on a monthly basis via the University accounting system. Payments shall be made monthly and account paid in full before final University payment to Contractor is made.

1.7 TEMPORARY FIRE PROTECTION

A. Contractor shall conform to all applicable codes, standards, regulations and the following rules, and instructions of the University of California Fire Department (UCFD).

B. Assign a qualified person with authority to maintain fire protection equipment, institute fire prevention measures, be a liaison with the University of California Fire Prevention Bureau (UCFPB) and direct the prompt removal of combustible and waste materials from the Project site. Prior to start of Work, the Project Superintendent and the Contractor's Safety Officer shall meet with the University's Representative and UCDFD Assistant Fire Marshal assigned to the Project for a mandatory safety meeting.

C. No burning shall be done on Project site.

D. Provide and maintain fire protection equipment including extinguishers, fire hoses, and other equipment as necessary for proper fire protection during the course of the Work

Use fire protection equipment only for extinguishing fires.

E. Locate fire extinguishers in field offices and throughout the Project site. In the area under construction, provide at least 1 multi-purpose dry chemical fire extinguisher for each 5,000-square feet of building floor area. Locate fire extinguishers so that a person never has to walk more than 75 feet to obtain one.

F. Fire extinguisher minimum size shall be 4A:20BC (10-pound ABC).

G. Call 9-1-1 and the Building Engineer and pull fire alarm box when applicable, for any emergency. Report the exact location (building name and street intersection) and nature of the emergency. If using a cellular phone dial (530) 752-1234 for an emergency located on University property. Contractor is responsible for and will be billed for fire response charges (actual cost of personnel and equipment) for any false alarm.

H. Refer to Section 01 41 00 Regulatory Requirements for permits required.

I. Vehicles and materials stored on Project site must not obstruct, block, damage or render useless any fire hydrants, fire department connection, fire alarm box or fire access roadway. Any necessary road closures or disruption to utilities shall be requested through the University's Representative.

J. Once accepted by the Fire Marshal, do not tamper with or work on any fire alarm or fire protection system without first gaining authorization from the UCFD. System shutdown requests shall require a minimum of 72-hours advance notice.

1.8 TEMPORARY HEAT AND VENTILATION

A. Provide temporary heat and ventilation as required to maintain adequate environmental conditions to meet specified minimum conditions for installation of materials; and to protect equipment, materials, and finishes from damage due to temperature or humidity. The use of temporary heating appliances will require a Hazardous Conditions Permit as specified in Section 01 41 00 Regulatory Requirements.

B. Provide adequate forced ventilation of enclosed areas to cure installed materials, to prevent excessive humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases.

C. Permanent HVAC System: If University authorizes use of permanent HVAC system for temporary use during construction, provide filter with Minimum Efficiency Rating Value (MERV) 13 at each exhaust or return air grille in system and remove at end of construction.

1.9 TEMPORARY SANITARY FACILITIES

A. Existing sanitary facilities may be used during construction. Maintain daily in clean and sanitary condition.

1.10 TEMPORARY TELEPHONE AND DATA SERVICE

A. Contractor shall provide a cellular telephone at all times for effective University's Representative's communication with the Contractor.

1.11 TEMPORARY WATER

A. Comply with plumbing code regarding Disinfection of Domestic Water Piping requirements prior to activation.

B. Install according to California Administrative Code, Title 17, Section 7603(c), and test immediately after installation by a certified tester in accordance with Title 17, CAC, Section 7605(d).

C. Install piping with taps located so that water is available throughout the Project site by the use of hoses. Protect piping and fittings against freezing.

D. Provide water for human consumption in accordance with the regulatory requirements for potable water.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 52 00

CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 JOB OFFICE

A. Contractor may utilize the suite they are working in for their construction office. It shall be removed upon completion of the project. If the suite is occupied and there is no space, or the suite is in use daily, then there shall be no on site construction office available.

B. Contractor shall be responsible for providing all necessary temporary utility hook-ups including but not limited to: sanitary sewer, electricity, telephone, data and water. Coordination and installation of temporary utilities will be accomplished in accordance with Section 01 51 00 Temporary Utilities.

C. Temporary Utilities: Refer to Section 01 51 00 Temporary Utilities

D. Contractor shall provide space with table and chairs for meetings for at least [8] people.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 56 00

TEMPORARY BARRIERS AND ENCLOSURES

PART 1 - GENERAL

1.1 TEMPORARY FACILITIES

A. Contractor shall provide and maintain the following temporary facilities as required to complete the Contract:

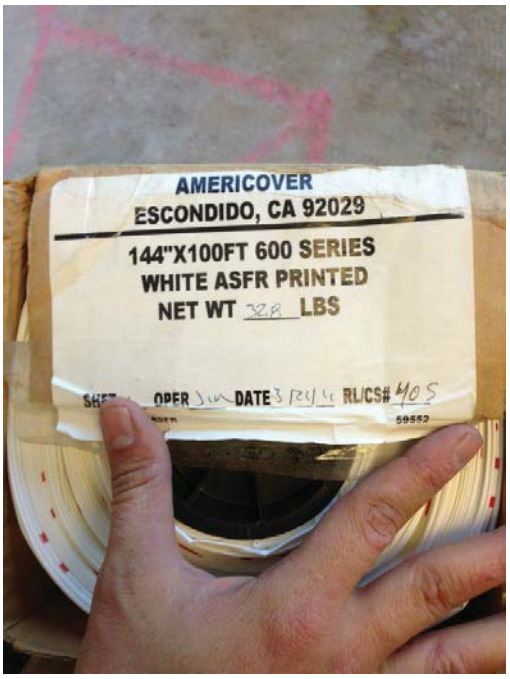
1. Rubbish chutes are NOT allowed. Use barricades around openings.
2. Barricades, lights and similar safety precautions.
3. All materials and equipment required to safely accomplish Work under this Section shall be in conformance with requirements of California Occupational Safety and Health act (Cal/OSHA), and other State and Federal Codes and regulations where applicable.

B. Removal: Upon completion of the Work, and before the final payment, Contractor shall remove all temporary Work and facilities to put the Project site in the condition required by the General Conditions with no additional cost to the University.

1.2 TEMPORARY PROJECT CONSTRUCTION FENCE / BARRIER

A. Provide barriers, i.e. fire rated / approved visqueen around construction site as required for all occupied suites under construction. All construction materials shall be new and maintained.

B. A zippered visqueen barrier or dust-proof barricade must be installed adjacent to occupied spaces or for any demising needs and kept maintained at all times. Thin, clear plastic or ripped / shoddy barriers are not acceptable. Contractor shall used fire rated plastic barrier. See below image of approved product (or equal).



C. The Contractor is responsible for removal of the materials at the end of construction.

D. Use material with smooth surfaces for Work exposed to the public.

E. Contractor shall not place any signs, advertisements, notices, or graphic materials on construction fencing that have not been approved in advance by University's Representative.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 58 00

PROJECT IDENTIFICATION

PART 1 - GENERAL

1.1 TEMPORARY PROJECT SIGNAGE

A. At every door and barricade separating the project work and staging areas from areas not included in the project work area, the Contractor shall provide, install and continuously maintain a construction warning sign. The 11 inch by 17 inch construction warning sign shall be plastic laminated on heavy cardstock and shall be securely affixed at eye level to the door or barricade. Contractor shall submit this sign to the University, for comment, prior to posting. Contractor shall submit this sign to The Building Office, for comment, prior to posting.

B. No signs or advertisements will be permitted on the Project site, including company names and logos on job site, except with express permission of University's Representative or as required in 1.1 A above.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS

A. All material and equipment incorporated in the Work shall be:

1. New, unless specifically noted otherwise in the Contract Documents.
2. In condition acceptable to the University's Representative.
3. Suitable for intended use.

1.2 UNIVERSITY FURNISHED ITEMS

A. Refer to Plans

1.3 TRANSPORTATION AND HANDLING

A. Arrange for delivery of materials and equipment to minimize length of on-site storage prior to installation.

B. All common carrier deliveries shall be marked for the Contractor. Identify location of Project site by Project name, street address, etc.

C. University will not receive deliveries on behalf of the Contractor.

D. Deliver manufactured products and materials in their original unbroken containers or bundles, clearly labeled with manufacturer's name, brand, and grade seal or model number and labels intact until time of use.

E. Handle materials and equipment in a manner to avoid damage to products and their finishes.

F. Promptly remove damaged or defective products from the Project site and replace at no additional cost to the University.

1.4 STORAGE AND PROTECTION

A. Other than Project site, storage space may not be available.

B. Store manufactured products in accordance with manufacturers' instructions and with seals and labels intact and legible.

1. Keep materials clean, dry, and undamaged.
2. Store products subject to damage by the elements in weathertight enclosures.
3. Maintain temperature and humidity in accordance with manufacturers' recommendations.

C. Exterior Storage

1. Store materials and equipment above ground on blocking or skids to prevent soiling, staining, and damage.
2. Cover products that are subject to damage by the elements with impervious protective sheet coverings. Provide adequate ventilation to prevent condensation.
3. Store sand, rock, or aggregate material in a well-drained area on solid surfaces to prevent mixing with foreign matter.

D. Arrange storage to allow adequate inspection.

E. Periodically inspect stored products to assure that products are maintained under specified conditions and are free from damage and deterioration.

F. Protection After Installation

1. Use protective materials and any methods necessary to prevent damage to installed materials and equipment from traffic, construction operations, weather, etc. Remove protection when no longer required.
2. Maintain temperature and humidity conditions in interior spaces for the Work in accordance with manufacturers' instructions for the materials and equipment being protected.

1.5 UNDERWRITERS' LABORATORIES LABEL

A. Materials and equipment, for which Underwriters' Laboratories, Inc. (UL) standards have been established and their label service is available, shall bear the appropriate UL Label.

1.6 MANUFACTURERS' TRADE MARKS AND NAMES

A. University's Representative reserves the right to review and request the removal or redesign of manufacturers' trade marks and names on items of materials and equipment which will be exposed to view in the completed Work. Such removal or redesign shall be at no additional cost to the University.

1.7 LEED AND ENVIRONMENTAL PERFORMANCE REQUIREMENTS

A. There are no LEED certification requirements for this project.

B. Indoor Air Quality: For all materials listed below used in the interior of the building (within the exterior weatherproofing system) and applied on site, provide product data and Material Safety Data Sheets highlighting VOC and other applicable chemical emission test results and limits and include statements that prohibited chemical components were not used as ingredients in the manufacture of the products.

1. Adhesives and Sealants:

Adhesives	**VOC Limit g/L)**
Carpet Adhesive	50
Carpet Pad Adhesive	50
Wood Flooring Adhesive	100
Rubber Floor Adhesive	60
Subfloor Adhesive	50
Ceramic tile Adhesive	65
VCT and asphalt tile Adhesive	50
Dry wall and panel Adhesive	50
Cove Base Adhesive	50
Multipurpose Construction Adhesive	70
Structural Glazing Adhesive	100
Single Ply Roofing Membrane Adhesive	250
PVC welding	285
CPVC welding	270
ABS welding	400
Plastic cement welding	250
Adhesive primer for plastic	250
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Structural Wood Member Adhesive	140
All others	250
Aerosol Adhesives	
General Purpose Mist	65% VOC by weight
General Purpose Web	55% VOC by weight
Special Purpose	70% VOC by weight

Substrates	
Metal to metal	30
Plastic foams	50
Porous material except wood	50
Wood	30
Fiberglass	80
Sealants	
Architectural	250
Nonmembrane Roof	300
Single Ply Roof Membrane	450
Other	420
Sealant Primers	
Architectural – nonporous	250
Architectural – porous	775
Modified Bituminous	500
Other	750

Requirements are from South Coast Air Quality District Rule 1168 (1/7/05) except for aerosol adhesive requirements which come from Green Seal Standard GS 36 (10/19/00) Applicable definitions apply.

a. Prohibited Chemicals: the manufacturer shall demonstrate that the following chemical compounds are not used as ingredients in the manufacture of the product.
   (1) chloroform
   (2) ethylene dichloride
   (3) methylene chloride
   (4) perchloroethylene
   (5) trichloroethylene

2. Paints and Coatings:

Interior Coatings	**VOC Limit g/L)**
Non-flat	150
Flat	50
Exterior Coatings	
Non-flat	200
Flat	100
Anti-corrosive Coatings (ferrous)	
Gloss, Semi-gloss and Flat	250

Requirements from Green Seal Standard GS 11 (10/19/00) and GC 03 (1/7/97). Applicable definitions apply.

Clear Wood Finishes	**VOC Limit g/L)**
Varnish	350
Lacquer	550
Shellac (clear)	730
Shellac (pigmented)	550
Stains	250
Sealers	
Waterproofing sealers	250
Sanding Sealers	275
Other Sealers	200

Floor coatings	100

Requirements are from South Coast Air Quality District Rule 1113 (1/1/04). Applicable definitions apply.

3. Carpet Systems:

Carpet*

	24 hr Emission Factor Limit ($mg/m^2/hr$)
Acetaldehyde	0.02
Benzene	0.055
Caprolactam	0.12
2-Ethylhexanoic Acid	0.046
Formaldehyde	0.05
1-Methyl-2-Pyrrolidinone	0.3
Naphthalene	0.02
Nonanal	0.024
Octanal	0.024
4-Phenylcyclohexene	0.05
Styrene	0.41
Toluene	0.28
Vinyl Acetate	0.4
Total VOCs	0.5
Formaldehyde	0.05

Cushion**

	Emission factor limit ($mg/m^2/hr$)
Total VOCs	1.00
4 – Phenylcyclohexane	0.30
Formaldehyde	0.05
Styrene	0.05

Adhesives
See requirements for adhesives and sealants (above) for VOC limits.
*Partial requirements (24 hour emission limits only). See Carpet and Rug Institute – Green Label Plus program for applicable definitions and additional testing requirements.
** See Carpet and Rug Institute – Green Label program for applicable definitions.

4. Composite wood and agrifiber products:

No added urea-formaldehyde resins. This requirement applies to laminating resins and binders used in fabrication as well as the base material.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.1 PREPARATION

A. Lay out and install all Work to lines and grades in accordance with Contract Documents.

1.2 LAYOUTS AND MEASUREMENTS

A. Provide all survey Work required for horizontal and vertical location of all Work in this Project.

B. The location shall be snapped from lines shown on the Drawings.

1.3 SURVEY REFERENCE POINTS

A. Basic horizontal and vertical control points for the Project will be established from existing structure.

1.4 PROJECT SURVEY REQUIREMENTS

A. Establish lines and levels.

B. Verify layouts as Work proceeds to assure compliance with required lines, levels, and tolerances.

1.5 RECORDS

A. Maintain a complete and accurate log of all control and survey Work as it progresses.

1.6 SUBMITTALS

A. Upon request, submit documentation to verify accuracy of field engineering Work.

B. For all seismic bracing systems, submit structural calculations and details prepared and signed by the Contractor's licensed engineer that include all resultant forces applied to the building structure. Do not over stress building structure. Calculations will be reviewed for compliance with design criteria, not for arithmetic.

1.7 SUPPORT AND BRACING

A. General

1. Design all support and bracing systems. Provide for attachment to portions of the building structure capable of bearing the loads imposed. Design systems to not over stress the building structure.

B. Seismic Bracing

1. Design and install all support systems to comply with the seismic requirements of the 2007 California Building Code (CBC) and ASCE7, Chapter 13 for nonstructural components.
2. Design and install seismic bracing so as not to defeat the operation on any required vibration isolation or sound isolation devices.
3. Seismic design data shall be presented on construction documents in accordance with Section 1603.1.5 of the California Building Code (CBC).
4. Seismic bracing shall be designed by a structural engineer licensed in California.
5. For seismic bracing for mechanical, electrical and plumbing systems, refer to the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA), "Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Piping Systems" for guidelines.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 73 29
CUTTING AND PATCHING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included

1. Patching and matching existing Work altered or disturbed to accommodate new construction.
2. Patching and matching existing Work damaged or defaced during new construction as required to restore to condition at time of award of Contract.
3. Matching of new Work in existing construction to adjacent existing Work unless otherwise noted.
4. Execute cutting, patching and matching in a manner to prevent damage to other Work and to provide proper surfaces for the installation of repairs, penetrations through surfaces, equipment, or other items.

1.2 SUBMITTALS

A. Submit in accordance with Section 01 33 23 Shop Drawings, Product Data and Samples.

B. Product Literature and Shop Drawings: Submit for review materials, methods, or systems different from existing Work to be matched.

C. Samples as requested by the University's Representative.

1.3 QUALITY ASSURANCE

A. Design Criteria

1. Patching shall achieve security and protection where exposed to weather, and shall preserve the continuity of existing fire ratings.
2. Cutting, patching and matching shall successfully duplicate the undisturbed adjacent finishes, colors, textures, and profiles. Where there is dispute over whether the duplication is successful or has been achieved to a reasonable degree, the judgment of the University's Representative shall be final.
3. Notify University Representative in writing if non-complying existing construction or field conditions are encountered.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in the original packages, containers or bundles with seals unbroken and labels intact until time of use.

1.5 PROJECT CONDITIONS

A. Environmental Requirements: Follow the manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials shall be as required to match the appearance, quality and performance of the existing finishes to be duplicated and materials to be replaced.

B. Where the existing finish to be duplicated was achieved with materials now out of production or otherwise unavailable, obtain review and acceptance by the University's Representative of substitutions.

C. Provide primers, sealers, underlayments, backing, blocking, furring, suspension systems, and related items required for any purpose in patching existing Work.

D. Materials shall be subject to the review of and acceptance by the University's Representative.

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

A. Perform Work in accordance with the manufacturer's recommendations, deviating only as directed by the University's Representative to achieve a good match.

B. For the following items, employ the installer or fabricator to perform any cutting, patching or matching of such items:

1. Weather-exposed or moisture-resistance elements.
2. Fireproofing.
3. Finishes surfaces exposed to view.

C. Adjust and fit products to provide a neat installation.

D. Inform the University's Representative of locations where Work will be noisy, and obtain the University's Representative approval of the times during which such Work will be done; otherwise keep noise to a minimum.

E. Finish or refinish surfaces as required to match adjacent finishes. Refinish to nearest intersection or refinish entire assembly.

F. Patching of old ceramic tile surfaces:

1. Match tile if practical.
2. If matching tile is unavailable, provide stock tile of color acceptable to University's Representative. Install replacement tile in a uniform, rectilinear pattern that is symmetrical to the repair area e.g., not a zigzag or checkerboard. Pattern shall be acceptable to University's Representative.
3. Minor small screw holes may be filled with a rubberized grout of a color close to the tile color.

3.2 PAINTING

A. Extent of Painting

1. Paint over the entire surface plane, unless otherwise noted.
2. Over patched wall, soffit, or ceiling surfaces, paint to the nearest cut off line for the entire surface, such as the intersection with the adjacent wall or ceiling, a beam, a pilaster, or to nearest opening frame where a total cut off does not occur within 10 feet of the patch, unless otherwise noted.

B. Ensure painted surfaces do not present a spotty, touched-up appearance.

C. Provide a smooth continuous surface in texture, coverage, and color.

3.3 PAVEMENT

A. Asphaltic and Portland Cement concrete shall be patched to match adjacent surfaces and thickness, with similar material, e.g., exposed aggregate concrete, colored concrete, etc.

B. Remove and replace all damaged concrete and all concrete to be demolished to the nearest full depth joint. Surface scribed and partial depth sawn joints shall not be acceptable in lieu of full depth joints unless specifically approved by the University Representative.

C. Restore pavement markings.

D. Other paving materials and systems such as decomposed granite; stone pavers, etc. shall be replaced or restored in kind. Replace or restore an entire panel or area to present a uniform appearance to the satisfaction of the University's Representative.

E. All new surfaces shall be within 1/4 inch elevation of adjacent surfaces. All slopes to adjacent surfaces shall be less than 1 in 20, unless approved by University's Representative.

3.4 LANDSCAPING AND IRRIGATION

A. Restore to pre-existing condition, using similar materials.

3.5 MECHANICAL AND ELECTRICAL SYSTEMS

A. Matching non-compliant materials currently in place will not be acceptable.

B. Where equipment or devices have been removed, and where the active side of the pipe remains, cap or plug all abandoned piping using either threaded or soldered fittings. Do not rely on the existing valves for a positive shutoff.

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 REQUIREMENTS

A. During the progress of the Work, keep the Building and Project site in a neat and clean condition that is free of debris to the satisfaction of the University's Representative. All materials and debris accumulated in conjunction with completing this Work shall be legally recycled or disposed of by Contractor off campus. Refer to Section 01 77 00 Closeout Procedures for final cleaning requirements.

B. Furnish labor, containers, transportation and payment of fees associated with recycling, reuse, salvage and disposal of demolition and construction materials. Do not use University refuse or recycling containers except as specifically permitted below.

1.2 RECYCLING

A. Recover for reuse and recycling debris and waste materials from the Work to achieve a minimum goal of diverting 75 percent of total Project waste (by weight) from landfill. Materials that cannot be reused nor recovered and recycled shall be disposed of as waste and debris in a legal and conscientious manner. Contractor may keep all revenues and other incentives for recycling materials from the project.

B. Recycle, re-use or salvage all of the following materials removed during demolition or transported to the project site and not incorporated into the Project. Provide separate containers with identifying signage for source separation of the following resources. Do not transport these materials to a landfill site:

1. Household recyclables including office paper, plastic bottles, plastic wrapping, etc.
2. Clean dimensional wood, pallet wood
3. Concrete
4. Concrete Block, Brick
5. Cardboard and paper board
6. Glass
7. Gypsum Boards
8. Paint (Non-Lead Base Paint)
9. Metal/Copper/ Steel/Aluminum
10. Organic material suitable for composting or other recycling
11. Carpet and carpet padding

1.3 HAZARDOUS MATERIALS

A. The University has determined that there are no known hazardous substances on this project. Should any suspicious substances be found, notify University’s Representative and refer to Section 013543, ENVIRONMENTAL PROCEDURES.

1.4 DISPOSAL

A. All excess soil shall be disposed of by the Contractor off the University property, at no additional cost to the University.

B. Solvents, oils and any other material that may be harmful to plant life shall be disposed of in containers. At completion of Work, any contaminated soil shall be removed from the University's property and replaced with good soil by Contractor at no additional cost to the University.

C. Do not burn or bury rubbish or waste materials on the University's property.

1.5 SUBMITTALS

A. Waste Management Plan (Non-Hazardous Materials):

1. The Waste Management Plan shall include a list of anticipated types and quantities of waste materials generated from the Project site and proposed siting locations (including map) for waste/recycling containers. The plan shall identify materials to be recycled, re-used or salvaged. It shall include efforts at source reduction, material handling procedures and collection of weight and hauling destination information.
2. Material Handling Procedures: List means by which source separated waste materials will be protected from contamination, and the means for recycling them consistent with requirements for acceptance by designated facilities.
3. Submit the initial Waste Management Progress Report – Construction Recycling Report to the University Representative within 5 days after the Notice to Proceed and prior to any waste removal. Update and resubmit the plan prior to final inspection. The final update shall include:
    a. Total amount of waste in tons landfilled from the Project and the identity of the transfer station/landfill.
    b. Total amount (in tons) of each material recycled, reused, or salvaged from the Project and the receiving party.
    c. Total amount of all materials recycled in tons.
    d. Total percentage of material recycled in tons.

B. Waste Management Progress Report – Construction Recycling Report:

1. The Progress Report shall include a summary of waste materials (recycled, salvaged, reused, disposed, etc.) by the Project. The Progress Report shall contain the amount of material (in tons) and the destination (landfill facility, material recovery facility, transfer station, used building materials yard, etc.). Attach weigh bills, disposal fees paid and other documentation confirming amount and disposal location of waste/recycled materials.
2. Update monthly and submit on the first business day of each calendar month or with each payment application

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT IMPLEMENTATION

A. Limit recycling and waste bin areas to areas approved on the Waste Management Plan. Keep recycling and waste bins neat and clearly marked in order to avoid contamination of materials. Recycled, re-used and salvaged materials shall be sorted on site unless the Contractor can demonstrate that there is insufficient space to accommodate it.

B. Do not stockpile resources or waste on-site beyond the period necessary for sorting and accumulation of practical quantities for transport off-site. Do not sell resources on the University's property. Provide for periodic collection of resources or waste and transportation off-site.

END OF SECTION

SECTION 01 77 00

CLOSE-OUT PROCEDURES

PART 1 - GENERAL

1.1 FINAL COMPLETION

A. When Work is complete, submit written certification to University's Representative that:

1. Work has been inspected for compliance with the Contract Documents.
2. Work has been completed in accordance with the Contract Documents.
3. Equipment and systems have been tested in presence of the University's Representative and are operational.
4. Work is complete and ready for final inspection.

1.2 PREPARATION FOR FINAL INSPECTION

A. Perform final cleaning as specified below.

B. In accordance with Section 01 78 00 Close-Out Submittals, assemble guarantees/warranties with service and maintenance contracts, operating and maintenance instructions, and other items as specified, and submit to the University's Representative.

1.3 FINAL CLEANING

A. Upon completion of the Work, promptly remove from the vicinity:

1. All of Contractor's equipment.
2. All temporary structures.
3. All surplus material, including construction debris, lumber, etc.
4. Mock-ups, field samples, and similar submittals unless directed otherwise by the University’s Representative.
5. Remove waste, surplus materials and rubbish from Project site, including roof areas.

B. The entire Project site shall be left in a neat and clean condition to the satisfaction of the University's Representative.

C. Execute final cleaning prior to final inspection. Cleaning shall be by experienced professional cleaners.

1. Clean interior and exterior surfaces exposed to view; remove temporary labels, stains and foreign substances, polish glass and glossy surfaces, glazing vacuum all floors.
2. Clean equipment and fixtures to a sanitary condition, clean permanent filters and replace disposable filters of mechanical equipment operated during construction. See Section 01 81 19 Indoor Air Quality Requirements.
3. Vacuum and wipe sides of electrical panels and cabinetwork.
4. Comply with manufacturer's instructions for cleaning.
5. Clean each surface or unit to condition expected from normal, commercial building cleaning and maintenance program.
6. Clean Project site, sweep paved areas, rake clean ground surfaces.
7. Remove stains, dirt, finger marks, etc., from wall and ceiling surfaces and trim.
8. Disinfect, clean and polish all plumbing fixtures.
9. Use cleaning materials and methods that will not create hazards to health or property or cause damage to products or Work.
10. Remove temporary tapes, wrapping, coatings, paper labels, and similar items. Dust, mop, wash or wipe exposed and semi-exposed surfaces as necessary to leave Work in new, clean condition.
11. Cleaning products shall meet the Green Seal Environmental Standard for Industrial and Institutional Cleaners (GS-37).

12. Floor sealers or strippers shall meet the Green Seal Environmental Standard for Industrial & Institutional Floor-Care Products (GS-40).

1.4 RESTORATION OF DAMAGED WORK

A. Restore or replace, as specified or directed by the University's Representative, materials and finishes damaged from movement of equipment or other operations at no additional cost to the University.

B. Restoration shall be equal to original Work, and finishes shall match appearance of existing adjacent Work.

1.5 REMEDIAL WORK

A. Remedial Work necessary owing to faulty workmanship or materials shall be at no additional cost to the University.

B. Work shall be coordinated with University's Representative and performed at such time and in such manner to cause minimal interruption and inconvenience to University's operations.

1.6 CLOSE OUT MATERIALS AND DOCUMENTS

A. Regardless of the specifications, the Contractor shall provide no less than 5% attic stock of all finish materials (Division 9). In the event the specifications exceed this 5%, then the higher values shall prevail.

B. Contractor shall photograph and formally list and transmit all attic stock to the University.

C. Close out binders shall be neat and clear and include a detailed table of contents, clearly divided and labeled and all product MSDS sheets, product data, O&M manuals, maintenance and cleaning requirements, equipment manuals and include no less than two (2) red-lined as-builts for architectural, structural, mechanical, electrical, plumbing, fire alarm and fire sprinkler plans. CAD files of as-builts [with the deviations incorporated] are also acceptable if 2 hard copies area also provided along with PDF’s. Deviations in color are required. Ensure all pages are stamped as as-builts and signed. Include cover page of specification book signed and stamped and written with “ CONTACTOR (infill) confirms the project has been built according to these specifications”.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 00

CLOSE-OUT SUBMITTALS

PART 1 - GENERAL

1.1 GUARANTEES

A. Compile and submit guarantees, bonds, and service and maintenance contracts specified in the individual Specification Sections.

B. Guarantees from Subcontractors shall not limit Contractor's warranties and guarantees to the University. Whenever possible, Contractor shall cause warranties of Subcontractors to be made directly to the University. If such warranties are made to the Contractor, Contractor shall assign such warranties to the University prior to final payment; refer to form entitled GUARANTEE at end of this section.

C. Submittal Requirements

1. Submit written guarantees, in the form of Guarantee/Warranty Form as shown in the exhibits in accordance with Section 013323, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES. Submit the original forms on sheets 8-1/2 by 11 inches punched for 3-ring binder. Fold larger sheets to fit into binders.

2. Submit an electronic copy in .PDF format with the warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.

3. Assemble required guarantees, bonds, and service and maintenance contracts.

4. Number: 1 commercial quality, 3-ring binder, with durable and cleanable plastic covers.

5. Identify each binder on the cover with typed or printed title, "Guarantees and Bonds", and the following:
   a. Project No.
   b. Title of Project.
   c. Name of Contractor.

6. Table of Contents: Neatly typed and in orderly sequence. Provide complete information for each item as follows:
   a. Product or Work item.
   b. Firm name, address, telephone number and name of principal.
   c. Scope.
   d. Provide information for University’s personnel.
      1) Proper procedure in case of failure.
      2) Circumstances that might affect the validity of guarantee or bond.

7. Binder Format:
   a. Place warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.
   b. Provide tabs for each CSI division.

8. Submit an electronic copy in .PDF format with the warranties in sequence by specification number. Where one warranty form covers multiple specifications, provide additional copies to place in subsequent specification locations.

9. Time of Submittals

   a. Within 10 days after date of Substantial Completion, prior to request for final payment.

b. For Work activities, where Final Completion is delayed beyond the date of Substantial Completion, provide updated submittal within 10 days after Final Completion, listing the date of Final Completion as the start of the Guarantee to Repair Period.

1.2 PROJECT RECORD DOCUMENTS

A. Submit the record documents in accordance with Section 017839, PROJECT RECORD DOCUMENTS.

1.3 SPARE PARTS AND MAINTENANCE MATERIAL

A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

B. Deliver to locations as directed by University's Representative.

C. When the University Representative requests that materials be delivered to locations other than the Project site, provide receipt signed by the receiver stating the nature of the material, the quantity, and the place and date. Deliver such receipts to the University's Representative upon completion of the Work.

D. In addition to required parts listed in other Sections of the Specification, provide any special programming software and database tools necessary to operate the system.

1.4 OPERATION AND MAINTENANCE MANUALS

A. Work Included

1. Compile Product Data and related information appropriate for University's maintenance and operation of products provided under this Contract.

2. Prepare operating and maintenance data as specified herein and as specified in individual Specification Sections.

B. Form of Submittal

1. Prepare data in the form of an instructional manual for use by University's personnel. Refer to the Exhibit “Close-out Log”

a. Format
1) Size: 8-1/2 by 11 inches.
2) Paper: 20 lb. minimum, white, for typed pages.
3) Text: Manufacturers' printed or neatly typewritten data.
4) Drawings
(a) Provide reinforced punched binder tab that is bound with the text.
(b) Fold larger Drawings to the size of the text pages.
5) Provide fly-leaf for each separate product or each piece of operating equipment.
(a) Provide typed description of products and major component parts of equipment.
(b) Provide indexed tabs.
6) Cover: Identify each volume with typed or printed title "Operating and Maintenance Instructions". List the following:
(a) Project No.
(b) Title of Project.
(c) Identify general subject matter covered in the volume.

b. Binders
1) Commercial quality three-ring binders with durable and cleanable plastic covers.
2) When multiple binders are used, correlate the data into related groups.

c. Submit an electronic copy of all material in .PDF format organized identically to the manual. The electronic copy shall be broken into individual files by equipment and system.

C. Content of Manual

1. Table of Contents: Include in each volume, neatly typewritten.
   a. Identify Contractor, name of responsible principal, address, and phone number.
   b. List each product included, indexed to the content of the volume.
   c. List, with each product, the name, address, and telephone number of:
      1) Subcontractor or installer.
      2) Maintenance contractor, as appropriate.
      3) Identify area of responsibility of each of the previously mentioned parties.
      4) Nearest source of supply for parts and replacement.
   d. Identify each product-by-product name and other identifying symbols as set forth in the Contract Documents.
2. Product Data
   a. Include only those sheets that are pertinent to the specific product.
   b. Annotate each sheet to:
      1) Clearly identify the specific product or part installed. Include part nomenclature as indicated in the Design, model number, serial number, operating data and options provided.
      2) Clearly identify the data applicable to the installation.
      3) Delete references to inapplicable information.
3. Drawings
   a. Supplement Product Data with Drawings as necessary to clearly illustrate:
      1) Relations of component parts of equipment and systems.
      2) Control and flow diagrams.
   b. Coordinate Drawings with information in Project record documents to assure correct illustration of completed installation.
   c. Do not use Project record documents as maintenance Drawings.
4. Written text: As required to supplement Product Data for the particular installation.
   a. Organize in a consistent format under separate headings for different procedures.
   b. Provide a logical sequence of instructions for each procedure.
5. Copy of each warranty, bond, and service contract issued.
   a. Provide information sheet to the University's personnel.
      1) Proper procedures in the event of failure.
      2) Circumstances that might affect the validity of warranties or bonds.

D. Manual for Equipment and Systems

1. For each unit of mechanical equipment and each mechanical system include the following:
   a. Description of unit or system, and component parts
      1) Function, normal operating characteristics, and limiting conditions.
      2) Performance curves, engineering data, and tests.
      3) Complete nomenclature and commercial numbers of replaceable parts.
      4) Include with the Manual the Submittal for the equipment. Update to reflect actual installed equipment.
   b. Operating procedures
      1) Start-up, break-in, and normal operating instructions.
      2) Regulation, control, stopping, shutdown, and emergency instructions.
      3) Summer and winter operating instructions.
      4) Special operating instructions.
   c. Systems Demonstration
      1) Prior to final inspection, demonstrate operation of each system to University's Representative and University personnel. All work, required for each system to be fully functional, shall be complete and the system shall be fully operational prior to the demonstration.

2) Instruct designated personnel in operation, adjustment, and maintenance of equipment and systems, using operation and maintenance data as basis of instruction.

d. Maintenance procedures
   1) Routine operations.
   2) Guide to "trouble-shooting".
   3) Disassembly, repair, and reassembly.
   4) Aligning, adjusting, and checking.
e. Servicing and lubricating schedule, with list of lubricants required.
f. Manufacturer's printed operating and maintenance instructions.
g. Description of sequence of operation by control manufacturer.
h. Original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings, and diagrams required for maintenance.
   1) Predicted life of parts subject to wear.
   2) Items recommended to be stocked as spare parts.
i. As-installed control diagrams by controls manufacturer.
j. Contractor's and Subcontractors' coordination drawings and as-built color-coded piping diagrams.
k. Charts of valve tag numbers, with the location and function of each valve.
l. Other data as required in the various Specification Sections.

2. For each electrical and electronic system, include the following:
   a. Description of system and component parts.
      1) Function, normal operating characteristics, and limiting conditions.
      2) Performance curves, engineering data, and tests.
      3) Complete nomenclature and commercial numbers of replaceable parts.
   b. Circuit directories of panelboards.
      1) Electrical service.
      2) Controls.
      3) Communications.
   c. As-built color-coded wiring diagrams.
   d. Operating procedures
      1) Routine and normal operating instructions.
      2) Sequences required.
      3) Special operating instructions.
   e. Maintenance procedures
      1) Routine operations.
      2) Guide to "trouble-shooting".
      3) Disassembly, repair, and reassembly.
      4) Adjustment and checking.
   f. Manufacturer's printed operating and maintenance instructions.
   g. Original manufacturer's parts list, illustrations, current prices, recommended quantities to be maintained in storage, assembly drawings, and diagrams required for maintenance.
      1) Predicted life of parts subject to wear.
      2) Items recommended to be stocked as spare parts.
   h. Other data as required in the individual Specification Sections.

3. Prepare and include additional data as may be required for instruction of the University's personnel.

4. Additional requirements for operating and maintenance data as specified in the individual Specification Sections.

5. Provide complete information for products specified in the individual Specification Sections.

E. Submittal Requirements

1. Submit 2 copies of the draft of the proposed format and table of contents prior to preparation of the data and a minimum of 45 days prior to the date of Substantial Completion or the scheduled training (whichever occurs first).
2. Submit 1 copy of the complete data in final draft form on or before 75 percent progress payment submittal.
3. Submit 4 copies of the approved data in final form a minimum of 7 days prior to the scheduled training or the inspections scheduled to establish Substantial Completion (whichever occurs first).
4. Submittal and acceptance of the operations and maintenance data is a prerequisite for issuance of the Certificate of Substantial Completion.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

GUARANTEE

Date: _____

Project Name: _____

_____ _____

Project Number Order Number

Project Location: _____

GUARANTEE FOR _____ (the "Contract"), between The
(Specification Section); Contract No.

Regents of the University of California ("University") and _____("Contractor").

_____ hereby guarantees to University
(Name of Subcontractor)

that the portion of the Work described as follows:

_____

_____

which it has provided for the above referenced Project, is of good quality; free from defects; free from any liens, claims, and security interests; and has been completed in accordance with Specification Section _____ and the other requirements of the Contract.

The undersigned further agrees that, if at any time within _____ months after the date of the guarantee the undersigned receives notice from University that the aforesaid portion of the Work is unsatisfactory, faulty, deficient, incomplete, or not in conformance with the requirements of the Contract, the undersigned will, within 10 days after receipt of such notice, correct, repair, or replace such portion of the Work, together with any other parts of the Work and any other property which is damaged or destroyed as a result of such defective portion of the Work or the correction, repair, or replacement thereof; and that it shall diligently and continuously prosecute such correction, repair, or replacement to completion.

In the event the undersigned fails to commence such correction, repair, or replacement within 10 days after such notice, or to diligently and continuously prosecute the same to completion, the undersigned, collectively and separately, do hereby authorize University to undertake such correction, repair, or replacement at the expense of the undersigned; and Contractor will pay to University promptly upon demand all costs and expenses incurred by University in connection therewith.

SUBCONTRACTOR

Signed: _____ Title: _____

Typed Name: _____

Name of Firm: _____

Contractor

License Number: _____

Address: _____

_____

Phone Number: _____

CONTRACTOR

Signed: _____ Title: _____

Typed Name: _____

Name of Firm: _____

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Record Documents consist of As-Built Project Drawings, Shop Drawings, Coordination Drawings (layout drawings), Specifications, and Addenda with all as-built information recorded on them, and Record Drawings that incorporate all as-built information.

B. Store Project record documents and samples in the Contractor's office separate from documents used for construction.

1.2 RECORD DOCUMENTS

A. As-Built Project Drawings

1. Maintain on Project site at all times in an approved location and in a clean, dry legible condition, 1 set of Project Drawings and 1 set of all Shop Drawings. These documents shall be used to record as-built conditions on a day-to-day basis, and shall be kept current, and shall be available for inspection by the University's Representative during normal working hours.
2. Track changes to the Documents in blue ink.
3. Record the following types of information on record drawings:
    a. Location of Work buried under or outside the building, such as plumbing and electrical lines and conduits. Provide horizontal and vertical dimensions from fixed points. Record all locations of underground Work, points of connection, valves, manholes, catch basins, capped stubouts, invert elevations, etc.
    b. Locations of all significant Work concealed inside the building, the locations of which were changed from those shown on the Drawings.
    c. Locations of all items, not necessarily concealed but varying from the locations shown on the Drawings.
    d. All changes in size, location, and other features of installation not shown on Drawings.
    e. Sufficient information such that Work concealed in the building may be located with reasonable ease and accuracy. This may be accomplished by dimension or by stating the relationship to the spaces in the building near which the Work was installed. The University's Representative's decision on what constitutes sufficient information shall be final.
    f. All electrical and control installations to indicate terminal points, wire numbers/circuit numbers, panel designations, device identification, and sequence of operations.
    g. Record existing below-grade utilities if they are exposed by the project or are located within the Project boundary on the record drawings.
    h. All changes shall be sketched or referenced directly on the record documents. If changes to the documents are issued via Addenda, RFI, Field Order, Letter of Instruction, or Change Order and include a detailed sketch, attach the sketch directly to the record documents.
4. Additional Drawings shall be provided as required to properly describe changes.

B. Specifications and Addenda

1. Record the following:
    a. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
    b. Changes made by Addenda, Change Order or Field Order, and clarifications and interpretations made by Letter of Instruction.

C. Coordination Drawings

1. Maintain the Coordination Drawings required by [Division 21-Fire Suppression, Division 22-Plumbing, Division 23-Heating, Ventilating, and Air-Conditioning (HVAC), Division 26-Electrical and Division 27-Communications and Division 28-Electronic Safety and Security of] the Specifications similar to the requirements for the Project drawings noted above. These layout drawings are not shop drawings as defined by the General Conditions, but, together with shop drawings or layout drawings of all other affected Sections, are used to check, coordinate, and integrate the Work of the various Sections.

1.3 SUBMITTAL OF PRELIMINARY RECORD DOCUMENTS.

A. Upon completion of the site underground work the submit on compact disk a digital color scanned copy of the Civil Drawings in pdf format to the University's Representative. Submit in accordance with Section 013323, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

1.4 SUBMITTAL OF FINAL PROJECT RECORD DOCUMENTS

A. Upon completion of the Work, the record documents shall be certified by the Contractor to represent the true, as-built conditions and submitted to the University's Representative.

B. Submittal and acceptance of complete and final Project Record Documents is a prerequisite for issuance of the Certificate of Substantial Completion.

1. For Work included in the Certificate of Substantial Completion, submit complete and final Project Record Documents a minimum of 14 days prior to the date of Substantial Completion.

2. For Work excluded from the Certificate of Substantial Completion, submit a minimum of 14 days prior to the date of acceptance of the Work.

C. Submit the final Record Documents in accordance with Section 013323, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section contains requirements for training the University's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed. Refer to Mechanical, Electrical and Plumbing specifications and Drawings for demonstration and training requirements.

1.2 RELATED WORK AND DOCUMENTS

A. Section 013323, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.

B. Section 017800, CLOSE-OUT SUBMITTALS.

1.3 QUALITY ASSURANCE

A. Where required by the Contract Documents, the Contractor shall provide on-the-job training of the University's personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives of the equipment manufacturers. Training shall include instruction in both operation and maintenance of the subject equipment.

1.4 SUBMITTALS

A. The following information shall be submitted to the University's Representative in accordance with the provisions of Section 01 33 23 Shop Drawings, Product Data and Samples. The material shall be reviewed and accepted by the University's Representative not less than 21 days prior to the provision of training.

1. Lesson plans for each training session to be conducted by the manufacturer's representatives. In addition, training manuals, handouts, visual aids, and other reference materials shall be included.
2. Subject of each training session, identity and qualifications of individuals to be conducting the training, and tentative date and time of each training session.
3. Electronic copies in the form or CD/DVD of all training sessions and field instructions shall be submitted to the University at conclusion of training.

PART 2 - PRODUCTS

2.1 GENERAL

A. Where specified, the Contractor shall conduct training sessions for the University's personnel to instruct the staff on the proper operation, care, and maintenance of the equipment and systems installed. Training shall take place at the Project Site and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 10 days prior to the date scheduled for the individual training session.

2.2 LESSON PLANS

A. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be presented along with a description of visual aids to be utilized during the session. Each plan shall contain a time allocation for each subject.

B. One complete set of originals of the lesson plans, training manuals, handouts, visual aids, and reference material shall be the property of the University and shall be suitably bound for proper organization and easy reproduction. The Contractor shall furnish 3 copies of necessary training manuals, handouts, visual aids and reference materials at least 2 days prior to each training session.

2.3 FORMAT AND CONTENT

A. Each training session shall be comprised of time spent both in the classroom and at the specific location of the subject equipment or system. As a minimum, training session shall cover the following subjects for each item of equipment or system:

1. Familiarization:
   a. Review catalog, parts lists, drawings, etc., which have been previously provided for the plant files and operation and maintenance manuals.
   b. Check out the installation of the specific equipment items.
   c. Demonstrate the unit and indicate how all parts of the specifications are met.
   d. Answer questions.

2. Safety:
   a. Using material previously provided, review safety references.
   b. Discuss proper precautions around equipment.

3. Operation:
   a. Using material previously provided, review reference literature.
   b. Explain all modes of operation (including emergency).
   c. Check out University's personnel on proper use of the equipment.

4. Preventive Maintenance:
   a. Using material previously provided, review preventive maintenance (PM) lists including:
      1) Reference material.
      2) Daily, weekly, monthly, quarterly, semiannual, and annual jobs.
         (a) Show how to perform PM jobs.
         (b) Show University’s personnel what to look for as indicators of equipment problems.
      3) Corrective Maintenance.
         (a) List possible problems.
         (b) Discuss repairs-point out special problems.
         (c) Open up equipment and demonstrate procedures, where practical.
      4) Parts.
         (a) Show how to use previously provided parts list and order parts.
         (b) Check over spare parts on hand. Make recommendations regarding additional parts that should be available.
      5) Local Representatives.
         (a) Where to order parts: Name, address, telephone.
         (b) Service problems.
            (c) Who to call.
            (d) How to get emergency help.

5. Operation and Maintenance Manuals:
   a. Review any other material submitted.
   b. Update material, as required.

PART 3 - EXECUTION

3.1 TRAINING

A. Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled such that classroom sessions are interspersed with field instruction in logical sequence. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any 1 day. Concurrent classes shall not be allowed. Training shall be certified by listing attendees and subjects covered.

B. Acceptable operation and maintenance manuals for the specific equipment shall be provided to the University prior to the start of any training. Video taping shall take place concurrently with all training sessions. All training sessions and field instruction shall be videotaped by the Contractor and tapes of all classes submitted to the University.

C. The following services shall be provided for each item of equipment or system as required in individual Specification Sections. Additional services shall be provided, where specifically required in individual Specification Sections.

1. As a minimum classroom equipment training for University's personnel will include:
   a. Using slides and drawings, discuss the equipment's specific location in the facility and an operational overview.
   b. Purpose and facility function of the equipment.
   c. A working knowledge of the operating theory of the equipment.
   d. Startup, shutdown, normal operation, and emergency operating procedures, including a discussion on system integration and electrical interlocks, if any.
   e. Identify and discuss safety items and procedures.
   f. Routine preventative maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
   g. Operator detection, without test instruments, of specific equipment trouble symptoms.
   h. Required equipment exercise procedures and intervals.
   i. Routine disassembly and assembly of equipment if applicable (as judged by the University on a case-by-case basis) for purposes such as operator inspection of equipment.

2. As a minimum, hands-on equipment training for University's personnel shall include:
   a. Identify location of equipment and review the purpose.
   b. Identifying piping and flow options.
   c. Identifying valves and their purpose.
   d. Identifying instrumentation.
   e. Location of primary element.
   f. Location of instrument readout.
   g. Discuss purpose, basic operation, and information interpretation.
   h. Discuss, demonstrate, and perform standard operating procedures and round checks.
   i. Discuss and perform the preventative maintenance activities.
   j. Discuss and perform startup and shutdown procedures.
   k. Perform the required equipment exercise procedures.
   l. Perform routine disassembly and assembly of equipment if applicable.
   m. Identify and review safety items and perform safety procedures, if feasible.

3. Classroom equipment training for the maintenance and repair personnel will include:
   a. Theory of operation.
   b. Description and function of equipment.
   c. Startup and shutdown procedures.
   d. Normal and major repair procedures.
   e. Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.
   f. Routine and long-term calibration procedures.
   g. Safety procedures.
   h. Preventative maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

4. Hands-on equipment training for maintenance and repair personnel shall include:
   a. Locate and identify equipment components.
   b. Review the equipment function and theory of operation.
   c. Review normal repair procedures.
   d. Perform startup and shutdown procedures.
   e. Review and perform the safety procedures.
   f. Perform University approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.

END OF SECTION

SECTION 01 81 19

INDOOR AIR QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section describes construction Indoor Air Quality (IAQ) goals and includes administrative and procedural requirements for the development and execution of a construction air quality management plan to maintain high indoor air quality during the Work and following completion of it. This is only required for project with a gross square footage in excess of 10,000 sq. ft.

1.2 PERFORMANCE REQUIREMENTS

A. Anticipate and prevent conditions that could compromise indoor air quality due to construction means, methods, process, and materials with particular attention to the following:

1. Eliminating the use of materials containing Volatile Organic Compounds (VOC), formaldehyde and certain chemical compounds for which limitations are specified in Section 01 60 00 Product Requirements, and select construction materials and processes that will eliminate potential IAQ pollutants and contaminants from the Work.

2. Protect the ventilation system components during construction and clean contaminated components after construction is complete.

B. Conform to recommendations of Sheet Metal and Air Conditioning National Contractors Association (SMACNA) Guidelines for Occupied Buildings under Construction, Chapter 3 Control Measures for the following:

1. HVAC protection
2. Source control
3. Pathway interruption
4. Housekeeping
5. Scheduling

1.3 SUBMITTALS

A. For projects over 10,000 square feet, prepare an IAQ Management Plan for the construction and commissioning phases of the project conforming to these specifications and the recommendations of Sheet Metal and Air Conditioning National Contractors Association (SMACNA) Guidelines for Occupied Buildings under Construction, Chapter 3 Control Measures.

1. Draft IAQ Management Plan Review Meeting: Once the University's Representative has reviewed the Draft IAQ Management Plan and prior to construction at the site, schedule and conduct a meeting to review the Draft IAQ Management Plan and discuss procedures, schedules and specific requirements for IAQ during the construction and pre-construction phases of the building. Discuss coordination and interface between the Contractor and other construction activities.
   a. Attendees: The Contractor and related Contractor personnel associated with the work of this Section, including personnel to be in charge of the IAQ management program, the University's Representative and such additional personnel as the University's Representative deems appropriate.

2. Final IAQ Management Plan: Make any revisions to the Draft IAQ Management Plan agreed upon during the draft IAQ plan meeting and incorporate resolutions agreed to be made subsequent to the meeting. No work in the building interior may be initiated until this final plan has been submitted and approved.

B. Construction Photographs: Digital, color images, 640 by 480 pixels on CD-ROM documenting construction IAQ management measures implemented during the Work such as duct protection measures and measures to protect on-site stored or installed absorptive materials from moisture.

Provide annotation for images including, date, time and subject. Provide photographs of examples of each measure at 3 different times during construction.

C. Product Data: Filtration media used during construction and installed immediately prior to occupancy with Minimum Efficiency Reporting Value (MERV) values highlighted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 APPLICATION

A. For the construction and commissioning phases of the Project provide the following:

1. HVAC Protection: Shut down the return side of the HVAC system whenever possible during heavy construction. If the system must remain operational during construction include the following strategies that apply:
   a. Fit the return side of the HVAC system with temporary filters.
   b. Isolate the return side of the HVAC system from the surrounding environment as much as possible (e.g., place all tiles for the ceiling plenum, repair all ducts and air handler leaks).
   c. Damper off the return system in the heaviest work areas and seal the return system openings with plastic.
   d. Upgrade the filter efficiency where major loading is expected to affect operating HVAC system.
   e. Clean permanent return air ductwork per National Air Duct Cleaning Association standards upon completion of all construction and finish installation work.
2. Source Control: Provide non-toxic formulations of materials and products and comply with chemical compound limitations throughout the work including but not limited to adhesives, coatings, substrate products, sealants, and cleaning products.
3. Pathway Interruption: Prevent contamination of clean spaces. Include the following strategies that apply:
   a. Use 100 percent outside air ventilation (when outside temperatures are between 55 degrees F and 85 degrees F and humidity is between 30 percent and 60 percent) with air exhausted directly to the outside during installation of finishes and other VOC emitting materials.
   b. Erect air infiltration barriers between work areas or between the inside and outside of the building to prevent unwanted airflow from dirty to clean areas.
4. Housekeeping: Reduce construction contamination in the building prior to occupancy through HVAC and regular space cleaning activities.
   a. Store building materials in a weather tight, clean area prior to unpacking for installation.
   b. Check for possible damage to building materials from high humidity.
   c. Clean all coils, air filters, and fans before testing and balancing procedures are performed.
5. Scheduling: Specify construction sequencing to reduce absorption of VOC’s by materials that act as sinks or contaminant sources. Complete application of wet and odor-emitting materials such as paints, sealants, and coatings before installing sink materials such as ceiling tiles, carpets, insulation, gypsum products, and fabric-covered furnishings are installed.
6. Material Protection: Protect stored and installed absorptive materials from exposure to moisture through precipitation, plumbing leaks, or condensation from the HVAC system to prevent microbial contamination. Where practical provide conditioning period in controlled environment to reduce moisture content of materials where protection failed or was otherwise ineffective.
7. Final Filters: Replace filtration media used during flush-out prior to occupancy.

3.2 IMPLEMENTATION

A. Manager: The Contractor's Quality Assurance Manager shall be responsible for instructing workers and overseeing and the IAQ Management Plan for the Project.

B. Progress Meetings: Construction related IAQ procedures shall be included in the pre-construction and construction progress meeting agendas.

C. Distribution: The Contractor shall distribute copies of the IAQ Management Plan to the Job Site Foreman, each Subcontractor and the University's Representative

D. Instruction: Provide on-site instruction regarding the IAQ procedures for all of the participants in the construction.

E. Documentation: Document IAQ measures with photographs.

END OF SECTION

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 – GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. General: The Work to be completed under this Contract shall be as shown, documented and set forth in the Contract Documents.

1. The scope and demolition is defined in the Specifications and indicated on the Drawings. As defined in the Specifications, majority of the space shall be demolished with specific components salvaged, protected, stored and inventoried. Drawings reflect approximate extent of existing Tenant construction. Contractor is responsible for touring all levels of the existing space to determine existing conditions.

2. This Contractor shall have the overall responsibilities for all of the Work specified here in Section 02 41 19. All Work normally defined as “Architectural Finish” and as listed as “Base Space Demolition” shall be completed by this Demolition Contractor. All Work normally defined as “Mechanical Systems” and as listed “Mechanical Space Demolition” shall be completed by a Mechanical Contractor under contract with this Contractor. All Work normally defined as “Electrical System” and as listed “Electrical Space Demolition,” shall be completed by an Electrical Contractor under contract with this Contractor.

3. The Contractor shall include in the scope of work “Salvaging” existing items to be reused or recycled in specific areas determined by the University and as called out on the plans.

B. Base Space Demolition: Demolition includes, but is not necessarily limited to, the following:

1. Refer to Drawings for areas and scope of demolition.

2. Contractor shall review during the bid phase and include within the bid to remove old and abandoned wiring, cables, straps and duct that are above the ceiling. The ceiling can be accessed to view during the Bid period upon request by Bidders.

C. Structure: Cut floor slab for new openings. Requires X-raying of decks to ensure avoidance of rebar and electrical conduit.

D. Mechanical Space Demolition: Prior to all mechanical demolition, Contractor shall consult building engineer. (Refer to Drawings and other Specification Sections for additional requirements.)

E. Electrical Space Demolition: All non-reusable data, phone and power wiring shall be removed above the ceiling and back to termination. It is mandatory that the building engineer and data/phone representative be contacted before commencement of such removal for

verification purposes. (Refer to Drawings and other requirements in this Section for special conditions.)

F. Salvage: The following items shall be carefully removed and stored neatly in area shown on the Drawing or as directed by the University's Representative.

1. Refer to drawings, notes and annotations found on: Demolition Plan, Symbols Legend, and in the Schedules for Doors, Windows, Hardware and Finishes.

G. Codes: Conform to codes and requirements of governing authority.

1. Obtain and pay for all permits for demolition; protection of the public and property; transportation and disposal of debris; and capping of utility services.

1.2 SUBMITTALS

A. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Schedule: Submit proposed methods and operations of building demolition to the University's Representative for review prior to start of work. Include in schedule coordination for shut-off, capping and continuation of utility services.

1. Permits and notices authorizing demolition.
2. Certificates of severance of utility services.
3. Permit for transport and disposal of debris.

C. Provide a detailed sequence of demolition and removal work to ensure uninterrupted progress of Tenant's and University Representative's operations.

1.3 JOB CONDITIONS

A. The demolition subcontractor and the Contractor's representative will walk through the premises with the University Representative and the Architect for verification of work prior to commencement.

B. The University Representative is to determine which materials are to be salvaged for reuse.

C. Occupancy: Current tenants will continue to occupy the floors above, below and within the floor space.

1. The Contractor is advised that the existing Tenants are and will continue to occupy portions of the existing floor space adjacent to the Work to be completed.

D. Condition of existing materials: The University Representative assumes no responsibility for actual condition of structures to be demolished.

1. Do not scale drawings, the Contractor is to verify all conditions (i.e. existing corridor locations and dimensions, existing door types and locations, lighting, floor and wall finish locations, etc.) in the field.

E. Protections: Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to adjacent occupied space, other facilities and persons.

F. Damages: Promptly repair damages caused to adjacent facilities by demolition operations at no cost to the University Representative.

G. Utility Services: Maintain existing utilities indicated to remain, keep in service and protect against damage during demolition operations. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the University Representative.

H. Special Mechanical System Requirements: The base building ventilation system will remain active at all times. This Contractor shall furnish and install impervious coverings over all return air openings. This Contractor shall close down the damper and fire damper at the core. After the completion of the Work, the Contractor shall be responsible for reactivating all of the dampers.

1. Provide disposable filters for supply air at each main air handler. Filters shall be changed out weekly during all demolition work.

I. Freight Elevator Use: Refer to Division 1 Specifications

PART 2 – PRODUCTS

2.1 MATERIALS
(Property of the Contractor)

A. All items not otherwise listed or noted as property of the University in this Specification or on the Drawings, become the property of the Contractor.

B. Immediately remove all such items or debris from the site as demolition occurs.

2.2 DUSTPROOF BARRIER

A. Erect an approved barrier where indicated before starting any demolition or construction. Seal in seams and connections to existing construction, walls, ceilings, and areas where the University Representative and Tenant's personnel and equipment will be in operation during construction. The dustproof integrity of the barrier shall be maintained throughout the work. Refer

PART 3 – EXECUTION

3.1 DEMOLITION

A. General Demolition Requirements: All items that are to be reused, shall be stored in a protected area within the Tenant's premises. The intent is to reinstall all reusable items removed.

1. The Contractor shall remove all wall conduits left after wall demolition, including switch boxes, plates, bridges or any other telephone/electrical wiring or equipment or as otherwise directed by the University Representative or the Electrical Contractor.

2. The Contractor shall remove all existing wall coverings, shades, and carpeting where noted on the drawings to receive new finishes, and patch wall surfaces as required to

receive paint. The University Representative shall inspect and approve all patched surfaces prior to applications or finish paint.

3. In all areas where demolition (removal or tile, carpeting, tack-less, partitions, etc.) causes unevenness in the slab, the Contractor shall patch and/or flash patch to level the slab to receive new finished floor.

4. The Contractor shall at all times protect the property of the University, including but not limited to windows, window coverings that remain, floor and ceiling tile, public toilets, elevators, doors, electrical air conditioning equipment, peripheral enclosures, etc.

5. Electrical and telephone outlets shown to be removed in existing partitions to remain shall have cabling removed and blank cover plates installed.

6. The Contractor shall cap and flush off behind finish surfaces all projecting plumbing, floor electrical/telephone outlets, and all other projecting items which are being abandoned.

7. All work shall be performed in accordance with all applicable authorities.

8. Remove the existing carpet, pad, adhesive, tack strips, base, ceramic tile, wall coverings and any applied method of attachment from the floor slab or wall surface. Remove and dispose of all waste and debris in an orderly manner from the building and site and properly dispose of in full accord with all applicable codes and governing authorities. Patch and prepare the floor and walls to receive the scheduled finish materials per the manufacturers recommendations.

9. Where existing wall finishes are shown as being removed, patch and prepare remaining existing construction as required for installation of new finishes per finish schedule and partition/finish plans.

10. This Contractor shall, under his Contract, be responsible for ceiling removal, ceiling suspension removal, lighting fixture removal, associate electrical demolition and maintenance of all ceiling mounted fire alarm speakers and devices in those areas (if any) of the premises where such ceiling exists. Refer to Drawings for specific requirements.

11. The Contractor shall disconnect, remove and carefully protect all existing fluorescent and incandescent light fixtures, air diffusers, ceiling tile and panels for new locations as required. Return any unused fixtures, etc. to University Representative.

12. Carefully cut and remove portions of construction required to be removed, in a manner not to disturb adjacent areas of construction to remain.

13. NOTE: This Contractor shall be responsible for providing adequate bracing to the structure above for all remaining ceilings and walls standing after the demolition of adjacent and/or intersecting ceilings and walls.

14. Floor penetration openings shall be sealed, filled and capped to maintain a structurally sound floor. Finish of floor opening and/or cap shall be flush with adjacent floor slab.

15. Where all drywall to remain has been damaged by the removal of abutting or intersecting drywall or other elements, the drywall surface to remain shall be patched by this Contractor, the Patch shall be accomplished with appropriate stud backing in a manner such that the adjacent surfaces to be patched to the patched area are flush, smooth and suitable for taping and floating by another Contractor. Examples of these conditions would be where partitions to be demolished intersect the core, furred columns or perimeter bulkhead.

16. Where ductwork is removed from sections of ductwork scheduled to remain, the openings shall be permanently sealed by this Contractor to prevent air leaks when the system is pressurized. The cap shall be of like material as that which is to remain and shall be sealed with hard cast or blue glue.

B. Pollution Controls: Use temporary enclosures and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

1. Clean adjacent space(s) and improvements of dust, dirt and debris caused by demolition operations, as requested by the University Representative. Return adjacent areas to condition existing prior to the start of Work.

C. Space Demolition: Demolish materials completely and remove from site. Use such methods as required to complete work within limitations of governing regulations.

3.2 DISPOSAL OF DEMOLISHED MATERIALS

A. General: Remove on a daily basis from site debris, rubbish and other materials resulting from demolition operations.

B. Under no circumstances shall refuse be allowed to block or otherwise impair circulation in stairs, corridors, sidewalks or other traffic areas at any time. Removal and disposal of all debris shall be in accordance with building management's methods, lease, state/local codes/laws, any/all environmental governing agency and any other governmental agency that has jurisdiction over this project.

C. Removal: Transport materials removed from demolished structures and dispose of off site.

D. Time of Demolition Work: General Demolition Work in the new construction area shall be accomplished during normal working hours unless otherwise designated.

1. Work and/or item that will cause noise, requires access, etc. on the floors below, shall be done during off-hours as scheduled and coordinated with the University Representative.

2. All labor and cartage costs shall be included in Bid(s).

3.3 DISPOSAL OF DEMOLISHED MATERIALS

A. Repair all areas of demolition performed in excess of that required, at no cost to the University Representative.

B. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations, as directed by the University Representative or governing authority. Return adjacent areas to condition existing prior to the start of work.

C. Upon completion of the demolition work, the Contractor shall provide that all areas be left broom clean.

3.4 RECYLCING AND RESUSE OF DEMOLISHED MATERIALS

A. The Contractor shall recycle the demolished materials in accordance with all State, County, City and local Recycling Ordinances, and or any other agency having jurisdiction over this project.

B. The Contractor shall provide a log and proof of the appropriate handling of the project's recyclable materials, in order to assure the University that all ordinances and suggestions by governing authorities and any agency having jurisdiction over this project have been followed.
C. The Contractor shall reuse all items and components as directed by the University and as noted in the drawings.
D. The Contractor shall contact local, state, national agencies, and any agency having jurisdiction over this project to reuse construction materials in order to utilize and reuse demolished items and components not listed by the University and otherwise omitted on the drawings.
E. The Contractor shall dispose of all demolished materials that are not reusable or recyclable and shall do so as directed and legally approved by State, County, City, local ordinances, and or any agencies having jurisdiction over this project.

END OF SECTION

SECTION 03 54 16

HYDRAULIC CEMENT UNDERLAYMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, general provisions of the Contract, and other related construction documents such as Division 01 specifications apply to this Section

1.2 SUMMARY

A. This Section includes a self-leveling underlayment that consists of a blend of Portland cement and other hydraulic cements and polymers that is used to level and smooth interior concrete, terrazzo, well-bonded ceramic & quarry tile, epoxy coating systems, wood, metal and properly prepared, non-water-soluble adhesive residue on concrete prior to the installation of finish flooring on all grade levels.

1. ARDEX K 15® Premium Self-Leveling Underlayment
2. ARDEX P 51™ Primer
3. ARDEX P 82™ Ultra Prime
4. ARDEX EP 2000™ Substrate Preparation Epoxy Primer
5. ARDEX E 25™ Resilient Emulsion

B. Related Sections include the following:

1. Section 03 30 00, Cast-In-Place Concrete
2. Section 09 05 61.13, Moisture Vapor Emission Control
3. Division 09 Flooring Sections

1.3 REFERENCES

A. ASTM C109M, Compressive Strength Air-Cure Only

B. ASTM C348, Flexural Strength of Hydraulic-Cement MortarsASTM F2170, Relative Humidity in Concrete Floor Slabs Using in situ Probes

C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Safety Data Sheets.

B. Qualification Data: For Installer

1.5 QUALITY ASSURANCE

A. Installation of the ARDEX product must be completed by a factory-trained applicator, such as an ARDEX LevelMaster® Elite, Choice Contractor or INSTALL Substrate Prep Certified Installer, using mixing equipment and tools approved by the manufacturer. Contact ARDEX Engineered Cements (724) 203-5000 for a list of recommended installers.

B. Product must have a hydraulic cement-based inorganic binder content as the primary binder which includes portland cement per ASTM C150: Standard Specification for Portland Cement and other specialty hydraulic cements. Gypsum-based products are not acceptable.

C. Manufacturer Experience: Provide products of this section by companies which have successfully specialized in production of this type of work for not less than 10 years. Contact Manufacturer Representative prior to installation.

1.6 WARRANTY: ARDEX K 15® installed as part of a floor system, shall be installed in conjunction with the recommended ARDEX Tile & Stone Installation Materials or WW HENRY Flooring Adhesive, as appropriate, to provide the ARDEX SystemOne comprehensive warranty, depending on the system installed.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products in original packaging, labeled with product identification, manufacturer, batch number and shelf life.

B. Store products in a dry area with temperature maintained between 50° and 85°F (10° and 29°C) and protect from direct sunlight.

C. Handle products in accordance with manufacturer's printed recommendations. PROJECT CONDITIONS

D. Do not install material below 50°F (10°C) surface and air temperatures. These temperatures must also be maintained during and for 48 hours after the installation of products included in this section. Install quickly if the substrate is warm and follow warm weather instructions available from the ARDEX Technical Service Department.

PART 2 - PRODUCTS

2.1 HYDRAULIC CEMENT UNDERLAYMENT

A. Hydraulic Cement-Based Self-Leveling Underlayment

1. Acceptable Products:

a. ARDEX K 15®; Manufactured by ARDEX Engineered Cements: 400 Ardex Park Drive, Aliquippa, PA, 15001, USA, (724) 203-5000, www.ardexamericas.com

i. Primer:

1. Standard Absorbent Concrete: ARDEX P 51™ Primer
2. Extremely Absorbent Concrete: May require two applications of ARDEX P 51™ to minimize the potential for pinholes forming in the ARDEX K 15.
3. Wood: ARDEX P 82™ Ultra Prime
4. Metal: ARDEX EP 2000™ Substrate Preparation Epoxy Primer
5. Other Non-Porous Substrates (burnished concrete, terrazzo, well-bonded ceramic, quarry and porcelain tiles, epoxy coating systems and non-water soluble adhesive residue on concrete and concrete treated with silicate compounds): ARDEX P 82™ Ultra Prime

ii. Performance and Physical Properties: Meet or exceed the following values for material cured at 73° F+/-3°F (23° C+/-3°C) and 50% +/-5% relative humidity:

1. Application: Barrel Mix or Pump
2. Flow Time: 10 minutes
3. Walkable: 2 to 3 hours
4. Compressive Strength: 5,500 psi (385 kg/cm^2) at 28 days, ASTM C109M
5. Flexural Strength: 1,200 psi (84 kg/cm^2) at 28 days, ASTM C348
6. VOC: 0

2.2 WATER: Water shall be clean, potable, and sufficiently cool (not warmer than 70°F).

PART 3 – EXECUTION

A. PREPARATIONGeneral: Prepare substrate in accordance with manufacturer's instructions.

1. Concrete:

a. Prior to proceeding please refer to ASTM F710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring. All concrete subfloors must be sound, solid, clean, and free of all oil, grease, dirt, curing compounds and any substance that might act as a bond breaker before priming. Mechanically clean if necessary using shot blasting or other. Acid etching and the use of sweeping compounds and solvents are not acceptable.

b. Substrates shall be inspected in accordance with ASTM F2170 and corrected for moisture or any other conditions that could affect the performance of the underlayment or the finished floor covering. For areas where moisture vapor emissions exceed the required limits refer to Section 09 05 61.13, Moisture Vapor Emission Control and install the appropriate ARDEX Moisture Control System.

B. Crack and Joint Preparation:

1. Moving Joints and Moving Cracks – honor all expansion, isolation joints and moving cracks up through the underlayment. A flexible sealing compound such as ARDEX ARDISEAL™ Rapid Plus Semi-Rigid Joint Sealant may be installed.

2. Saw Cuts, Dormant Control Joints and Dormant Cracks – fill all dormant control joints and dormant cracks with ARDEX ARDIFIX™ Low Viscosity Rigid Polyurethane Crack & Joint Repair or ARDEX FEATHER FINISH® Self-Drying, Cement-Based Finish Underlayment as recommended by the manufacturer.

C. Wooden subfloors: The wood subfloor either must be solid hardwood flooring; a minimum of ¾" (19 mm) tongue-and-groove, APA-rated Type 1, exterior exposure plywood; or an approved OSB equivalent. The wood subfloor must be constructed according to prevailing building codes and must be solid and securely fixed to provide a rigid base free of undue flex. Any boards exhibiting movement must be refastened to create a sound, solid subfloor. The wood must be clean and free of all foreign matter. If necessary, sand down to bare wood. Vacuum to remove all dust. Do not use solvent, strippers or cleaners. Open joints should be filled with ARDEX FEATHER FINISH®. It is the responsibility of the installation contractor to ensure that the wood subfloor is thoroughly clean and properly anchored prior to the installation of any ARDEX material. Metal subfloors:

1. Metal subfloors must be rigid, well supported, properly anchored and free of undue flex and vibration. They must also be clean and free of all rust, corrosion and foreign matter.

2. Non-lead metal substrates must be mechanically cleaned and profiled to create a bonding surface. Please note that care must be taken when mechanically preparing thin metal foils so that the metal foil is not compromised. Use an #80 or #100 grit sanding screen to mechanically profile the metal surface. A hand or floor sander may be used. After sanding, thoroughly deep vacuum to remove all loose material, and then wipe the metal using a clean, white cloth dampened with 91% isopropyl alcohol. Repeat wiping using a new cloth on each pass until the degree of discoloration on the cloth remains consistent on subsequent passes (typically, approx. 5 – 7 passes). Lightly shot blasting also is suitable. From this point until the metal has been primed, disposable shoe covers should be worn by anyone traversing the surface of the prepared metal. Allow 15 – 20 minutes for residual alcohol to evaporate before proceeding. Contact the Technical Service Department for guidelines on preparing lead substrates.

D. Adhesive residues on concrete must first be tested to make certain they are not water-soluble. Water-soluble adhesives must be completely mechanically removed down to clean concrete. Non-water-soluble adhesives should be prepared to a thin, well-bonded residue using the wet- scraping technique as recommended by the Resilient Floor Covering Institute (www.rfci.com). The prepared residue should appear as nothing more than a transparent stain on the concrete after scraping.

E. Non-porous subfloors such as ceramic, porcelain and quarry tile, burnished concrete, epoxy coating systems as well as terrazzo should be clean and free of all waxes, sealers, dust, dirt, debris and any other contaminant that may act as a bond breaker. If necessary, clean by mechanical methods such as shot blasting.

3.2 APPLICATION OF ARDEX K 15®

A. Examine substrates and conditions under which materials will be installed. Do not proceed

with installation until unsatisfactory conditions are corrected.

B. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas from contact due to mixing and handling of materials.

C. Priming:

1. Note: When using ARDEX P 51, It is critical to ensure that the ARDEX P 51 is dry prior to proceeding with the next installation step. To determine if the ARDEX P 51 is dry after a minimum of 30 minutes (max. 24 hours), pour water onto the surface of the primer in several areas and rub it with your finger. If the water remains clear, the primer is dry. If the water turns cloudy or milky, additional drying time is needed.
2. Primer for standard absorbent concrete subfloors: Dilute ARDEX P 51 1:1 with water and apply evenly with a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, thin film (min. 30 minutes, max. 24 hours). Underlayment shall not be applied until the primer is dry.
3. Primer for extremely absorbent concrete subfloors: Make an initial application of ARDEX P 51 mixed with 3 parts water using a soft push broom. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry thoroughly (1 to 3 hours) before proceeding with the standard application of primer as described above for standard absorbent concrete.
4. Primer for non-porous subfloors such as burnished concrete, terrazzo, well-bonded ceramic, porcelain and quarry tile, epoxy coating systems, wooden subfloors and non-water soluble adhesive residues over concrete: Prime with ARDEX P 82 Ultra Prime. Follow the mixing instructions on the container and apply with a short-nap or sponge paint roller, leaving a thin coat of primer no heavier than a coat of paint. Do not leave any bare spots. Remove all puddles and excess primer. Allow to dry to a clear, slightly tacky film (minimum 3 hours, maximum 24 hours). Underlayment shall not be installed until primer is dry. Note: If a suitable acrylic curing compound has been used on the concrete, test the surface for porosity. If the concrete is porous, prime with ARDEX P 51. If it is non-porous, prime with ARDEX P 82. For wood substrates, once the primer is applied, install 3.4 galvanized, expanded diamond metal lath mesh, stapling approximately every 6 inches (15.2 cm). Do not walk on wet primer.
5. Primer for metal substrates: Prime the prepared subfloor with ARDEX EP 2000 and immediately broadcast fine sand to refusal into the fresh epoxy. After a 16-hour cure remove all excess sand. Remove all excess sand prior to proceeding:

    a. Do not sweep. Using a rubber squeegee, consolidate excess sand into piles.
    b. Shovel the piles of sand into barrels.
    c. Vacuum remaining sand using a heavy-duty, bucket-style (Shop-Vac®-style) vacuum and HEPA dust extraction vacuum system.

D. Mixing: Comply with manufacturer's printed instructions and the following.

1. Add 7 quarts (6.6 L) of clean potable water per 55 lb. (25 kg) bag. For applications over wood and metal, the addition of ARDEX E 25™ Resilient Emulsion is required to increase the resiliency of the ARDEX K 15. In these cases, mix 2 quarts (1.9 L) of ARDEX E 25 with 6 quarts (5.68 L) of water for each bag of ARDEX K 15.

2. Mix using a ½" (12 mm) heavy-duty drill (min. 650 rpm) with an ARDEX T-1 mixing paddle. Do not overwater. When mixing sanded materials, ARDEX recommends using the ARDEX DUSTFREE™ or a standard "gutter hook" vacuum attachment in combination with a wet/dry (Shop-Vac® style) vacuum and HEPA dust extraction

vacuum system. Additionally, each bag should be handled with care and emptied slowly to avoid creating a plume of dust. Contact the ARDEX Technical Service Department for more details on ARDEX products and air quality management.

3. Aggregate mix: For areas to be installed over 1 ½" (4 cm) thick, aggregate may be added to reduce material costs. Mix ARDEX K 15® with water first, then add 1 part aggregate by volume of washed, well-graded 1/8" to 3/8" (3 to 9.5 mm) pea gravel. The aggregate size must not exceed 1/3 the depth of the pour. Do not use sand. Note: The addition of aggregate will diminish the workability of the product and may make it necessary to install a finish coat to obtain a smooth surface. Allow the initial application to dry for 12 to 16 hours, and then prime this layer with ARDEX P 51 mixed 1: 1 with water. Allow the primer to dry (min. 30 minutes, max. 24 hours) before installing the neat coat of ARDEX K 15.

4. For pump installations, ARDEX K 15® shall be mixed using the ARDEX ARDIFLO™ Automatic Mixing Pumps. Contact the ARDEX Technical Service Department (888) 512- 7339 for complete pump operation instructions.

E. Application: Comply with manufacturer's printed instructions and the following:

1. Installations over metal and other non-porous substrates should be limited to a thickness of ½" (12.7 mm) unless otherwise approved by the ARDEX Technical Services Department. For all other substrates, ARDEX K 15® must be installed at a minimum thickness of 1/8" (3 mm) over the highest point in the floor, which typically results in an average thickness of ¼" (6 mm) or more over the entire floor. ARDEX K 15® can be installed up to 1 ½" (4 cm) over large areas neat, and up to 5" (12.7 cm) with the addition of proper aggregate. ARDEX K 15® can also be featheredged to match existing elevations. If a true featheredge is needed, ARDEX recommends using ARDEX FEATHER FINISH® for transitions.

2. Pour or pump the liquid ARDEX K 15® and spread into place with the ARDEX T-4 Spreader. Immediately use the ARDEX T-5 Smoother to smooth the surface. Wear non- metallic cleats to avoid leaving marks in the liquid ARDEX K 15®.

3. Wood subfloors require the use of the mesh-reinforced ARDEX K 15® + E 25™ Resilient Emulsion Underlayment System. After priming, install 3.4 galvanized diamond metal lath by stapling to the wooden subfloor approximately every 6 inches to center.

4. Metal subfloors require the use ARDEX K 15® + E 25™ Resilient Emulsion Underlayment System.

F. Curing

1. ARDEX K 15® can be walked on in 2-3 hours. Moisture-insensitive tiles such as ceramic, quarry and porcelain can be installed after 6 hours. All other finish floor coverings can be installed after 16 hours at 70°F (21°C). For resinous systems such as epoxy and polyurethane floors please contact the ARDEX Technical Services Department.

3.3 FIELD QUALITY CONTROL

A. Where specified, field sampling of the ARDEX underlayment is to be done by taking an entire unopened bag of the product being installed to an independent testing facility to perform compressive strength testing in accordance with ASTM C 109/modified: air-cure only. There are no in situ test procedures for the evaluation of compressive strength.

3.4 PROTECTION

A. Prior to the installation of the finish flooring, the surface of the underlayment should be protected from abuse by other trades by the use of plywood, Masonite or other suitable protection course.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 – GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. The full extent of metal fabrications work which may be required including items fabricated from iron and steel shapes, plates, bars, strips, tubes, pipes and castings which are not a part of structural steel or other metal systems in other sections of these specifications is not shown on the drawings.

B. Types of work in this Section include metal fabrications for:

1. Rough Hardware
2. Loose Bearing and Leveling Plates
3. Miscellaneous and Framing Supports

C. Related Work Specified Elsewhere:

1. Section 064023: Architectural Woodwork
2. Section 123500: Plastic Faced Casework
3. Section 099123: Painting

1.2 STANDARDS

A. Except as modified by governing codes and by this Specification, conform to the applicable provisions and recommendations of the following standards:

1. “Specification for the Design of Cold-Formed Steel Structural Members,” AISC.
2. “Structural Welding Code,” AWS D1.1
3. “Steel Structures Painting Manual, Volume 2, Systems and Specifications,” SSPC.

1.3 QUALITY ASSURANCE

D. Structural Performances: Provide assemblies which, when installed, comply with the minimum requirements of the Local Building Codes for structural performance, unless more stringent requirements are shown on the Drawings.

E. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible.

F. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly.

1.4 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings for fabrication and erection of miscellaneous metal fabrications. Include plans, elevations and details of sections and connections. Show anchorage and accessory items. Provide templates for anchor and bolt installation by others. Refer to section 013300 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

1. Include samples of all conditions of welded, butt and screwed connected joints and intersections.

PART 2 – PRODUCTS

2.1 GENERAL

A. Metal Surfaces: For fabrication of miscellaneous metal work which will be exposed to view, sue only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.

2.2 FERROUS METALS

A. Steel Plates, Shapes and Bars: ASTM A36

B. Steel Plates to be Bent or Cold-Formed: ASTM A283, Grade C.

C. Steel Tubing: Hot-formed, welded or seamless, ASTM A501.

D. Steel Bars and Bar-Size Shapes: ASTM A36.

E. Cold-Finished Steel Bars: ASTM A108, grade as selected by fabricator.

F. Hot Rolled Steel Bars (including bar-size shapes): ASTM A575 (Merchant Quality) or ASTM A56 (Special Quality), quality and grade as selected by Fabricator.

G. Steel Pipe: ASTM A53, Type E, F or S at Fabricator's option, Grade A, black finish unless shown or specified as galvanized, standard weight (Schedule 40) unless otherwise shown or specified.

H. Hot-Formed Rectangular Steel Tubing: ASTM A501, butt welded, cold-finished and stress relieved.

I. Cold-Drawn Steel Tubing: ASTM A5012, sunk drawn, butt welded, cold-finished and stress relieved.

J. Steel Sheet for Cold-Forming: ASTM A569, hot-rolled sheet steel of commercial quality, pickled and oiled, free of defects which would impair the work.

K. Fasteners: Select fasteners for the type, grade and class required.

1. Bolts and Nuts: Regular hexagon head type, ASTM A325.

2. Machine Screws: Cadmium plated steel, FS FF-S-92.

3. Plain Washers: Round, carbon steel, FS FF-W-92.

4. Masonry Anchorage Devices: Expansion shields, FS FF-S325.

5. Toggle Bolts: Tumble-wing type, FS FF-B-588, type, class and style as required.

6. Lock Washers: Helical spring type carbon steel, FS FF-W-84

7. Expansion Bolts: Toothed steel or lead shield expansion devices of the type and size shown with galvanized bolts, except do not use lead shield bolts for overhead anchorage.

L. Concrete Inserts: Furnish unit-type inserts of the type and size shown, of cast iron, malleable iron or hot-dip zinc-coated steel.

M. Power Driven Anchors: Type and size shown or, if not shown, comply with manufacturer's standards. Use only devices and tools which comply with ANSI A10.3. Use power driven anchors only at times/places where acceptable to the Contractor's Safety Superintendent. Do not use as suspension member anchor.

2.3 PAINT

A. Metal Primer Paint: Fabricator's standard and conforming to SSPC, type 2-64.

1. Primer selected must be compatible with finish coats of paint. Coordinate selection of metal primer with finish paint requirements specified in Division 9.

2.4 FABRICATION

A. General:

1. Workmanship: Use materials of size and thickness shown or, if not shown, or required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on Shop Drawings, using proven details of fabrication and support. Use type of materials shown or specified for various components of work.

a. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the work.

b. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces.

c. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners or type shown or, if not shown, Phillips flathead (countersunk) screws or bolts.

d. Provide for anchorage of type shown coordinated with supporting structure.

e. Fabricate and space anchoring devices to provide adequate support for intended use.

f. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware and similar items.

A. Finishing, Ferrous Items:

1. Shop Painting: Shop paint miscellaneous ferrous metal work, except members or portions of members to be embedded in masonry, surfaces and edges to be field welded and galvanized surfaces, unless otherwise specified.

a. Follow procedures for preparation and painting published by SSPC. Provide dry paint film thickness of 2 mils minimum.

2.5 MISCELLANEOUS METAL FABRICATIONS

A. Rough Hardware and Support Angles: Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, angles, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting materials supplied by others and for anchoring or securing materials to concrete or other structures.

1. Refer to Specification sections and details for support requirements.

2. Manufacture of fabricate items of sizes, shapes, and dimensions required. Furnish malleable iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

B. Bearing Plates: Provide bearing and leveling plates fabricated as indicated. Furnish to other trades for installation.

C. Miscellaneous Trim: Provide shapes and sizes as required for the profiles shown. Except as otherwise noted, fabricate units from structural steel shapes and plates and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings and anchorages as required for coordinator of assembly and installation with other work.

PART 3 – EXECUTION

3.1 INSPECTION

A. Installer must examine the areas and conditions under which miscellaneous metal items are to be installed and notify the Contractor, in writing, of condition detrimental to the proper and timely completion of the Work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 PREPARATION

A. Furnish setting drawings, diagrams, templates, instructions and directions for installation of anchorages, such as concrete inserts, anchor bolts and miscellaneous items having integral anchors. Coordinate delivery of such items to project site.

3.3 INSTALLATION

A. Setting Loose Plates: Clean concrete and/or masonry bearing surfaces of any bond-reducing materials and roughen to improve bond to surfaces. Clean the bottom surface of bearing plates.

B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrication to be in-place construction; including, threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts and other connectors as required.

C. Cutting, Fitting and Placement: Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.

   1. Set work accurately in location, alignment, elevation, plumb, level, true and free of rack, measured from established lines and levels.

   2. Fit exposed connections accurately together to form tight hairline joints. Weld connections which are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations.

   3. Grind exposed joints smooth and touch-up shop paint coat.

D. Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made and methods used in correcting welding work.

END OF SECTION

SECTION 06 40 23
ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section.

B. Specifically submit the hardware prior to any fabrication. Hardware for tracks, pulls, locks shall be of a medium to heavy duty quality. Draw tracks must allow full motion. All locked draws and cabinets doors must be true and plumb with the counter and each other or they shall be rejected.

1.1 DESCRIPTION OF WORK

A. The extent of each type of architectural woodwork is shown on the Drawings and in schedules. Architectural woodwork is defined to include (in addition to items so designated on the Drawings) miscellaneous exposed wood members commonly known as "Finish Carpentry" or "Millwork," except where specified under another section of these Specifications.

B. Fabrication, finishing, and installation of millwork specified in this section, shall be by one Contractor and shall not be sublet unless specifically approved by the University Representative.

C. The types of architectural woodwork include, but are not necessarily limited to, the following:

1. Refer to Millwork Schedule.

D. Related Work Specified Elsewhere:

1. Section 05 50 00: Metal Fabrication
2. Section 07 84 13: Firestopping
3. Section 07 92 00: Caulking and Sealants
4. Section 08 14 16: Wood Doors
5. Section 08 71 00: Finish Hardware
6. Section 08 80 00: Glass and Glazing
7. Section 09 29 00: Gypsum Wallboard Systems
8. Section 12 35 00: Plastic Faced Casework

1.2 QUALITY ASSURANCE

A. Quality Standards: Except as otherwise shown or specified, comply with provisions of the Architectural Woodwork Institute (AWI) "Quality Standards," Revised 1990. Highest grade applicable. “Millwork, casework and cabinet work shall be manufactured in accordance with standards established in the Manual of the Woodwork Institute (WI), current edition, in the grade or grades herein specified or as shown on the Drawings. If the manufacturer is not a WI licensee, Contractor shall furnish to University’s Representative, prior to installation, a Certificate of Re-inspection by the WI indicating that the work in question meets the requirements of the WI grade specified. If the manufacturer is a WI licensee, each elevation of work shall bear the WI Certified Compliance grade label indicating the grade specified, and by the completion of the job, WI Certified Compliance Certificate shall have been issued

certifying that the installation fully meets the requirements of the grade specified. The foregoing shall not be construed to limit the power and authority of the University's Representative to reject any millwork which does not in University's Representative's opinion meet with any one or more of the specifications of this contract.

B. Quality Standards: For the following types of architectural woodwork, comply with the indicated standards as applicable:

1. Lumber: AWI 100
2. Standing and Running Trim: AWI Section 300, premium grade
3. Paneling: AWI 500 Class A Rated per AWI 200 G-12
4. Wood Shutters: AWI 1200
5. Architectural Cabinets: AWI 400A Premium
6. Shelving: AWI Section 600, custom grade
7. Miscellaneous Work: AWI Section 700
8. Plastic Laminate Casework: AWI Section 400, premium grade except use premium standard for orientation of laminate grain
9. Architectural Flush Doors: AWI 1300
10. Stile and Rail Doors: AWI 1400
11. Factory Finishing: AWI Section 1500

C. Wood Door Standards:

1. Architectural Flush Doors: AWI 1300

D. "Quality Standards;" Architectural Woodwork Institute (AWI).

E. "Commercial Standards CS;" U.S. Department of Commerce.

F. "Voluntary Product Standards (PS;" U.S. Department of Commerce.

G. "Industry Standard I.S.;" National Woodwork Manufacturer's Association (NWMA).

H. "Interim Standard for Mat-Formed Wood Particleboard;" National Particleboard Association (NPA).

I. Fire-Rated Wood Doors: Provide wood doors with fire resistance ratings indicated or required to comply with governing regulations and which are identical in materials and type of construction to those used in assemblies which have been tested in compliance with ASTM E152 and are labeled and listed by a testing and inspection organization acceptable to authority having jurisdiction.

1. Provide UL label on each labeled door and panel.

J. Non-Fire-Rated Wood Doors: NWMA Industry Standard I.S. 1 "Wood Flush Doors" of the National Woodwork Manufacturer's Association and AWI Standard No. 1300.

1. Factory mark each door with the NWMA "Quality Certified" Seal of Approval for conformance with NWMA I.S. 1.

K. Requirements of Regulatory Agencies: All material used within this Section shall conform to the applicable Building Codes. Refer to AWI 100 for Flame Spread Classification of Materials. Unless otherwise noted under Part 2 - Materials of this Specification Section, all materials shall have minimum classification of Class A (0-25 Flame Spread).

L. Plastic laminate and/or veneer millwork details, sections, etc., may only show and/or indicate finished face or exposed plastic laminate and/or veneer for design and/or detailing purposes. General Contractor and Millwork Contractor is requested to provide, install, etc., all plastic laminate and/or veneer to cover all other exposed areas, cabinet interiors, edges, etc., and to provide all required balance matching. All color finish and graining to match face color, finish and graining, typical.

1.3 WORKMANSHIP

A. Quality of workmanship shall be the highest known "cabinet-maker or furniture quality." All miter joints shall be tight with no gaps or open spaces. Filling of miter joints with crack filler prior to finishing is not acceptable. Loose joints shall be hairline, flat, in single plane, with no exposed screws, nails or other fasteners. All dimensions, reveals and joints shall be held exact.

1.4 DESIGN RESPONSIBILITY

A. The Drawings and Specifications indicate the design intent of this Work and define special required element.

B. This Contractor shall be responsible for the detail design of the complete work of this Section. He shall supplement the general design shown with a detailed Design Drawing for approval.

C. By accepting a Contract, this Contractor agrees that the general design shown is adequate to permit compliance with the performance requirements without extra cost.

D. When various details or requirements are vague, or in contradiction, the Contractor shall immediately request a clarification.

E. The Tenant owns all architectural woodwork designs, including casework, tables and chairs and drawings associated with such designs.

1.5 WARRANTY

A. Refer to Section 013300 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. This Contractor agrees to warrant his work for five (5) years against becoming unserviceable or objectionable in appearance as a result of being defective or non-conforming. This Contractor further warrants the overall effective integration and correctness of individual parts, the whole of the system(s) and compatibility with adjoining substrates, materials and work by other trades.

C. Warranty: (Doors)

1. Submit expressed full written agreement in form approved by the Tenant/Architect signed by the Contractor and Manufacturer, agreeing to repair or replace defective doors which have warped (bow, cup or twist) or which show telegraphing of construction below face, do not conform to tolerance limitations of NWMA or AWI. The warranty shall also include refinishing and reinstallation which may be required due to repair or replacement of defective doors. Warranty shall be in effect for lifetime of installation.

2. NOTE: In addition to the above warranty, Contractor is advised that wood doors that are installed with center hung pivots only shall be warranted for the same warranty

described above (including the 1/4" maximum warpage) regardless of the height of the door. All costs relative to this special warranty shall be borne by this Contractor.

3. Special Conditions: Off set tolerance at meeting edge of pairs of doors shall not exceed 1/8" even if single doors comply with warp tolerance.

4. Contractor shall repair or replace defective work to the satisfaction of the University's Representative.

1.6 SUBMITTALS

A. Refer to Section 013300 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Product Data: (Doors)

1. Submit door manufacturer's specifications and installation instruction, including other data as may be required to show compliance with the specified requirements. Transmit a copy of each instruction to the Installer.

2. Include details of core and edge construction, trim for openings and louvers (if any) and similar components.

3. Include certifications as may be required to show compliance with the Specifications.

C. Shop Drawings: (Doors)

1. Submit Shop Drawings indicating the location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and/or other pertinent data.

D. Shop Drawings: Submit Shop Drawings showing location of each item, dimensioned plans and elevations, large scale details, attachment devices and other components including hardware schedule(s). Submit Shop Drawings for all Architectural Wood work items required. Key Shop Drawings to drawing and section number as shown on the Architectural Drawings.

1. It shall be the responsibility of the Millwork Contractor to obtain copies of Shop Drawings of all items (by Others) to be built into the millwork and to coordinate the required openings.

2. Submit preliminary and final Shop Drawings for review. Completeness of Shop Drawings shall be sufficient to indicate compliance with the Contract Documents and to correlate with other materials. In general, they shall indicate size, material, quantity, finish, attachment methods (including cleating system), connections, weight, performance data, direction of grain or pattern depending on the specification.

3. The Millwork Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents unless the Contractor has received written approval for the deviation.

4. Submit preliminary Shop Drawings prior to or in conjunction with samples. Review preliminary Shop Drawings to determine mutually acceptable detailing of portions of this Work which are not completely defined in the Contract Documents.

5. Submit final Shop Drawings in the manner specified.

6. Include flitch and panel numbers for all veneers on each part of this work to assure proper and carefully controlled sequential installation.

E. Millwork Schedule: Millwork Contractor shall provide a millwork schedule as part of their shop drawings. It should track (1) millwork number, (2) brief description, (3) each step of production (core, veneer, machine, assembly, sanding, finishing), (4) delivery, and (5) installation.

1. Schedule shall be revised and resubmitted on a bi-monthly basis.

F. Samples: (Doors)

1. Submit 12" x 12" (0.3m x 0.3m) corner section of each door type specified indicating construction, veneer and finish for approval.

G. Samples: Finish samples of veneer and lacquer to be submitted with bid.

1. Samples required include, but are not necessarily limited to, the following:

a. Wood veneers and solid wood
b. Hardware
c. Special materials
d. Lacquered wood surfaces

2. For each species and cut or pattern of architectural woodwork submit for approval:

a. Submit two sets (without finish) of full size, full length sample flitches for selection; a minimum of three samples of each flitch, one from each third of the flitch.

b. Following acceptance of sample flitch(es) arrange for final selection trip(s) by the Architect and/or University Representative to each of the sites where the veneers are available for the purpose of selecting the total number of flitches required to complete the work. The Contractor shall accompany the Architect and/or University Representative on such trip(s). Contractor shall pay for all costs.

H. Finish Samples: Following selection of veneer flitches, submit samples prior to starting this work and sufficiently early to coordinate with other trades and other work as follows:

1. Three samples, 1'-0" x 1'-0", of each specified veneer and finish.

2. Three samples of each wood type, veneer face and matching solid stock.

3. Three samples of opaque finish on appropriate substrate to achieve gloss required.

4. Wood veneer samples shall be submitted on each substrate material proposed for use. Fabricated veneer samples using the face veneers selected and typical variations of grain, color, texture and finish expected in the final installation. Size of samples shall be 1'-0" x 1'-0" or larger, depending on veneer matching. End matching will not be acceptable.

I. Attachment Supplies: Submit samples of all attachment devices, cleats, clips and all similar attachment devices.

1. Solid stock samples shall be submitted of the profiles and types of woods scheduled on the Drawings. Each sample shall be representative of the specified graining, color, texture and finish expected in the final installation.

2. Size of samples shall be 2'-0" long minimum.

3. Following University's Representative review, two samples will be returned to the General Contractor.

4. One sample shall be retained by the General Contractor and one sample forwarded by him to the fabricator.

J. Review of samples will be for color, texture, grain and finish only, and subsequent review does not relieve the Millwork Contractor from complying with other Contract requirements. Each sample shall be tagged and the tag shall contain the following information:

1. Locations where the material will be used
2. Specification of substrate material (if any) and manufacturer
3. Finish Specifications
4. Wood types, grades and specie
5. Date sample was made and who prepared it

1.7 PRODUCT, DELIVERY, STORAGE AND HANDLING

A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

1. NOTE: Special care and handling of doors and panels at the job site.

2. Store flat on a level surface in a clean, dry, well ventilated area protected from sunlight.

3. Doors should not be subjected to extremes of heat and/or humidity conditions. Relative humidity should not be less than 30% or more than 60%.

4. Allow doors to become acclimated to finished building heat and humidity before hanging. (Minimum 72 hours.)

B. Deliver woodwork at the Contractor's direction and approval of this Contractor.

1.8 JOB CONDITIONS

A. Examine site conditions affecting this Work. Report unsatisfactory conditions to the University's Representative and do not proceed until those conditions have been corrected. Commencing work implies acceptance of conditions existing at the site as satisfactory to the outcome of this Work.

B. Millwork Contractor shall advise the Contractor of temperature and humidity requirements for woodwork installation areas.

C. Do not install woodwork (including doors) until the required temperature and relative humidity have been stabilized and will be maintained in installation areas.

D. Provide all fire retardant treated blocking as required for installation of Architectural Woodwork.

PART 2 - PRODUCTS

2.1 BASIC MATERIALS AND FABRICATION METHODS

A. General: Except as otherwise indicated, comply with the following requirements for architectural woodwork not specifically indicated as prefabricated or prefinished standard products.

B. Wood Moisture Content: Refer to Paragraph 1.08, Job Conditions for Contractor responsibility for verification of the following requirements. Provide kiln-dried lumber, 6% to 11% for solid wood and veneer(s). Maintain temperature and humidity conditions (hardwood and softwood) through fabrication, installation and finishing operations so that moisture content at time of installation will be 8% to 13%.

1. Refer questions of best visual effect to University Representative for resolution as the Work progresses.

C. Veneers: (Transparent) Thickness - 0.0357" minimum

1. As noted on Drawings.

D. Veneers: (Opaque Finish)

1. Birch
2. Poplar
3. Medium density overlay (Crezon)
4. Fiberboard

E. Veneer Matching: Where matched veneer treatment is shown, provide end match and assemble for the continuous sequential use of flitches across each separate expanse of matched work as indicated (panels, doors, casework and similar units).

F. Assembly: Each panel shall consist of even number of equal-width sheets of veneer per panel, center balanced.

G. Defects: Pitch marks, defective knots, eyes, deteriorated wood and other visual defects shall be removed by hand and patched to match the face veneer. Patches visible to the "eye" will not be allowed. All patches shall be of the quality work performed in the approved samples.

H. Veneer Construction: Provide a 5-ply construction consisting of a veneer core or particle board core with 1-ply face and back. Laminations shall be performed using a ureaformaldehyde glue line, hot press applied. Cold press applications are prohibited. Balance sheets shall be same veneer specie or similar and thickness as exposed finish face.

Veneer and Solid Stock Suppliers:

Dooge Veneers, Inc.
4455 Airwest Avenue
Grand Rapids, MI 49508
(616) 698-6450

William L. Marshall, Ltd.
450 Park Avenue South
New York, NY 10016
(212) 684-3600

R.S. Bacon Veneer Co.
100 S. Mannheim Road

David R. Webb Co., Inc.
150 East 58th Street

Hillside, IL 60162 New York, NY 10022
(312) 547-6673 (212) 753-5176

Other suppliers will be accepted subject to University Representative's review. Veneer and solid stock to come from same supplier.

I. Board Products:

1. Particle Board: Medium density (forty-five (45) lbs./cu. ft.) minimum wood chip and phenolic resin binders, compressed board, 3/4" thickness unless otherwise indicated.

2. Medium Density Overlay: (Crezon)

3. Fiberboard: Medium density forty-five (45) lbs/cu. ft.

4. Plywood: Five-ply construction closed grain hardwood plywood with exterior glue complying with requirements for specified woodwork grade.

5. Hardboard: PS 58, Class 1 (tempered), smooth one side or both sides where indicated, 1/4" thickness unless as otherwise indicated.

6. Particle Board, Fiberboard, Plywood and Hardboard shall contain no added ureaformaldehyde.

J. Solid Stock:

1. Hardwood for Transparent Finishes: Selected for color and graining. Unless otherwise shown, provide solid material of the same species as adjacent or abutting exposed, transparent finished veneer. Graining to match veneer.

2. Hardwood for Opaque Finish: Birch, Poplar or White Oak. Custom grade.

K. Specialty Items Finishes: Refer to Drawings for miscellaneous items and finishes to be supplied by this Contractor.

L. Design and Construction Features: Comply with the details shown for profile and construction of architectural woodwork. Where not otherwise shown, comply with applicable Quality Standards, with alternate details as Fabricator's option.

M. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, wherever possible, to receive hardware, appliances, Electrical Work and similar items. Locate openings accurately and use templates or roughing-in diagrams for proper size and shape. Smooth the edges of cut-outs and, where located in countertops and similar exposures, seal the edges of cutouts with az water-resistant coating. Color as selected and approved by the University Representative.

1. Grommet(s): Provide for all pre-cut openings and/or where shown on the Drawings.

2. Openings: Refer to Part 1.06 for review of Shop Drawings by others.

N. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain field measurements and certify dimensions and Shop Drawing details as required for accurate fit.

1. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

O. Material Thickness: The following thicknesses for drawers shall apply except when shown different on the Drawings:

1. Tops, Bottoms, Ends, Divisions: 3/4" thick
2. Face Plates: Equal to door thickness with 3/4" minimum
3. Web Frames: 3/4" minimum
4. Bottoms: 1'4" KorTron II. Drawers over 24" wide require center bottom support. Weight all drawers.
5. Fronts: Provide double fronts equal to door thickness, 3/4" minimum
6. Backs and Sides: 1/2", full dovetail construction
7. Shelves: Unsupported, exposed shelves 3/4" thick to 42" and 1" minimum over 42". Semi-exposed shelves 3/4" thick to 48"

P. Special Construction: Wood Panels

Q. Paneling:

1. Fire-Rated Paneling: Provide paneling as indicated below which is identical in construction to units tested per method indicated, and which are marked and classified for fire performance characteristics indicated by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

2. Fire Performance Characteristics: Provide flush wood panels of wood veneer density and fire-retardant particleboard core construction having surface burning characteristics per ASTM E84.

a. Provide Premium Grade Class "A" rated paneling per AWI 200 G-12. Wood paneling shall conform to AWI 500 Premium Grade with veneer matching as specified or as shown on the drawings.

b. Refer to drawings and details for special rabbited and recessed jointing. Provide solid matching wood at all recesses.

2.2 DOORS (Cabinet)

A. Doors (Cabinet): 3/4" minimum thickness except doors over 36" wide 48" high to be 1-1/4". Use overlay type except where shown otherwise on Drawings.

2.3 DOORS (Taller than 4'-0")

A. General: Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration, Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions.

1. Deliver wood doors cartoned and/or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.

B. Solid Core Doors:

1. (AWI 1300, Type S1C-5) Staved Lumber Core: Finger Jointed Blocks staggered and glued together, all glued core, Type I construction. Minimum 4-1/2" top and bottom rail.

2. Particle Board Core: (Type PC-5 Ply) Single thickness slab of 3-ply particle board conforming to NP TS 5594 B or CS 236, Type I, Density C, Class I, hot pressed with synthetic resin glue. Linear expansion shall not exceed 0.02% in either direction when tested in accordance with ASTM C1037, Sections 76 through 79. Faces of core slab shall be of o.01" (25mm) thick flakes with resin content a minimum of 50% higher than core resin content. Face layer shall be a minimum of 25% higher than core density. Provide minimum hardwood 4-1/2" top and bottom rails. Minimum 3" side rails.

3. Mineral Core: Incombustible mineral core, non-asbestos complying with AWI Type FD 1-1/2 and NWWDA Industry Standard IS 1-78 Series.

C. Stile and Rail Doors: Comply with AWI 1400 Premium Grade.

1. Modified as follows: Doors shall consist of three or more vertical stave panels grooved to receive tongues stiles and cross rails.

a. Stiles shall be minimum 3-5/8", cross rails shall be minimum 5" wide, and top and bottom rails shall be minimum 5" wide.

D. All Types of Doors Shall Have:

1. Back Side: Of same species and finish as front side.

2. Edge Bands: Kiln dried hardwood matching face veneers for natural finish.

a. Reveals at wood veneer surfaces to have internal hardwood implants. Quirks to have internal hardwood edgebands.

E. Crossbanding: Select species, 1 ply hardwood Poplar, or wood with similar hardness to match color of face veneer, 1/16" thick each side of core followed by 1 ply face and 1 ply back.

1. Extend crossbands full width of door with grain at right angels to face veneer, tapeless spliced without voids.

F. Particle Board Door Assembly: Stile and rails securely bonded to particle board core under pressure to form one solid glued-up piece, then sanded. Crossbands shall be laminated to core with Type I adhesive by hot press process, then sanded.

1. Thickness: Varies - see schedules and details.
2. Hardware: Premachine for all hardware using hardware manufacturer's templates.

2.4 ADHESIVES

A. Interior Locations: PS 51, Type II, water resistant typically, except use Type I waterproof glue in areas of high humidity.

B. Environmental Requirements.

1. Select Adhesives that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standard rules #1168.

2. Aerosol adhesives must comply with current Green Seal Standard for Commercial Adhesives GS-36.

2.5 VENEERS

A. Face Veneer (For Specified Finish):

1. Type: 0.0357" (minimum) thickness, conforming to PS 51 PREMIUM GRADE. Fabricate to AWI premium standards. Edge banding exposed on the face of the door is not acceptable. Match faces of doors in pairs. Face veneer shall be tapeless spliced with the grain running vertically, belt and polished sanded of the following species:

   a. Species: As noted on Drawings

B. Veneer Match (For Specified Finish):

1. Single Doors: Book match, center match with an even number of pieces of veneer across door face and with a joint occurring on the centerline of the door with the same figure and grain on each side of the centerline.

2. Pairs or Sets of Doors: Provide continuous sequence of veneer between pairs of adjoining series of doors using same width of veneer pieces on adjoining door faces. Comply with additional requirements for veneer quality and matching as previously specified.

2.6 PREPARATION FOR AND FINISHING

A. Comply with AWI Quality Standards, Section 1500, for sanding, filling countersunk fasteners, back-priming and similar preparations for the finishing of architectural woodwork, as applicable to each unit of work.

B. Back side of all "stops" adjacent to glass shall be completely finished.

C. Finishes: To approved samples. Submit finished products and process with preliminary bid.

D. Transparent Finish: Conversion varnish complying with MIL-V-12954 to a cured film thickness of 1 mil. Prior to application of finish, prepare wood surfaces with oil stains or toners as required to match approved sample. Sheen as selected by the University Representative.

E. Natural Veneer Finish: Natural veneer doors and paneling shall be finished with a highly moisture resistant lacquer factory applied to properly prepared surfaces. Match samples on file for gloss.

AWI FINISH SYSTEM #2 CATALYZED LACQUER
PREMIUM GRADE

Open grain woods (filled finish)	Stain Vinyl washcoat Filler Vinyl Sealer Sand (220 grit stearated paper) Topcoat Topcoat	Stain Nitrocellulose Washcoat Filler Nitrocellulose Sealer Sand (220 grit stearated paper) Topcoat

Open grain woods (open grain finish)	Stain Vinyl Sealer Sand (220 grit stearated paper Topcoat Topcoat	Stain Nitrocellulose Sealer Sand (220 grit stearated paper) Topcoat

2.7 CABINET HARDWARE AND ACCESSORY MATERIALS

A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for units which are specified as "door hardware" in Section 08700 or in other sections of these Specifications.

B. Hardware Standards: Except as otherwise indicated, comply with ANSI A156.9 "American National Standard for Cabinet Hardware."

C. Millwork Hardware:

1. Hinges: Number per leaf as per manufacturer's loadcharts, but not less than three (3) per leaf. Full or half overlay as required spring loaded for ease of door operation as required.

   a. Prameta or Mepla, European style concealed hinges. (or equal)

2. Pulls:

   a. Cabinet door and drawer pull: As noted on plans.

3. Touch Latch: Glynn Johnson No. 4 (or equal)

4. Magnetic Latch: Provide two catches on doors over 4' high. Hafele 264.26.702. (or equal)

5. Drawer Guides: Accuride (or equal), of correct size for drawer depth. Use full extension type for file drawers and where indicated. Provide one pair guides for each drawer.

   a. Accuride #C3037
   b. Accuride #C4437 (heavy duty)

6. Adjustable Shelf Supports: KV 255 or Capitol #1753 Pilaster Standards and KV 256 or Capitol #1757 supports, 4 per shelf. (or equal)

7. Adjustable Shelf Supports: KV 87 slotted standards and KV 187 slot supports, (heavy duty) (spaced at 36" o.c.)(or equal)

8. Adjustable Shelf Supports: KV 85 double slot standard and KV double slot bracket. (spaced at 30" o.c.)(or equal)

9. Closet Bars: Garcy #A3337, Flange Garcy #3361 size as required. (or equal)

10. Shelf Clips: Capitol #86 pin shelf support, bright Zincro (or equal). Provide predrilled holes in cabinet sides spaced at 1" o.c. and not more than 1-1/2" from shelf edges. Finish zinc plate and/or chrome.

11. Hand Rods: capitol #641-2 (or equal) with flangeless socket #262-2, 1-3/16" diameter extra lengths as required.

12. Silencers: Neoprene pads as required. (Minimum two [2] per door.) Color to match adjacent construction color.

13. Leveling Glides: Provide leveling glides, whether or not shown on drawings for all freestanding millwork. Provide 1-1/2" adjustable glide, exposed surfaces to be dull bronze.

14. Locks: Locks for all millwork cabinet doors and drawers shall be located per the elevations or per the approval of the University Representative.

    a. Locations of all locks as well as keying shall be reviewed with the University Representative prior to installation of locks.

15. Approved Manufacturers: National Lock, Corbin or approved equal.

16. Door Hardware: Refer to drawings and Section 08710.

17. Miscellaneous: Cable Grommets for work stations / built-in desks, countertops, etc.; S60 (BLK) 2-3/8” Grommets by Sugatsune America, Inc [www.sugatsune.com] or equal. Provide two grommets at each work station area (min.). Verify locations with University Representative prior to installation.

D. Provide all required hardware in finishes as selected.

E. Undercounter Light: Where shown by others. Refer to plans and lighting schedule. Coordinate location of fixtures, junction boxes and cutouts with the Electrical Contractor. Provide cut-outs, grommets and boxes as required for electrical work by others.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examination: This Contractor must examine the substrates and conditions under which the work is to be installed and notify the University’s Representative in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to this Contractor.

3.2 PREPARATION

A. Prior to installation of architectural woodwork, examine shop fabricated work for completion and complete work as required including back priming and removal of packing.

3.3 INSTALLATION

A. Install the work plumb, level, true and straight with no distortions.

B. Shim, as required, using concealed shims and/or furniture levelers. Install to a tolerance of 1/8" in 8'-0" for plumb and level, and with 1/32" maximum offset in flush adjoining surfaces, 1/8" maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts. Scribe base as required to hard floors, such as wood and marble.

D. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. NO joints in verticals (standing). Stagger joints in adjacent and related members. Cope at returns, miter at corners and comply with Quality Standards for joinery.

E. Casework: Install without distortion so that drawers will fit openings properly and be accurately aligned.

1. Adjust hardware to center drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated. Maintain veneer sequence matching (if any) of casework with transparent finish.

F. Bases: Base shall be blind nailed over shims. (Glued base is not allowed.)

G. Freestanding Items: Provide complete installation instructions for any parts requiring assembly and/or adjustments. Installation of freestanding items that require mounting, fitting, shims and scribing shall be provided by Millwork Contractor/Fabricator.

3.4 WOOD DOOR INSTALLATION

A. Job Conditions: Manufacture all wood doors two inches (2") longer than shown on Drawings and/or schedules. Bottom of door only will be trimmed to each opening for required clearance.

B. Factory Prefitting and Prematching: Prefit doors and panels in accordance with tolerance requirements of NWMA Industry Standard I.S. 1. Provide standard bevel or radius to edges of doors as required by the installation.

1. Machine doors and panels for finish hardware in accordance with hardware templates.

C. Inspection: Installer must examine door frames and verify that frames are of the correct type and have been installed as required for proper hanging of corresponding doors. Installer shall notify the Contractor, in writing, of conditions detrimental to the proper and timely installation of wood doors. Do not proceed with installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

1. Install fire-rated doors in corresponding fire-rated frames in accordance with the requirements of NFPA No. 80.

D. Installation: Condition doors to average prevailing humidity in installation area prior to hanging.

E. Hardware: For installation, see Section 08700.

F. Manufacturer's Instructions: Install wood doors in accordance with manufacturer's instructions and as shown.

G. Job Fit Doors: Fit doors to frame for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining.

1. Bevel non-fire-rated doors 1/8" in 2" at latch and hinge edges.

2. Bevel fire-rated doors 1/16" in 2" at lock edge.

H. Clearances: Fire non-fire-rated doors provide clearances of 3/32" at jambs and heads; 1/8" at meeting stiles for pairs of doors; and 3/8" from bottom of door to top of floor covering.

I. Adjust and Clean:

1. Operation: Rehang or replace doors which do not swing or operate freely, as directed by the University Representative.

3.5 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

B. Clean hardware, lubricate and make final adjustments for proper operation.

C. Clean woodwork on exposed and semi-exposed surfaces. Touch-up shop-applied finishes to restore damaged or soiled areas.

D. Protection: This Contractor shall provide protection and maintain protection necessary to ensure that the work will be without damage or deterioration at the time of acceptance.

1. All furnished items shall be inspected by the University Representative, Architect and Contractor and a "punch list" of unsatisfactory or missing items, if any, agreed upon.

2. Millwork Contractor shall be responsible for correcting all "punch list" items.

E. Instruct University Representative of adjustments and preventive maintenance (i.e., cleaning methods, materials).

F. Millwork Contractor shall be required to conduct a site walk through and adjust all millwork six (6) months after installation.

G. Millwork Contractor shall remove his debris from site on a daily basis; shall vacuum carpet(s) at work area(s) throughout the day and will thoroughly, to the University Representative's satisfaction, vacuum the carpet at the work area(s) at the end of each work day.

END OF SECTION

SECTION 07 81 16
CEMENTITIOUS FIREPROOFING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and apply spray-on fireproofing as shown on the Drawings and as specified, complete. Contractor shall submit in advance of using any products, cut sheets and samples of intended products for building engineer review and UCLA fire marshal approvals. Contractor shall ensure actual samples of the used product are kept on site, for physical inspection by the fire marshal.

1.2 SUBMITTALS

A. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Submit fireproofing manufacturer's specifications for materials and application with copies of CCR Title 24 and UL approvals. Upon completion, inspect sprayed fireproofing and submit a written certification that all installed materials and workmanship conform to Specifications and Code requirements. Refer to plans.

1.3 (NOT USED)

1.4 JOB CONDITIONS

A. Install temporary coverings and protection to prevent the sprayed material from contaminating adjoining surfaces and construction and to prevent damage or the creation of a public nuisance. Conform to requirements of codes listed in plans.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Asbestos-free fireproofing, nominal dry density of 1.25 psf per inch thickness, published minimum bond strength of 300 psf per ASTM E736, minimum 3100 psf compression strength per ASTM E761, maximum 0.002 grams psf air erosion per ASTM E859, maximum 17 cc abrasion resistance and 4 cc impact penetration per City of San Francisco test method, UL listed 10 or less flame spread and 5 or less fuel contribution and 0 smoke development per ASTM E84 test. Deliver materials in original factory containers bearing manufacturer's name, identification, UL approval label, and date ensuring material is current. Store in a dry place until used.

PART 3 - EXECUTION

3.1 APPLICATION

A. Conform preparation of surfaces, mixing, and application to manufacturer's printed instructions, and UL and CCR Title 24 requirements. Apply to thicknesses as required to provide fire resistance ratings meeting requirements based on material installed, at no extra cost to the University.

1. Fireproofing: Apply fireproofing to those thicknesses providing specified fire protection as shown or required. Set temporary gauge pins or the like to assure correct thickness at all locations.

2. Apply before ducts, pipes, boxes, conduits, and like items are installed and after hangers, supports, and steel framing for these items are secured to steel members.

3. Defective Work: Fireproofing work that becomes loose or is damaged during the course of construction shall be corrected as approved and at Contractor's expense.

END OF SECTION

SECTION 07 84 13
FIRESTOPPING

PART 1 - GENERAL

Contractor shall submit in advance of using any products, cut sheets and samples of intended products for building engineer review and UCLA fire marshal approvals. Contractor shall ensure actual samples of the used product are kept on site, for physical inspection by the fire marshal. Maintain on site until all fire caulking / proofing work is signed off by university inspectors and fire marshal.

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this section.

1.1 SUMMARY

A. This Section includes firestop sealant, safing insulation and firestops/firestopping as required by any/all codes and/or laws for the following locations and/or construction.

1. Openings between connecting floors.
2. In walls at raised floors or where shown and required by Code.
3. Below all wood raised floor systems.
4. All pipes, ductwork or conduit penetrating a fire-rated wall or floor assembly.
5. Head of wall firestopping at fire rated full height partitions.
6. Behind all applied wall finishes, panels, millwork, etc.

B. Fire stop mortar not allowed.

1.2 SUBMITTALS

A. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product data from manufacturers for each joint firestop sealer grout or safing insulation product required, including instructions for joint preparation and joint sealer application and insulation installation instructions.

C. Certified Tests Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including r-values (aged values for plastic insulations), densities, compression strengths, fire performance characteristics, perm ratings, water absorption ratings and similar properties.

1. Certificates from manufacturers of joint firestop sealers and safing insulation attesting that their products comply with specification requirements and are suitable for the use indicated.

2. Samples of each product.

D. Certificates: Submit certificates from manufacturer and installer.

1. Product test reports for each type of joint firestop sealer evidencing compliance with requirements.

1.3 QUALITY INSURANCE

A. Manufacturers Certificate: Not less than 5 years experience manufacturing types of product specified.

B. Installer Certificate: Engage an Installer who has successfully completed within the last 3 years at least 3 sealer applications similar in type and size to that of this Project and is approved by manufacturer for this type of insulation.

1. Pre-installation conference to be attended by Installer, Contractor, University's Representative and representatives from affected trades.

C. Warranty: Contractor to warrant that the firestopping system will provide a permanent installation.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels informing about manufacturer, product name and designation, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

C. General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage and protection during installation.

1.5 PROJECT CONDITIONS

A. Environmental Conditions: Do not proceed with installation of firestop joint sealers under the following conditions:

1. When ambient and substrate temperature conditions are outside the limits permitted by manufacturers.

2. When substrates are wet due to rain, frost, condensation, or other causes.

B. Joint Substrate Conditions: Do not proceed with installation of firestop joint sealers until contaminants capable of interfering with their adhesion as removed from joint substrates.

PART 2 - PRODUCTS

2.1 FIRE-RESISTANT JOINT SEALERS

A. General: Provide manufacturer's standard fire-stopping sealant, with accessory materials, having fire-resistance ratings indicated as established by testing identical assemblies per ASTM E 814 by Underwriter's Laboratories, Inc. or other testing and inspecting agency acceptable to authorities having jurisdiction.

B. Foamed-In-Place Fire-Stopping Sealant: two-part, foamed-in-place, silicone sealant formulated for use in a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors.

C. One-Part Fire-Stopping Sealant: One part elastomeric sealant formulated for use in a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors.

D. Available Products: Subject to compliance with requirements, products which may be incorporated in the Work include, but are not limited to, the following:

1. Foamed-In-Place Fire-Stopping Sealant:

   a. "Dow Corning Fire Stop Foam"; Dow Corning Corp.
   b. "Pensil 851"; General Electric Co.
   c. Or Approved Equal.

2. One-Part Fire-Stopping Sealant:

   a. "Dow Corning Fire Stop Sealant"; Dow Corning Corp.
   b. "3M Fire Barrier Caulk CP-25"; Electrical Products Div./3M
   c. "RTV 7403"; General Electric Co.
   d. "Fyre Putty"; Standard Oil Engineer Materials Co.
   e. "Fyre Shield"; Tremco
   f. "Fyre-Sil"; Tremco (High Movement)

E. Accessory Materials for Fire-Stopping Sealants: Provide forming, joint fillers, packing and other accessory materials required for installation of fire-stopping sealants as applicable to installation conditions indicated.

F. Select sealants that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standards Rule #1168.

2.2 FIRESTOPPING INSULATING MATERIALS

A. General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.

B. Semi-Refractory Fiber Board Safing Insulation: Semi-rigid boards designed for use as a firestop at openings between edge off slab and exterior wall panels at tops of rated walls and as shown, produced by combining semi-refractory mineral fiber manufactured from slag with thermosetting resin binders to comply with ASTM C 612, passing ASTM E 136 for combustion characteristics; r-value of 4.0 at 75º F (23.9º C), meeting point exceeding 2000º F. Supports to be 26 gauge galvanized steel.

C. Manufacturers of Semi-Refractory Fiber Insulation:

1. Manville Corp.
2. United States Gypsum Co.
3. Or Approved Equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive joint sealers, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joint immediately before installing joint sealers to comply with recommendations of joint sealers manufacturers and the following requirements:

1. Remove all foreign material from joint substrates which could interfere with adhesion of joint sealers, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellents; water; surface dirt.

2. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.

3. Remove laitance and form release agents from concrete.

B. Joint Priming: Prime joints substrates where recommended by joint sealer manufacturer based on preconstruction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer’s recommendation. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION

A. General: Comply with manufacturer’s printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing, and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

C. At full height fire-rated walls: Install fire safing insulation as shown on the drawings at wall head conditions:

1. Protect all fire safing insulation by installing 22 gauge galvanized sheet metal closure at top and bottom, which complies with the DBC for protection of fire safing insulation.

2. Tool exposed surfaces of mortar or sealants.

3. At plastic pipes penetrating floors provide a gauge galvanized steel sleeve around pipes, fire stop sealant within sleeve.

4. At opening between walls and floors install fire safing insulation per DBC requirements and in accordance with AAMA Tir-A3.

3.4 CLEANING

A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealers and insulation from contact with contaminating substances or from damage resulting from construction operation or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deteriorated joint sealers immediately and installations with repaired areas indistinguishable from original work.

END OF SECTION

SECTION 07 92 00
CAULKING AND SEALANTS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Furnish and apply caulking and sealants as shown on the Drawings and as specified, complete.

1. Caulking as specified is for installation on the interior of the building unless sealant is indicated on the Drawings.
2. Submit all materials in advance to the Fire Marshal and maintain MSDS and material information as well as a container of the product on all site until all caulking work is signed off by Wildan and Fire Marshal.

2. Sealant as specified shall be installed on the exterior of the building, and where sealant is otherwise indicated on the Drawings.

3. Sealants must comply with USGBC LEED criteria for suitable emissions.

4. Refer to Section 01 33 00: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

1.2 GUARANTEE

A. Furnish to the University's Representative a written guarantee against all defects in materials and workmanship, including against discoloration, sagging, cracking, mildewing and similar defects for two (2) years from date of acceptance. Refer to Specification Section 01 78 00.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Materials utilized shall be from new cartridges with shelf-life valid during installation. Do not use seconds or remnants.

1. Color shall be as follows:

a. For joints separating two similar materials, match finish surface color.
b. For joints separating dissimilar materials, such as perimeter joints around louvers, door frames, window frames, etc., match wall surface color, except match mortar color in face brick walls.

B. Caulking shall be acrylic latex type caulk.

C. Sealant: Provide two (2) component rubber based compounds complying with Federal Specification TT-S-0027C.

1. Class "A" for non-traffic horizontal surfaces.
2. Class "B" for vertical surfaces.

D. Primer shall be as recommended by the caulking or sealant manufacturer.

E. Filler material shall be as recommended by the caulking or sealant manufacturer.

F. Select sealants that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standards Rule #1168.

PART 3 - EXECUTION

3.1 PREPARATION

A. Preparation of Surfaces:

1. Joint Preparation. After all cleaning operations on the exterior of the building are completed, rake out all joints between the frames and the masonry walls to remove all loose mortar materials and brush-clean to remove all dust and dirt. Where no backstop occurs to receive the caulking or sealant compound, fill joints with filler material as recommended by the caulking or sealant manufacturer.

3.2 APPLICATION

A. Application: Apply caulking or sealant, and primer in accordance with the printed instructions of the caulking or sealant manufacturer. Apply primer when and where recommended by the manufacturer.

3.3 ADJUSTMENT AND CLEANING

A. Clean and leave free from stains surfaces of all materials adjoining caulked or sealed joints. Remove excess of caulking or sealant on adjoining surfaces in accordance with the caulking or sealant manufacturer's printed recommendations.

END OF SECTION

SECTION 08 11 00

HOLLOW METAL DOORS AND FRAMES

WILSHIRE CENTER

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification Sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. The extent of standard Steel Doors and Frames is indicated on the Drawings.

B. This Section includes:

1. Metal frames for transoms, sidelights, borrowed lights and other openings, of types and styles as shown on drawings and schedules.

C. Related Work Specified Elsewhere:

1. Section 024119: Selective Demolition
2. Section 081216: Aluminum Metal KD Frames
3. Section 081416: Wood Doors
4. Section 087100: Finish Hardware
5. Section 092900: Gypsum Wallboard Systems
6. Section 099123: Painting

1.2 QUALITY ASSURANCE

A. Provide and install doors and frames complying with the applicable requirements of the following publications:

1. ASTM E-84 (1987) Surface Burning Characteristics of Building Materials

2. ASTM E-90 (1987) Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions

3. ASTM E-152 (1981a) Method of Fire Tests of Door Assemblies

4. ASTM E-283 (1984) Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors

5. DHI-02 (1986) Installation Guide for Doors and Hardware

6. AAMM HMMA 861 (1987) Hollow Metal Manual, Section: Guide Specifications for Commercial Hollow Metal Doors and Frames

7. NFPA 80 (1986) Fire Doors and Windows

8. NFPA 80A (1987) Protection of Buildings from Exterior Fire Exposures

9. NFPA 101 (1988) Code for Safety to Life from Fire in Buildings and Structures

10. SDI 100 (1985) Standard Steel Doors and Frames

11. SDI 106 (1966) Recommended Door Type Nomenclature

12. SDI 107 (1984) Hardware on Steel Doors

B. Contractor shall coordinate hardware requirements with the hardware supplier prior to submittal of final door and frame shop drawings.

C. Temperature Rise Ratings: At stairwell enclosures, provide doors which have Temperature Rise Rating of 450deg. F (232 deg. C) maximum in 30 minutes of fire exposures.

1.3 SUBMITTALS

A. Refer to Section 013323 - SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Shop Drawings: Submit Shop Drawings for the fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections.

C. Manufacturer's Data: Submit copies of manufacturer's technical data for fabrication, shop painting and installation of steel doors and frames. Provide one copy of instructions by transmittal to the Installer.

D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for that each door and frame assembly has been constructed to conform to design, materials, and construction equivalent to requirements for Labeled construction.

E. Certificate from Manufacturer: Evidencing a minimum 5 years experience manufacturing products of this type and that products are per specifications.

F. Certificate from Installer: Evidencing a minimum of 3 years successful experience installing products of this type.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver doors and frames cartoned or crated to provide protection during transit and job storage.

B. Inspect doors and frames upon delivery for damage. Minor damages may be repaired provided the refinished items are equal in all respects to new work and acceptable to the University's Representative otherwise, remove and replace damaged items as directed.

C. Store doors and frames at the building site under cover. Place units on at least 4" high wood sills or on floors in a manner that will prevent rust and damage. Avoid the use of non-vented plastic or canvas shelters which could create a humidity chamber.

D. If the cardboard wrappers on doors become wet, remove cartons immediately. Provide 1/4" spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with contract requirements, manufacturers offering steel doors and frames which may be incorporated in the work include, but are not limited to, the following:

1. Manufacturer:

a. Steel Doors and Frames, (Match existing as noted on plans):

i. Steelcraft/Div. American Standard Co.
ii. Trussblit, Inc.
iii. Republic Builders Product Corp./Subs. Republic Steel.

2.2 MATERIALS

A. Hot-Rolled Steel Sheets and Strips: Commercial quality carbon steel, pickled and oiled, complying with ASTM A569 AND ASTM A568.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A366 and ASTM A568.

C. Galvanized Steel Sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A526, with ASTM A525, G60 zinc coating, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 18-gauge galvanized sheet steel.

E. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, complying with ASTM A153, Class C or D as applicable.

F. Shop Applied Paint:

1. Primer: Ruster-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints. Field final painting and shop applied primer specified in Section 09900, "Painting."

G. Supports and Anchoring Devices: Structural steel complying with ASTM A36' or sheet steel complying with ASTM A366 cold-rolled or ASTM A569 hot-rolled. Fabricate from minimum 16 gauge material. Zinc coating to comply with ASTM A153, Class B.

H. Fasteners: Galvanized or cadmium plated steel.

1. Bolts and Nuts: ASTM A307, Grade A.

I. Expansion Bolts: FS FF-S-325, Group III, expansion shield (self-drilling tubular expansion shell bolt anchors), Type 1 or 2 with galvanized bolts.

2.3 FABRICATION

A. General: Fabricate steel door and frame units to be rigid, neat in appearance, and free from defects, warp, or buckle. Accurately form metal to required sizes and profiles. Wherever practical, fit and assemble units in the manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment to assure proper assembly at the project site.

Weld exposed joints continuously, grind, dress, and make smooth, flush, and invisible. Metallic filler to conceal manufacturing defects is not acceptable.

B. Comply with SDI-100, Grade II, heavy duty, Model I for interior doors.

C. Machine Screws: FS FF-S-92, carbon steel, Type III cross-recessed, Design I or II recess, style 2c flat head.

D. Gauges: All frames shall be 16 gauge steel. All doors shall be 18 gauge steel.

E. Fabricate exposed faces of doors and panels, including stiles and rails of non-flush units, from only cold-rolled steel.

F. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel (at fabricator's option).

G. Fabricate exterior doors, panels, and frames from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gauge inverted steel channels.

H. Exposed connections with hairline joints shall be accurately machined, filed and fitted, unless otherwise shown.

I. Conceal all fastenings, unless otherwise shown. Countersink exposed screws using flat Phillips head screws.

J. Comply with requirements of "Structural Welding Code" of the American Welding Society for welding of steel. Welds shall be strong and durable.

K. Fabricate frames with mitered and welded corners.

2.4 FINISH HARDWARE PREPARATION

A. Prepare doors and frames to receive mortised and concealed finish hardware, including cut outs, backer plates, reinforcing, drilling, and tapping in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware." Locate per NAAMM CHM-1 unless otherwise indicated. If not specified, follow the recommendations of the hardware manufacturer. Do not prep until hardware has been submitted and approved by the Building Engineer and the height and backset and lock type has been approved.

B. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

C. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site. Provide backer plates for all surface applied closure.

D. Finish Hardware Reinforcement: Reinforce frames for required finish hardware with steel secured by spot welding as follows:

1. Hinges and Pivots: 3/16" thick x 1-1/2" wide x 6" longer than hinge.

2. Strike Plate Clips: 3/16" thick x 1-1/2" wide x 3" long.

3. Surface-Applied Closers: 12 ga. by size as required.

E. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers in strike jambs of single swing frames and 2 silencers on heads of double-swing frames.

F. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes, welded to frame, at back of finish hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

2.5 ANCHOR DEVICES

A. Jamb Anchors: Furnish jamb anchors as required to secure frames to adjacent construction, formed of not less than 18 gauge galvanized steel.

B. Floor Anchors: Provide floor anchors for each jamb and mullion formed of not less than 12 gauge galvanized steel as follows:

1. Clip type anchors with two (2) 3/8” holes to receive fasteners, welded to bottom of jambs and mullions.

C. Head Anchors: Provide two (2) anchors at head of frames exceeding 42” wide for frames mounted in steel stud walls.

D. Head Strut Supports: Provide 3/8” x 2” vertical steel struts extending from top of frame, at each jamb, to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable bolted anchorage to frame jamb members.

2.6 SHOP PAINTING

A. Clean, treat and paint exposed and concealed surfaces of fabricated door and frame units.

B. Clean steel surfaces of mill scale, rust, oil, grease, dirt and other foreign materials before the application of the shop coat of paint. Select one of the methods specified in SSPC-SP-1-63 for the removal of oil or grease.

C. Apply pretreatment to cleaned metal surfaces, using cold phosphate solution (SSPC-PT2), hot phosphate solution (SSPC-PT1) or basic zinc chromate-vinyl butyryl solution (SSPC-PT3).

D. Apply shop coat of prime paint within time limits recommended by pretreatment manufacturer. Apply a smooth coat of even consistency to provide a uniform dry film thickness of not less than 2.0 mils.

E. Apply two coats of metal primer to reinforcement and attachment steel which will be in contact with masonry or concrete.

F. Back paint all metal frames in masonry wall with 1/32” asphalt coating.

PART 3 - EXECUTION

3.1 INSPECTION

A. Installer must examine the substrate and conditions under which doors and frame units are to be installed. Notify the Contractor, in writing, of any conditions detrimental to proper and timely

completion of work. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.2 INSTALLATION

A. General: Install door and frame units and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

B. Placing Frames: Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames," unless otherwise indicated.

1. Except for frames located at in-place concrete or masonry and at drywall installation, place frames prior to construction of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

2. In masonry construction, locate 3 wall anchors per jamb at hinge and strike levels.

3. At in-place concrete or masonry construction, set frames and secure to adjacent construction with machine screws and masonry anchorage devices.

4. Install fire-rated frames in accordance with NFPA Std. No. 80.

5. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In open steel stud partitions, place studs in wall anchor notches and wife tie. In closed steel stud partitions, attach wall anchors to studs with tapping screws.

C. Door Installation: Fit hollow metal doors accurately in frames, within clearances specified in SDI-100.

1. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

3.3 ADJUST AND CLEAN

A. Final Adjustment: Check and readjust operating finish hardware items in door and frame units just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including frames which are warped, bowed of otherwise unacceptable.

END OF SECTION

SECTION 08 12 16
ALUMINUM METAL KD FRAMES

PART 1 – GENERAL

1.0 RELATED DOCUMENTS

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1.1 DESCRIPTION OF WORK

A. The extent of standard metal frames is shown on the Drawings and schedules.

B. Types of frames required include:

1. Door and Window Frames
2. Partition and Door Frames
3. Miscellaneous Partition Trim

C. Related Work Specified Elsewhere:

1. Section 06 40 23: Architectural Woodwork
2. Section 08 14 16: Wood Doors
3. Section 08 71 00: Finish Hardware
4. Section 09 29 00: Gypsum Wallboard System
5. Section 09 91 23: Painting

1.2 QUALITY ASSURANCE

A. Provide frames complying with the Architectural Aluminum Manufacturer's Association and as herein specified.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's data for fabrication and installation instructions. Transmit one copy of instructions to the Installer. Refer to Section 01 33 00: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Shop Drawings: Submit Shop Drawings for the fabrication and installation of aluminum frames. Include details of each frame type, elevations, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements and details of joints and connections. Show anchorage and accessory items.

C. Samples: Submit two (2) 12" long full width extrusions in exact coloration for approval prior to fabrication.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General: Provide fire-rated frames as shown on the door schedule.

B. Frames: All frames of sizes shown, and are which to be furnished under this contract, shall be manufactured by:

Western Integrated – Series #300 – Interior Door Frames = Per building standard.

Advanced Architectural Frames and Wilson aluminum KD frames are also accepted substitutions as long as ratings and profiles meet the building standard. Ensure profiles can meet existing throat conditions. [Match existing frames and profiles within the Lease Space or as noted on the Construction Documents]

C. Fire Rating: None unless noted on drawing
D. Construction: Door frame sections shall be furnished with ("Separate Studs"), ("Fastrack Studs"), attachment studs; prepared for any standard weight 4½" template hinge, for 1¾" doors, and (2¾"), ASA strike plates; and supplied with continuous polypropylene pile soundseal.

E. Finish: Finish of all exposed surfaces for frame and sidelight components shall be factory clear anodized finish.

2.2 FABRICATION

A. General: Fabricate frame units to be rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles.

B. Finish Hardware Preparation: Prepare frames to receive mortised and concealed finish hardware, including cutouts, reinforcing, drilling and tapping in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation."

1. Latch keeper shall be sized to accept hardware manufacturer's standard latch keeper.

2. Provide and install internal reinforcement clips at all frames to receive closers. Contractor to provide additional blocking where door reinforcement stud is required to be cut to accept electric strike.

3. Reinforce door frame units to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site. Through bolting will not be permitted. Provide and install stiffener plates for head of frames where closers are scheduled.

PART 3 – EXECUTION

3.1 INSPECTION

A. Installer must examine the substrate and conditions under which metal KD frames are to be installed. Notify the Contractor in writing of any conditions detrimental to proper and timely completion of work. Do not proceed until unsatisfactory conditions have been corrected in a manner acceptable by Installer.

3.2 INSTALLATION

A. General: Perform installation work under Manufacturer's Installation Recommendations. Assemble and install frame units and accessories in accordance with final Shop Drawings and Manufacturer's data and as herein specified.

B. Placing Frames: Place frames after construction and finishing of enclosing walls and ceilings. Set frames accurately in position, plumbed, aligned and secured permanently in opening. Corners of frames shall be accurately joined, reinforced and fitted to flush hairline joints. Apply snap-on trim to conceal fasteners.

C. Blocking: Wood blocking to be installed for all areas that have cutouts made to frames.

3.3 ADJUST AND CLEAN

A. Remove and replace defective work. Replace frame or trim members whose finish has been damaged beyond satisfactory repair my minor touch-up. Use factory furnished touch-up paint and supply University Representative a minimum of one quart of unopened touch-up paint.

END OF SECTION

SECTION 08 14 16
WOOD DOORS

WILSHIRE CENTER

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide wood doors as shown on the Drawings and as specified, complete. Stain to match doors on the same floor as work in question. Provide stains samples in advance. Doors shall be stained off premises for new doors and existing doors where possible. If doors are in rated locations and must be stained or finished in the field, work shall occur after hours and with permission from the office of the building.

B. Definitions:

1. The undercut dimension, 3/4-inch (19 mm), unless otherwise indicated on the door schedule, shall be clear dimension from the floor elevation, as shown on the floor Drawings, to the bottom of the door.

a. Door undercut dimension at wood doors having mortise-type automatic door bottoms for door seals shall be as required for automatic door bottoms as specified in Section 08 71 00, FINISH HARDWARE.

1.02 SUBMITTALS

A. Refer to Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Shop Drawings and Product Data: The following list includes the required shop drawings that shall be submitted.

1. Doors. Manufacturer and specifications.

2. Stain. Submit stain samples. It is critical that the door stains meet the University finish requirements for stained wood doors. Wood grain must be visible and enhanced.

3. Prep. Submit a detail showing the height of the door handle prep prior to prep and install.

4. Do not prep door until hardware has been submitted and approved by building engineer.

C. Certificates: Submit manufacturer's certifications as required hereinafter to show compliance with the specifications.

1.03 PRODUCT DELIVERY AND STORAGE

A. Delivery of Materials:

1. Doors shall not be delivered to the Project site until the entire building has been free from dampness due to plastering, gypsum wall board finishing or other moisture-producing work for at least ten (10) days.

2. Protect doors during transit by enveloping each unit in an individual cover. Pallet-loads of doors shall be provided with covers and skids to protect materials from transit damage.

3. Doors and protective covers shall be individually marked in accordance with approved shop drawings.

B. Storage of Materials, Equipment and Fixtures: Heat shall be furnished in the door storage area during cold or humid weather. Protect doors against dampness; store in dry and well-ventilated area, and do not subject units to extreme changes of temperature or humidity. Comply with the "On-Site Care" recommendations of NWMA pamphlet, "Care and Finishing of Wood Doors," and with the manufacturer's printed recommendations.

1.04 GUARANTEE

A. Furnish to the University's Representative a written guarantee against all defects in materials and workmanship including against warping, checking, delamination and core show-through. Guarantee doors as follows:

1. solid core doors, interior, five (5) years from date of acceptance;

2. solid core doors, exterior, and hollow core doors, two (2) years from date of acceptance.

Refer to Section 01 78 00, GUARANTEES, BONDS, AND SERVICE AND MAINTENANCE CONTRACTS, for submittal form.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Wood doors shall be in accordance with the AWI brochure, "Flush Doors," and the NWMA Publication I.S.1, "Wood Flush Doors." Face veneer of doors shall be plain sliced white oak - (Match Landlord Sample]. All of the doors furnished on the Project shall be by one manufacturer.

1. Doors shall be premium grade.

B. Doors shall have matching hardwood edge strips laminated to the stiles.

1. Where glazing panels or louvers are indicated, openings in non-fire rated doors shall be edged with matching hardwood. Provide trim for openings in fire-rated doors which have been tested and UL listed for the kind of door and rating required.

C. Solid Core Flush Doors: All doors, other than fire-rated doors and sound insulating doors, shall be solid core flush doors, 1-3/4 inches (450 mm) thick as follows, unless otherwise shown on the Drawings.

1. Core shall be TYPE PC (particleboard solid core) in accordance with NWMA Publication I.S.1.

2. Face veneers shall be premium grade.

3. Pairs of doors shall have matched grain face veneers.

4. Particleboard shall contain no added ureaformaldehyde.

D. Fire-rated doors shall be UL labeled fire doors as follows for the label scheduled on the Drawings, except pairs of 1/3-hour labeled doors shall have Warnock Hersey Fire Laboratories' labels:

1. For "B" Label (1-hour rating), use FD 1.
2. For "B" Label (1-1/2-hour rating), use FD 1-1/2.
3. For "C" Label (3/4-hour rating), use FD 3/4.
4. For "20-Minute" Label (1/3-hour rating), use FD 1/3.

a. Pairs of doors shall have fire retardant treated wood edges to meet Warnock Hersey label requirements

5. Sixty (60) and ninety (90) minute fire-rated doors in corresponding fire-rated frames shall have producer's standard UL stiles for flush-type hinges and shall be installed in accordance with the requirements of NFPA Publication No. 80, "Standard for Fire Doors and Windows."

6. Wood door construction is approved for mortise at fire-rated door locations where mortise-type automatic door bottoms are scheduled.

E. Louvers. All louvers shall have three (3) coats of baked enamel of color selected by Owner's Representative to match door color. Sizes are scheduled on the Drawings.

1. Provide UL-labeled louvers at all doors required by the Drawings to be fire-rated and to be equipped with louvers.

PART 3 - EXECUTION

3.01 PREPARATION

A. Prepare doors as required for all finish hardware. Obtain hardware templates for use during machining. Verify hardware locations and core type of door prior to matching.

1. All pairs of wood doors shall have beveled leading edge at inactive leaf and beveled lock edge at active leaf, pre-fit at the factory. Provide 1/8-inch (3.2 mm) maximum space at narrowest dimension and 11/32-inch (8.7 mm) maximum space at widest dimension of double-bevel between inactive and active door leafs. Bevel shall not exceed 1/8-inch (3.2 mm) in 2 inches (50.8 mm).

B. Acclimatize doors to the average prevailing humidity in the installation area prior to hanging wood doors.

3.02 INSTALLATION

A. Install wood doors in accordance with manufacturer's printed recommendations.

3.03 PROTECTION OF COMPLETED WORK

A. After the doors are installed in their openings, furnish protection to prevent damage due to other construction operations and movement of materials, equipment and people through the door openings.

END OF SECTION

SECTION 08 71 00

FINISH HARDWARE

WILSHIRE CENTER

PART 1 – GENERAL

1.0 GENERAL RULES

1. All hardware locksets for **UCLA Wilshire Center** shall be Arrow Brand and match the building standard with cylinders and keyways.
2. Coordinate all keying requirements with the building engineer; a keying schedule is required.
3. Any hardware, which are removed and not reinstalled by the contractor, shall be stored as directed by The Building Office. No such removal may be made unless shown on the plans and specifications and/or approved by The Building Office.

1.1 DESCRIPTION OF WORK

A. Provide finish hardware as shown on the Drawings, as specified and as scheduled, complete.

1. Provide hardware templates as required for metal doors and frames and other work to be factory-prepared for the installation of hardware.

2. Furnish additional items of hardware which are necessary to make a complete installation.

3. Only one (1) manufacturer for each category of finish hardware shall be furnished throughout the project.

4. Prior to submitting or ordering new doors, frames or hardware, and prior to prepping new doors, verify with building engineer for correct back-set, lock operation / lockset function etc. Incorrect assumptions will not be grounds for compensation. A submittal of lockset functions must be submitted.

B. Definitions: Finish hardware is hereby defined to include all items known commercially as builders' hardware, as required for swing-types of doors, and all cylinders for special doors as itemized herein.

1.2 SUBMITTALS

A. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. Product Data: Submit complete product data.

C. Prior to delivery of hardware, submit hardware shop drawings and a hardware schedule of all hardware required. The schedule shall follow the requirements of the specifications and list type, manufacturer's name and number, finish and location. In addition, furnish a schedule fully identifying all abbreviations and symbols used.

1. Furnish with each set of shop drawings, one (1) copy of the standard mounting heights for hardware, published by the DHI.

2. Furnish a graphic keying chart of the project depicting the keying system of the building.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Packing and Marking: Package each item of hardware and each lockset separately in individual containers, complete with necessary screws, keys, instructions and installation template for mortising tools. Mark each container with item number corresponding to number shown on Contractor's hardware schedule.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Finishes: Hardware shall have the following standard finishes unless listed differently on the plans:

1. US26D (BHMA) US Equivalent, unless otherwise specified.

2. US26 (BHMA No. 629), when used in toilets.

3. For exposed surfaces of surface-type door closers and closer arms, paint to match hardware finish on remainder of door. Refer to Section 09 91 23, PAINTING.

4. Metal astragals and metal door edges, including factory-painted units, paint to match door frame.

B. Description of Hardware: The following paragraphs describe individual hardware items to establish the design intent and function of required hardware.

1. Corridor Hardware: “Arrow” “QL Series” Cylindrical #QL81-SB-26D-Q71-KD-AR, Finish: #26D Satin Chromium Plated.
Two (2) Pair of non-bearing butt hinges- McKinney #TA2714 4.5” x 4.5” NRP, Finish: 626
One (1) Surface Closer-Norton 8500 Series, Finish: 689
One (1) Threshold McKinney - #MCK 273A 36”, Finish: A
One (1) Door Stop- McKinney #FS01-L, Finish: 626
One (1) McKinney – Smoke Seal #MCK S88W 21 Color: Black

For paired entry add:
One (1) T Astragal – McKinney - #MCK355CS 108” Color: C
One (1) Surface Closer-Norton 8500 Series, Finish: 689
One (1) Threshold – McKinney - #MCK 273A 72” in lieu of 36” Finish: Aluminum.

2. Interior Hardware: “Arrow” “QL” Series” Cylindrical Entrance Lockset #QL72-SB-26D-Q71-KD-AR, Finish: #26D Satin Chromium Plated.
Four (4) Non-bearing butt hinges-McKinney #TA2714 4.5” x 4.5” NRP, Finish: 626.
One (1) Floor Door Stop- McKinney #FS01-L, Finish: 626

3. Door Closers: Door closers shall be Norton brand. Size of door closers shall be not less than that listed by the door closer manufacturer's tables for the corresponding width of door, or as specified. Provide all mounting brackets required for a complete installation. Provide drop plates, shoe supports and blade stop spacers, as required, to facilitate complete installation of closers at door locations having narrow top rails.

The opening force for fire rated doors or rated doors may be increased to a maximum of 15 pounds by the Campus Building Official.

a. Provide closers that meet requirements of 5 pounds (2.27 kg) opening pressure for handicapped persons at interior doors. Closer opening pressure at exterior doors shall be 5 pounds (2.27 kg) for handicapped persons. Closers for handicapped persons are scheduled with suffix "HC".

b. Electronic release door closers shall be operated with voltage of 120 V a.c. Electronic closers shall be UL-rated and connected to the building's fire alarm system with smoke detector at both sides of door, which when activated will release the holder mechanism causing the closer to close the door. Doors shall be capable of being closed and opened manually without setting off fire alarm. Each shall have concealed electrical connections to track on head frame. Doors shall open to their maximum potential that door opening permits.

4. Door Stops: Supply stops wherever an item of door hardware or a door, when opened, might contact a wall or other part of the building construction. Wall stops shall be provided where possible, when wall or floor stop option is scheduled. Risers for carpeted floors shall also be provided, as required, where floor stops occur at carpeted floors. Door stops shall not project more than 4” from the wall.

5. Panic Devices: Provide dummy trim (DT) where scheduled.

6. Thresholds: Provide thresholds with manufacturer's standard return closed (RCE) at each end of threshold, where there are no adjacent abutting surfaces. Other thresholds shall be as specified in Paragraph 2.01.B.13, "Floor Closers," and Paragraph 2.01.B.16, "Pivot Sets."

7. Door pulls and push plates.

8. Lever and Self-Latching Flush Bolts: Provide the bottom bolt with dustproof strike, except where metal thresholds occur.

9. Coordinators: Provide with mounting brackets for stop-applied hardware and filler pieces as required to provide a complete installation. Paint coordinators, mounting brackets and filler pieces to match the color of the frame upon which they occur. If required, provide carry bars by the coordinator manufacturer. Provide additional 1/4-inch (6.4 mm)-thick mounting brackets for frame stop-applied door closers at exterior double doors, where coordinators are to be mounted on and connected through specified weatherstripping to stop on frame.

10. Automatic Flush Bolts: For metal doors and wood doors. Provide with top strikes, bottom dustproof strikes and wear strike plates; except, bottom strikes are not required where metal thresholds occur. Provide automatic flush bolts in sets (one (1) top and one (1) bottom automatic flush bolt per set).

11. Kickplates: US32D (BHMA No. 630). 10 inches (254 mm) high by 1-1/2 inches (38 mm) narrower than the width of the door. Provide oval head screws 8 inches (203.2 mm) on centers.

12. Smoke gaskets shall be provided at all fire-rated doors where scheduled. Smoke gaskets at head and jambs shall be pressure-sensitive, adhesive-type silicon rubber at meeting stiles of pairs of doors, where scheduled. The gasket retainer shall be surface-applied to leading edge of inactive door leaf near edge of door, opposite door swing side. Smoke gaskets shall be brown in color, and be UL-classified as "Gasketing

Material for Fire Doors." Astragals at meeting stiles of fire-rated pairs of doors, when required or scheduled, shall be considered as smoke gasketing.

13. Floor closers shall be for physically handicapped access with sealed units and up to 30-second delayed action. Provide floor closers with side jamb pivots, top pivots, thresholds and concealed overhead door stops of the same manufacturer, as scheduled. Floor closers shall provide no more than 5 pounds (2.27 kg) resistance to opening of the doors by handicapped persons.

14. Door seals at door head and jambs shall be provided where scheduled and shall be pressure-sensitive, adhesive-type silicon rubber; color as selected by University's Representative.

15. Door seals at door bottoms shall be automatic door bottoms of the heavy-duty type, aluminum, with neoprene insert and fully-mortised into bottom of wood door. Door construction shall be approved by University's Representative for mortise at fire-rated door locations.

16. Pivot sets with 3/4-inch (19 mm) offset, as scheduled. Each pivot set shall include bottom pivot jamb portion, arm and top pivot. Provide side jamb pivots and thresholds of the same manufacturer, as scheduled. Bottom pivots at exterior door locations shall be installed up on the side jamb. Plastic spacer shims shall be set below the threshold under the bottom pivots to strengthen the threshold.

17. Light seals at door head and jambs, where scheduled. Seal inserts shall be vinyl or neoprene.

18. Plunger door holders shall be as scheduled. Holder shoes shall be of gray rubber, bolted into a flanged cup.

19. Floor sills at acoustical metal doors shall be as scheduled. Sill finish shall be US28, satin aluminum. Sills shall be fully grouted in and fastened securely to the floor. Refer to Section 04 05 13, MORTAR.

C. Keying:

1. Building Engineer shall be responsible for coordinating building keying system with Contractor and project manager. Contractor to provide approved building standard keyway to building engineer.

D. Labeled Hardware:

1. Provide hardware which meets the requirements of NFPA Publication No. 80 and of UL and Warnock Hersey for all fire-rated doors and frames.

2. Where panic exit devices are required on fire-rated doors, furnish supplementary marking on door UL label indicating "Fire Door to be Equipped with Fire Exit Hardware," and furnish UL label on exit device indicating "Fire Exit Hardware."

3. Unless astragals are scheduled, hardware items scheduled hereinafter at pairs of UL-labeled doors are for doors that are "UL Listed with No Overlapping Astragal Requirements." If pairs of UL-labeled doors furnished by the door manufacturer do not have "UL Listing with No Overlapping Astragal Requirements," overlapping astragals shall be provided, including door coordinators with carry bar, at no additional cost to University. When required, connect astragal to active door leaf of the pair. Carry bar is

not required when inactive door leaf of the pair is equipped with automatic or self-latching flush bolts.

E. Fasteners:

1. Provide all required fasteners of type, size, quantity and finish for installation with each hardware item. Provide Phillips flat head screws except where otherwise indicated. Finish of exposed fasteners shall match hardware finish or, if exposed upon surfaces of other work, shall match the finish of such other work as closely as possible.

2. Machine screws and expansion shields shall be used for attachment of hardware to concrete or masonry. Toggle bolts shall be used for attaching hardware to gypsum wallboard or plaster surfaces.

3. Provide fasteners which are compatible with both the unit to be fastened and the substrate, and which will not cause corrosion or deterioration of hardware, base material or fasteners.

a. Fasteners exposed to the weather in the finished work shall be brass, bronze, aluminum or stainless steel, as applicable to match the item being fastened. Where these materials cannot be used, steel fasteners shall be zinc or cadmium-plated in accordance with ASTM B633, Type SC3 or ASTM A165, Type NS, respectively.

2.2 MANUFACTURERS

A. The following manufacturers' names appear on the hardware schedule to designate the standard of the items specified and continuity with existing hardware in the building where no known equal is listed:

1. Refer to Architectural Drawings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Hardware for installation on metal doors, frames or other work shall be factory-prepared for hardware installation and shall be made to standard templates of the hardware manufacturer. Drilling and tapping for hardware installation shall be done in the field.

3.2 INSTALLATION

A. Install hardware items in compliance with the manufacturer's printed recommendations.

B. Do not install surface-mounted items until finishing operations have been completed on the substrate.

3.3 FIELD QUALITY CONTROL

A. Mount hardware items at heights indicated in DHI "Recommended Locations for Builders Hardware," and in accordance with the "Regulations for Accommodation of the Disabled in Public Accommodations" in the California State Building Code, Title 24, Parts 2, 3 and 5.

3.4 ADJUSTMENT AND CLEANING

A. Adjust and check each operating item of hardware to ensure correct operation and function of all units.

1. Lubricate moving parts with type of lubrication recommended by manufacturer. Utilize graphite-type if no other lubrication is recommended.

2. Replace units which cannot be adjusted or lubricated to operate freely and smoothly as intended for the application specified, as approved and at Contractor's expense.

3.5 SCHEDULES

A. Special Finishes: Rough, clear abrasive coating shall be applied at the factory to levers at lock and latch sets where "knurled level is scheduled.

B. Schedule of Hardware (for equal products, refer to Paragraph 2.02 above):

1. Refer to Architectural Drawings.

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. Provide glass and glazing as shown on the Drawings and as specified, complete.
B. If existing glass to be re-used is scratched or damaged, please notify University at time of bidding. Any glazing installed with scratches or damage shall be replaced by Contractor at no cost to the University

1.2 QUALITY ASSURANCE

A. Reference Standards: Glass and glazing for this project shall meet or exceed the requirements of the "Safety Standard for Architectural Glazing Materials" (CSPC 16 CFR 1201) and ANSI 297.1 specifications, as applicable.

1.3 SUBMITTALS

A. Refer to Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Samples: The following list includes the required samples that shall be submitted.

1. Wire glass sample.
2. Art Glass sample.
3. Laminated glass sample.
4. Obscured laminated glass.

1.4 GUARANTEE

A. Furnish to University's Representative a written guarantee against all defects in materials and workmanship, including that the insulating units will not develop material obstruction of vision between the interior glass surfaces caused by failure of the hermetic seal due to faulty construction, for five (5) years from date of acceptance. Refer to Section 0178 00, GUARANTEES, BONDS, AND SERVICE AND MAINTENANCE CONTRACTS, for submittal form.

PART 2 – PRODUCTS

2.1 MATERIALS

A. General. Except where otherwise specified, each piece of glass shall bear the manufacturer's label to identify type, thickness and quality.

1. Glass shall be as specified and in conformance with FS as indicated.

2. Tinted glass color shall be as selected by University's Representative.

3. Tinted glass shall have the following minimum characteristics.

   a. Shading coefficient: .57
   b. Transmittance: .47
   c. Absorptance (outer glass): .48
   d. Absorptance (inner glass): .16

B. Clear Plate/Float: FS DD-G-451D, Type I, Class 1, Quality Q3, 1/4-inch (6.0 mm)-thick unless otherwise indicated.

   1. Fully-tempered where shown.

C. Wire Glass: 1/4-inch (6.0 mm)-thick square pattern bearing UL approval.

D. Tinted glass, unless otherwise indicated on the Drawings, shall be as follows:

   1. 1/4-inch (6.0 mm)-thick plate or float.
   2. Tinted, color as selected by University's Representative.
   3. Edges factory-tinted and clean-cut.
   4. Fully-tempered where shown or scheduled herein.

E. Fully-tempered glass shall be glazing quality, shall meet FS DD-G-1403B and ANSI 297.1, and unless otherwise indicated on the Drawings, shall be as follows:

   1. 1/4-inch (6.0 mm)-thick.
   2. FS Type I, clear.
   3. Tinted, color as selected by Univserity's Representative.

F. Spandrel Glass: 1/4-inch (6.0 mm)-thick spandrel glass shall be insulated at the factory with one (1)-inch fiberglass with foil back.

   1. Color shall be as selected by University's Representative.

G. Insulating glass shall consist of two (2) lites of glass with a hermetically and permanently sealed air space, and shall conform to Sealed Insulating Glass Manufacturer's Association No. 65-7-2, "Sealed Insulating Glass Units".

   1. Exterior lite shall be 1/4-inch (6.0 mm)-thick plate or float glass tinted.

   2. Interior lite shall be 1/4-inch (6.0 mm)-thick clear plate/float glass.

   3. Air space shall be 1/2-inch (13 mm).

H. Ultra-Violet Filtering Glass: Filtering glass shall be 1/4-inch, clear two (2)-ply ultra-violet filtering laminated glass with a polyvinyl buteral inner layer to filter light wave lengths up to 400 nanometers. Glass shall meet the requirements of FS DD-G-451.

I. Glazing compound shall be as follows:

   1. For metal frames, compound shall be in accordance with section "Glazing Materials" of the FGMA Glazing Manual. The use of nonskinning compounds, nonresilient-type preformed sealers and preformed impregnated-type gaskets will not be permitted; metal sash putty will not be permitted. When flexible vinyl gasket channels are used, the material shall conform to ASTM D 2287.

a. Compound used for glazing aluminum shall be pigmented with aluminum powder to match the aluminum unit without staining or discoloring, shall be non-hardening, and shall be of a type that does not require painting.

b. Glazing Accessories. As required to supplement the accessories furnished with the items to be glazed and to provide a complete installation, including glazing points, clips, shims, angles, heads, setting blocks and spacer strips.

PART 3 – EXECUTION

3.1 PREPARATION

A. Field Measurements: Sizes for glass shall be measured from the actual frames, doors and sash. Sizes noted on the Drawings are approximate only.

3.2 INSTALLATION

A. Workmanship shall be in accordance with the standards of the FGMA Glazing Manual.

1. Obscure glass shall be installed at locations indicated on Drawings. Install exterior glass with smooth side outside.

2. Wired glass shall be installed in all locations where indicated on Drawings.

3. Labels. Do not remove labels until the installed glass is given final cleaning and polishing.

B. Glazing. In conformance with the nomenclature and procedures of the FGMA Glazing Manual.

3.3 ADJUSTMENT AND CLEANING

A. Replacement and Cleaning: Upon completion of the work, all glass surfaces shall be cleaned, with all labels, paint spots, putty and other defacements removed. Cracked, broken and imperfect glass shall be replaced as approved and at no additional cost to the University.

3.4 SCHEDULES

A. Replacement and Cleaning: Glass shall be installed in locations indicated on the Drawings in conformance with the type of glass designated by the following schedule:

1. Type "A".3/8” thick clear tempered glass

END OF SECTION

SECTION 09 29 00

GYPSUM WALLBOARD SYSTEMS

PART 1 – GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

1.1 DESCRIPTION OF WORK

A. The extent of the gypsum wallboard work is shown on the Drawings and in schedules, and is hereby defined to include gypsum board work with a tape-and-compound joint treatment system known as "drywall finishing" work.

B. Work Included: Furnish and install all gypsum drywall construction, including light-gauge metal stud non-load bearing wall framing and furring, gypsum wallboard, acoustical batt insulation, all required accessories, and taping and joint finishing, as shown on the Drawings and specified herein or as required to complete the Work.

C. The types of work required include the following:

1. Gypsum wallboard including screw-type metal support system
2. Gypsum wallboard finishing (joint tape-and-compound treatment and skim-coating)
3. Acoustical insulation
4. Sealants and Caulking

D. Related Work Specified Elsewhere:

1. Section 08 12 16: Aluminum Metal KD Frames
2. Section 08 14 16: Wood Doors
3. Section 08 80 00: Glass and Glazing
4. Section 09 51 13: Acoustical Ceilings
5. Section 09 91 23: Painting

1.2 QUALITY ASSURANCE

A. Fire-Resistance Rating: Where work is indicated for fire-resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities including UL and A.I.A.

B. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including their commendations of the manufacturer.

C. Reference Standard: Comply with requirements of ASTM C754, except where more detailed or more stringent requirements are shown including the recommendations of the manufacturer.

D. Requirements of Regulatory Agencies: Comply with the applicable requirements of all governing codes and authorities, unless otherwise shown or specified.

E. Manufacturer: Obtain gypsum boards, trim accessories, adhesives and joint treatment products from a single manufacturer or from manufacturers recommended by the prime manufacturer of gypsum boards.

1.3 PRODUCT HANDLING

A. Deliver gypsum wallboard materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry, well ventilated space, protected from the weather, under cover and off the ground.

1.4 JOB CONDITIONS

A. Maintain ambient temperatures at not less than 50 F, for the period of twenty-four (24) hours before wallboard finishing during installation and until compounds are dry.

B. Ventilation, either natural or supplied by fans, circulators or air conditioning systems shall be provided to remove excess moisture during joint treatment.

1.5 SEQUENCING AND SCHEDULING

A. Coordination: Coordinate installation and finishing of gypsum board systems with insulation, painting, wall covering, mechanical and electrical, or other Sections whose work is dependent upon or related to gypsum board. do not enclose walls or partitions until all required framing, insulation, mechanical, and electrical inspections have been made and approved.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers: Furnish products manufactured by Eagle Gypsum Products, Domtar Gypsum, Georgia-Pacific, Gold Bond, or U.S. Gypsum.

2.2 METAL SUPPORT MATERIALS

A. General: To the extent not otherwise indicated, comply with ASTM C754, "Installation of Steel Framing Members to Receive Screw-Attached Gypsum Wallboard" (as specified and recommended) for metal system supporting gypsum drywall work.

B. Ceiling suspension Main Runners: 1-1/2" 16 gage Cold Rolled steel channels, 0.475 lb. per foot.

1. Hanger Wire: ASTM A641, soft, Class 1 galvanized, pre-stretched; sized in accordance with ASTM C754.

2. Hanger Anchorage Devices: Provide concrete inserts, clips, bolts, screws and other devices applicable to the indicated method of structural anchorage for ceiling hangers. Size devices for 3x calculated load supported, except size direct-pull concrete inserts for 5x calculated load.

C. Sheet Steel: Conform to applicable provisions of ASTM A568, minimum yield strength 33 ksi for thickness less than 20 gauge and 40 ksi for 20 gauge and heavier, with zinc coating conforming to ASTM A525.

D. Studs:

1. Interior Partitions: Minimum 25 gauge electro-galvanized steel, screw type, with minimum 1-1/4" hemmed legs and pre-punched webs, width as indicated, and complying with applicable provisions of ASTM C645.

2. Design Requirements: Thickness or gauge of studs is subject to height limitations recommended by manufacturer, based on maximum deflection of L/240 when partition or wall assembly is subjected to a 5 psf uniform lateral load at interior partitions.

3. ASTM C645; 20 gauge x 1-5/8", 2-1/2", 3-5/8" deep, except as otherwise indicated.

E. Stud Tracks:

1. Interior Partitions: Minimum 25 gauge electro-galvanized steel, screw type, minimum 1" unhemmed legs, width same as studs for indicated partition, and complying with applicable provisions of ASTM C645. Where studs heavier than 25 gauge are indicated or required, provide track of same gauge as studs.

2. Stud System Accessories: Provide stud manufacturer's standard clips, shoes, ties, reinforcements, fasteners and other accessories as needed for a complete stud system.

F. Metal Furring Channels: DWC Hat shaped, 7/8" (22mm) high, 25 ga. (0.53mm), galvanized per ASTM A164.

G. Furring Anchorages: 16 ga. (1.6 mm) galvanized wire ties, manufacturer's standard wire-type clips, bolts, nails or screws as recommended by furring manufacturer and complying with ASTM C754.

2.3 BOARD MATERIALS

A. Fire Rated Gypsum Wallboard: UL-rated 1/2" or 5/8" thick, 4'-0" wide x minimum 8'-0" long, tapered edge, fire-resistant core gypsum wallboard with manila paper finish, complying with applicable provisions of ASTM C36 and FS SS-L-30D, Type III, Grade X, Class 1.

B. Gypsum Backing Board: Equal to U.S. Gypsum Co. "Sheetrock" backboard, 5/8" thick, Type 'X', unless otherwise indicated, 4' width.

2.4 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum wallboard work of the type and grade recommended by the manufacturer of the gypsum board.

B. Polyethylene Vapor Retarder: ASTM D 4397, 6 mils, 0.13 perms.

C. Laminating Adhesive: Special adhesive or joint compound specifically recommended for laminating gypsum boards.

D. Gypsum Board Fasteners:

1. Metal Framing to Structure: Power driven fasteners providing 190 lb. (86.2 kg) single shear resistance and 200 lb. (90.7 kg) bearing strength.

2. Metal to Metal Within Drywall Systems: 3/8" (9.5 mm), Type S or S-12, pan head.

3. Gypsum Wallboard to Metal Framing: Lengths as required Types S or S-12, bugle head.

4. Powder Actuated Fasteners: Hilti Type SDF22 or Equal, as recommended by framing manufacturer.

5. Impact Anchors: Hilti HPS Series or equal, as recommended by framing manufacturer.

E. Trim Accessories: Provide trim accessories of the sized required for the drywall applications (i.e.: all exposed outside corner, edges, openings, etc.) as indicated, shown and specified, fabricated from galvanized steel and of the following types:

1. Provide metal corner bead at external corners with smooth rigid nose and perforated and knurled flanges.

2. Provide metal casing bead trim for protection of exposed drywall edges around openings, with square or round nose, joint compound treatment required.

3. Provide beaded nose with exposed flange knurled for joint treatment.

4. Where kerfed jambs are shown, provide trim with special leg designed for insertion into jamb slot.

5. Refer to Drawings for special head track reveal and trim. All trim pieces shall be spackled, taped and finished unless otherwise noted.

6. Where drywall abuts or intersects dissimilar construction, provide square edge casing bead, joint compound treatment necessary.

7. Where control joints are shown or required in drywall areas, provide one-piece joint assembly of non-corrosive metal with continuous unperforated expansion strip for insertion into joint.

F. Edge Treatment: Galvanized steel type 200 "L" bead, 1/2" or 5/8" thick, with minimum 7/8" wide flange.

G. Corner Treatment: Galvanized steel corner bead with 1-1/4" wide flanges.

H. Control Joints: Galvanized steel type 093, minimum overall width 1-3/4", with tape-protected 1/4" wide reveal.

I. Fasteners: Type S bugle-head drywall screws minimum 1" long for 1/2" wallboard, 1-18" long for 5/8" wallboard, and 1-5/8" long for double thickness wallboard or 1" shaft liner panels.

J. Joint Treatment Materials:

1. Joint Tape: Reinforced, perforated paper tape designed specifically for drywall joint treatment, as recommended by wallboard manufacturer, minimum 2" wide. Provide manufacturer's recommended woven glass fiber joint tape at tile backer board.

2. Joint Compound: Pre-mixed, vinyl-based general purpose joint compound containing no asbestos, as recommended by wallboard manufacturer.

3. Finishing Compound: Pre-mixed, vinyl-based topping compound containing no asbestos, as recommended by wallboard manufacturer.

K. Concealed Acoustical Sealant: Sealant shall be "Tremco Acoustical Sealant", a non-drying, non-skinning, non-staining, permanently resilient, synthetic rubber-based acoustical sealant with "gunning" characteristics at 20 F (-7 C) as manufactured by the Tremco Mfg. Company of Cleveland, Ohio.

1. Acoustical Sealant: Tremco, Presstite No. 579.64, W.W. Henry No. 313B, or approved equal.

2. Backing Rod: Closed-cell, bead or rod polyethylene foam.

L. Concealed Acoustical Tape: Foam type; Norton Sealants Division; Norseal V-730.

M. Special Acoustical Sealant: Provide one Component Silicone Sealant, "Silpruf" by General Electric co. (Sound rated walls).

N. Sheet caulking for junction boxes: "Lowry's Electrical Box Sealer."

O. Acoustical Insulation:

1. Acoustical Wall Insulation: Thermafiber sound attenuating blankets complying with FS HH-1-521; Type I; density of not less than 2.5 pound per cubic foot. Unfaced, self-supporting, semi-rigid blanket or sheet for units to be self-supported by friction fit. Provide 1-1/2", 2-1/2", 3-1/2" nominal thickness or as indicated on the Drawings.

Products/Manufacturers: Thermafiber Blanket; U.S. Gypsum or Owens Corning.

P. Environmental Requirements: 1. Select Adhesives that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standards Rule No. 1168. 2. Aerosol adhesives must comply with current Green Seal Standard for Commercial Adhesives GS-36. 3. Select sealants that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standards Rule No. 1168

PART 3 – EXECUTION

3.1 INSPECTION

A. Installer shall examine the substrates and the spaces to receive gypsum wallboard and the conditions under which it is to be installed; and shall notify the Contractor, in writing, of

conditions detrimental to the proper and timely completion of the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. General:

1. Construction Tolerances for Gypsum Drywall Work: Do not exceed 1/8" (3.2mm) in 8 ft. (2.4 m) non-accumulative variation from plumb or level in any exposed line of surface, except at joints between units.

(a) Do not exceed 1/16" (1.6 mm) variation between planes of abutting edges or ends. Shim as required to comply with specified tolerances.

2. Cutting, Fitting and Trimming: Accurately measure and precut gypsum drywall units for all penetrations, prior to installation. Make all cuts from face side by scoring and snapping away from face side or by sawing. Completely cut paper on backface; do not break paper by tearing. Maintain close tolerances for accurate fit at joints between sheets and at framed openings and to allow for covering of edges of cutouts with plates and escutcheons. Cut edges smooth as required for neat and accurate fit.

3. Screws: Apply drywall screws with a positive-clutch electric power-driven screwdriver equipped with an adjustable screw depth control head and a Phillips bit. Drive screws not less than 3/8" (9.5 mm) from ends of edges of wallboard and to a uniform depth not over 1/32" (0.8 mm).

3.2 INSTALLATION OF METAL SUPPORT SYSTEMS

A. General: To the extent not otherwise indicated, comply with ASTM C754, and manufacturer's instructions. Coordinate with Mechanical and Electrical Work. Do not attach or support metal framing to ducts, pipes or conduit.

3.3 INSTALLATION OF STEEL FRAMING FOR SUSPENDED CEILINGS

A. Do not bridge building expansion joints with support system, frame both sides of joints with furring and other support as indicated.

B. Space ceiling suspension main runners 4'-0" o.c., and space hangers as indicated, or if not otherwise indicated, at 4'-0" o.c. along runners; coordinate with structure.

C. Level main runner channels to a tolerance of 1/8" (3.2 mm) in 12 ft. (3.6 m) measured both lengthwise on each runner and transversely between parallel runners.

D. Space ceiling furring members 16" o.c., except as otherwise indicated.

E. Wire-tie or clip furring members to main ceiling runners and to other structural supports as indicated.

F. Fit tight to conduits, duct work, other work concealed by ceiling and/or sound rated walls. Seal all around by packing with "Duxseal" and caulked with "Silpruf".

G. Install supplementary framing, runners, furring, blocking and bracing at opening and terminations in the Work and at locations required to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum board alone.

H. Provide furring and framing to conceal all pipes, ducts, conduits and raceways not indicated a exposed.

I. Drive screws only through pre-punched holes in channels.

J. Resilient channels are to be attached with mounting flanges facing in only one direction on ceilings and with the gap between the channel and stud faces oriented upward on walls.

K. Hold back ends of channels one to three inches from intersecting surfaces.

L. Locate channels so that gypsum board will not be cantilevered more than 6" from vertical surfaces.

3.4 INSTALLATION - PARTITION METAL FRAMING AND FURRING

A. General: Install metal studs, tracks, furring channels in accessories in strict compliance with manufacturer's installation procedures. Anchor all components firmly into position, and plumb to within 1/8" throughout their height or horizontal plane of any run.

B. Stud Tracks: Attach tracks in continuous runs to floor and overhead structure or ceiling grid as indicated. Use suitable fasteners as recommended by framing manufacturer. Space fasteners maximum 24" o.c., beginning 2" from each end. Bed tracks in two continuous 1/4" beads of acoustical sealant at sound-rated walls or partitions.

C. Studs: Position studs vertically into tracks at uniform 24" spacing unless otherwise indicated, with open sides facing in same direction. Rotate into position for friction fit, and fasten to tracks with self-tapping screws. Screws shall penetrate flanges of both stud and track. Attach both flanges of studs and tracks at top. Install studs in continuous lengths wherever possible; if necessary to splice studs, provide minimum 8" nested lap, with two screws per stud flange.

1. Install 20 gauge studs at each jamb for openings up to 4'-0" wide and with doors 200 lbs or less.

2. Install 2-20 gauge studs at each jamb for openings to 4'-0" wide with doors 200 lbs to 300 lbs.

3. Spot grout jambs anchors for solid core doors over 2'-8" wide.

4. Extend partition stud system through acoustical ceilings where indicated and elsewhere as indicated to the structural support or substrate above the ceiling.

5. Terminate partition stud system at ceilings where shown on Drawings. Provide matching stud diagonal bracing to structure above for partition stability. (4'-0" o.c.. alternate sides.)

6. Partitions shall be continuous over doors or openings same as adjacent walls.

D. Openings and Block-Outs: Install double studs at all door jambs, and continuous track at door heads. Provide continuous framed support at all four sides of openings or block-outs for duct or other penetrations through walls or partitions. Verify required sizes for all openings or block-outs, and provide space for shims as required.

E. Ceiling Framing: Space 1/1-2" cold-rolled suspension channels at maximum 24" o.c. using specified wire hangers. Fasten furring channels to suspension channels at 24" o.c. using pre-formed wire clips or 18 gauge tie wire.

F. Bracing and Support: Provide overhead or diagonal bracing as indicated or as required to secure framing plumb, rigid, and in alignment. Construct bracing from standard stud and track members unless otherwise indicated. Coordinate bracing with ductwork and other overhead systems or utilities to avoid conflicts.

G. Fire-Rated Partitions: Verify stud sizes, gauges, and widths at fire-rated partitions to ensure compliance with specified rating. Provide breakaway anchor clips at intermediate floor framing.

H. Sound-Rated Partitions: Install floor and overhead tracks in continuous beads of acoustical sealant as specified. Provide resilient channels at furring, ceilings, or partition framing as required to achieve the designated sound ratings.

1. Isolate stud system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support free from axial loading.

2. Provide continuous tracks sized to match studs. Align runner tracks accurately to the partition layout at both floor and ceiling. Secure runner tracks as recommended by the stud manufacturer for the floor and ceiling construction involved except do not exceed 24" (0.6 m) o.c. for other types of attachment. Provide fasteners at all corners and ends of runner tracks.

3. Provide steel channel framing secured to floor for low height walls for stability. Alternate return wall 4" perpendicular to partition (4").

3.5 ACOUSTICAL INSULATION

A. General: Comply with applicable provisions of Gypsum Association Publications GA-216-85, Recommended Specifications for the Application and Finishing of Gypsum Board, and GA-600-88, Fire Resistance Design Manual, unless otherwise noted herein.

B. Non-Rated Partitions: Apply wallboard to framing members horizontally or vertically, at Contractor's option, with joints occurring over framing members. Space fasteners 12" o.c.

C. Fire-Rated Partitions: Apply type X wallboard in single or double layers as required to achieve the specified or required fire rating. Comply with GA Fire Resistance Design Manual regarding thickness orientation of wallboard, placement of joints, and spacing of fasteners.

D. Ceilings: Apply wallboard to ceilings with factory edges occurring over framing members. Stagger end joints approximately 1/2 the panel length. Space fasteners 8" o.c. throughout. Comply with applicable requirements of GA Fire Resistance Design Manual at rated ceiling assemblies.

E. Installation: Install gypsum drywall board with face side out. Do not install imperfect, damaged or damp drywall boards. Butt boards together for a light contact at edges or ends with not more than 1/16" (1.6 mm) open space between boards.

1. At hollow metal door frames, cut boards to fit around hardware reinforcement or mortar boxes. Spot grout frames with a quick setting grout or compound at each jamb anchor clip just prior to insertion of boards into frame. Insert boards into

frame so that its edge is fully bedded against inside surfaces of the frame. Butter the edge of boards with joint compound if necessary to achieve full bedding.

2. Locate edges or end joints over supports except in horizontal applications or where intermediate supports or gypsum board backblocking is provided behind end joints. Position boards so that tapered edge joints abut and mill-out or field-cut end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partition walls.

3. Provide additional framing and blocking as required to support gypsum drywall at openings and cutouts and to support built-in anchorage and attachment devices for other work.

4. Neatly cut wallboard at joints, intersections, wall openings, switches and outlet boxes. Excessive Joint with or oversize cuts at openings (greater than 1/8") will be cause for rejection.

5. Where chase walls are shown with metal stud construction, provide bracing between parallel rows of studs. Unless otherwise shown, provide gypsum drywall braces not less than 1/2" (12.7 mm) thick x 12" (0.3 mm) wide and cut to width of chase. Locate at quarter points in wall height between each pair of parallel studs. Fasten with not less than 3 screws at each stud.

6. Install wall/partition boards vertically only, unless otherwise approved by the University Representative. Comply with the method stated in GA-600 for the tested assembly. Install boards long enough to allow for probable variance(s) in level of concrete floor slabs.

7. Form control joints in drywall construction on 30 ft. (9.1 m) centers unless otherwise shown. Allow 1/2" (12.7 mm) continuous opening between edges of adjacent drywall boards to allow for insertions of control joint trim accessory specified.

8. Do not locate joints within 8" (0.2 mm) of corners of openings, except where control joints are shown at jamb lines or where openings occur adjacent to exterior or interior angles of an area. Wherever possible, cut boards so that single vertical joint occurs over center of door openings.

9. Cover both faces of studs with gypsum board in concealed spaces (above ceilings, etc.), unless otherwise shown in the Details.

10. Isolate perimeter of non-load-bearing wallboard partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge with J-type semi-finishing edge trim. Seal Joints with acoustical tape and sealant.

F. Floating Construction: Where feasible, including where recommended by manufacturer, install gypsum board with "floating" internal corner construction, unless isolation of the intersecting boards is indicated or unless control or expansion joints are indicated.

1. Bottom edge of wallboard shall not be greater than 3/8" from finished floor. Apply finish, tape and float to bottom edge of wallboard.

G. Tile Backer Board: Install reinforced cementitious tile backer board at showers, tub enclosures, and all other areas subject to direct exposure to water. Space fasteners 6" o.c. at ends, edges, and along intermediate supports.

H. Double-Layer Application: Install ceiling base layer of gypsum backing board prior to wall/partition board installation, and install face layer of exposed gypsum board subsequently. Apply both base and finish layers vertically to walls and partitions.

1. Fasten both layers with screws. Offset joints between layers not less than 10".

3.7 SOUND RATED DRYWALL APPLICATION

A. Where sound-rated wallboard work is indicated, including double-layer work and work on resilient furring, seal the work at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with manufacturer's recommendations for location of beads and close off sound-flanking paths around or through the work including sealing of partitions above acoustical ceilings.

1. At partition walls, provide continuous beads of sealant at juncture of both faces of runners or plates with floor and ceiling construction and wherever drywall abuts dissimilar materials. Seal prior to installation of drywall boards.

2. At ceilings, provide continuous beads of sealant wherever drywall abuts dissimilar materials.

3. At control joints, provide continuous bead of sealant at all faces of control joints. Seal prior to installation of surface-applied control joint accessories and locate at proper depth in joint to allow for insertion of expansion portion of control joint accessory.

4. Seal partition air tight to the metal deck above with continuous acoustical caulking. Where partition runs perpendicular to direction of metal deck flutes, scribe gypsum board to deck and caulk.

5. After installation of drywall base layers, cut face layer sheets 1/2" (12.7 mm) less than floor-to-ceiling height and position with 1/4" (6.35 mm) open space between drywall and door, ceiling and dissimilar vertical construction. Fill 1/4" (6.35 mm) open space with continuous sealant beads after installation of face layer.

6. At openings and cutouts, fill open spaces between drywall and fixtures, cabinets, outlet boxes, piping ducts and other flush or penetrating items, with continuous bead of sealant.

7. Seal sides and back of electrical boxes with a minimum 1/8" (3/17 mm) layer of sealant to completely encase box and joints.

8. Outlet and switch boxes for telephone, electrical or computer cables in partitions shall not be placed back to back. Stagger on opposite sides of partition at least one stud space. Seal back of boxes with outlet box pads.

B. Sound Flanking Paths: Where sound-rated partition walls intersect non-rated drywall partition walls, extend sound-rated construction to completely close sound flanking paths through non-rated construction. Seal joints between face layers at vertical interior angles of intersecting partitions.

1. Where partition intersects window mullion, overlap gypsum board on mullion to within 1/2" glass. Attach gypsum board to mullion with mastic and fill voids as necessary. Place metal corner mold at end of gypsum board and paint flat black. Compress backer rod between end of gypsum board and glass.

2. Supply and return air slots shall not be continuous through partition.

3. Sound flanking paths above ceiling between spandrel beams and exterior building wall shall be closed off and sealed air tight with gypsum board or plaster.

4. Gypsum board at intersection with adjoining partitions shall not run continuous through partition on office side.

5. Where demising partition intersects column furring, furred gypsum board shall not run continuous through partition.

6. Install sound attenuation blankets in all sound-rated partition walls. Completely fill space between studs to full height of partition wall. Fit carefully behind electrical outlets and other work which penetrates partition wall. Attach to back face of drywall in accordance with drywall manufacturer's instructions.

3.8 ACOUSTICAL SEALANT INSTALLATION

A. Use acoustical sealant to form an airtight seal at all penetrations and perimeter of sound rated partitions, floors and ceilings. Gypsum Wall Board. Use backer rod where gaps to be sealed exceed 3/8".

B. Use sheet caulking to seal the back and sides of all junction boxes recessed in acoustically rated partitions.

3.9 DRYWALL ACCESSORIES

A. Edge Treatment: Install metal corner beads at all external corners. Unless otherwise indicated, install "L"-beads at exposed ends of wallboard panels and at abutting joints with other materials, leaving a minimum 1/8" reveal for caulking.

B. Control Joints: Install metal control joints at approximately 30'-0" o.c. in large expanses of walls, at 50'-0" o.c. maximum in ceilings and at other locations indicated on the Drawings.

C. Special Accessories and Trim: See Drawings for location, size, and type of special trim pieces, such as reveals and bullnoses.

3.10 INSTALLATION OF WALLBOARD FINISHING

A. General: Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration.

B. Joints: Center paper joint tape over joints and embed in uniform layer of joint tape of sufficient width and depth to provide firm and complete bond. Apply skim coat of joint compound over tape. Feather edges of joint compound evenly onto adjacent surface of wall board.

C. Interior Corners: Treat interior corners which do not terminate with "L"-beads by folding reinforcing tape to conform to adjacent surfaces and to true, straight angles. Embed tape in joint compound.

D. Metal Accessories and Trim: Conceal metal flanges with at least two coats of joint compound. Feather compound out 8" to 10" beyond nosing of metal trim pieces.

E. Fasteners, Dents and other Depressions: Fill dimples, gauges, and other depressions with joint compound, feathered smooth to match adjacent surfaces.

F. Top or Finish Coat: Sand joint compound as required to obtain uniform, smooth surface prior to application of finishing compound. Apply first coat of finishing compound over joint compound, feathering out beyond edge of joint compound. Allow to thoroughly dry (at least 24 hours), then apply second coat, feathering edges out slightly beyond first coat.

G. Skim Coat: After final sanding of joint and fastener treatment surfaces, apply thin skim coat over entire surface of wallboard to minimize suction and porosity or other variations between treated areas and face paper surfaces, and to improve fastener and joint concealment.

3.11 PROTECTION

A. Completed Work: Protect completed drywall surfaces from injury or damage from work of other trades. Repair any areas damaged prior to final completion and acceptance of the Work, at no additional cost to the University.

3.12 CLEAN-UP

A. Clean floors of drywall debris and leave broom clean. Remove excess material, scaffolding, tools and other equipment upon completion of work.

END OF SECTION

SECTION 09 51 13
ACOUSTICAL CEILINGS

WILSHIRE CENTER

PART 1- GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. Work Included: Furnish and install all acoustical ceilings and suspension systems as shown on the Drawings, and specified herein, or as required to complete the Work. Ceiling and suspension types.

Refer to Drawings for actual ceiling systems, materials and ceiling finishes as required. Comply with manufacturer's directions. Acoustical ceiling grid and tile are building standards therefore no substitutions shall be accepted. If the project requires patching or matching what is currently in place, then Contractor shall match the grid and tile accordingly.

B. The types of acoustical ceilings specified in this Section include the following:

1. Acoustical panel ceiling, semi-exposed suspension

C. Related Work Specified Elsewhere:

1. Section 09 29 00: Gypsum Drywall Systems

1.2 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications: Manufacturer shall have not less than five (5) years experience in the manufacturing/fabrication of the types of products specified.

2. Installer Qualifications: Installer shall have not less than five (5) years of successful experience in the installation of the types of products specified.

B. General: Obtain units from one manufacturer, cured by one process and of uniform texture and color for each type required, for each continuous, visually related area. Do not change brands of materials during the course of the work without approval.

C. Certification:

1. Fire Rated Assemblies: Submit written certification of compliance with UL designs for fire rated ceiling assemblies.

2. Acoustical Properties: Submit copies of tests performed by independent testing agencies confirming compliance with required noise reduction coefficients (NRC) and sound transmission class (STC) of acoustical materials.

D. Acceptable Manufacturers:

1. Acoustical Tiles: Armstrong” Millennia Climaplus Beveled Tegular. White, 24” x 24”.

2. Suspension System: USG - Donn Industries, 2’-0” x 2’-0” Fineline DXF / DXLF narrow 9/16” face with ¼” reveal suspended ceiling system. Color: White.

3. Refer to drawings for details and standards.

E. Manufacturers listed herein are included for the Contractor's convenience in establishing quality, performance, function and aesthetic appearance acceptable to the University ‘s Representative.

1. Other manufacturers, as approved by the University ‘s Representative may be used whose qualities are equivalent to or exceed the specified manufacturer.

F. Subcontract the installation of acoustical ceilings to an experienced installation firm which is acceptable to the manufacturer of the acoustical units, as shown by current written statement from the manufacturer.

G. Coordination: Coordinate scheduling and installation of suspension system and ceiling installation with mechanical, electrical, and other work which will be built into or is dependent upon suspended ceilings.

H. Regulatory Requirements: Comply with all applicable building code requirements concerning fire resistance ratings and fire-rated ceiling assemblies. Unless otherwise indicated, fire-rated ceiling assemblies shall conform to UL Design No.

I. Standards for Terminology and Performance: Applicable publications by the Acoustical and Insulating Materials Association (AIMA), including "Performance Data, University’s Representative ural Acoustical Materials".

J. Fire Hazard Classification: Where acoustical panel ceilings are required to comply with a fire hazard classification for flamespread, fuel contribution and smoke development, provide panels which have been tested, rated and labeled by UL for the required ratings as listed in the "Classified Building Materials Index" by UL.

1. Classification: Maximum of 25 for flamespread, 25 for fuel contributed and 25 for smoke developed (Class 25).

K. Suspended Acoustical Ceiling Systems: Suspended acoustical ceiling systems shall be installed in accordance with U.B.C. Standard No. 47-18.

3.3 SUBMITTALS

A. Refer to Section 01 33 00, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Product Data: Submit manufacturer's Product Specifications and installation instructions for each acoustical ceiling material required and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these Specifications. Distribute on (1) additional copy of each installation instruction to the Installer.

1. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods which may be detrimental to finishes and acoustical performance.

C. Samples: Submit three (3) sets of 12" square samples for each acoustical unit required. In each set of samples show the full range of exposed color and texture to be expected in the completed work. Sample submittal and University's Representative's review will be for color and texture only. Compliance with other requirements is the exclusive responsibility of the Contractor.

1. Submit three (3) 12" (0.3 m) long samples of each exposed runner and molding.

D. Maintenance Stock: At time of completing the installation, deliver stock of maintenance materials to the University's Representative. Furnish full size units matching the units installed, packaged with protective covering for storage, and identified with appropriate labels.

1. Acoustical Units: Furnish quantity of full size units equal to one percent (1%) of amount installed.

1.4 JOB CONDITIONS

A. Deliver acoustical ceiling units to project site in original unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.

B. Space Enclosure: Do not install interior acoustical ceilings until space has been enclosed and until work above ceilings has been completed, and until ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

C. Existing Conditions: Contractor shall be responsible for examining existing conditions (such as, but not limited to, light fixtures, diffusers and strip diffusers and provide a complete grid and tile installation in accordance with the design intent without additional cost to the University.

1.5 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping: Deliver materials in manufacturer's original, unopened packages, with all labels intact and legible.

B. Storage and Protection: Store acoustical ceiling materials under cover and protected from exposure to moisture and physical abuse. Remove damage materials and replace at no additional cost to the University.

PART 2 - PRODUCTS

2.1 ACOUSTICAL CEILING UNITS, GENERAL

A. Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NRC or NIC as applicable), light reflectance coefficient (LR), edge detail and joint detail.

2.2 ACOUSTICAL PANELS

A. General: Rigid board of mineral fiber wet-felted or molded with binders and filler.

B. Density: Provide manufacturer's standard density panels, minimum 10 lbs. per cu. ft. (160.18 kg/cu. m) density. Where indicated and where necessary for compliance with requirements, provide "high-density" panels with a minimum density of 17 lbs. per cu. ft. (272.31 kg/cu. m).

C. Binder: Manufacturer's standard binder as recommended for the application indicated.

D. Sag Resistance: Provide panels which have been tested and certified by the manufacturer for maximum of 1/4" (6.35 mm) sag at 90ºF (32.22ºC) and 70% relative humidity; in accordance with AIMA "Test Procedures for Sag Resistance of Ceiling Panels".

E. Light Reflectance Rating: Except as otherwise indicated, provide factory-finished acoustical panels which have been tested by a recognized testing laboratory in accordance with the procedures of ASTM C253 to show a light reflectance rating of not less than 0.75 (AIMA value "a").

F. Noise Reduction Coefficient (NRC): The NRC is defined as the average of sound absorption coefficients, determined in accordance with ASTM C423 and reported by AIMA method for a specification range of 10 points for middle frequencies of 240, 500, 1000 and 2000 Hertz. Provide not less than a range of 0.55 to 0.65.

G. Sound Transmission Class (STC): The STC is defined as a single-figure rating for sound transmission loss through the acoustical panel ceiling, determined in accordance with ASTM E90 and ASTM E413 and reported as a 5-Db range. Provide not less than a range of 35-39 for mounting No. 7.

1. Manufacturer: Armstrong or USG, unless otherwise noted on plans
2. Size: 24" x 24", unless otherwise noted on plans
3. Thickness: 5/8", unless otherwise noted on plans
4. Pattern: Refer to plans, as necessary

2.3 CEILING SUSPENSION MATERIALS

A. General: Comply with ASTM C635, as applicable to the type of suspension system required for the type of ceiling units indicated. Coordinate with other work supported by or penetrating through the ceilings, including light fixtures, HVAC equipment and partition system (if any).

1. Include the necessary components for a complete suspension system including, but not limited to, inserts, anchors, hangers, carrying channels, main runners, cross runners, splines, edge molding, splices, clips, fasteners, tie wires, hold-down devices and similar members, devices and accessories as applicable.

B. Structural Classification: Medium-duty system. Minimum weight of main runner shall be 12 lbs./l.f. (17.9 kg/m) if direct hung, 3.5 lbs. l.f. (5.1 kg/m) if indirect hung.

C. Attachment Devices: Size for five (5) times the design load indicated in ASTM C635, Table 1, Direct Hung.

1. Hanger Wires: Galvanized carbon steel, ASTM A641, soft temper, prestretched, yield-stress load of at least three (3) times design load, but not less than 12 gauge (0.106").

D. Concrete Inserts: Type recommended by suspension system manufacturer, sized for pull-out resistance of not less than 5-times the hanger design load for the structural classification indicated (ASTM C635, Table 1, direct hung). For wire-type inserts, provide units of not less than 8 gauge. (4.1 mm) galvanized wire construction.

E. Carrying Channels: Hot rolled or cold rolled steel channels for support of ceiling runner, with deflections less than 1/360 x spans; but in no case less than 1-1/2" (38.1 mm) section weighing 0.475 lbs. per lin. ft. (0.71 kg/lin. m). Channels shall not be less than required by governing regulations or for fire resistance ratings.

2.4 SEMI-EXPOSED SUSPENSION SYSTEM

A. General: Except as otherwise indicated, provide manufacturer's standard units of the metal, finish and shapes recommended for the applications indicated. Provide steel members where required by NFPA for plenum return conditions.

B. Type of System: Direct-hung suspension system.

C. Exposure of System: Provide fully-exposed suspension system (for lay-in panels) with lower flanges of both main runners and cross runners exposed.

D. Finishes of Exposed Members: Provide uniform factory applied finish on exposed surfaces of ceiling suspension system including moldings, trim and accessories.

E. Semi-Exposed System: “Match Existing”

1. Donn Industries (building standard):
   a. Fineline (1/4")
2. Chicago Metallic Corporation:
   a. Ultraline 3500 (1/4")

Or equal

F. Semi-Exposed Suspension System: Ultraline System--double web--1/4" reveal-bolt slot, 1-5/8" high, 0.18 metal, 9/16" wide exposed flange with continuous bolt slot. Provide main runners, cross runners, edge moldings, and accessories engineered and coordinated into a complete system. Cope flanges to form flush intersections. Cut out edges of the screw slot at intersections to provide a continuous slot in both directions. Provide additional standard cross tees slotted to receive air boots. Provide support frame for light fixtures compatible to system.

2.5 MISCELLANEOUS MATERIALS

A. Acoustical Sealant: A heavy-bodied, non-shrinking, non-drying, non-sag grade compound intended for interior sealing of concealed construction joints.

1. Tremco Acoustical Sealant; Tremco Manufacturing Co.
2. USG Acoustical Sealant; U.S. Gypsum Co.
3. Or equal

PART 3 – EXECUTION

3.1 INSPECTION AND PREPARATION WORK

A. Inspection: Installer must examine the conditions under which the acoustical ceiling work is to be performed and notify the Contractor, in writing, of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Pre-Installation Conference: Prior to the start of acoustical ceiling installation, meet at the project site with the installers of related work, including lighting, ductwork, partitions and similar work above and below the ceiling plane. Review areas of potential interference and resolve conflicts before proceeding with the work. Coordinate ceiling layout with the layout of other work which penetrates or is supported by the ceiling in each space of the building.

C. Layout: Lay out work in accordance with Reflected Ceiling Plans and approved shop drawings. Unless otherwise indicated or required to uniformly space light fixtures, beginning at center of rooms or spaces and work outward, so that no panel will be less than one-half full length or width. Use rotating laser or water level to establish elevations within tolerance of 1:1000.

3.2 INSTALLATION

A. General: Install materials in accordance with manufacturer's printed instructions and to comply with governing regulations, fire resistance rating requirements a indicated and industry standards applicable to the work.

1. Arrange acoustical units and orient directionally-patterned units (if any) in the same direction.

B. Suspension System: Space runners at 4’-0" O.C., or as required by panel size, and secure with minimum 12 gauge hanger wires. Install cross tees or splines at spacing required by acoustical panels. Provide lateral bracing as required by building codes, and in accordance with manufacturer's recommendations and approved shop drawings. Install edge molding at room perimeter walls and at columns or other penetrations through the ceiling.

1. Install suspension system to comply with ASTM C636, with hangers supported only from building structural members as indicated.

2. Locate hangers near each end (within 12") and spaced 4’-0" along each carrying channel or direct-hung runners, unless otherwise indicated.

3. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension

system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, countersplaying or other equally effective means.

4. Install additional hanger wires at recessed light fixtures resting on same ceiling component or supported by cross tees on more than two (2) sides.

5. Secure wire hangers by looping and wire-tieing either directly to structures or to inserts, eye-screws or other devices which are secure and appropriate for the substrate and which will not deteriorate or fail with age or elevated temperatures.

C. Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before fastening to vertical surface.

1. Install edge trim moldings where indicated, and elsewhere as needed to conceal edges of acoustical units which would otherwise be exposed to view after completion of the work. Anchor with fasteners or, if not possible, secure in place with permanent adhesive.

2. Secure moldings to building construction by fastening with screw-anchors into the substrate, through holes drilled in vertical leg. Space holes not more than 3" from each end and not more than 16" O.C. along each molding.

D. Masonry and Concrete: Fasten with wood or machine screws into lead shield type anchors drilled into construction.

E. Stud Construction: Fasten with toggle bolts or similar self-expanding screw anchors.

1. Level molding with ceiling suspension system, to a level tolerance of 1/8" in 12'-0".

2. Miter corners of moldings accurately to provide hairline joints, securely connected to prevent dislocation.

F. Acoustical Panels: Install acoustic panels in accordance with manufacturer's recommendations and approved shop drawings. Provide hold-down clips at rooms or spaces containing Halon fire protection systems, or where required by building codes or by applicable UL designs.

3.3 CLEANING AND PROTECTION

A. Clean exposed surfaces of acoustical ceilings, including trim edge molding and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage.

B. Visible signs of touch-up or repair to exposed surfaces will not be accepted.

C. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage at no additional cost to the University.

D. The Installer shall advise the Contractor of required protection for the acoustical ceilings, including temperature and humidity limitations and dust control, so that the work will be without damage and deterioration at the time of acceptance by the University.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. The extent of resilient flooring and accessories is shown on the Drawings and in schedules and includes:

1. Resilient floor tiles
2. Resilient base and accessories
3. Sheet flooring
4. Luxury Vinyl Tile (LVT)

1.2 QUALITY ASSURANCE

A. Wherever possible, provide resilient flooring and accessories produced by a single manufacturer.

B. Flame Spread Rating: ASTM E84 flame spread of seventy-five (75) or less.

1. Install tile after other finishing operations, including painting, have been completed. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by tile manufacturer.

C. Resilient flooring to be slip-resistant.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of resilient flooring and accessory. Refer to Section 01 33 00 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Samples: Submit two (2) sets of samples of each type, color and finish of resilient flooring and accessory required.

1. Full size tile samples
2. 6" long sample of resilient flooring accessories

C. Maintenance Instructions: Submit manufacturer's written instructions for recommended maintenance practices for each type of resilient flooring and accessories.

D. Replacement Material: Deliver to the University Representative, after completion of work, replacement materials from the same manufactured lot as material installed and as follows:

1. Tile flooring, not less than one (1) box for each fifty (50) boxes, or fraction thereof, for each type, size and color installed. Refer to Section 01010 for project specific attic stock required

1.4 JOB CONDITIONS

A. Continuously heat areas to receive flooring to 65ºF for at least forty-eight (48) hours prior to installation when project conditions are such that heating is required. Maintain 65ºF temperature continuously during and after installation as recommended by flooring manufacturer, but for not less than forty-eight (48) hours.

B. Installer must review installation procedures and coordination with other work, with Contractor and other Contractors and Subcontractors whose work will be affected by flooring.

1. Existing floor shall be leveled with floorstoning or grinding to a tolerance of 1/4" in 10'-0" (non-accumulative)

1.5 DELIVERY AND STORAGE

A. Deliver materials to the project site in the manufacturers' original unopened containers, clearly marked to indicate pattern, gauge, lot number and sequence of manufacture.

B. Carefully handle all materials and store in original containers at not less than 65ºF (18ºC) for at least forty-eight (48) hours before start of installation. Stack all boxes of each pattern and color in sequence as numbered by factory.

PART 2 - PRODUCTS

2.1 TILE FLOORING

A. Vinyl Composition Tile (VCT): FS SS-T-312B, Type IV, 12"x12"x1/8" gauge unless otherwise indicated, pattern extending through full tile thickness.

1. Manufacturer: Armstrong or Mannington, Product: Refer to drawings for product, size and color.
2. For computer / hub rooms, IDF rooms, server rooms, use “anti-static” tile as called out in the plans.

2.2 ACCESSORIES

A. Resilient Base: Provide rubber base complying with FS SS-W-40, Type I, with matching end stops and corner units (cut from rubber base material), 1/8" gauge, (RB-1) straight base without cove at carpeted floors, topset style elsewhere.

1. Preformed or molded corner units not allowed.

WALL BASE:
Manuf: Johnsonite or Burke - Color (AS NOTED) Size: (AS NOTED)
Refer to drawings.

B. Strips: Resilient Edge Strips: 1/8" thick, homogenous vinyl or rubber composition, tapered or bullnose edge, carpet edge guard is specified in Section 09680.

C. Vinyl Reducer Strips Between Carpet and Tile: As selected.

D. Adhesive for Resilient Flooring: Type recommended by resilient flooring manufacturer, best suited for the purpose.

E. Adhesive for Resilient Bases: Waterproof type as recommended by base manufacturer.

F. Primer: Non-staining type primer as recommended by resilient flooring manufacturer.

G. Leveling and Patching Compounds: Latex types as recommended by flooring manufacturer.

H. Wax: FS P-W-55, 16% concentration; slip resistant, water emulsion base.

I. Environmental Requirements.

a. Select Adhesives that meet or do not exceed current South Coast Air Quality Management District (SCAQMD) standards Rule #1168.

b. Aerosol adhesives must comply with current Green Seal Standard for Commercial Adhesives GS-36.

PART 3 – EXECUTION

3.1 INSPECTION

A. Installer must examine the substrate and conditions under which resilient flooring and accessories are to be installed. Notify Contractor, in writing, of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 PREPARATION

A. Prior to laying the flooring, broom clean or vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work.

B. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in sub-floors.

C. Perform moisture tests on concrete slabs to determine that concrete surfaces are sufficiently cured and ready to receive flooring.

D. Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

3.3 INSTALLATION

A. General: Install flooring after finishing operations, including painting, have been completed and permanent heating system is operating. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer and as hereinbefore specified.

1. Place flooring with adhesive cement in strict compliance with manufacturer's recommendation. Extend flooring into toe spaces, door reveals, closets and similar openings.

2. Maintain reference markers, holes or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

3. Install flooring on covers for telephone and electrical ducts and other such items as occur within finished floor areas.

4. Maintain overall continuity of color and pattern with pieces of flooring installed in these covers. Tightly cement edges to perimeter of floor around covers and to covers.

B. Prime Coat: Apply primer to concrete surfaces working well into surface using minimum quantity that will assure complete surface over age. Allow primer to dry before applying adhesive. Prime coat may be omitted if recommended by resilient flooring manufacturer.

C. Adhesive: Apply to substrate with properly notched steel trowels; allow adhesive to become tacky before applying resilient flooring.

1. Tightly cement flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks or other surface imperfections.

D. Tile Floors: Unless otherwise indicated on the Drawings, lay tile from center marks established with principal walls, discounting minor offset so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2" tile at room perimeters. Lay tile square to room axis, unless otherwise shown.

1. Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tiles are not acceptable.

a. Lay tile with grain running in one direction.

2. Adhere tile flooring to substrates using full spread of adhesive applied in compliance with flooring manufacturer's directions.

E. Sheet Flooring: Lay sheet flooring to provide as few seams as possible with economical use of materials. Match edges for color shading and pattern at seams in compliance with manufacturer's recommendations.

1. Adhere sheet flooring to substrates using method approved by flooring manufacturer for type of sheet flooring and substrate condition indicated.

2. Use conventional full spread adhesive method unless otherwise indicated.

3. Use modified conventional full-spread adhesive method with two-part epoxy adhesive under seams, latex-resin base multi-purpose adhesive elsewhere.

4. Use conventional perimeter bonding adhesive procedures where recommended by flooring manufacturer.

5. Use special perimeter bonding adhesive for vinyl sheet tension flooring.

6. Prepare seams in vinyl sheet flooring with manufacturer's special routing tool and heat weld with vinyl thread in accordance with manufacturer's instructions.

7. Prepare seams in vinyl sheet flooring in accordance with manufacturer's instructions for most inconspicuous appearance, sealing continuously with fluid-applied sealant or adhesive as standard with manufacturer.

8. Provide integral flash cove base where shown on Drawings including cove support strip and metal top edge strip. Construct coved base in accordance with manufacturer's instructions.

F. Accessories: Apply resilient base to walls, columns, pilasters and other permanent fixtures in rooms or areas where base is required.

1. Install base in as long lengths as practicable, with preformed corner units or fabricated from base materials with mitered coped inside corners. Straight pieces less than 24" long are not permitted.

2. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces.

3. On masonry surfaces or other similar irregular surfaces, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.

4. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at all unprotected edges of flooring, unless otherwise shown.

3.4 CLEANING AND PROTECTION

A. Remove any excess adhesive or other surface blemishes using neutral type cleaners as recommended by flooring manufacturer. Protect installed flooring from damage by covering.

B. Finishing: Not more than four (4) days before acceptance or occupancy by the Tenant, clean the resilient flooring and base. Wash thoroughly with a cleaner recommended by the flooring manufacturer, in accordance with the flooring manufacturer's recommendations. As soon as the resilient flooring is completely dry, apply wax and buff, with number of coats of wax and buffing procedures in accordance with the floor and wax manufacturer's instructions.

END OF SECTION

SECTION 09 68 13
CARPET TILE

PART 1 - GENERAL

1.1 SUMMARY

A. Interface tiles, or equal, as shown on Drawings. This carpet requires a Tac Tile, or equal, method of installation, NO GLUE. Floor must be cleaned and prepped to accommodate the Tac Tile system. See manufactures spec's. Tac Tile samples needs to be part of the approved flooring submittal. Tackable adhesive to be compatible with the selected carpet tile and installed in accordance with the manufacturer's recommendations and warranty requirements.

1.2 INFORMATION SUBMITTALS

A. Product Data: For each type of product indicated. Submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

B. Product Data: Manufacturer's technical data, installation and maintenance instructions for flooring and accessories.

C. Manufacturers' and Installer's Warranties.

1.3 ACTION SUBMITTALS

A. Shop Drawings: Show the following:

1. Pattern type, repeat size, location, direction, and starting point.

2. Pile direction.

3. Insets and borders.

4. Edge, transition, and other accessory strips.

5. Transition details to other flooring materials.

B. Samples: For each type, color, texture required.

1. Carpet: 12-inch-square Sample.

2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch-long Samples.

C. Mockup: Provide 4' x 4' mockup, including flooring transitions and wall/base intersections, for University Representative's review prior to installation.

1.4 WARRANTY

A. Special Warranty for Carpet: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet installation that fail in materials or workmanship within specified warranty period. Failures include, but are not limited to, more than 10

percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, excess static discharge, and delamination.

1. Warranty Period: 10 years from date of Substantial Completion.

1.5 EXTRA MATERIALS

A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Carpet: Full-width rolls equal to 5 percent of amount installed for each type indicated, but not less than 10 sq. yd.

2. Carpet Tiles: Provide 5%.

PART 2 - PRODUCTS

2.1 CARPET

A. Source: Shaw - Refer to Finish Materials Schedule.

2.2 INSTALLATION ACCESSORIES

A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet manufacturer.

B. Tac Tile, or equal, method of installation, NO GLUE. Floor must be cleaned and prepped to accommodate the Tac Tile system. See manufactures spec's. Tackable adhesive samples need to be part of the approved flooring submittal. Carpet tile pattern as noted on plans and approved by University Representative prior to installation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with CRI 104 and carpet manufacturer's written installation instructions.

B. Comply with carpet manufacturer's written recommendations and Shop Drawings for direction of carpet; maintain uniformity of carpet direction and lay of pile.

C. Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

D. Install pattern per University Representative's approved diagram.

END OF SECTION

SECTION 09 72 00

WALLCOVERING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Vinyl wall covering or Xoral.

B. Materials: Refer to Construction Documents finish schedule

C. Related Sections:

1. Division 09 Section 09900 Interior Paint; for priming wall surfaces, primers, coatings, and paint for woven glass-fiber wall coverings.
2. Division 09 Section "Staining and Transparent Finishing" for field-applied finishes for wood-veneer wall coverings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include data on physical characteristics, durability, fade resistance, and flame-resistance characteristics.

B. Submittals:

1. Product Data for Credit EQ 4.1: For adhesives, including printed statement of VOC content.
2. Product Data for Credit EQ 4.2: For paints and coatings, including printed statement of VOC content and chemical components.

C. Shop Drawings: Show location and extent of each wall-covering type. Indicate pattern placement, veneer matching (where appropriate), seams, and termination points.

D. Samples for Initial Selection: For each type of wall covering indicated.

E. Samples for Verification: Full width by 36-inch- (914-mm-) long section of wall covering.

1. Sample from same print run or dye lot to be used for the Work, with specified treatments applied. Show complete pattern repeat. Mark top and face of fabric.
2. Sample from same flitch to be used for the Work, with specified finish applied.

F. Product Schedule: For wall coverings use same designations indicated on Drawings.

G. Qualification Data: For qualified testing agency.

H. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for wall covering.

I. Maintenance Data: For wall coverings to include in maintenance manuals.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing identical wall coverings applied with identical adhesives to substrates according to test method indicated below by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Surface-Burning Characteristics: As follows, per ASTM E 84:

a. Flame-Spread Index: 25 or less.
b. Smoke-Developed Index: 450 or less.

2. Fire-Growth Contribution: Textile wall coverings complying with acceptance criteria of UBC Standard 8-2.
3. Fire-Growth Contribution: Textile wall coverings tested according to NFPA 265, NFPA 286 and complying with test protocol and criteria in the 2003 IBC.

B. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build mockups for each type of wall covering on each substrate required. Comply with requirements in ASTM F 1141.
2. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install wall coverings until spaces are enclosed and weathertight, wet work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

B. Lighting: Do not install wall covering until a permanent level of lighting is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by wall-covering manufacturer for full drying or curing.

1.6 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Wall-Covering Materials: For each type, full-size units equal to 5 percent of amount installed.

PART 2 - PRODUCTS

2.1 WALL COVERINGS

A. General: Provide rolls of each type of wall covering from same print run or dye lot.

2.2 VINYL WALL COVERING:

A. Vinyl Wall-Covering Standards: Provide mildew-resistant products complying with the following:

1. FS CCC-W-408D and CFFA-W-101-D for Type II, Medium
2. ASTM F 793 for strippable wall coverings that qualify as Type II, Commercial Serviceability products.
3. Products: Subject to compliance with requirements, provide the following:

a. Refer to Construction Documents finish schedule.

B. Total Weight Excluding Coatings: as noted on construction documents.

C. Width: 54 inches (1372 mm) or as noted

D. Backing: Nonwoven fabric.

1. Fiber Content: as noted on drawings

E. Repeat: as noted on drawings

F. Stain-Resistant Coating: as noted on drawings

G. Colors, Textures, and Patterns: Refer to Construction Documents finish schedule.

2.3 ACCESSORIES

A. Adhesive: Mildew-resistant, non-staining, strippable adhesive, for use with specific wall covering and substrate application; as recommended in writing by wall-covering manufacturer and with a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

B. Primer/Sealer: Mildew resistant, complying with requirements in Division 09 Section 09900 "Interior Painting" and recommended in writing by wall-covering manufacturer for intended substrate.

C. Wall Liner: Nonwoven, synthetic underlayment and adhesive as recommended by wall-covering manufacturer.

D. Seam Tape: As recommended in writing by wall-covering manufacturer.

E. Metal Primer: Interior ferrous metal primer complying with Division 09 Section 09900 "Interior Painting."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for levelness, wall plumbness, maximum moisture content, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Comply with manufacturer's written instructions for surface preparation.

B. Clean substrates of substances that could impair bond of wall covering, including dirt, oil, grease, mold, mildew, and incompatible primers.

C. Prepare substrates to achieve a smooth, dry, clean, structurally sound surface free of flaking, unsound coatings, cracks, and defects.

1. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electronic moisture meter.
2. Plaster: Allow new plaster to cure. Neutralize areas of high alkalinity. Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
3. Metals: If not factory primed, clean and apply metal as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
4. Gypsum Board: Prime with primer as recommended in writing by primer/sealer manufacturer and wall-covering manufacturer.
5. Painted Surfaces: Treat areas susceptible to pigment bleeding.
6. Remove all existing layers of wall covering, glues, adhesives, etc. from entire wall surface and float wall accordingly for a proper installations.

D. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finish with fine sandpaper.

E. Remove hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

G. Install wall liner, with no gaps or overlaps, where required by wall-covering manufacturer. Form smooth wrinkle-free surface for finished installation. Do not begin wall-covering installation until wall liner has dried.

3.3 INSTALLATION

A. General: Comply with wall-covering manufacturers' written installation instructions applicable to products and applications indicated except where more stringent requirements apply.

B. Cut wall-covering strips in roll number sequence. Change roll numbers at partition breaks and corners.

C. Install strips in same order as cut from roll.

D. Install reversing every other strip.

E. Install wall covering with no gaps or overlaps, no lifted or curling edges, and no visible shrinkage.

F. Match pattern 72 inches (1830 mm) (or as required) above the finish floor.

G. Install seams vertical and plumb at least 6 inches (150 mm) from outside corners and 6 inches (150 mm) from inside corners unless a change of pattern or color exists at corner. No horizontal seams are permitted.

H. Fully bond wall covering to substrate. Remove air bubbles, wrinkles, blisters, and other defects.

I. Trim edges and seams for color uniformity, pattern match, and tight closure. Butt seams without any overlay or spacing between strips.

3.4 CLEANING

A. Remove excess adhesive at finished seams, perimeter edges, and adjacent surfaces.

B. Use cleaning methods recommended in writing by wall-covering manufacturer.

C. Replace strips that cannot be cleaned.

D. Reinstall hardware and hardware accessories, electrical plates and covers, light fixture trims, and similar items.

END OF SECTION

SECTION 09 91 23

PAINTING

PART 1 – GENERAL

Refer to finish schedule if Scuff-Master paint is required over new or existing HM doors and/or frames. Ensure adequate prep and application per manufacturers guidelines. Ensure suitable floor prep is carried out. Refer to building rules. Due to the prep and noxious smell, Scuff-Master painting work must only be done Friday after hours until Sunday midnight.

A. Standard paint on drywall shall also be after hours but may be Monday through Friday as well as weekends. Refer to building rules.

1.1 Related Documents

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and the Division-1 Specification sections, apply to work of this Section

B. Work included:
1. Submittals.
2. Preparation of surfaces.
3. Painting of all interior surfaces, except as otherwise specified.
4. Painting of all exterior surfaces, except as otherwise specified.

C. Related Work:
1. Shop prime coats and factory finishes.
2. Painting specified as Work of other Sections.
3. Sealants and caulking.
4. Water repellent sealer.
5. Anti-graffiti coating.

D. Surfaces Not To Be Painted:
1. Non-ferrous metal work (other than zinc-coated surfaces) and plated metal, unless particular items are specified to be painted.
2. Integrally colored concrete block.
3. Portland cement plaster scheduled to receive elastomeric coating unless otherwise shown or scheduled.
4. Sandblast finished concrete.
5. Exterior concrete walls and surfaces unless otherwise scheduled.
6. Surfaces concealed in walls and above solid ceilings.
7. Non-metallic walking surfaces unless specifically shown or specified to be painted.
8. Factory finished surfaces.
9. Ceramic tile and plastic surfaces.
10. Resilient flooring and base.
11. Elastomeric coatings.
12. Galvanized gratings.
13. Surfaces indicated not to be painted.
14. Surfaces specified to be finish painted under other Sections.

1.2 AQMD RULES: Furnish paint materials that conform to the current rules and regulations of all governing Air Quality Management Districts and other public environmental control and protection agencies having jurisdiction. If any paint materials specified herein do not conform to said rules and regulations, paint manufacturer of proposed paint materials shall prepare a list of non-conforming specified painting materials and proposed substitute conforming paint materials; Contractor shall deliver the list to the University's Representative for review. Refer to Section 01 25 00 for basic substitution requirements.

1.3 SUBMITTALS: Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

A. List of Paint Materials: Prior to submittal of Samples, submit a complete list of proposed paint materials that identifies each material by manufacturer's name, product name and number, including primers, thinners, and coloring agents, together with manufacturers' catalog data fully describing each material as to contents, recommended usage, and preparation and application methods. Identify surfaces to receive various paint materials. Do not deviate from approved list.

B. Color Samples: Prior to submittal of Samples obtain Architects color and gloss selections and instructions. Using materials from approved list, prepare and submit 8-1/2" by 11" Samples of each complete opaque paint finish.

C. Natural or Stain Finish Samples: Prepare these Samples on 12" squares of the same species and appearance of wood as used in the Work.

1.4 JOB CONDITIONS.

A. Protection: Protect all painting while in progress and cover and protect adjoining surfaces and property of others from damage. Exercise care to prevent paint contacting surfaces not to be painted. During painting of exterior work, cover windows, doors, concrete, and other surfaces not to be painted.

B. Weather Conditions: Apply paint to clean, dry, prepared surfaces. Do not apply exterior paint during rainy, damp, foggy, or excessively hot and/or windy weather. Arrange for temporary heat and ventilation for interior painting.

C. Precaution: Place oily rags and waste in self-closing metal container and remove from site at the end of each day. Do not let rags and waste accumulate.

D. Cover all return air grills with a visqueen barrier during any painting preparation work and actual painting. Ensure all doors remain closed during preparation and painting process.

PART 2 - PRODUCTS

2.1 MATERIALS: Use the paint products of only one paint manufacturer unless otherwise specified or approved. In any case, primers, intermediate, and finish coats in each painting system must all be the products of the same manufacturer, including thinners and coloring agents, except for

materials furnished with shop prime coat by other trades. To the maximum extent feasible, factory mix paint materials to proper color, gloss, and consistency for application. Furnish paints from one of the following manufacturers: Frazee Paint Company products specified herein designate the intended types and qualities.

A. Frazee
B. Benjamin Moore Pristine (Eco Spec product)
C. Dunn Edwards Ecoshield (**Current University Standard)**
D. Or approved equal.

Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:

1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
2. Non-Flat Paints and Coatings: VOC content of not more than 50 g/L.
3. Anticorrosive Coatings: VOC content of not more than 250 g/L.
4. Varnishes and Sanding Sealers: VOC content of not more than 275 g/L.
5. Stains: VOC content of not more than 250 g/L.
6. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
7. Restricted Components: Paints and coatings shall not contain any of the following:

    a. Acrylonitrile.
    b. Antimony.
    c. Benzene.
    d. Butyl benzyl phthalate.
    e. Cadmium.
    f. Di (2-ethylhexyl) phthalate.
    g. Di-n-butyl phthalate.
    h. Di-n-octyl phthalate.
    i. 1,2-dichlorobenzene.
    j. Diethyl phthalate.
    k. Dimethyl phthalate.
    l. Ethylbenzene.
    m. Formaldehyde.
    n. Hexavalent chromium.
    o. Isophorone.
    p. Lead.
    q. Mercury.
    r. Methyl ethyl ketone.
    s. Methyl isobutyl ketone.
    t. Methylene chloride.
    u. Naphthalene.
    v. Toluene (methylbenzene).
    w. 1,1,1-trichloroethane.
    x. Vinyl chloride.

PART 3 - EXECUTION

3.1 INSPECTION: Examine all surfaces to be finished under this Section and verify satisfactory condition. Report to the University's Representative in writing all those conditions that prevent or interfere with correct preparation and application of Work of this Section. Do not proceed with painting and finishing on involved surfaces until all reported conditions are corrected. Application of the first coat of any finishing system constitutes acceptance of the surface by Painting Subcontractor. This does not relieve the Contractor from proper preparation of surfaces.

3.2 WORKMANSHIP: Apply paint materials in accordance with the manufacturer's instructions by brush or roller; spray painting is not allowed without specific approval in each case. Apply each coat at the proper consistency, free of brush or roller marks, sags, runs, or other evidence of poor workmanship. Do not lap paint on glass, hardware, and other surfaces not to be painted; apply masking as required. Sand between enamel coats.

3.3 PREPARATION: Properly prepare surfaces to receive finishes.

A. Concrete: Fill all cracks, holes and other blemishes with portland cement patching plaster or a stiff paste mixed of finish paint and fine sand, finished to match adjoining surfaces. Remove surface glaze by sanding, wire brushing, or light brush-off sandblasting. Neutralize all alkali conditions according to the paint manufacturer's directions. Dry surfaces to receive a breathing type latex paint at least two weeks, free of visible moisture, and dry surfaces to receive oil, alkyd, or epoxy based paint until the moisture content does not exceed 8% when tested with an electronic moisture-measuring instrument.

B. Masonry: Repair minor holes and cracks with a stiff paste of finish paint and fine sand or vinyl type block filler. Report major or unsightly defects to the Architect for correction. Neutralize all alkali and efflorescence according to paint manufacturer's directions.

C. Gypsum Wallboard: Touch-up minor defects with spackle and sand smooth and flush. Report other defects for correction as specified.

D. Shop Coated Metal: Degrease and clean of foreign matter. Clean and spot paint field connections, welds, soldered joints, burns, or abraded portions with same material used in shop coat. After complete hardening, sand entire surfaces for coat to follow.

E. Uncoated Ferrous Metal: Degrease and clean of dirt, rust, mill scale, and all other foreign matter using rotary brushes, solvent, or sandblasting. Remove pits and welding slag, and clean surfaces to bright metal before priming. Apply metal primer not more than three hours after preparation.

F. Galvanized Metal: Degrease and clean of foreign matter. Apply specified pretreatment and immediately apply primer paint as soon as pretreatment is dry.

G. Enameled Woodwork: Sand smooth with grain and dust clean. After priming, putty nail holes, cracks, or other defects with putty matching color of finish paint. Cover knots and

sappy areas with shellac or approved knot sealer. Sand each base coat smooth when dry. Use extra care for wood doors to level grain and repair defects so doors, when fully painted, do not show any evidence of wood grain or defects when viewed under any lighting condition or angle.

H. Transparent Finished Woodwork: Sand smooth with the grain and dust clean. Repair all defects with filler tinted to match stain or wood color, as required, after first coat of sanding sealer and remove all smears.

I. Fixtures, Equipment, and Hardware Items: Cooperate with other trades and coordinate removal of fixtures, equipment, and hardware as required to perform painting. Items to be removed include, without limitation: signs and graphics; switch and receptacle plates; escutcheons and like plates; all surface-mounted equipment; free-standing equipment blocking access; grilles and louvers at ducts opening into finished spaces; and other items as required and directed.

J. Surfaces Not Mentioned: Prepare surfaces according to recommendations of the paint manufacturer and as approved.

3.4 COATS AND COLORS: The number of paint coats specified to be applied are minimum. Ensure acceptable paint finishes of uniform color, free from cloudy or mottled areas and evident thinness on arises. "Spot" or undercoat surfaces as necessary to produce such results. Tint each coat a slightly different shade of finish color to permit identification. Conform to the approved Samples. Obtain approval of each coat before applying next coat; otherwise, apply an additional coat over entire surface involved at no additional cost to University.

3.5 EXTERIOR PAINTING: (Use the following manufacturers or approved equals)

A. Concrete Block Masonry - 100% Acrylic Flat:

1st Coat:	262 Block Filler
2nd Coat:	203 Duratec

B. Metal - Ferrous - 100% Acrylic Gloss Enamel:

1st Coat:	561 Metal Prime or 168 Prime Plus
2nd Coat:	143 Mirro Glide Gloss
3rd Coat:	143 Mirro Glide Gloss

Exception: On exposed surfaces of steel stairs, including steel pipe or tubing railings on stairs or separately on walls, and on exterior and interior sides of steel doors and frames, apply 2 coats of 648 Aro-Plate Industrial Enamel or approved equal in lieu of the 2nd and 3rd Coats above.

C. Metal – Ferrous and Galvanized - 100% Acrylic Semi-Gloss Enamel:

1st Coat:	561 Metal Prime or 168 Prime Plus
2nd Coat:	128 Satin Glide II
3rd Coat:	128 Satin Glide II

D. Metal - Galvanized: Treat with Jasco Prep N'Prime pre-treatment before priming.

1st Coat:	561 Metal Prime or 168 Prime Plus
2nd Coat:	143 Mirro Glide Gloss
3rd Coat:	143 Mirro Glide Gloss.

Exception: On roof and wall flashings, wall louvers, and other sheet metal flashings to be painted and visible on building exterior surfaces, apply two coats of 203 Duratec or approved equal in lieu of the 3rd Coat above (total of four coats in addition to vinyl wash primer).

E. Wood - Opaque Semi Gloss Acrylic Paint:

1st Coat:	168 Prime Plus
2nd Coat:	128 Satin Glide II
3rd Coat:	128 Satin Glide II

F. Wood - Stain Finish: Apply one coat of Frazee 385 Madera Semi Transparent stain, or one coat of UGL Zar Rain Stain Semi-Transparent oil type semi-transparent or approved equal as selected.

3.6 INTERIOR PAINTING: Provide paint finishes as scheduled on the Drawings or directed, gloss of finishes as scheduled or, where not scheduled, as designated by the Architect (Use the following manufacturers or approved equals).

A. Enamel Finishes: Of following glosses:

1. Gloss 100% Acrylic Enamel(non-blocking for doors, trim):143 Mirro Glide
2. Semigloss 100% Acrylic Enamel (non-blocking for doors, trim): 032 Envirokote
3. Semi Gloss Acrylic Co-Polymer Enamel (for walls): 032 Envirokote
4. Eggshell Acrylic Co-Polymer Enamel (for walls): 029 Envirokote

B. Enamel - Drywall:

1st Coat:	061 Aqua Seal or approved equal.
2nd Coat:	Enamel, gloss as scheduled or designated
3rd Coat:	Enamel, gloss as scheduled or designated

C. Latex – Drywall Ceilings:

1st Coat:	W101 Vinylastic or approved equal.
2nd Coat:	W401 Decovel or approved equal.
3rd Coat:	W401 Decovel or approved equal.

D. Enamel - Concrete and Plaster:

1st Coat:	168 Prime Plus or approved equal.
2nd Coat:	Enamel, gloss as scheduled or designated
3rd Coat:	Enamel, gloss as scheduled or designated

E. Enamel - Wood:

1st Coat:	168 Prime Plus or approved equal.
2nd Coat:	Enamel, gloss as scheduled or designated

F. Stain and Polyurethane: FOR VERY LIGHT STAIN OR UNSTAINED WOOD:

1st Coat:	685 Wood Stain (where stain is scheduled)
2nd Coat:	2002 Frazee/Flecto Satin Polyurethane or approved equal.
3rd Coat:	2002 Frazee/Flecto Satin Polyurethane or approved equal.

G. Stain and Polyurethane: FOR MEDIUM TO DARK STAINED WOOD:

1st Coat:	685 Wood Stain (where stain is scheduled)
2nd Coat:	McCloskeys Urethane, Semi-Gloss or approved equal.
3rd Coat:	McCloskeys Urethane, Semi-Gloss or approved equal.

H. Flat - Metal: Treat galvanized metal with Jasco Prep N'Prime or approved equal.

1st Coat:	561 Metal Prime or 168 Prime Plus
2nd Coat:	002 Majestic or approved equal.
3rd Coat:	002 Majestic or approved equal.

I. Enamel - Metal: Treat galvanized metal with Jasco Prep N'Prime or approved equal.

1st Coat:	561 Metal Prime or 168 Prime Plus or approved equal.
2nd Coat:	Enamel, gloss as scheduled or designated
3rd Coat:	Enamel, gloss as scheduled or designated

Exception: On exposed surfaces of steel stairs, steel pipe or tubing railings on steel stairs or separately on walls, and all surfaces of steel doors and door frames, apply 2 coats of 628 Aro-Plate Semigloss Enamel in lieu of the 2nd and 3rd Coats above.

3.7 MISCELLANEOUS PAINTING:

A. Duct Interiors: Paint with flat black fire-retardant paint to the extent visible through grilles and registers in finished rooms and spaces.

B. Fire Extinguisher and Fire Hose Cabinets: Apply 2 coats of paint finish, inside and out, matching finish and color of adjoining areas, unless otherwise noted or directed.

C. Color Coding: In mechanical and electrical equipment rooms, paint ducts, piping, conduit, equipment, and machinery, except such items having a complete factory finish, as specified for interior metal, colors as directed. Not more than 8 colors will be required.

D. Weather stripping or Sound Seals: Paint all exposed metal surfaces of the seals to match the door frame, whether or not unfinished, furnished with factory prime coat, or factory treated for paint adhesion.

E. Mechanical and Electrical Work: Carefully review Divisions 15 and 16 of these Specifications regarding painting performed hereunder and other painting required to be performed under this Section. Perform painting of mechanical and electrical equipment and materials not expressly specified to be painted as part of Work of Divisions 15 or 16, including required identification and color code painting, stenciling, and paint banding.

F. Miscellaneous: For any items not specifically indicated or specified that require a paint finish, apply 3 coats of paint as directed.

3.8 CLEAN-UP PROTECTION

A. Clean-Up: During the progress of the work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each work day.

1. Upon completion of painting work, make a detailed inspection of paint finishes, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping using care not to scratch or otherwise damage finished surfaces. Touch-up and restore all damaged or defaced painted surfaces. after all painting is completed make good all damage caused by cleaning. Carefully touch-up all abraded, stained or otherwise disfigured painting, as approved, and leave entire painting in first-class acceptable condition

B. Protection: Protect work of other trades, whether to be painted or not, against damage by painting and finishing work. Correct any damage by cleaning, repairing or replacing and repainting as acceptable to the University Representative.

1. Provide "Wet Paint" signs as required to protect newly painted finishes. remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

END OF SECTION

SECTION 10 44 00
FIREFIGHTING DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. Provide firefighting devices, including fire extinguishers, fire extinguisher cabinets and fire hose/valve cabinets, as shown on the Drawings, as required by building officials, and as specified, complete. Comply with all codes.

1.2 SUBMITTALS

A. Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

B. Shop Drawings and Product Data: The following list includes the required shop drawings that shall be submitted.

1. Cabinets.
2. Extinguishers.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Extinguishers: UL and State Fire Marshal approved, Type 2A/10BC, 4-1/4 inches diameter, 6 inches overall width, 14-5/8 inches high.

B. Cabinets: Fully-recessed, steel construction with white baked enamel interior, 1-1/4 inch flat face trim.

C. Doors: Full glass with lock, flat trim overlapping trim on cabinet, silk-screened lettering arranged along the hinge; colors shall be as selected by University's Representative from manufacturer's standard. Door frame finished in epoxy-based enamel; colors shall be as selected by University's Representative from manufacturer's standard.

D. Fire Hose Valves : NOT USED

PART 3 - EXECUTION

3.1 INSTALLATION

A. Securely fasten extinguisher cabinets and brackets to structure, square and plumb in accordance with manufacturer's printed instructions.

3.2 SCHEDULES

A. Provide fire extinguishers and cabinets indicated on the Drawings and as required by the fire department and local building codes.

1. Top of fire extinguisher cabinet shall be 5'0" above finish floor.

END OF SECTION

SECTION 12 35 00

PLASTIC FACED CASEWORK

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this Section.

1.1 DESCRIPTION OF WORK

A. The extent of plastic faced casework is shown on the Drawings.

B. The Work includes the fabrication and installation of custom plastic faced casework composed of base cabinets, wall cabinets, counter tops, storage cabinets, shelf units and other miscellaneous units.

C. Related Work Specified Elsewhere:

1. Section 06 40 23: Architectural Woodwork
2. Section 07 84 13: Firestopping
3. Section 07 92 00: Caulking and Sealants

1.2 QUALITY ASSURANCE

A. Quality Standards: Except as otherwise shown or specified, comply with provisions of the Architectural Woodwork Institute (AWI) "Quality Standards," Revised 1990. Highest grade applicable.

B. Plastic Laminate Casework: AWI Section 400, premium grade except use premium standard for orientation of laminate grain.

1. Use medium density (forty-five [45] lbs./cu. ft.) particle board for all core materials. (3/4" thick U.N.O.)

C. Plastic Laminate:

1. Details, Sections, etc., may only show and/or indicate finished face or exposed plastic laminate for design and/or detailing purposes. Contractor and Millwork Contractor is required to provide install, etc., all plastic laminate to cover all other exposed areas, cabinet interiors, edges, etc., and to provide all required balance matching. All color finish and graining to match face color, typical.

1.3 WORKMANSHIP

A. Quality of workmanship shall be the highest known "cabinetmaker or furniture quality." All miter joints shall be tight with no gaps or open spaces. Loose joints shall be hairline, flat, in single plane, with no exposed fasteners. All dimensions, reveals and joints shall be exact.

1.4 DESIGN RESPONSIBILITY

A. The Drawings and Specifications indicate the design intent of this Work and define special required elements.

B. When various details or requirements are vague, or in contradiction, this Contractor shall immediately request a clarification.

1.5 WARRANTY

A. This Contractor agrees to warrant his work for two years against becoming unserviceable or objectionable in appearance as a result of being defective or non-conforming., This Contractor further warrants the overall effective integration and correctness of individual parts, the whole of the system(s) and compatibility with adjoining substrates, materials and work by other trades.

B. Contractor shall repair or replace defective work to the satisfaction of the University Representative.

1.6 SUBMITTALS

A. Shop Drawings: Submit Shop Drawings showing plans, elevations, ends, cross-sections, service run spaces, location and type of service fixtures with lines thereto. Show details and location of anchorages and fitting to floors, walls and base.

1. Include layout of units with relation to surrounding walls, doors, windows and other building components.

2. Coordinate Shop Drawings with other work involved.

B. Samples: Submit two (2), 2"x3" samples of manufacturer's plastic laminate colors, patterns and textures for exposed and semi-exposed materials for Architect's selection. Samples will be reviewed by the University Representative for color, texture and pattern only. Compliance with other specified requirements is the exclusive responsibility of the Contractor.

C. Refer to Section 01 33 23 **SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES**, for procedures.

1.7 PRODUCT HANDLING

A. Deliver plastic faced casework only after wet operations in building are completed.

B. Store completed plastic faced casework in a ventilated place, protected from the weather, with relative humidity therein of 50% or less at 70^{O}F.

C. Protect finished surfaces from soiling and damage during handling and installation. Keep covered with polyethylene film or other protective covering.

1.8 JOB CONDITIONS

A. Humidity and Temperature Controls: Advise Contractor of requirements for maintaining heating, cooling and ventilation in installation areas as required to reach relative humidity necessary to maintain optimum moisture content.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Definitions: The following definitions apply to plastic faced casework units:

1. Exposed: Surfaces visible when doors and drawers are closed. Bottoms of casework more than 4' above floor. Backs and edges of hinged door.

2. Semi-Exposed: Surfaces that become visible when drawers and doors are opened. Tops of casework 6'-6" or more above floor.

3. Concealed: Surfaces permanently hidden after installation, such as backs of cabinets against walls.

4. Semi-concealed: Knee spaces on work units and tables.

B. Board Products:

1. Particle Board: Medium density (minimum forty-five [45] lbs.'cu./ft.) minimum wood chip and phenolic resin binders, compressed board, 3/4" thickness unless otherwise indicated. (Use where noted on Drawings as plywood.)

2. Hardboard: PS 58, Class 1 (tempered), smooth one side or both sides where indicated, 1/4" thickness unless as otherwise indicated.

3. Particle Board and Hardboard shall contain no added ureaformaldehyde.

C. Plastic Laminate: Comply with NEMA LD3; Type 2, .050" thickness.

D. Design and Construction Features: Comply with the details shown for profile and construction of plastic faced casework. Where not otherwise shown, comply with applicable Quality Standards, with alternate details (indicate on shop drawings) as Fabricator's option.

E. Pre-Cut Openings: Fabricate plastic faced casework with pre-cut openings, wherever possible, to receive hardware, appliances, plumbing fixtures, electrical work and similar items. Locate openings accurately and use templates or roughing-in diagrams for proper size and shape. Smooth the edges of cut-outs and, where located in countertops and similar exposures, seal the edges of cutouts with a water-resistant coating. Color approved by the University Representative.

1. Grommet(s): Provide for all pre-cut openings and/or where shown on the drawings.

F. Measurements: Before proceeding with fabrication of casework required to be fitted to other construction, obtain field measurements and certify dimensions and Shop Drawings details as required for accurate fit.

1. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of casework for accurate fit.

G. Material Thickness: The following thickness for cabinet work shall apply except when shown thicker on the Drawings:

1. Tops, Bottoms, Ends, Divisions: 3/4" thick.

2. Face Plates: Equal to door thickness with 3/4" minimum.

3. Web Frames: 3/4" minimum.

4. Drawer Bottoms: 1/4" KorTron II, "Color as selected." Drawers over 24" wide require center bottom support. Weight all drawers.

5. Drawer Fronts: Provide double fronts equal to door thickness. 3/4" minimum.

6. Drawer Backs and Sides: 1/2", full dovetail construction.

7. Shelves: 3/4" to 28"; 1" to 40"; 1-1/2" to 60" maximum unsupported lengths. Where shelving is to receive plastic laminate, cover front and back edges, top and bottom of shelf with plastic laminate.

8. Storage Shelving: Plastic laminate or KorTron.

H. Bases: Finishes as indicated on Drawings. Design to space as shown on drawings.

I. Doors (Cabinet): 3/4" minimum thickness except doors over 36" wide and 60" high to be 1-1/4". Use overlay type except where shown otherwise on Drawings. The finish on door fronts, backs and edges to be the same.

J. Plastic Laminate: Plastic laminate colors, finishes and patterns:

1. Manufacturers: As noted on Drawings.

K. Finishes:

1. Plastic laminate for horizontal surfaces: NEMA Type 2, 0.050" thick, General-Purpose Type (high pressure).

2. Plastic laminate for postforming: NEMA Type 3, 0.042 thick, Postforming Type (high pressure).

3. Plastic laminate for external vertical surfaces: NEMA Type 4, 0.028" thick, General-Purpose Type (high pressure).

4. Plastic laminate for cabinet linings: 0.020" thick.

5. Plastic laminate for concealed panel backing: 0.020" thick, Backer-Type (high pressure).

L. Fabricate exposed edges of casework, including edges and inside faces of doors, and drawers when open, with matching plastic laminate, except as otherwise indicated.

M. Plastic Laminate Countertops: Except as other wise indicated, provide separate plastic laminate countertops (installed on other casework or other support system as indicated) to comply with the requirements for casework for plastic laminate finish.

2.2 CABINET HARDWARE AND ACCESSORY MATERIAL

A. General: Provide cabinet hardware and accessory materials associated with plastic faced casework except for units which are specified as "door hardware" in Section 08700 or in other sections of these Specifications.

B. Hardware Standards: Except as otherwise indicated, comply with ANSI A156.9 "American National Standard for Cabinet Hardware."

C. Hinges: Number per leaf as per Manufacturer's load charts, but not less than three (3) per leaf. Full or half overlay as required spring loaded for ease of door operation as required.

1. Prameta or Mepla, European style concealed hinges

D. Pulls:

1. As noted on drawings.

E. Touch Latch: Glynn Johnson No. 4

F. Magnetic Latch: Provide two catches on doors over 4' high. Hafela 264.26.702.

G. Drawer Guides: Grant or Accuride, of correct size for drawer depth. Use full extension type for file drawers and where indicated. Provide one pair guides for each drawer.

1. Accuride #C3037
2. Accuride #C4437 (heavy duty)

H. Adjustable Shelf Supports: KV 255 pilaster standards and KV 256 supports.

I. Adjustable Shelf Supports: KV 87 slotted standards and KV 187 slot supports, (heavy duty) (spaced at 36" o.c.)

J. Adjustable Shelf Supports: KV 85 double slot standard and KV double slot bracket. (spaced at 30" o.c.)

K. Closet Bars: Garcy, #A3337, Flagne Garcy #3361 size as required.

L. Shelf Clips: Capitol #86 pin shelf support, bright Zincro. Size as required. Provide predrilled holes in cabinet sides spaced at 1" o.c. and not more than 1-1/2" from shelf edges. Finish zinc plate and/or chrome.

M. Hand Rods: Capitol #641-2 with flangeless socket #262-2, 1-3/16" diameter extra lengths as required.

N. Silencers: Neoprene pads as required to match frame.

O. Locks: Locks for all millwork cabinet doors and drawers shall be located per the elevations or per the approval of the Architect.

1. Locations of all locks as well as keying shall be reviewed with the Architect prior to installation of locks.

P. Approved Manufacturers: National Lock, Corbin or approved equal.

1. Provide all required hardware in finish as selected.

Q. Undercounter Light: Where shown by others. Refer to plans and lighting schedule. Coordinate location of fixture, junction boxes and cutouts with the Electrical Contractor. Provide cut-outs, grommets and boxes as required for electrical work by others.

2.3 FABRICATION

A. Fabricate plastic faced casework to dimensions, profiles and details shown. Comply with AWI 400B Premium Grade.

B. Assemble units in the shop in as large components as practicable to minimize field cutting and jointing. Mortise and tenon, glue and screw joints for maximum strength using precision jigs and clamps to insure square corners and plumb vertical surfaces.

C. Provide 1-1/2" (minimum) lumber edges (glued to core prior to laminating) on the hinge side of all doors. Provide the same lumber edge on the leading edge of cabinet divider for hinge attachment. For hardware installation, drill pilot holes and use full-threaded screws.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examination: This Contractor must examine the substrates and conditions under which the Work is to be installed, and notify the Architect, in writing, of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to this Contractor.

3.2 PREPARATION

A. Deliver concrete inserts and similar anchoring devices to be built into substrates well in advance of the time substrates are to be built.

B. Prior to installation of casework, examine shop fabricated work for completion and complete work as required including removal of packing.

3.3 INSTALLATION

A. Install the work plumb, level, true and straight with no distortions.

B. Shim, as required, using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level (including counter tops) and with 1/32" maximum offset in flush adjoining surfaces, 1'8" maximum offsets in revealed adjoining surfaces.

C. Scribe and cut work to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.

D. Anchor casework to anchors or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nail for exposed nailings, countersunk and filled flush with casework and matching laminate.

E. Casework and/or cabinets: Install without distortion so that doors and drawers will fit openings properly and be accurately aligned.

1. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

F. Countertops: Anchor securely to base units and other support systems as indicated.

3.4 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

A. Repair damaged and defective casework wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace casework. Adjust joinery for uniform appearance.

B. Clean hardware, lubricate and make final adjustments for proper operation.

C. Clean casework on exposed and semi-exposed surfaces. Wet wipe inside of all drawers. Touch-up shop-applied finishes to restore damaged or soiled areas.

D. Protection: This Contractor shall provide protection and maintain protection necessary to ensure that the Work will be without damage or deterioration at the time of acceptance. Method as approved by the University Representative.

1. Instruct University Representative of adjustments and preventive maintenance (i.e., cleaning methods, materials).

2. This Contractor shall be required to conduct a site walk through and adjust all casework six months after installation.

END OF SECTION

SECTION 12 36 00
COUNTERTOPS

PART 1 – GENERAL

1.0 RELATED DOCUMENTS:

Drawings, Division H – General Requirements, Division I – Technical Requirements and Division J – Technical Specifications and LEED Equal Specification Section 013500 apply to this Section.

1.1 SECTION INCLUDES

A. Countertops for architectural cabinetwork.

1.2 RELATED REQUIREMENTS

A. Section 064100 - Architectural Wood Casework.

1.3 REFERENCE STANDARDS

A. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
B. ANSI A208.1 - American National Standard for Particleboard; 2009.
C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.
D. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2007).
E. MIA (DSDM) - Dimensional Stone Design Manual; VII, 2007.
F. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
G. PS 1 - Structural Plywood; 2009.

1.4 SUBMITTALS

A. Product Data: Manufacturer's data sheets on each product to be used, including:

1. Preparation instructions and recommendations.
2. Storage and handling requirements and recommendations.
3. Specimen warranty.

B. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
C. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
B. Installer Qualifications: Fabricator.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 – PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
B. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
   1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3 Grade HGS, 0.048 inch nominal thickness.
      a. Finish: Matte or suede, gloss rating of 5 to 20.
   2. Back and End Splashes: Same material, same construction.
C. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 1-1/4 inch, minimum.
   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISSFA-2 and NEMA LD 3; orthopthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with the MIA Dimension Stone Design Manual.
      b. Finish on Exposed Surfaces: Polished.
   3. Wall Panels: 1/2 inch, and 3/4 inch thick.
   4. Other Components Thickness: 3/4 inch, minimum.
   5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.

2.2 ACCESSORY MATERIALS

A. Wood-Based Components:
1. Wood fabricated from old growth timber is not permitted.
B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.
C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

2.3 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.

3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
C. Seal joint between back/end splashes and vertical surfaces.

3.4 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
C. Field Joints: 1/8 inch wide, maximum.

3.6 PROTECTION

A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 22 00 00
PLUMBING

PART 1 – GENERAL

1.1 SCOPE

A. General Requirements:

1. Related Documents: Architectural specifications, general, special supplementary conditions, and tenant construction shall form a part of these specifications.
2. Scope of Work: Provide all required labor, materials, equipment and contractor's services necessary for complete and safe installation of Heating, Ventilating, Air Conditioning and Plumbing Work in conformity with requirements of all Authorities having jurisdiction; as indicated on drawings and/or herein specified or described.
3. Site Cleanliness: Keep site free from this section's surplus material, tools and rubbish at all times during construction period and, upon completion, leave site in clean condition.
4. Site Security: Protect this section's materials and equipment from all damage due to fire, theft, vandalism, weather, etc.
5. Damage to Other Work: Repair any damage caused by this section to work of other sections.
6. Damage to Fireproofing: Repair any damaged fireproofing caused by this section to integrity of original construction.
7. Site Safety: Contractor covenants and agrees that he and his subcontractors and his and their agents, servants and employees will provide and maintain a safe place to work and that he and they will comply with all laws and regulations of any governmental authority having jurisdiction thereof, and Contractor agrees to indemnify, defend and hold harmless, Engineer, University Representative, tenant and Architect from and against any liability, loss, damage or expense, including attorney's fees, arising from a failure or alleged failure on the part of Contractor, his subcontractors and his and their agents, servants and employees to provide and maintain a safe place to work or to comply with all laws and regulations of any governmental authority having jurisdiction thereof.
8. Verification of Existing: Before submitting bid, become thoroughly familiar with actual existing conditions and systems at the building and of the present installations to which connections must be made or which must be changed or altered, and base building requirements and practices. The intent of the work is shown on the drawings and described herein, and no consideration will be granted by reason of lack of familiarity on the part of the Contractor with actual physical conditions, requirements, and practices at the site.
9. Requirements of Other Sections: Carefully check the documents of other sections to ascertain the requirements of any interfacing materials or equipment being furnished and/or installed by that section which relate to this section, and provide the proper installation and/or connection including controls.
10. Information Transfer: Transmit all information required for work being performed by other sections in ample time for the proper installation and connection, and for the provision of all openings required in floors and walls.
11. Holes and Structure: Field drilling and cutting of holes in building structure required for work under this section shall be coordinated through the Contractor and approved by the University Representative and Building Structural Engineer. All such coordination, drilling, cutting and reinforcing costs shall be borne by this Contractor.

12. Sleeves: Furnish and set all sleeves for the passage of pipes and ducts through walls, roof and floors and elsewhere as will be required for the proper protection of each pipe and duct passing through building surfaces. Coordinate this work with Contractor in order to properly expedite and perform this work.
13. Passage of Equipment: Check the dimensional requirements of equipment of this section to ensure that such equipment can pass through the necessary areas to reach its ultimate installed location. Include in bid costs for all work required, including any work required to move the equipment through the site to its final location, including any dismantling and re-assembly.
14. Signage: Provide signage required by codes and authorities having jurisdiction.
15. Potential Delivery Problems: Notify the Contractor and Engineer, in writing, within five days of award of contract, of the proposed delivery schedule of any equipment or material that may prevent the installation from being completed by the project completion date.
16. Warranty: Submit a single guarantee stating that all portions of the work area in accordance with contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one year from date of final acceptance by the University Representative, except that where guarantees or warranties for longer terms are specified by contract, such longer term shall apply.
17. Rectification: At no additional cost to Tenant or the University Representative, within 24 hours after notification, correct any deficiencies including pipe leaks, which occur during the guarantee period, all to the satisfaction of the Tenant or the University Representative. Leaks which occur prior to the completion of this contract shall be repaired at once. The Contractor shall be responsible for any damage caused by such deficiencies and repair thereof and reimburse the University Representative and/or Tenant for all costs incurred.

B. Work Included: the work under this Section shall consist of all labor, materials, equipment, facilities, transportation and services necessary for and reasonably incidental to the furnishing, installation, completion and testing of all plumbing work as indicated on the drawings and as specified herein. Testing shall be furnished by the Contractor. The work in general shall include, but not be limited to, the following principal items:

1. Sanitary waste and vent system.
2. Domestic water system.
3. Plumbing fixtures.

C. Building Rules:

1. All demolished copper lines ¼” or larger shall remain property of the building and handed over to the building engineer.
2. Waste, water, and vent lines that are to be removed shall be abandoned to the nearest point of connection.
3. Waterlines that are to be modified must be correctly capped and tested.
4. Remove all abandoned plumbing and sewer lines and cap at the source (point of connection).

1.2 RELATED WORK

A. Cutting and patching of building structure and partitions.

1.3 QUALITY ASSURANCE

A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Codes and Regulations:

1. In addition to complying with specified requirements, comply with pertinent regulations of the 2013 CBC and 2013 CPC.
2. In the event of conflict between or among specified requirements and pertinent regulations, the more stringent requirement will govern.

1.4 WORKMANSHIP, MATERIALS AND EQUIPMENT

A. All work shall be performed in a workmanlike manner and shall present a neat and mechanical appearance when completed. All materials shall be of type, quality and of minimum rating prescribed herein or indicated by manufacturer's name, type, model or catalog number. All materials furnished and installed under this contract shall be of first quality. All materials shall be a product of domestic manufacturers.

1.5 CUTTING AND PATCHING

A. Contractor shall perform all cutting and patching required for the introduction and placement of his/her work. He/She shall employ people to perform all patching work that are skilled in the particular trade involved. Cutting and patching required as a result of the omissions of an opening in construction shall be done by the Contractor at his/her own expense.

1.6 PROTECTION OF WORK

A. All work shall be protected at all times from danger by freezing, breakage, dirt, foreign materials, etc., and shall replace all work so damaged. The Contractor shall use every precaution to protect the work of others, and he/she will be held responsible for all damage to other work caused by his/her work or through the neglect of his/her workers.

1.7 COORDINATION

A. See Section 01 31 13 Project Coordination.

B. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation sub-base and support.

C. Pipe Sleeves and Inserts: furnish and install all pipe sleeves and pipe support inserts before concrete is poured.

1.8 PRODUCT SUBSTITUTION

A. See Section 01 25 00, Substitution Procedures.

1.9 EXCAVATING AND BACKFILLING

A. Perform all excavation and backfilling as required. Contractor shall establish all lines and elevations prior to opening trenches and shall be responsible for correctness thereof.

1.10 CLEAN-UP

A. Contractor shall at all times keep the premises free from accumulation of waste materials or rubbish caused by his/her employees or work. After completion of work and prior to final acceptance, thoroughly clean all parts of the work, remove all debris and surplus equipment and leave installation in perfect condition, ready for use.

1.11 SUBMITTALS AND SHOP DRAWINGS (DIGITAL ONLY)

A. Submittals:

1. Comply with pertinent provisions of General Conditions and Division 1.
2. No product will be accepted on job-site without prior approval.
3. Reference catalog cuts and brochures of products to proper paragraph in Specifications. Furnish numerical index by Specification paragraph number listing product name, catalog number and reference to page number of submittal brochure.
4. Cross reference individual catalog numbers of substitute products to numbers of specified materials.
5. Submittals shall be complete otherwise the submittals will be rejected.
6. Submittal shall include, but not be limited to the following:

    a. Pumps, pump characteristic curves.
    b. Plumbing fixtures and equipment, cuts, including trim and fittings, and roughing dimensions.
    c. Water heating equipment and storage tank.
    d. Drains and waste receptors.
    e. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
    f. Specialties, valves, gauges and thermometers of all types.
    g. Foundations, supports, hangers, inserts.
    h. Wiring diagrams, control panel boards, motor starters and controls for electrically operated equipment furnished by work specified in other Sections.
    i. All special products furnished by work specified in other Sections.

B. Shop drawings:

1. Prepare shop drawings or transparencies at a scale suitable to clearly delineate the subject.
2. Drawing legend shall contain project title, drawing title, drawing number and number of drawings to set.
3. Scale shop drawings shall be furnished prior to installation of equipment for:

    a. Areas noted on plan as required shop drawings.
    b. Approved deviations from plans.

C. Draw equipment rooms layouts to a minimum scale of ¼” = 1’- 0”, including equipment, piping, accessories, showing clearances for operating and servicing.

D. Conflicts in Shop Drawings or Submittals: Contractor agrees that shop drawing submittals processed by the University’s Representative do not become contract documents and are not change orders, that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the contractors convenience in organizing his work and to permit the University’s Representative to monitor the contractor's progress and understanding of the design. The process of review of the contractor's submittals is not the purpose of testing the University’s Representative’s perception. If deviations, discrepancies or conflicts between shop drawings submittals and contract documents are discovered either prior to or after the shop drawings submittals are processed by the University’s

Representative, the contractor agrees that the contract documents shall control and shall be followed.

1.12 MAINTENANCE AND AS-BUILT DRAWINGS (DIGITAL ONLY)

A. Upon completion of the installation, furnish complete sets of operating and maintenance instructions for the systems specified in this section to the University's Representative.

B. The Contractor shall incorporate, among others in the set of operating and maintenance instructions to the University's Representative, the following directions:

1. Schedule of major components of each system with manufacturer's catalog data, nameplate data, and parts list.
2. Preventive maintenance schedule for each major component of each system.
3. Pressure test reports.
4. Directory: Names, addresses and telephone numbers of Contractor, its subcontractor's and related equipment suppliers, including name of person to contact in each case.
5. Furnish a separate listing of all components from each manufacturer and from each supplier.
6. Specific Manufacturer's Warranties. List each piece of equipment covered, with day and date warranty begins, date of expiration and name, address and telephone number of person to contact regarding problems during warranty period.
7. Listing of extra stock parts furnished as part of the Contract

C. As-Built Drawings: Two complete sets of ¼" = 1'-0" scale black and white Mechanical Drawings will be provided as record drawings for the purpose of showing a complete picture of the work as actually installed.

1.13 MANUFACTURER'S WARRANTY

A. Standard warranty of manufacturer shall apply for replacement of parts after expiration of other warranty periods stated in specifications if they are for shorter time than standard manufacturer's warranty. Manufacturer shall furnish and replace parts to University. Furnish University's Representative printed manufacturer's warranties complete with material included and expiration dates upon project completion.

1.14 PLUMBING BUILDING STANDARDS

A. All specified items installed are to be building standard unless called out differently on the plans.

B. Provide a final layout as required and approved by University Representative and the Tenant Improvement Plan prior to commencing work. Complete plans shall show all new piping and points of connections.

C. All work shall conform to local codes.

D. Submit for plan check review as required.

E. Extend existing utilities line size with shut-off valves to allow for future Tenant Improvements.

F. No piping shall be permanently closed up, furred in or covered over before it has been tested, inspected and approved by University Representative.

G. Piping shall be concealed where space provides. Pipes shall not be exposed in finished rooms unless approved by the Architect and University Representative.

H. New piping must be completely chemically cleaned and flushed.

I. Fixtures must be approved prior to commencing with the work (include in submittals).

J. Provide and install handicap fixtures in compliance with the State regulations.

K. Fixtures: [see section 2.9]

PART 2 – PRODUCTS

2.1 SANITARY, SOIL, WASTE AND VENT SYSTEM

A. Soil, waste and vent piping to 5' outside the building may be one of the following:

1. Hubless cast iron soil pipe and fittings, CISPI – 301, ASTM A888, with stainless steel clamp and shield couplings, CISPI – 301
2. Hubless cast iron soil pipe, CISPI- 301, ASTM A888 with hub and spigot cast iron fittings CISPI – 301, ASTM A74 with the A.B. & I. "Best" cast iron coupling and rubber gaskets, ASTM C564.
3. Hubless cast iron soil pipe, CISPI 301, ASTM A 888 with M.G. mechanical joint couplings.

B. Cleanouts:

1. Manufacturers: J.R. Smith or equal.
2. Accessories: Where installed in construction with waterproof membrane, provide cleanouts with flashing clamp device with corrosion-resistant clamping bolts.
3. Floors:

   a. Finished (tile or resilient covering): J.R. Smith #4048 or equal with Nikaloy square top and tapered thread bronze plug. Set tops square with floor tile or resilient covering pattern.
   b. Unfinished: J.R. Smith #4248 or equal with cast iron round tractor type cover and tapered thread bronze plug.

4. Walls: tapped tee or C.I. ferrule, with tapered thread bronze plug. J.R. Smith #4472 or equal chrome plated for tiled walls, prime coated for painted walls.

2.2 DOMESTIC COLD WATER

A. Pipe and fittings: Type "K" hard-drawn copper tibe, ASTM B88, with wrought copper solder joint fittings, ANSI B16.22. Cast bronze solder joint fittings, ANSI B16.18, may be used only for sizes for which wrought copper fittings are not manufactured. Leadless solder joints.

B. Valves: Lead Free

1. Provide systems with valves where indicated on Drawings and as specified. All valves shall be easily accessible. Valves for similar service shall be of same manufacturer.

2. Provide systems with valves so located and arranged as to give complete regulating control over all systems. Valves shall be installed on both sides of all equipment, on risers and on all branch mains.
3. Acceptable Manufacturers: Hammond, Milwaukee, Stockham, Nibco Manufacturer's name and figure number specified are for type, construction and quality required. All valves shall be lead free.

    a. Ball Valve (2" and smaller): Hammond UP #8501, 150 lb., threaded. (or equal)
    b. Ball Valve (2½" and larger): Nibco #S-580-66 LF, 150 lb. (or equal)
    c. Check Valve (2" and smaller): Hammond #UP904, 125 lb., threaded. (or equal)
    d. Check Valve (2½" and larger): Hammond, 125 lb., flanged. (or equal)

C. Unions and flanges: Lead Free

1. Unions (2" and smaller): cast bronze ground joint pattern, brass to iron seat, ASTM B62 and ANSI B16.18.
2. Flanges (2½" and larger): 150 lb., cast bronze, solder joint, ASTM B62 and ANSI B16.24.

    a. Flange gaskets shall be 1/16" thick and suitable for water. Garlock or equal.
    b. Bolting Materials: Carbon steel heavy hex bolts and nuts, ASTM A307 type B.

2.3 INSTALLATION OF FIXTURES AND EQUIPMENT SPECIFIED ELSEWHERE

A. Work Included:

1. Furnish and install straight or angle stops on all industrial cold water lines at hose bibbs, and elsewhere as indicated or required.
2. Furnish and install water hammer arrestors in industrial cold water lines to all equipment or apparatus equipped with quick closing valves.

B. Fixtures: (Refer to Fixture Schedule, Plumbing cover sheet)

2.4 PIPE HANGERS AND SUPPORTS

A. General:

1. A hanger assembly shall consist of an upper attachment secured to structure, a hanger rod and a pipe hanger.

    a. The upper attachment shall be as follows:

        1) Concrete: Concrete insert, or expansion shield.
        2) Steel Framing: Beam clamp.
        3) Wood Framing: Angle clip with one leg bolted thru wood member with a plate washer on each side. Bolt shall be same size as required rod size. Lag bolts will not be allowed.

2. Pipes at the same elevation may be supported by acceptable trapeze hangers.
3. Explosive type fasteners or studs will not be permitted.
4. Hangers and supports shall fit outside of all pipe insulation and insulation inserts unless specified otherwise.

5. Refer to Drawings for fabrication of special supports.
6. All water piping shall be isolated from structure.

B. Hanger spacing for horizontal suspended piping shall be as follows, unless specified or shown on the Drawings otherwise.

1. Cast iron soil pipe shall be supported at not more than 5 ft. Intervals with support not more than 18" from hub.
2. Steel Pipe 1" and Smaller: Not to exceed 6 ft. – 0 in.
3. Steel Pipe 1-1/4" and Larger: Not to exceed 10 ft. – 0 in.
4. Copper Tubing 1½" and Smaller: Not to exceed 6 ft. – 0 in.
5. Copper Tubing 2" and Larger: Not to exceed 10 ft. – 0 in.
6. In all cases, space pipe supports to provide adequate support for the pipes, the medium in the pipes, insulation, valves and fittings to prevent any sagging or separation of joints.

C. Hanger Rods: Solid mild steel, sized as specified below. Maximum length of all thread rod shall not exceed 6".

Pipe Size	Rod Diameter
½" thru 3"	3/8"
4" thru 6"	½"

D. Vertical piping shall be supported, not hung, at each floor with malleable iron or steel bolted pipe clamps. Clamps for water pipes shall rest on neoprene and cork pads.

E. Hangers shall be clevis, or split ring type. Manufacturers: Tolco or equal.

F. Provide pipe to structure or hanger isolation as follows:

1. Hangers: Water piping shall be isolated from hangers with two (2) layers of ¼" felt.

2. Through Structural Members:

a. All waste piping shall be isolated from all points of contact with the structure of the building with two (2) thicknesses of ¼" heavy Pumbers' Felt. There shall be no points of contact between any waste line and the structure of the building including studs, gypboard, plates, headers, or any other part of the building.
b. All water piping shall be isolated the same as the waste piping except piping 1" and smaller. 1" and smaller water piping shall be isolated using Acousto-Plumb isolators as manufactured by Speciality Products Co. or equal. This includes stub-outs at fixtures.

2.5 PIPE FLASHING

A. Provide a flashing assembly at every pipe passing through a roof.

B. Lead flashing and counterflashing:

1. For Vent Piping: Stoneman #S-1000-4 or equal, 4 lb. Lead, 6" skirt.

2. For Other Than Vent Piping: Stoneman Versa-Flash or equal, 4 lb. Lead, 6" skirt.

2.6 DIELECTRIC ISOLATORS

A. Isolate incompatible piping materials.

B. For piping 2" diameter and smaller, use Watts LF3003 rated to 180°F at 250 PSI or equal.

C. For piping 2-1/2" diameter and larger, use flange dielectric isolation sets equivalent to Watts LF3100 rated to 180°F at 175 PSI or equal.

2.7 TOOLS

A. Furnish all special tools necessary for the care and operation of any equipment.

B. Identify tools for the specific equipment.

2.8 PIPE SLEEVES

A. Provide pipe sleeves for all piping passing through concrete walls and floors.

B. Sleeves shall be Crete-Sleeves by Sperzel Co. or equal.

2.09 FIXTURES

A. Fixtures types shall be located and scheduled as indicated on the architectural drawings [master keynote list] and noted below: Per plan

PART 3 – EXECUTION

3.1 PIPING INSTALLATION

A. Layout of Work:

1. Perform all dimensional layout of the work and establish all lines and grades as set forth on the Drawing.
2. Be responsible for conformity of the finished work with Drawings and Specifications.
3. Layout rough-in for contract equipment as well as University furnished equipment and appliances in accordance with rough-in diagrams furnished by the Manufacturer.

B. Installation:

1. Inspect all piping prior to installation, pipe found unsatisfactory on inspection or damaged by handling shall be promptly removed from the job site.
2. All piping systems shall be graded and valved to allow complete drainage and control of all systems.
3. Install horizontal sanitary and storm drainage piping to uniform grades conforming to the 2013 CBC and 2013 CPC for this installation or as indicated on Drawings.
4. All piping shall run parallel to building construction and shall be neat and workmanlike. Do not cut or drill structural members except as approved by the University's Representative, or specifically noted on the Drawings.
5. Conceal all piping in finished portions of the building unless noted otherwise on the drawings.

6. Coupled shot sections of pipe, bushings, close nipples, long screws, and crosses are prohibited.
7. Install all piping in such a manner as to prevent any undue noise from the flow of water under normal conditions.
8. Install piping to permit free expansion and contractions, except where the Drawings specifically indicate an anchor or guide. Do not connect stiffening structural members to bends or elbows. Water piping shall be secured to structure at fixture locations.
9. Use offsets necessary to prevent undue strain on piping. The springing of piping into place is prohibited.
10. Select and install pipe supports and hangers in such a manner as to impose only negligible restraint on the free movement of piping and not deform piping. No anchors shall be employed.
11. Locate pipe supports as close as possible to valves or other heavy piping specialties.
12. Carefully locate supports and hangers so that they do not hinder free movement of adjoining piping or occupy open space in a pipe rack.
13. Buried Piping:

    a. Carefully handle and lower pipe in such a manner as to avoid damage to the pipe.
    b. Excavate a socket hole under the joint so that pipe will be supported on its body. Provide socket holes large enough (but not excessive) to allow adequate space for workers to "make" the joints.

14. All exposed polished or enamel connection from fixtures shall be put on with special care showing no tool marks or threads at fittings.
15. Sway bracing shall be installed per 2013 CBC and 2013 CPC.

3.2 PIPE JOINTS

A. Copper Tubing:

1. Cut square and remove all burrs. Ream for full flow.
2. Clean outside ends of tubing and male fittings and sockets of female fittings to bright finish. Clean with emery cloth.
3. Properly apply solder flux to surfaces being jointed. Application and type of flux shall be as recommended by the specific solder manufacturer.
4. Remove internal parts of solder-end valves prior to soldering.
5. Refer to specific piping system for type of solder.

B. Cast Iron Soil Pipe and Joints: Install in accord with coupling manufacturer's instructions. Refer to specific piping system for type of coupling.

3.3 PROTECTIVE COATING FOR UNDERGROUND PIPING

A. General: protect underground pipe as specified. Protect fittings similar to piping.

B. Cast Iron Pipe: Asphaltum varnish or similar coating standard of pipe manufacturer.

C. Copper Tubing and Pipe: no coating required.

3.4 CLEANING AND DEGREASING OF PIPING

A. Clean all piping systems to remove all dirt, grease, scale, foreign substances, etc.

B. At Contractor's option use air or inert gas blown through the lines of gas system, to prove the piping clean. All other piping systems shall be thoroughly flushed out with water unless specified otherwise.

C. Prior to commencing work, submit for approval a complete procedure for flushing of piping systems. Include flushing source, system flushing inlet pressure, and size of inlet and outlet flushing connections with their locations for each system.

3.5 EQUIPMENT AND APPLIANCE INSTALLATION

A. Install equipment and appliances, both University furnished and in contract where shown, as indicated, and in accordance with manufacturer's recommendations for the specific service.

B. Provide anchor bolts, setting Drawings and templates for setting equipment.

C. Assure correct alignment of equipment or appliance after setting.

D. Where grouting is necessary, use non-shrink type.

3.06 TESTING OF PIPING

A. Testing and inspection of all piping systems and associated equipment for leaks shall be furnished by the Contractor after installation and cleaning and prior to placing into service.

B. A rigid visual inspection of each specific piping system shall be made prior to conducting tightness tests, to ascertain that all appurtenances and equipment are provided, properly connected and supported, and in all respects ready for testing by the Contractor.

C. Equipment such as hot water, flexible hose, safety valves and similar test pressure. Equipment shall either be disconnected from the piping or be isolated by valves or blanks during testing by the Contractor.

D. Indicated pressure gauges mounted locally may be tested with the lines, provided the test pressure does not exceed the scale range.

E. The application of pressure to a system shall be under control at all times, so that in no case shall the test pressure be exceeded by more than 6%.

F. Gauges used for testing as furnished by the Contractor shall be tested for accuracy as approved by University's Representative, and then installed as close as possible to the low point of the piping system.

G. Do not apply test pressure until the piping system and its contents approach the same temperature.

H. While piping is under test, exercise care that excessive pressure does not occur due to increase in ambient temperature.

I. Piping test pressure shall be as specified with the particular system. If test pressures are not specified, they shall be 150% of design pressure for the specific system being tested.

J. Conduct hydrostatic tests with water at a temperature below 100 degrees F.

1. Fill the system slowly with water and vent at highest points to expel the air before pressurizing.
2. Carefully examine all joints for leaks or defects.

3. Provide connections as required to accomplish the above.

K. Keep accurate test records of each line or system tested. Each test shall include:

1. Identification of piping system and test number.
2. Testing medium.
3. Test pressure.
4. Date of test acceptance.

L. Tests: allow to stand 4 hours or longer as directed to provide tight without leaks. Perform tests in presence of the University's Representative.

1. Soil, waste, and vent system and storm drain system. Test with water to a static head of 10 ft.
2. Domestic Water System: test with water at 1-1/2 times system pressure.

M. Chlorination Procedure

1. A 72 hour pre-notification must be given to UCLA Environmental, Health and Safety (EH&S) by the contractor or UCLA representative
2. The chlorine is injected into the line by the contractor. The contractor and EH&S will ensure that the type of chlorine being used is acceptable for potable water lines. Chlorine tablets used for pools (with a stabilizer) are not allowed
3. The chlorinated water in the line will be isolated from the main. If the chlorinated water is not isolated then it is possible for the chlorinated water to enter the main and injure people down-line
4. The contractor and EH&S will verify (by using chlorine test strips) that the proper concentration of chlorine is achieved:

   a. 25 ppm if a 24-hour contact time is utilized (100 ppm best)
   b. 100 ppm if a 3-hour contact time is utilized

5. A Check is made to make sure that the final chlorine concentration (after 3-hours or 24) is not less than half the original. If the concentration is less than half the original the procedure must be repeated.
6. The flushing of the line must be discharged to the sanitary sewer; not the storm drain.
7. After the line is flushed, the concentration of chlorine must be the same as the background concentration in the main.
8. The contractor will take a minimum of two water samples: one for a Plate Count test and one for a Total Coliform test.
   Note: It may be necessary to sample at several sample points.
9. The water samples will be sent to a State Certified Laboratory (on ice).
10. The bacteriological results must be below the following:

    a. Standard Plate Count: less than 500 colony forming units/ml
    b. Total Coliforms: absent

11. UCLA Environment, health and safety will review all test results and release the line if:

    a. The results meet the requirements then the line(s) can be opened.
    b. The results fail the chlorination procedure must be repeated.

N. At the completion of the work, completely adjust all valves and equipment for their proper use and seating.

3.07 DEMOLITION

A. The Contractor shall visit the site and familiarize him/herself with all existing conditions affecting his/her work. See Section 013543, Environmental Procedures, for hazardous materials information.

B. Protection:

1. Perform demolition in such a manner as to eliminate hazards to persons and property and to minimize interference with use of neighboring utilities and structures or interruption of use of such utilities and free passage to and from the structures.
2. Provide safeguards, including warning signs and the like that are required for the protection of University's and Contractor's employees and others, during demolitions and removal operations.
3. Care shall be taken to prevent spread of flying particles and dust.

C. Contractor shall examine all the items which are designated to be reused, and refurbish them and store them for reuse.

D. Contractor shall contact University’s Representative to see which items (equipment, fixtures, etc.) University wishes to keep. University’s Representative will direct Contractor as to where items shall be stored.

E. All removed equipment, piping, etc., which are not to be reused or kept by the University shall be removed from the site and shall become the property of the Contractor.

F. On completion of the demolition work and after removal of all debris, the site shall be left in clean condition satisfactory to the University’s Representative. Cleaning shall include offsite disposal of items, materials, debris, and rubbish resulting from demolition operations.

END OF SECTION

SECTION 23 00 00
MECHANICAL

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

A. General Requirements:

1. Related Documents: Architectural specifications, general, special supplementary conditions, and tenant construction shall form a part of these specifications.
2. Scope of Work: Provide all required labor, materials, equipment and contractor's services necessary for complete and safe installation of Heating, Ventilating, Air Conditioning and Plumbing Work in conformity with requirements of all Authorities having jurisdiction; as indicated on drawings and/or herein specified or described.
3. Site Cleanliness: Keep site free from this section's surplus material, tools and rubbish at all times during construction period and, upon completion, leave site in clean condition.
4. Site Security: Protect this section's materials and equipment from all damage due to fire, theft, vandalism, weather, etc.
5. Damage to Other Work: Repair any damage caused by this section to work of other sections.
6. Damage to Fireproofing: Repair any damaged fireproofing caused by this section to integrity of original construction.
7. Site Safety: Contractor covenants and agrees that he and his subcontractors and his and their agents, servants and employees will provide and maintain a safe place to work and that he and they will comply with all laws and regulations of any governmental authority having jurisdiction thereof, and Contractor agrees to indemnify, defend and hold harmless, Engineer, University Representative, tenant and Architect from and against any liability, loss, damage or expense, including attorney's fees, arising from a failure or alleged failure on the part of Contractor, his subcontractors and his and their agents, servants and employees to provide and maintain a safe place to work or to comply with all laws and regulations of any governmental authority having jurisdiction thereof.
8. Verification of Existing: Before submitting bid, become thoroughly familiar with actual existing conditions and systems at the building and of the present installations to which connections must be made or which must be changed or altered, and base building requirements and practices. The intent of the work is shown on the drawings and described herein, and no consideration will be granted by reason of lack of familiarity on the part of the Contractor with actual physical conditions, requirements, and practices at the site.
9. Requirements of Other Sections: Carefully check the documents of other sections to ascertain the requirements of any interfacing materials or equipment being furnished and/or installed by that section which relate to this section, and provide the proper installation and/or connection including controls.
10. Information Transfer: Transmit all information required for work being performed by other sections in ample time for the proper installation and connection, and for the provision of all openings required in floors and walls.
11. Holes and Structure: Field drilling and cutting of holes in building structure required for work under this section shall be coordinated through the Contractor and approved by the University Representative and Building Structural Engineer. All such coordination, drilling, cutting and reinforcing costs shall be borne by this Contractor.
12. Sleeves: Furnish and set all sleeves for the passage of pipes and ducts through walls, roof and floors and elsewhere as will be required for the proper protection of each pipe

and duct passing through building surfaces. Coordinate this work with Contractor in order to properly expedite and perform this work.

13. Passage of Equipment: Check the dimensional requirements of equipment of this section to ensure that such equipment can pass through the necessary areas to reach its ultimate installed location. Include in bid costs for all work required, including any work required to move the equipment through the site to its final location, including any dismantling and re-assembly.
14. Signage: Provide signage required by codes and authorities having jurisdiction.
15. Potential Delivery Problems: Notify the Contractor and Engineer, in writing, within five days of award of contract, of the proposed delivery schedule of any equipment or material that may prevent the installation from being completed by the project completion date.
16. Warranty: Submit a single guarantee stating that all portions of the work area in accordance with contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one year from date of final acceptance by the University Representative, except that where guarantees or warranties for longer terms are specified by contract, such longer term shall apply.
17. Rectification: At no additional cost to Tenant or the University Representative, within 24 hours after notification, correct any deficiencies including pipe leaks, which occur during the guarantee period, all to the satisfaction of the Tenant or the University Representative. Leaks which occur prior to the completion of this contract shall be repaired at once. The Contractor shall be responsible for any damage caused by such deficiencies and repair thereof and reimburse the University Representative and/or Tenant for all costs incurred.

B. Building Rules

1. All plumbing, electrical and air conditioning plans and submittals must be submitted in a timely manner and approved by Building Management and the Chief Engineer as well as the project mechanical engineer before commencement of work. Building's Chief Engineer needs a minimum of one week to approve plans. As soon as possible, architectural plans should be submitted so plumbing, electrical and air conditioning can be prepared and/or approved. Any contractor design for network or hub rooms must include design and layout collaboration with the building engineer. Complete architectural, mechanical, electrical, and plumbing as-builts are required as part of the contractor's close-out package.

2. Any modifications to the building HVAC system need prior approval from The Building Office. All HVAC plumbing work must comply with the building and safety codes and in accordance with building specifications.

3. No light fixtures are to be installed directly under proprietary air conditioning units.

4. Deviations from the plans or re-routing ductwork to avoid clashes with other infrastructure must be approved, in writing, in advance. Failure to do so and failure to achieve air balance shall be at the sole cost of the Contractor to remedy. Deviations that have cost impact but are necessary shall be submitted in advance.

5. The University shall arrange for a preconstruction air test during the day 8:00am to 4:00pm – Monday to Friday. All air test activities shall be planned and coordinated with the building engineer and Contractor. The air test shall be performed by a licensed test and balance Contractor certified by either NEBB or AABC.

6. Contractor shall not cut existing pneumatic lines and shall coil and protect them after advising the Engineer of their location.

7. All demolished / exposed ductwork ends shall be sealed with heavy visqueen to prevent dust being drawn into the building ductwork prior to connections.

8. All return air grills require air filters to be placed above them to prevent dust being drawn into the return air plenum.

9. Contractor shall coordinate installation of all PE switches and thermostats with the building engineer, regardless of what is shown on the drawings.

10. Contractor shall balance the HVAC in the suite as required or as called out in the project specific plans and specifications.

11. Any discovered HVAC units, equipment or faulty equipment shall be brought to the attention of the building engineer for salvage or directive to demolish.

12. Remove unused mechanical equipment and abandoned ducts.

C. Major Items of Work Include:

1. Air conditioning systems: Supply, return and exhaust air distributions systems, including ductwork, terminal air units, supply air diffusers, return air grilles, exhaust air registers, controls and connections to existing work.
2. Thermal and acoustical insulation.
5. Pipe and piping accessories.
6. Pipe Protection.
7. Controls.
8. Testing and balancing of all systems.

D. General Items:

1. Access Door Panels: Provide concealed controls, dampers, valves and equipment requiring access with adequately sized access doors/panels. In removable type ceiling, provide access tile identification only.
2. Cutting and patching for mechanical work.
3. Insulation: Furnish insulation for al piping, equipment and ducts that permit heat loss or gain or will form condensation.
4. Coordinate all new work with existing installations.
5. All additional waste and condensate lines shall have no less than 1% minimum slope.
6. Contractor shall inspect job site and verify exact location, size and loading of existing piping prior to installation and connection of any new waste, vents and water.
7. Make up water for any industrial equipment shall first pass through an approved backflow prevention unit.

E. Related Work Specified in Other Sections.

1. Finished painting.
2. Installing access doors.
3. Motor starters and disconnect switches, wiring and conduit.

1.2 SUBMITTALS (DIGITAL ONLY)

A. Provide submittal material with descriptive data for all products and materials including, but not limited to the following list. All submittals shall be highlighted to indicate specific products or materials being used. Product Data: Submit manufacturer’s data for fabrication and installation instructions. Transmit one copy of instructions to the Installer. Refer to Section 01 33 23: SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.

1. Ductwork accessories.
2. Ductwork typical construction.
3. Duct sealing.
4. Flexible ducting.
5. Air moving equipment
6. Terminal units
7. Dampers.
8. Insulation and lining.
9. Diffusers, grilles, and registers.
10. Certified acoustical test performance data, for diffusers, registers, grilles and terminal air units.
11. Air and water test and balance.
12. Control devices and systems.
13. Sprinkler system layouts in code compliance.

B. Shop drawings:

1. Prepare shop drawings or transparencies at a scale suitable to clearly delineate the subject. Sheet sizes shall be 8-1/2" x 11" minimum or multiples of 8-1/2" x 11".
2. Drawing legend shall contain project title, drawing title, drawing number and number of drawings to set.
3. Scale shop drawings shall be furnished prior to installation of equipment for:

   a. Areas noted on plan as required shop drawings.
   b. Approved deviations from plans.

C. Draw equipment rooms layouts to a minimum scale of ¼" = 1'- 0", including equipment, piping, accessories, showing clearances for operating and servicing.

D. Conflicts in Shop Drawings or Submittals:

Contractor agrees that shop drawing submittals processed by the University's Representative do not become contract documents and are not change orders, that the purpose of the shop drawing review is to establish a reporting procedure and is intended for the contractor's convenience in organizing his work and to permit the University's Representative to monitor the contractor's progress and understanding of the design. The process of review of the contractor's submittals is not the purpose of testing the University's Representative's perception. If deviations, discrepancies or conflicts between shop drawings submittals and contract documents are discovered either prior to or after the shop drawings submittals are processed by the University's Representative, the contractor agrees that the contract documents shall control and shall be followed.

1.3 MAINTENANCE MANUALS AND AS-BUILT DRAWINGS

A. Operating and Maintenance Instructions (DIGITAL ONLY)

1. Complete sets of instructions containing the manufacturer's operating and maintenance instruction for each piece of equipment shall be furnished in accordance with the general requirements to the University Representative. The following identification shall be inscribed on the covers; the words "Operating and Maintenance Instructions", the name and location of the building, the name of the contractor and the contract number.

2. The Contractor shall incorporate, among others in the sets of operating and maintenance instructions to the University Representative, the following directions:

    a. Part numbers of all replaceable parts.
    b. Cuts and rating tables.
    c. Oiling, lubricating and greasing data.
    d. Complete electrical load data from operation tests.
    e. Air flow data on all fans indicated on the drawings.
    f. Serial numbers of all principal pieces of equipment.
    g. Installing companies' names, addresses and telephone numbers.
    h. Control diagrams and operating sequences together with labeling of control wiring and instruments to match diagrams.

3. After approval by the University Representative, copies of this instruction and maintenance manual shall be furnished to the University Representative.

B. As-Built Drawings: Complete sets of ¼" = 1'-0" scale black and white Mechanical Drawings will be provided as record drawings for the purpose of showing a complete picture of the work as actually installed. Provide both digital files and one hard copy to the University Representative.

1.4 HVAC BUILDING STANDARDS

The final plans shall be as required and as approved by University Representative and landlord's building standards, and the Tenant Improvement Plans. Plans overlaid on reflected ceiling plans showing avoidance of all obstructions and installation and control details are required before commencing the work. All specified items installed are to be building standard.

A. Controls:

1. Thermostats - Pneumatic, with concealed temperature adjustment set-dial and blank cover with satin chrome or brushed aluminum or brushed bronze (as selected) finish. Two (2) pipes. Thermostats shall be wall mounted in locations specified within 12 inches of door opening. Unless otherwise noted, individual thermostats shall be provided with blank covers (Type 1). Where noted in plan and in all corner offices and larger conference rooms, thermostats shall be provided with exposed set-point adjustment and indicating dial (Type 2).

    a. Preferred Device: Johnson T4002-3139 DA, double tube, fully proportional type cover (White Plastic) or equal. Submit actual sample prior to purchase.
    b. All Tenant Improvements work in the building shall have matching thermostats with regard to function and shall be direct acting and horizontal.
    c. The contractor shall verify all existing thermostats are functional prior to starting any demolition work and notify the building engineer if there are any thermostats that are not functional. The building engineer shall assist with this process.

2. Unit VAV controls shall be pneumatic, and of the pressure compensating with volume regulation both minimum and maximum with 100% shut-off. Set minimum at 30% for space or 60 CFM O.A., whichever is less.
3. Controls shall be by the unit manufacturer, Johnson, or equal, to match existing.

B. Air Volume Control Equipment:

1. All zones will be cooling only. All VAV boxes to be Krueger direct acting. All outlets minimum size 6 inches, shall have balancing dampers. Lined plenums shall be factory manufactured same as unit.
2. Units shall be UL listed.

C. Allowance - (all VAV boxes shall be “Normally Open”):

1. There shall be one VAV system per zone of not greater than 1200 square feet in area.
2. Each corner office of more than 200 square feet and all conference rooms shall be separately controlled as a single zone with their own box and thermostat.
3. Three exterior offices with commonality shall be separately controlled as a single zone with one (1) thermostat in the center office for all.
4. Elevator lobby and corridors shall be a separate zone with thermostat on elevator lobby wall.

D. Duct Work:

1. Flexible Duct - Genflex “IL-1” Young Flex all or equal, U.L. Type 1, 1½” thick acoustic insulation fiberglass with vapor barrier and with spun wire core. Maximum of 12” diameter and minimum of 6” diameter. Maximum length limited per diffuser to not greater than 3’- 6’.

    a. Install “tight”, without sags.
    b. Hanger straps to be 2” wide, minimum.

2. Sheet metal ducts shall be galvanized steel, rectangular or round, and shall be furnished and installed as detailed in 2013 California Mechanical Code Chapter 6 and ANSI/SMACNA 006-2006 HVAC Duct Construction Standards for low pressure duct work.
3. Seal sheet metal ducts with DP 1020 water based non-toxic sealant or equal.

    a. Duct tape and minimum of 2 s/m screws to be used at connection of flex duct.

4. Elbow for ducts with width of 12 inches and less shall be radius type with the throat radius equal to the duct width.
5. All joints are to be inspected and sealed.
6. All hangers shot to the slab above are to be one piece construction forming a trapeze to support the duct and screwed to the duct and sealed.
7. Where metal ducts are touching, insulation shall be placed between the ducts to insure against vibration and noise.
8. Where flex duct joins the metal duct, spin-ins, of other metal fittings, these ducts shall be screwed, banded and sealed with DP 1020 water based non-toxic sealant or equivalent.
9. Where flex duct is hung with a thin strap, a larger piece of metal shall be used as a sleeve between the flex and the strap to insure against collapsing the flex duct.
10. Two pieces of flex duct joined together will not be accepted.
11. All duct work is to be supported independently with hangers shot to the slab above, and no duct work is to be supported from another duct, conduit, pipe, or other handy piece of equipment.
12. Maximum air volume shall be limited to that with a pressure loss less than 0.12 in w.g. for 100 feet.

E. Air Distribution:

1. Ceiling diffusers - 24 x 24 perforated face, white enamel, Krueger 1200P series or equal with core configuration as required. Neck size to suit CFM or FPM, throw pattern and building standard acoustical requirements.
2. Return Air Grilles - 24 x 24 - matching by Krueger 1196A (perforated plate only) or equal. Due to light spillage, the return air grille shall have a round neck adapter with 12" neck with 12" flex transition or a return air boot to obscure "see-thru." Use where there is light spillage or where good acoustics require same.
3. Return air may be accomplished by utilizing plastic egg-crate at the drapery pocket not less than 6" deep along the length of window wall adjacent to window treatment, if specified.
4. Match ceiling type.

F. Corridor System and Fire Dampers. (Quantity as required):

1. The ceiling plenum is serving as the return air path. As such demising and/or corridor wall(s) may cut off this natural path. If so, a way shall be opened using wall cutouts with U.L. and local code approved fire dampers as required with connecting duct work penetrating each area.
2. Maximum velocity through free area of damper shall be 500 FPM. Size shall be for all supply areas served whether presently facilitated or not, with a safety factor of 20%. Fire dampers shall be Air Balance, Inc. "Fire Seal" model 119, type C or Ruskin FDR-LA 16125 and have a U.L. listing label.

G. Testing and Balancing Air Distribution Systems

1. University shall procure services of an independent air balance and testing agency, which is a member of the associated air balance council (or NEBB), to balance, adjust, and test equipment, air distribution systems and exhaust systems. Contractor shall ensure the system is ready for University Air Balance and provide University no less than five (5) working days to request a formal air balance. Failure to pass air balance due to contractor error shall require an additional air balance. This added cost shall be a back charge to the contractor. The air balance is required in order to achieve a certificate of occupancy.
2. Balance and testing shall not begin until systems have been completed and are in full working order. Contractor shall coordinate with the University to ensure all controls are in full operation during each working day of testing and balancing by University.
3. Agency shall perform testing and balancing in accordance with NEBB or AABC National Standards for field measurement and instrumentation.
4. Work shall be done under supervision of a qualified engineer. Instruments shall be accurately calibrated and maintained in good working order. Conduct tests in presence of University Representative or Architect when requested.
5. All air balancing, whether the University formal air balance or Contractors optional "pre-test" prior to said University formal balance must be coordinated between building engineer and contractor prior to commencement to ensure adequate building static pressure. All readings and anomalies discovered during the air balance must be brought to the Chief Engineer's attention at that time in order to identify and correct the problem.

H. Miscellaneous Requirements

1. No air conditioning zone is to overlap into another tenant space.
2. No air cooled condensers will be allowed for tenant auxiliary air conditioning.
3. All conference rooms to have their own zone with thermostat.
4. Hand dampers with handles are to be provided in all supply ducts before attaching flex duct air drops.
5. All hand dampers to be clearly tagged by hanging tag from a wire long enough to be seen above the ceiling grid.
6. All unused or abandoned duct work and piping within the revised areas shall be removed and blanked off at mixing box.

I. Perimeter Electric Heating Panels

1. Relocate heat panels as required to avoid running over new partition or demising walls. Relocate existing heat panel away from partitions for proper clearance. Refer to drawings for more information. Relocate heat panel thermostats as needed thru-out remodel area. No additional heat panel thermostats or zones shall be required unless shown on the plans.
2. PE switches shall be tied to the specific VAV box serving the area in which the heat panels are located.
3. Contractor shall meet with building engineer prior to starting PE/heat panel re-work to ensure harmonics and building standards are complied with and to ensure the scope of work relating to the heat panels is understood.
4. The Building shall take possession of heat panels that are removed.
5. For additional or replacement heat panels not called out on the Drawings, that are required by either tenant or University, the University shall furnish said panels.

PART 2 - PRODUCTS

2.1 DUCTWORK

GENERAL: All safing, ducts, dampers, access doors, joints, hangers, stiffeners, fire dampers and fire retarding materials, in accordance with requirements of SMACNA 006-2006 HVAC Duct Construction Standards, Metal and Flexible, 2005, Third Edition and all other authorities having jurisdiction and as described herein. Except for the following:

1. Fig. 2-2 Longitudinal Seams-Rect. Duct – Button punch snap lock is not acceptable. Use Pittsburgh lock 3/8-inch minimum pocket for rectangular ducts.
2. Fig. 4-3 Vanes and Vane Runners- Double thickness vanes. Single banes with traling edge are acceptable. Trailing edge length shall be 3 times with vanes spacing.
3. Fig. 4-6 Branch connections-Straight Tap, Butt Flange and Dovetail joints are not acceptable. Use 45 degree entry cinch lock. Use conical or bellmouth branch connections for round ducts.
4. Fig. 7-2 Duct Access Doors – Use continuous piano hinge in lieu of butt hinge.
5. Fig. 7-3 Access Doors – Round Duct – Split Sleeves are not acceptable.
6. Fig. 4-2 rectangular Elbows – Type RE-1 radius elbow shall always be used when space permits. Square throat elbows with double wall vanes (single vanes with trailing edge are acceptable) may be used for supply ducts when space is limited.
7. Fig. 3-2 Round Duct Longitudinal Seams – Snap lock seam is not acceptable.
8. Fig. 3-1 Round Duct Transverse Joints – RT-3 Drawband joint and RT-5 Crimp Joint are not acceptable. Use RT-1 Beaded Sleeve Joints.
9. Fig. 304 Round Duct Elbows-Pleated and Adjustable Elbow are not acceptable. Adjustable elbow may be used in duct pressure under 1-inch static pressure, provided sheet metal straps and screws are installed to lock elbow position and all joints and seams are sealed.

10. Fig. 3-5 90 degree Tees and Laterals – 90 degree Tap and Saddle Tap are not acceptable. Use 45 degree laterals or Conical Tees shown on Fig 3-6.
11. Fig. 3-10 and 3-11 Flexible Duct Supports – Use 4-inch wide band in lieu of 1-inch band straps.
12. Fig. 5-2 Upper Attachment Devices - Typical - Details 1, 3b, 4, 5, 7, 9, 10, 11, and 14 are not acceptable.
13. Fig. 5-4 Upper Attachments-typical-this detail is not acceptable.
14. Fig. 7-11 Flexible Duct Liner Installation - Use only metal weld pins and 1005 area coverage of adhesives. This also applies to rigid duct liners.
15. Each duct transverse joint and longitudinal seam shall be sealed airtight using UL listed duct sealant in accordance with SMACNA Table 1-1 Duct Sealing Class A Requirements.
16. Pipe penetration of casing shall be sealed with a continuous weld per Fig. 9-14. Mastic sealant is unacceptable.
17. Where duct lining is installed downstream of static pressure dampers, mixing dampers, volume dampers or at any point in the lined duct system where high velocity air may occur, provide perforated sheet metal lining to prevent erosion. This applies to all low, medium and high pressure duct systems.
18. Provide “Hat-Section” for smooth laminar air flow in lined duct at each accessory, i.e., mixing dampers, volume dampers, fire/smoke dampers, etc. Also, on ducts with external insulation, provide “Hat-Section” to exposed quadrant of damper.
19. Adhere to AMCA recommendations.
20. All ductwork to be insulated and acoustically lined.
21. Leak test all ductwork. Test shall be certified by a Balancing Agency (AABC or NEBB member) to comply with the latest SMACNA HVAC Air Duct Leakage Test Manual.
22. All ductwork should be designed and installed so that it does not contribute to noise transmission between adjacent rooms.
23. Provide stainless steel supports for stainless steel ductwork and Galvanized supports for galvanized sheet metal ductwork.
24. Provide manual volume damper at all branch ducts. Install “Hat” section to expose damper quadrant in externally insulated ductwork. Provide tight sealing nylon bushings or grommets at duct openings for damper shafts under the hat section. Fill space under the “Hat” section with insulation. Cut slot in end of damper rod.(quadrant end) to indicate blade position. Locate quadrant in accessible location. Provide access doors when located above inaccessible ceiling or remote control mechanism in approved locations with proper labels.
25. Construct ductwork per SMACNA 006-2006 HVAC Duct Construction Standards, no substitutions or equivalency will be accepted.
26. In remodel work where more than two or three branches are to be demolished from the main duct, they should be removed up to the main duct and the opening smoothly patched.
27. Provide air control valves in laboratories where air pressure relationship to be maintained is critical.
28. All connections to supply air diffusers in non-hospital projects in lay-in ceiling systems may be made with flexible ductwork, not to exceed seven feet in length.
29. All seismic restrain of ductwork and equipment shall be per the California Building Code. SMACNA, NUSIG or engineered system prepared by a California licensed engineer experienced in seismic design.
30. All welders shall be American Welding Society (AWS) or LA certified. Welding procedures shall be per AWS.

A. All sheet metal work shall have a pressure classification as follows:

1. Supply duct between main loop and inlet to terminal air unit - 4 inches W.G.
2. Supply ducts downstream of terminal air units, air handling units and fans - 2 inches W.G.
3. Return and exhaust air ducts - 2 inches W.G.

B. Ductwork: Unless otherwise specified.

1. Cold rolled “commercial” quality hot dipped galvanized in accordance with ASTM No. M525-67.

   a. Air Conditioning Systems.
   b. Ventilation Systems.

2. Dimensions scheduled on drawings are clear inside dimensions.
3. Fittings: Same gauge and construction as ducts. Elbows shall have centerline radius not less than 1.5 times width.
4. Duct supports as required by SMACNA.
5. Ducts with transverse and longitudinal bracings in accordance with SMACNA.

C. Flexible Ductwork:

1. The flexible duct for connection of ceiling air diffusers shall be a factory fabricated assembly consisting of and inner sleeve, insulation and an outer moisture barrier. The inner sleeve shall be constructed of an elastomeric compound reinforced with woven fiberglass banded to a vinyl coated spring steel wire supporting helix. A minimum 1 inch thick fiberglass insulating blanket shall encase the inner sleeve and be sheathed with an outer moisture barrier of a reinforced metalized Mular/neoprene laminate, or equal.
2. Acoustical performance of the flexible duct shall be in accordance with Air Diffusion Council Flexible Air Duct Test FD72R1: Paragraph 3.2.1, Sound Attenuation. The test data shall be made by an accredited independent testing laboratory in accordance with the above testing procedure.
3. The sound attenuation (insertion loss) of the flexible duct shall meet or exceed the values tabulated herein.

   Straight Duct Insertion Loss in Decibel Per Length of 10 Feet with No Airflow.

		Frequency Bank - Hertz						
Flexible Duct Inner Diameter		125	250	500	1000	2000	4000	8000
6 inches	5	10	18	22	22	20	13	
8 inches	4	9	17	22	22	18	10	
12 inches	3	7	15	22	22	16	8	

4. Certified test data shall be submitted for approval.
5. Installation of the flexible duct shall be in accordance with the manufacturer’s instructions and recommended procedures.
6. Flexible ductwork to be a maximum of 3.5 ft. in length. On runs requiring over 3.5 ft., install balance of duct run in sheet metal with standard sheet metal fittings.
7. Connections, airtight joints, fastened with clamps (similar to Ideal 5200 or 5600 series) and sealed with sealing compound and tape.
8. Flexible duct bends shall be installed with centerline radius not less than 1.5 time diameter and shall not be crushed to fit limited clearance.
9. Duct shall be U.L. approved.

D. Access Doors:

1. Furnish access door of sufficient size as required, for access, inspection, maintenance, and replacement to all instruments, controls and equipment.

E. Dampers:

1. Furnish all dampers necessary for proper control and balancing of air distribution as follows:

   a. All ducts which split in 2 or more branches to serve supply diffusers.
   b. At each supply and return device - see clause 2.09.
   c. As indicated.

F. Fire dampers shall be designed and constructed in accordance with NFPA Standard 90A and UL Standard 555 and shall be so labeled with a permanent identification. Fire damper shall be out-of-air stream type with a factory supplied sleeve. Fire damper shall be Ruskin Model CFD (or equal) with insulating blanket and State Fire Marshal listing.

G. Turning Vanes: Galvanized steel, single thickness turning vanes with 2 in. inside radius for all square elbows, unless otherwise noted.

H. Volume Dampers and Accessories: Provide Single blade type: use SMACNA Fig. 7-4 (Fig. A and Fig. C are not acceptable). For multi-blade volume damper, use SMACNA Fig. 7-5 (opposed blade action).

1. Follow SMACNA Fig. 7-4 and 7-4D for all details except as listed herein on single blade and two bladed dampers for 2” W.G. class duct with end bearing.
2. Use 3/8” continuous square rod and 18 gauge galvanized stiffened blade for damper blade sizes 18” wide by 10” high and smaller.
3. Use ½” continuous square rod and 16 gauge galvanized stiffened blade for damper blade sizes 19” to 48” wide by 10” high. Maximum blade size is 48” by 10” high.
4. Maximum of two blades without a frame. Over two blades, use a manufactured 16 gauge galvanized steel frame. All hardware shall be galvanized except brass trunions and bronze oilite bearings: Pottorff Series 400; or equal.
5. Quadrant shall be Durodyne model 3/8” K-4/1/2” K-5 Quadline or equal.
6. Provide closed end bearing, Durodyne SB-338 (3/8”) / SB-312 (1/2”) or equal.
7. Cut slot in end of damper rod (quadrant end) to indicate blade position.

2.2 TERMINAL AIR UNITS

A. Subject equipment shall be tested to and comply with all requirements of this specification. Representative samples shall be subjected to tests in accordance with applicable standards and procedures in order to demonstrate such compliance. All measurements shall be made in accordance with Air Diffusion Council Test Code No. 106R3, ASHRAE Standard 36.72. Test conditions and procedures shall be as specified in applicable standards cited above and in the Schedule. The results of the tests shall be certified by the testing agency and submitted for approval. The submittal shall include a complete description of the test conditions and the measurement procedure.

B. Units shall be furnished with 4-way controller.

2.3 DIFFUSERS

A. All diffusers, grilles and registers shall be of type and capacity as indicated on drawings. Steel and/or extruded aluminum construction with baked enamel finish color as selected by Architect. Diffusers to have no visible screw heads or connectors. Return grilles and exhaust registers similar to supply.

B. Opposed blade damper shall be provides in the neck of all supply and return air devices. These shall be adjustable through the face of the device.

C. Outlets furnished shall provide for the required capacity with no apparent drafts or excessive air movement. Outlets which cause excessive air movement or drafts shall be replaced at no cost to the University Representative.

D. Ceiling diffusers and registers shall be as called out on drawings. All diffuser and grilles frame styles shall be appropriate for the type of ceiling. Continuous linear diffuser plenums shall be lined with ½" lining.

E. The noise level produced shall comply with all requirements of the acoustical specification stated herein. A representative sample shall be tested in accordance with the procedure specified herein in order to demonstrate such compliance. All measurements shall be made in accordance with Air Diffusion Council Test Code No. 1062R3, and ASHRAE Standard 36-72. Test conditions shall be in accordance with the applicable standards. The test results shall be certified by the testing agency and submitted for approval. The test report shall include a complete description of the test conditions, measurement procedure and sample calculation.

F. The sound power level (PWL re 10^{-12} watts) of each type and size diffuser specified shall not exceed the values as follows:

	PWL in dB re 10^{-12} watts							
	Octave Band Center Frequency, Hz							
CFM Range	125	250	500	1000	2000	4000	8000	
Linear								
Diffuser up to	125	41	34	28	24	21	19	18
126 - 180	43	36	30	26	23	21	20	
181 - 280	45	38	32	28	25	23	22	
281 - 400	46	39	33	29	26	24	23	
Diffuser up to	125	46	39	33	29	26	24	23
126 - 180	48	41	35	31	28	26	25	
181 - 280	50	43	35	33	30	28	27	
281 - 400	51	44	38	34	31	29	28	

2.4 ROOM THERMOSTATS

A. Room thermostats and transmitter shall be of the miniature type. Two-pipe with pneumatic relays, pneumatic feedback and adjustable sensitivity. Room thermostats shall have concealed adjustments, plain cover without visible logo and be direct acting. Room thermostat shall be Johnson Controls to match the base building standards.

B. Thermostat shall be new and free from defects.

2.5 DOMESTIC WATER PIPING

A. As shown and scheduled on Drawings.

2.6 SOIL, WASTE AND VENT PIPING

A. As shown and scheduled on Drawings.

2.7 ESCUTCHEONS

A. Provide exposed piping with escutcheons where passing through walls, ceilings or partitions.

B. Provide sleeving for all piping that penetrates floor slabs.

2.8 ACCESS DOORS

A. Provide concealed valve access (except in removable tile ceilings) with adequate size access doors.

B. Provide duct access doors in all ducts with new fire dampers.

2.9 INSULATION AND LINING

A. Materials:

1. Insulation, jackets, facings, adhesives, coatings, and accessories fire hazard rating by Underwriters Laboratories, Inc. Steiner tunnel test method for fire hazard classification of building materials, standard UL 723, ASTM E-84, NFPA-225.

   a. Flamespread: Maximum 25.
   b. Fuel contributed and smoke developed: Maximum 50.
   c. Flameproofing treatments subject to deterioration due to moisture or humidity not acceptable.

2. Insulation shall be Manville, or equal.
3. Label as required by code.

B. All insulation applied according to manufacturer's published recommendations.

C. Insulate all piping, ductwork and equipment, except as follows:

1. Vents, overflow, cold water, drain and relief piping.
2. Return air ducts in conditioned spaces and exhaust air ducts, except where indicated.

D. Type of Insulation:

1. Duct insulation: 2-inch thick, ¾ lb. density, glass fiber insulation, with aluminum foil facing. Manville R-Series Microlite, or equal.
2. Duct lining: 2-inch thick, 1½ lb. density coated on air side with a fire resistant black neoprene coating. Manville Linacoustic, or equal.

2.10 IDENTIFICATION

A. An identification label shall be provided for the following types of equipment:

1. Terminal Air Units.
2. Damper Motors.
3. Valves.

B. Identification labels shall be by Seton, or equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION OF THE WORK

A. The contract drawings indicate the general arrangements for ductwork, piping and equipment:

1. Mechanical drawings included herewith are diagrammatic and do not indicate necessary offsets, obstructions or structural conditions.
2. It is the responsibility of the Contractor to install the work in such a manner that it will conform to the structure, avoid obstructions, maintain headroom, leave adequate clearances for maintenance and repairs, and provide clearance and access as required by codes.
3. Above items to be performed at no additional cost to the University Representative.
4. Manufacturer's drawings and instructions shall be followed in all cases where the makers of the devices and equipment furnish directions or details not shown on the drawings or described in the specifications.
5. Drawings are not intended to be scaled, but shall be followed with sufficient accuracy to coordinate with other work and structural limitations.
6. Seismic Design: The Contractor shall be responsible for all anchors, supports and connections of mechanical work to the building structure to prevent damage as a result of an earthquake, including manufactured equipment, the connection and integrity of shop fabricated and field fabricated materials and equipment. All supports, equipment and connections thereto shall be designed to conform to requirements of the California Administrative Code.
7. All ductwork shall be properly supported from building structure and/or framing in an approved manner, independent of the ceiling support system. Where overhead construction does not permit direct fastening of supports, furnish additional framing.
8. All equipment shall be securely fastened to building construction with approved supports.
9. Refer to architectural drawings for exact location of diffusers, grilles , registers, and plumbing fixtures.
10. All fire dampers shall be installed according to the requirements of the UL and State Fire Marshal listings.
11. Coordinate the work of this section with the work of other sections in ample time for proper installation and connection
12. Carefully check space requirements with other sections to ensure that all equipment cab be installed in the spaces allotted thereto.
13. Prepare drawings and calculations, attend meetings, obtain all approvals and/or variances required by all authorities having jurisdiction, conduct required tests and obtain required permits.

B. Tenant Fire Protection Work:

1. Alteration of existing systems to comply with tenant space requirements.
2. Installation of new sprinkler heads to match building standard unless noted otherwise. Install concealed sprinkler heads in all locations. (within noted scope of work areas shown on plans)
3. Provide and install all required pipe, valves, flow switches, indicators, drains, hangers, gauges, heads, identification and interface with existing systems for a complete operable, automatic fire sprinkler system.
4. Prepare drawings and calculations, attend meetings, obtain all approvals and/or variances required by all authorities having jurisdiction, conduct required tests and obtain required permits.

C. Fire Sprinkler New Construction:

1. Coordinate sprinkler head locations and piping with lighting fixtures, HVAC equipment, partitions, suspended ceilings, etc. Contractor shall review routing of all piping and sprinkler head locations in all finished areas and adjust piping sizes as required to handle any heads installed as hydraulic calculations require. All sprinkler heads shall match the existing building heads. Contractor to submit sample of sprinkler head prior to procuring or installing. Heads are Reliable KFRU2B upright and KFRP1C pendent.

3.2 CONTROL DEVICES

A. All control devices not specified to be furnished and installed under the Electrical sections shall be provided under this section.

3.3 TESTING AND BALANCING

A. General:

1. Adjustment: Each piece of equipment and all of the systems shall be adjusted to insure proper functioning of all controls and shall be left in operating condition
2. Preliminary Operation: The University Representative reserves the right to operate any systems or equipment prior to final completion and acceptance of the work. Such preliminary operation shall not be construed as an acceptance of any work.

B. Air Distribution and Exhaust Systems:

1. Balance and adjust air distribution system to quantities indicated on drawings in accordance with Associated Air Balance Council (AABC) manual, latest edition.
2. Balancing and testing as arranged by the University shall be performed and supervised by a certified independent firm specializing in testing and balancing, The firm shall be a member of AABC. Test reports shall be submitted in bound folders and on AABC type report forms. All diffusers shall be identified by designations on drawings.
3. Diffuser air delivery shall not be less than nor exceed by more than 5% the air delivery indicated on the plans.
4. Upon completion of the installation, Contractor shall rebalance any air distribution system affected by the renovation, including terminal air units and air outlets.

C. Fire Sprinkler System:

1. Upon completion and prior to acceptance of the installation, subject the system to a hydrostatic test pressure of 200 psi for a two-hour duration with no visible leakage.
2. Test of the complete sprinkler system shall be made under the direction of and in the presence of a representative of the University Fire Marshal.
3. Should any piece of apparatus or any work or material fail in any of the tests, it shall be immediately removed and replaced by perfect material at the contractor’s expense and the portion of the work by the contractor at his expense.

3.4 SUBMITTALS (DIGITAL ONLY)

A. After final operation for inspection and acceptance, deliver all copies of operation instructions, maintenance manuals and parts descriptions to the University Representative.

B. All tools supplied with the equipment for maintenance shall be tagged and temporarily secured to the unit, or turned over to the University Representative.

END OF SECTION

SECTION 23 07 19

PIPING INSULATION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Piping insulation.

B. Jackets and accessories.

1.2 REFERENCE STANDARDS

A. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2007.

B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2007.

C. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007.

D. ASTM C449 - Standard Specification for Mineral Fiber Hydraulic-Setting Thermal Insulating and Finishing Cement; 2007.

E. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2010.

F. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation; 2009.

G. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2008.

H. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2007e1.

I. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2007.

J. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2010a.

K. ASTM C585 - Standard Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System); 2010.

L. ASTM C591 - Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation; 2009.

M. ASTM C610 - Standard Specification for Molded Expanded Perlite Block and Pipe Thermal Insulation; 2010.

N. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008.

O. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2007.

P. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2006.

Q. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.

R. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2010.

S. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials; National Fire Protection Association; 2006.

T. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.

1.3 SUBMITTALS

A. See Section 01 33 23 for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

C. Manufacturer's Instructions: Indicate installation procedures that ensure acceptable workmanship and installation standards will be achieved.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than five years of documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified in this section with minimum five years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

1.6 FIELD CONDITIONS

A. Maintain ambient conditions required by manufacturers of each product.

B. Maintain temperature before, during, and after installation for minimum of 24 hours.

PART 2 – PRODUCTS

2.1 REQUIREMENTS FOR ALL PRODUCTS OF THIS SECTION

A. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84, NFPA 255, or UL 723.

B. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.

C. Materials shall meet the requirements of NFPA 90A.

D. All insulation shall be installed in accordance with National Commercial and Industrial Standards (NCIA).

E. Products shall not contain asbestos, lead, mercury, or mercury compounds.

F. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

G. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

H. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

2.2 GLASS FIBER

A. Manufacturers:

1. Knauf Insulation; Model ASJ/SSL: www.knaufusa.com. (or equal)
2. Johns Manville Corporation; Model Micro-Lok AP-T, Micro-Flex CTS: www.jm.com. (or equal)
3. Owens Corning Corp; Model ASJ/SSL-11: www.owenscorning.com. (or equal)
4. CertainTeed Corporation; Snap On, 500 deg., ASJ-SSL: www.certainteed.com. (or equal)

B. Insulation: ASTM C 547 and ASTM C 795; semi-rigid, noncombustible, end grain adhered to jacket.

1. 'K' value: ASTM C 177, 0.24 at 75 degrees F.
2. Maximum service temperature: 850 degrees F.
3. Maximum moisture absorption: 0.2 percent by volume.
4. Factory-Applied Jacket: All Service Jacket with Self-Sealing Adhesive (ASJ-SSL).

2.3 CELLULAR GLASS

A. Manufacturers: (or equal)

1. Pittsburgh Corning Corporation; Model Foamglas: www.pittsburghcorning.com.

B. Insulation: ASTM C 552, Grade 1. Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells.

1. 'K' value: 0.24 at 75 degrees F.
2. Service Temperature: Up to 900 degrees F.
3. Water Vapor Permeability: 0.005 perm inch.
4. Water Absorption: 0.2 percent by volume, maximum.

2.4 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturer:

1. Armacell International; Model AP Armaflex: www.armacell.com.
2. RBX Insul-Tube 180.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C

534 Grade 1; use molded tubular material wherever possible; conductivity (k) not to exceed 0.27 at 75°F.

1. Minimum Service Temperature: -40 degrees F.
2. Maximum Service Temperature: 220 degrees F.

2.5 JACKETS

A. PVC Plastic.

1. Manufacturers:

a. Johns Manville Corporation: www.jm.com. (or equal)

2. Jacket: One piece molded type fitting covers and sheet material, off-white color.

a. Minimum Service Temperature: 0 degrees F (-18 degrees C).
b. Maximum Service Temperature: 150 degrees F (66 degrees C).
c. Moisture Vapor Permeability: 0.002 perm inch (0.0029 ng/Pa s m), maximum, when tested in accordance with ASTM E96/E96M.
d. Thickness: 10 mil (0.25 mm).
e. Connections: Brush on welding adhesive.

3. Covering Adhesive Mastic:

a. Compatible with insulation.

B. Canvas Jacket: UL listed 6 oz/sq yd (220 g/sq m) plain weave cotton fabric treated with dilute fire retardant lagging adhesive.

1. Lagging Adhesive:

a. Manufacturers:
b. Compatible with insulation.

C. Aluminum Jacket: ASTM B209 (ASTM B209M) formed aluminum sheet.

1. Thickness: 0.016 inch (0.40 mm) sheet.
2. Finish: Smooth.
3. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
4. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.
5. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.010 inch (0.25 mm) thick stainless steel.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that piping has been tested before applying insulation materials.

B. Verify that surfaces are clean and dry, with foreign material removed.

3.2 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Exposed Piping: Locate insulation and cover seams in least visible locations.

D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

E. Glass fiber insulated pipes conveying fluids below ambient temperature:

1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

F. For hot piping conveying fluids over 140 degrees F (60 degrees C), insulate flanges and unions at equipment.

G. Glass fiber insulated pipes conveying fluids above ambient temperature:

1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

H. Inserts and Shields:

1. Application: Piping 1-1/2 inches (40 mm) diameter or larger.
2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
3. Insert location: Between support shield and piping and under the finish jacket.
4. Insert configuration: Minimum 6 inches (150 mm) long, of same thickness and contour as adjoining insulation; may be factory fabricated.
5. Insert material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

I. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions.

J. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with canvas jacket sized for finish painting.

K. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

L. Buried Piping: Provide factory fabricated assembly with inner all-purpose service jacket with self-sealing lap, and asphalt impregnated open mesh glass fabric, with one mil (0.025 mm) thick aluminum foil sandwiched between three layers of bituminous compound; outer surface faced with a polyester film.

M. Heat Traced Piping: Insulate fittings, joints, and valves with insulation of like material,

thickness, and finish as adjoining pipe. Size large enough to enclose pipe and heat tracer. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

3.3 SCHEDULES

A. Plumbing Systems: Refer to plumbing drawings.

END OF SECTION

SECTION 260000
ELECTRICAL

PART 1 - GENERAL

1.0 DESCRIPTION

A. Specifications are of simplified form and include incomplete sentences. Words or phrases such as “The Contractor shall,” “shall be,” “furnish,” “provide,” “a,” “an,” “the,” and “all” have been omitted for brevity.

B. Drawings are diagrammatic and indicate general arrangement of systems and work. Following drawings in laying out work and check drawings of other trades to verify space conditions.

C. Definitions:

1. “Furnish” or “Provide”: To supply, install and connect up complete and ready for safe and regular operation of particular work referred to unless specifically otherwise noted.
2. “Install”: To erect, mount and connect complete with related accessories.
3. “Supply”: To purchase, procure, acquire and deliver complete with related accessories and warranties.
4. “Work”: Labor, materials, equipment, apparatus, controls, accessories and other items required for proper and complete installation.
5. “Wiring”: Raceway, fittings, wire, boxes and related items.
6. “Concealed”: Embedded in masonry or other construction, installed in furred spaces, within double partitions or hung ceilings, in trenches, in crawl spaces or in enclosures.
7. “Exposed”: Not installed underground or “Concealed” as defined above.
8. “Equal”: Equal in materials, weight, size, design and efficiency of specified product.

D. Scope of Work: Labor, materials, equipment, services and fees necessary for complete safe installation in conformity with applicable codes and authorities having jurisdiction; as indicated on drawings and herein specified.

Refer to Drawings for all fixtures and finishes. Products listed in the drawings supersede the general standards listed within this specification section.

E. Ensure all outlets are labelled for circuitry, dedicated circuit or Title 24 energy saving outlets. Ensure all outlets on dedicated circuits are 20 amp rated outlets.

F. The Contractor shall secure all approvals and pay all fees for all work installed. Certificates shall be delivered to the University’s Representative before final payment will be made.

1.2 JOB CONDITIONS

A. Connections to Existing Work:

1. Install new work and connect to existing work with minimal interference to existing facilities.
2. Temporary shutdowns of existing services:

a. At no additional charge.
b. At times not to interfere with normal operations of existing facilities.
c. Only with prior approval and written consent of the University.

3. Alarm and emergency systems: Not to be interrupted.
4. Maintain continuous operation of existing facilities as required with necessary temporary connections between new and existing work.
5. Connect new work to existing work in neat and acceptable manner. Restore existing disturbed work to original condition including maintenance of wiring continuity as required.
6. Provide complete electrical separation from adjoining suite (normal power).

B. Removal and Relocation of Existing Work:

1. Safe-off, disconnect, remove and relocate electrical material, equipment and other work noted and required by removal or changes in existing construction. Verify operational status of existing material and equipment with building engineer and data representative to avoid interruption of potential current usage.
2. Verify and identify all circuits in demolished areas to be reused, verify circuiting to be safe-off is not servicing devices to remain energized. Indicate identified circuits on as-built documents.
3. Provide new material and equipment required for relocated equipment.
4. Disconnect load and line end of conductors feeding existing equipment.
5. Remove conductors from existing raceways to be rewired.
6. Remove abandoned conductors, raceways, conduit, boxes back to originating panel. Label spared circuits as “Spare” in panel schedule. Remove unused conduit and box support elements.
7. Cap abandoned conduit where it cannot be removed.
8. Cut and cap abandoned floor raceways flush with concrete floor or behind walls and ceilings.
9. Dispose of removed raceways and wire.
10. Dispose of removed electrical equipment as directed.

1.3 QUALITY ASSURANCE

A. Quality and Gauges of Materials:

1. Quality of materials:

a. New, best of their respective kinds, free from defects and listed by Underwriters Laboratories, Inc., or bearing their label.
b. Materials and equipment of similar application: Same manufacture, except as noted.

B. Current Characteristics:

1. Distribution.

a. 480Y/277 Volts, 60 Hertz with grounded neutral.
b. 208Y/120 Volts, 60 Hertz with grounded neutral.

C. Heights of Outlets:

1. From finished floor to centerline of outlets for:

a. Receptacles and telephones:

1)	Generally:	1 ft. - 3 in. to bottom of box from finish floor
2)	Over workbenches:	3 ft. - 6 in.

b. Wall switches: 4 ft. - 0 in. to top of box from finish floor

c. Motor controllers: 5 ft. - 0 in.

2. Exceptions:

a. At junction of different wall finish materials.
b. On molding or break in wall surface.
c. In violation of code.
d. As noted or directed coordinate with Architectural drawings.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Moving of Equipment: Where necessary, ship in crated sections of size to permit passing through available spaces.

B. Accessibility:

1. For operation, maintenance and repair.
2. Minor deviations: Permissible.
3. Changes of magnitude or involving extra cost: Not permissible without review.
4. Group concealed electrical equipment requiring access with equipment freely accessible through access doors.

1.5 SUBMITTALS

A. Submit shop drawings and product data in Refer to Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES. Submittal package to identify product to be used for the project.

B. Shop Drawings:

1. Submit prior to installation per Section 01 33 23.
2. Panelboards: Dimensions, schedules and catalog cuts.
3. Transformer
4. Wall switches.
5. Insertion receptacles.
6. Dimmer switches.
7. Device plates.
8. Poke-throughs.
9. Lighting fixtures.
10. Lighting Control System.
11. Life safety system.
12. Key switches.

a. Descriptive data for all products and materials.
b. Recommended application and installation methods, including area coverage for smoke detectors.
c. Information and data, such as drawings showing device locations and types, riser diagrams, wiring diagrams, approvals, test data, etc. required by local Authorities.
d. Complete shop drawings of all custom-fabricated or assembled products, including wiring diagrams.
e. Drawings identifying all terminals and illustrating all device wiring connections.

12. One set of as-built PDF drawings.

PART 2 - PRODUCTS

2.1 GENERAL

A. Nameplates:

1. Fastened with epoxy cement, engraved white Lamicoid sheet with 3/4 in. black lettering.
2. Inscription: Subject to review, indicating equipment and voltage.
3. Provide for:

    a. Disconnect switches.
    b. Circuit breakers.
    c. Panels.
    d. Cabinets.

B. Supports:

1. Supports from building construction: Beam clamps, steel fishplates (in concrete fill only) or cantilever brackets.
2. Grouped lines and services: Trapeze hangers of bolted angles or channels.
3. Where building construction is inadequate: Provide additional framing.

2.2 MATERIALS

A. Raceways:

1. Rigid steel conduit (RGS): Full-weight pipe, galvanized, threaded, minimum ¾".
2. Intermediate metal conduit (IMC): Lightweight steel pipe, galvanized, threaded, minimum ¾".
3. Electro-metallic tubing (EMT): Thin wall pipe, galvanized, threadless, minimum ¾".
4. Flexible aluminum conduit: Not allowed.
4. Flexible steel conduit: Not allowed. Refer to Section 3.01.B.13 for exceptions.

B. Fittings and Accessories:

1. Raceway fittings:

    a. Rigid steel: Nonsplit, threaded, steel or malleable iron. Zinc die cast not permitted.
    b. Rigid aluminum conduit: Nonsplit, threaded copperfree aluminum alloy or hot-dipped galvanized.
    c. Electro-metallic tubing: Compression or double set screw type. Galvanized rigid steel elbows, 2 in. or larger.
    d. Flexible metallic conduit: Angle wedge type with insulated throat.
    e. Bushings: Metallic insulated type.

C. Boxes:

1. Outlet boxes: Except as otherwise required by construction, device or wiring.

    a. Stamped or welded steel, 4 in. square or octagon for:

        1) Lighting fixtures: 1-1/2 in. deep above ceiling, 2-1/8 in. deep in wall.
        2) In wall for receptacles and switches: 1-1/2 in. deep.
        3) In wall for telephone and data: 2-1/8 in. deep.
        4) With raised covers and fixtures studs where required.
        5) Through-the-wall type, not permitted.

6) Without fixture or device: Blank cover.
7) Offset back-to-back outlets: Minimum 6 in. separation.

b. Galvanized cast iron or aluminum with threaded hubs: 4 inch round, 2 inch deep on ceiling, and 4 inch square, 2 inch deep on wall.
c. Boxes for outdoors and damp locations: Weatherproof, cast metal.
d. In hazardous locations: Cast, copper-free aluminum.
e. Boxes without fixture or device: Provide with blank cover.

2. Junction and pull boxes:

a. Galvanized sheet steel.
b. Covers: Screw-on, except as noted.
c. All boxes to be closed prior to final sign off.
d. Discovered open boxes should be brought to Building Engineer's attention for further action.
e. With insulated supports and cables.
f. Location: As noted or required and accessible.
g. Provide barriers:

1) 480Y/277 volt wiring energized from separate services.
2) 208Y/120 volt and 480Y/277 volt wiring.
3) Emergency and normal wiring.

h. Provide barriers in existing boxes between:

1) 480/277 volt wiring energized from separate services.
2) 208/120 volt and 480Y/277 volt wiring.
3) Emergency and normal wiring.

3. Floor boxes: galvanized cast iron with brass covers and flanges, or as indicated on drawings suitable for conduit and devices indicated.

D. Wire and Cable:

1. Conductors:

a. ASTM Standard Solid No. 12 and smaller, Stranded No. 10 and larger.

1) Type: Copper.
2) Size:

a) General use:

(1) No. 12 minimum
(2) At 120 volts and over 100 ft. circuit length: No. 10 minimum.
(3) At 277 volts and over 200 ft. circuit length: No. 10 minimum.

b) Control and alarm, except as noted:

(1) No. 14 minimum.
(2) At 120 volts and over 200 ft. circuit length: No. 12 minimum.

c) Other voltages and phases: As required to maintain voltage drop.
d) Increase raceway sizes for larger wire as required.

2. Insulation:

a. THWN/THHN: Feeders and branch circuits except as noted.

b. Color coding: As per Code. Where color-coding is unavailable, certify in writing and request permission to overlap color-taping conductors (minimum length 6 in.) in accessible locations.

3. Accessories:

a. Tags:

1) Flameproof linen or fiber in accessible locations.
2) Feeders: Indicate feeder number, size, phase and points of origin and terminations.
3) Control and alarm wiring: Indicate type (Control or alarm), size of wire, and points of origin and terminations.

b. Terminations, splices and taps under 600 volts:

1) Copper conductors No. 10 and smaller: With compression-type of twist-on spring-loaded connectors and clear nylon-insulated covering.
2) Copper conductors No. 8 and larger: Mechanical bolted pressure or hydraulic compression type using manufacturer's recommended tooling.
3) Cable lugs and connectors: Compression type of same metal as conductor. Provide to match cable, with marking indicating size and type.

E. Devices:

1. Local wall switches shall be "DECORA" model no. #6291-w1 or 3 way #6293 w1, 277 volt, color white, as manufactured by Leviton Corp. See plans for switch specifications, see plans for low voltage switching specifications.

2. Dimmer switches shall be Universal Incandescent, LED or CFL slider type, size as indicated. Dimmer switches shall be "DECORA, SureSlide " Model No. #IPL06 – LED/CFL 150 W, Incandescent 600W, 120VAC, 60HZ, color white, as manufactured by Leviton Corp., see plans for low voltage switching specifications.

3. Provide key switch for restrooms.

3. Insertion receptacles shall be "DECORA" Model No. # 6227-w-1, color white, as manufactured by Leviton Corp., (or equal).

4. Fire rated poke-throughs shall be Legrand 4FFATC Multi Service furniture feed, RC4 type (or equal)

5. Device plates shall be "DECORA", color to meet building standard device color, as manufactured by Leviton Corp., (or equal).
a. For receptacles with other than 120 volt, inscribed voltage available.

6. Occupancy sensor shall be "DECORA" Model No. #6775, color white, as manufactured by Leviton Corp., (or equal).

Occupancy sensor technology:	passive infrared
Adjustment:	single-pole
Min. pattern:	180 degrees
Min. coverage range:	2100 sf
Min. time adjustment:	1 minute
Max. time adjustment:	15 minute
Min. Load Rating:	800W@120V INC 1200VA@120V 2700VA@277V FL
Voltage:	120/277 Volt AC 60Hz
Photo Cell:	Ambient Override ON
Standards And Certifications:	UL and CSA
Min. warranty:	1-year

7. GFCI Receptacle shall be ” HUBBEL” GF20WL, color white, (or equal).

F. Low Voltage Distribution Equipment:

1. Disconnect switches:

a. Fused or nonfused as noted.
b. Voltage as required.
c. Heavy duty, except as noted.
d. Horsepower rated for motor loads.
e. Toggle type:

1) Non-fused, load breaks.
2) Maximum ratings:
a) 20 amp at 600 volts.
b) 30 amp at 250 volts.

3) 2 pole: Equal to Arrow-Hart, No. 6808F. Square D Class 2510
4) 3 pole: Equal to Arrow-Hart, No. 7810F. Square D Class 2510

f. Knife-blade type:

1) Load break, quick-make-quick break, UL Class 4 up to 600 amp.
2) Maximum rating except as noted: 800 amp.
3) Arc quenchers.
4) Individually mounted: Equal to General Electric “TH”, Square D H32 series, or equal.
5) Panelboard or switchboard mounted: Equal to General Electric “QMR”, Square D “QMB” or equal.

g. Enclosures: Dead Front, NEMA Type 1, except as noted.

2. Fuses: Match building standard:
a. Match existing.
b. For motor and transformer loads:
1) Current limiting, dual element, time delay type, maximum rating: 600 amp at required voltage.
2) 200,000-amp IC, UL Class RK5: Equal to Bussmann Fusetron FRN or FRS or Lo-Peak LPN or LPS.

c. For other loads: Match building standards:

1) Current limiting, fast acting type.
2) 200,000-amp IC (UL Class RK5, up to 600 amp; Class RK1, over 600 amp). (Equal to Bussmann Limitron KTN, KTS, or KTU)

d. All fuses: Same manufacturer.
e. Provide 1 spare matching fuse for each set of 3.

3. Circuit breakers:
a. Molded case:

1) Thermal-magnetic, quick-make-quick-break.
2) Manually operated with insulated trip-free handle.
3) Multi-pole types: With internal trip bar.
4) Terminals: UL listed for 75 degree C and suitable for copper or aluminum cable.
5) Enclosures: Dead front, NEMA Type 1, except as noted.
6) Frames, IC and interchangeable trips:

a) 120/240 volts, 100-amp frames.
(1) Interrupting capacity: 10,000 amps.
(2) 1, 2 and 3 poles

b) 240 volts, 225-ampere frame:
(1) Interrupting capacity: 25,000 amps.
(2) 3 poles.
c) 277 volts, 100-amp frame:
(1) Interrupting capacity: 14,000 amps.
(2) 1 pole.

d) 480 volts, 100-amp frame:
(1) Interrupting capacity: 20,000 amps.
(2) 2 and 3 poles.

e) 480 volts, 225-amp frame:
(1) Interrupting Capacity: 30,000 amps.
(2) 2 and 3 poles.
(3) Interchangeable Trip

4. Distribution Panels:
a. Match existing.

5. Transformers:
a. Match existing manufacturer.

G. Lighting Fixtures:

1. Provide fixtures, components and lamps.
2. Type of fixtures indicated per plan.
3. Incandescent: 120 volt, except as noted.
4. Fluorescent:
a. 277 volt, except as noted.
b. Shall be certified by the manufacturer to comply with Title 24.

Office Area Specifications: REFER TO DRAWINGS FOR SPECIFICATIONS

5. Fixture catalog numbers used to illustrate equipment type do not necessarily denote required mounting equipment or accessories. Provide accessories to suit.

6. Ballasts: Dimming Electronic, Instant Start, 2 or 3 T-5 or T-8 Lamp 277V (OR AS NOTED ON DRAWINGS)
7. Motion or Occupancy Sensors must be compatible in power and harmonics with specified building standard electronic ballasts.
8. Contractor's base bid is to include fixtures on schedule (SEE DRAWING).
9. If LED lights are specified, include all related controls for Title 24 compliance.
10. If fluorescent fixtures are new or re-used, provide dimmable ballast and related controls for Title 24 compliance.
11. Exit signs shall be dual circuits – Connect to emergency power and normal building power.

H. Life Safety System:

1. Provide Life Safety System components necessary for a complete system and connect to existing Base building system. All Fire Alarm work shall be performed by Simplex-Grinnell. The work shall include, but not limited to the following:

   a. Alarm initiating devices.
      1) Area ionization smoke detectors.
      2) Duct ionization smoke detectors.

   b. Horn-Strobes.
   c. Emergency signaling and paging speakers.
   d. Magnetic door holders.
   e. Remote alarm/trouble station.
   f. Conduit, wiring, outlets, wire, etc. required to provide power to and interconnect all components listed above.

2. The entire installation, including materials and equipment shall be compatible with base building equipment and meet or exceed the minimum standards and requirements of the following:
   a. Underwriters' Laboratories, Inc. listing service.
   b. NFPA National Fire Codes.
   c. Uniform Building Code as accepted and/or modified by local Authorities.
   d. State of California Title 24 High Rise Requirements.

3. All equipment and materials used shall be standard components, regularly manufactured and of the same manufacturer.
4. System Supervision: Per Building Standards.
5. Alarm Initiating Devices: Per Building Standards.
6. Emergency Signally and Paging Speakers: Per Building Standards.

I. Telephone/Data Control System:

1. Complete System of:
   a. Empty Conduit, minimum 1½" conduit size.
   b. Pull boxes.
   c. Outlets.
   d. Sleeves.
   e. Fishwires and pullcords.
   f. Terminal Boards.
   g. Terminal Strip Cabinets.

2. Outlets:

a. Wall: 4 in. Square with bushed cover plate.
b. Floor: Poke-through fittings.

3. Terminal Boards: Fireproof plywood, sizes as indicated.
4. Conduit: 1 in. minimum.
5. Tel/Data cable installation by University to be coordinated with General Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Painting:
   a. Paint:

      1) Best grade for its purpose.
      2) Deliver in original seal containers.
      3) Apply in accordance with manufacturer's instructions.
      4) Colors: As selected by University's Representative.

   b. Galvanized iron primer: Panel and pull boxes, after fabrication.
   c. Hot dipped galvanized or dipped in zinc chromate: Outlet boxes, junction boxes, conduit hangers, rods inserts and supports.
   d. Zinc chromate with finish to match surroundings: Marred surfaces of steel equipment and raceways.

2. Cleaning:
   a. Brush and clean work prior to concealing, painting or priming.
   b. Painted exposed work soiled or damaged: Clean and repair to match adjoining work before final acceptance.
   c. Remove debris from inside and outside of material and equipment.

3. Cutting and Patching: As required for new work.

B. Raceways:

1. Minimum size: ¾ inch for power distribution.
2. Run concealed, except as noted
3. Supports:
   a. Ceiling trapeze, strap hangers or wall brackets.
   b. U-bolts: At each floor level of riser raceways and connected to acceptable supports.
   c. Riser clamps: At each floor level or riser raceways and resting on slab.
   d. Secure raceways to support with pipe straps or u-bolts.
   e. Spacing:

      1) Minimum 10 ft. on centers for metallic raceway and as required for non-metallic raceway.
      2) 5 ft. on centers for wireways.
      3) Per code and as noted for others.

   f. Mount supports to structure with:

      1) Toggle bolts on hollow masonry.

2) Expansion shields or inserts in concrete and brick.
3) Machine screws on metal.
4) Beam clamps on framework.
5) Wood screws on wood.
6) Pan through straps in metal deck.
7) Nails, rawl plugs or wood plugs not permitted.
8) Where required by structure: Through bolts and fish plates.

4. Exposed: Run parallel with or at right angles to walls.
5. Clearance from water, steam or other piping: Minimum 3 in. separation from steam and hot water pipes, except 1 in. from pipe cover at crossings.
6. For hung ceiling outlets: Run in hung ceilings and connect to ceiling support channels.
7. In masonry: Run vertically only.
8. Maintain grounding continuity of interrupted metallic raceways with ground conductor, and in flexible conduit for feeders and motor terminal connections.
9. Empty raceways over 10 ft. long: Provide fish or pull wire, galvanized or nylon rope.
10. Rigid steel conduit:

a. Permitted uses:
1) Feeders.
2) Branch circuits.

b. Paint male threads of field-threaded conduit with graphite-base pipe compound. Butt conduit ends.
c. Touch up marred surfaces and field-out threads, CR.-cold galvanized.

11. Intermediate metallic conduit:
a. Permitted uses: Same as rigid steel conduit.

12. EMT:

a. Permitted uses:
1) Feeders and branch circuits.
2) Dry locations, dry walls, hanging ceilings, hollow block walls and furred spaces.

13. Flexible steel conduit:
a. Aluminum flex conduit is not acceptable. Flexible steel conduit may be used only where acceptable by code authorities and only as follows:

1) Where indicated.
2) For final connection to motors, vibrating equipment or where required for equipment servicing.
3) For connections to recessed lighting fixtures from nearby accessible junction boxes, min. 4 ft., max. 6ft. length..
4) For concealed branch, horizontal circuit runs in stud walls and in dry locations where structural conditions prevent the use of other types of conduit.
5) For sheet connections where rigid conduit is impractical.
6) In commercial kitchens, damp locations or areas exposed to the weather, use liquidtight type of flexible conduit provided the jacket temperature limitation will not be exceeded.
7) Provide separate green copper ground.
8) With written authorization.

. 14. Flexible aluminum conduit: (Not allowed)

15. MC Cable: (Not Allowed)
16. Aluminum conduits:

    a. Permitted uses:
        1) Feeders.
        2) Branch circuits.

    b. Through concrete and masonry walls and floors: Use metallic sleeve and seal conduit in sleeve.
    c. Maintain clearance between conduit and surfaces:
        1) In moist locations.
        2) In interior spaces below exterior finished grade.

    d. Connectors to steel surfaces: Maintain galvanized-to-aluminum contact or paint with asphalt-base paint.
    e. Pull wire: Steel core nylon rope and terminal ball.
    f. Use galvanized steel elbows for all bends.

17. Expansion fittings: At right angles with slip joint centered in expansion joint. Provide on length of runs in accordance with manufacturer's recommendations. Preset to allow for temperature variation.
18. Raceways passing through fire-rated construction. Seal opening with fire sealant.
19. Outlet boxes:

    a. Set boxes square and true with building finish.
    b. Secure to building structure by adjustable strap irons or grout in with masonry.

c. Verify outlet locations in finished spaces with architectural drawings of interior details and finishes.
    d. Provide barriers between switches connected to different phases for voltages exceeding 150 volts to ground.

20. Panel, junction and pull boxes:

    a. Location:
        1) Clear of other trades.
        2) Conceal junction and pull boxes in finished spaces.
        3) Accessible.

    b. Support: From building structure, independent of conduit. Provide floor-to-ceiling channels for mounting on dry wall and lightweight construction.

    c. Outlet boxes for fixtures recessed in hung ceilings: Accessible through opening created by removal of fixture. Secure to black iron ceiling support.

    d. Motor terminal boxes: Coordinate with motor branch circuit conduit and wiring. Add box volume where required.

21. Fire sealants: Provide for raceways and wire passing through floor slots, sleeves and openings in fire-partitioned rooms.
22. Outdoor installation: Weatherproof except as noted; below grade, waterproof.
23. Tests:

    a. Continuity:

        1) Test resistance of feeder conduits from service to point of final distribution using 1 conductor return.

2) Maximum: 25 OHMS Resistance

C. Wire and Cable:

1. 600 Volt Cable:
   a. Not more than three (3) lighting or convenience outlet circuits in 1 conduit unless otherwise indicated.
   b. Separate raceways for conductors of 208Y/120 and 480Y/277 volt systems, except 480 volt motor branch circuit wiring and related 120 volt control wiring.
   c. No thermoplastic wires in computer area raised floors.

2. Tests:
   a. Continuity and insulation tests:
      1) 600 Volts: Megger, 50 MegOhms, minimum.
      2) 100 Percent of feeders.
      3) 10 percent of branch circuits.

   b. Perform:
      1) Prior to connecting equipment.
      2) In presence of authorized representative.

   c. Submit written report of results.
   d. Correct or replace cable resting below the above listed standard.

D. Distribution Panelboards:

1. Balance the load over phases when new circuits are added to new or existing panels.
   a. Provide multi-cable lugs where required.

2. Provide typewritten directory in new panelboards.
3. Place all existing circuits and update directories on existing panelboards where circuiting is changed.
4. Tests: Open and close load break switching devices under load.

E. Life Safety System:

1. Installation shall be supervised and tested by the Manufacturer of the system equipment. The work shall be performed by skilled technicians under the direction of experienced engineers, all of whom shall be properly trained and qualified for this work.
2. System shall be installed with all conduit, conductors, outlet boxes, fittings, connectors and accessories necessary to ensure a complete, operable system in compliance with all applicable Codes and regulations.

   a. Conduit: All conduit and its installation shall be in accordance with this Specification.
   b. Wire and cable: All wiring shall be installed in metal conduit or within equipment. Conductors shall be installed in accord with this Specification. Conductors within equipment enclosures shall be carefully cabled and laced. They shall be color-coded and individual conductors shall be tagged with E-Z code markers indicating circuit number and type. Markers shall be used on all conductors at each outlet or pull box and at each equipment enclosure.
   c. Outlet pull and junction boxes shall be painted red on the exterior and shall be installed in accord with this Specification.
   d. End-of-line resistors for speaker circuits shall be installed in floor terminal cabinets.
   e. Pigtail and/or tapped connection will not be allowed on supervised circuit. Connections shall be made directly to and from device terminal screws.

F. Telephone/Data Circuit System:

1. Fishwire or pullcords, in raceway over 10 ft. long.
2. Power supply for telephone equipment rooms.
3. Run empty conduit from outlet into accessible hung ceiling.
4. Provide dedicated ground wire from building steel to telephone system isolation transformer.

END OF SECTION

LIST OF DRAWINGS

SHEET NO.	TITLE	SHEET DATE
A-0.0	COVER SHEET	10.16.19
BP-0.1	BUILDING PERMIT	10.16.19
A-0.1	SITE PLAN AND EGRESS PLAN	10.16.19
A-0.1.1	ACCESSIBLE PATH OF TRAVEL PLAN AND DETAILS	10.16.19
A-0.2	EXITING PLAN AND OCCUPANCY PLAN	10.16.19
A-0.3	SUITE ACCESSIBLE PATH OF TRAVEL PLAN	10.16.19
A-0.4	ACCESSIBLE RESTROOM AND DETAILS	10.16.19
A-0.5	GREEN FORMS AND NOTES	10.16.19
A-1.0	DEMOLITION PLAN AND REFLECTED CEILING DEMOLITION PLAN	10.16.19
A-2.0	CONSTRUCTION PLAN AND FINISH PLAN	10.16.19
A-3.0	REFLECTED CEILING PLAN AND POWER & COMMUNICATIONS PLAN	10.16.19
D-1.0	DETAILS	10.16.19
D-2.0	DETAILS	10.16.19
D-3.0	INTERIOR ELEVATIONS AND DETAILS	10.16.19
M-T24	MECHANICAL TITLE 24 FORMS	10.16.19
M-001	MECHANICAL LEGENDS, SCHEDULES AND NOTES	10.16.19
M-100	MECHANICAL PARTIAL DEMOLITION FLOOR PLAN SUITE 620	10.16.19
M-200	MECHANICAL PARTIAL DEMOLITION FLOOR PLAN SUITE 620	10.16.19
M-300	MECHANICAL DETAILS	10.16.19
E-0.0	ELECTRICAL ABBREVIATIONS, SYMBOLS & GENERAL NOTES	10.16.19
E-0.1	ENERGY COMPLIANCE FORMS	10.16.19
E-0.2	ENERGY COMPLIANCE FORMS	10.16.19
E-0.3	EGRESS LIGHTING CALCULATIONS	10.16.19
E1.0	PANEL SCHEDULES	10.16.19
E-2.0	DEMOLITION AND NEW POWER PLANS	10.16.19
E-3.0	DEMOLITION AND NEW LIGHTING PLANS	10.16.19
E-4.0	ELECTRICAL DETAILS	10.16.19
P-001	PLUMBING LEGENDS, SCHEDULES NOTES AND OVERALL PLAN	10.16.19
P-100	PLUMBING ENLARGED PLAN AND DETAILS	10.16.19

END OF LIST OF DRAWINGS