

ADDENDUM NO. 03
SEPTEMBER 13, 2017

PROJECT: **School of Public Health MEP Renovation**
FROM: **Infrastructure Associates, Inc.**
6117 Richmond Ave.
Houston, Texas 77057
TO: **Prospective Bidders**

THE SOLICITATION MENTIONED ABOVE IS AMENDED AS SET FORTH BELOW.

This Addendum uses the "change-page" method as follows:

For Revisions to the Project Manual:

Remove obsolete pages and delete, replace, or add pages as indicated issued under this Addendum.

For Revisions to Drawings:

Remove obsolete sheets and replace or add sheets issued as indicated under this Addendum.

PART 1 - CHANGES TO PROJECT MANUAL

- A. Add the following new specification sections to the project manual issued September 13, 2017 as Addendum #3:
1. 015750 – TEMPORARY INFECTION CONTROL
 2. 230110 – HVAC SYSTEM CLEANING

PART 2 - CHANGES TO DRAWINGS

- B. Revise the following drawing sheets with drawing revisions issued September 13, 2017 as Addendum #3:
- 1 G100 – GENERAL INFORMATION
 - 2 M706 – CONTROLS POINTS

- END -

SECTION 01 57 50
TEMPORARY INFECTION CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Construction activity type.
- B. Infection control groups and performance requirements.
- C. Quality control.
- D. Infection control permits.
- E. Infection control procedures.
- F. Enforcement.

1.02 PROJECT REQUIREMENTS

- A. In addition to following all Federal, State and Local requirements, the contractor shall also comply with the Owner's Infection Control Risk Assessment (ICRA) for this project. The Owner is required to manage the design and building of the environment when it is renovated, altered or newly created per The Joint Commission on Accreditation of Healthcare Organization (JCAHO) regulation EC.8.30. The assessment identifies construction related hazards that could potentially compromise patient care in occupied areas within healthcare institutions.
- B. The construction activity types, infection control risk groups, and procedures identified in this section and the drawings, are to be used in conjunction with the Owner's Infection Control Risk Assessment (ICRA). This risk criteria addresses the impact demolition, renovation, or new construction activities have on air-quality requirements, infection control, utility requirements, noise, vibration, emergency procedures, water damage and mold remediation.

1.03 RELATED SECTIONS

- A. Section 01 10 00 - Summary
- B. Section 01 50 00 - Temporary Facilities and Controls
- C. Section 01 70 00 - Execution Requirements
- D. Section 01 57 21 - Indoor Air Quality Controls

1.04 CONSTRUCTION ACTIVITY TYPES

- A. The construction activity types are defined by the amount of dust that is generated, the duration of the activity, and the amount of shared HVAC systems. Contact the Owner's Safety department, Facilities Planning and Development department, and Infection Control department if any activity is questionable under these guidelines.
- B. Type A: Inspections and non-invasive activities. Includes, but is not limited to, removal of ceiling tiles for visual inspection (limited to 1 tile per 50 square feet), painting (but not sanding), wallcovering, electrical trim work, minor plumbing, and activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
- C. Type B: Small scale, short duration activities that create minimal dust. Includes, but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting of walls or ceiling where dust migration can be controlled.
- D. Type C: Any work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies. Includes, but is not limited to, sanding of walls for painting or wallcovering, removal of floorcoverings, ceiling tiles and casework, new wall construction, minor ductwork or electrical work above ceilings, major cabling activities, and any activity that cannot be completed within a single workshift.
- E. Type D: Major demolition and construction projects. Includes, but is not limited to, activities that require consecutive work shifts, requires heavy demolition or removal of a complete ceiling system, and new construction.

1.05 INFECTION CONTROL RISK GROUPS

GROUP 1 GROUP 2 GROUP 3 GROUP 4
 LOWEST MEDIUM HIGH HIGHEST
 RISK RISK RISK RISK

Office areas in Rehab/Phy. Therapy Ambulatory Care Center All I.C.U.'s (PACU, office suites. All patient areas not Kitchen PICU, NICU)

OTHERWISE LISTED. DIAGNOSTIC IMAGING DAY SURGERY

Gift shop PT/OT (including Pharmacy (admixture
 Corridors (in non-patient Pharmacy (non-admixture areas)
 areas) areas) Cath Lab
 Cardiology/Ecocardio-Dialysis
 graphy Endoscopy
 Dental Clinic BMT Unit/Transplant
 Morgue Inpatient Care Units
 Emergency Room Routine Care
 Nuclear Medicine Special Care
 Laboratories (General) Critical Care
 Respiratory Therapy Negative Pressure/
 Isolation Areas
 All Operating Rooms
 Sterile Processing/
 Supply Areas
 Labor and Delivery
 Newborn Nursery
 Immunocompromised
 Patient Areas
 Burn Unit

1.06 CONSTRUCTION ACTIVITY / INFECTION CONTROL MATRIX

- A. If not shown on the Drawings, determine the level of infection control classification necessary for the Work by matching the construction activity with the designated risk group in the Matrix below. Provide the associated Infection Control Procedures for the determined Class as specified in Part 3 - Execution of this Section.

CONSTRUCTION ACTIVITY

RISK GROUP TYPE TYPE TYPE TYPE

"A" "B" "C" "D"

GROUP 1	I	II	II	III / IV
GROUP 2	I	II	III	IV
GROUP 3		I	III	III / IV IV
GROUP 4		III	III / IV	III / IV IV

1.07 PERFORMANCE REQUIREMENTS

- A. Infection control is critical in areas of all facilities. Construction activities causing disturbance of existing dust, or creating new dust, must be conducted in tight enclosures cutting off any flow of particles into patient areas. Protection of building materials from exposure to water must be provided.
- B. Require all contractors, subcontractors, sub-subcontractors, material suppliers, vendors, employees, or agents to be bound by these same requirements. Before any construction on site begins, the Contractor's on-site management team shall attend a mandatory meeting held by the Owner's Infection Control authorities, for review of the Infection Control Risk Assessment (ICRA), training and instruction on precautions to be taken. This requirement will not be enforced if the work involved is classified as I, type A only.
- C. HEPA equipped air filtration machines shall provide air flow into construction area at fewer than 100 FPM at barricade entrances with doors fully open. HEPA equipped air filtration machines shall be connected to normal power, ganged to a single switch for emergency shut off, and shall run continuously. Filters are to be replaced at intervals recommended by the machine manufacturer.
- D. Performance requirements for certain activities may be modified by the Owner's Safety or Infection Control Departments. Any modifications will be written on the Infection Control Permit. Any modifications made by owner's personnel does not relieve the Contractor of compliance with proper infection control procedures.

1.08 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements for submittal procedures and requirements.
- B. Submit report of infection control procedures, including location and details of barriers.
- C. Product Data: Submit product data for products used in infection control program.

1.09 QUALITY CONTROL

- A. The Owner's Infection Control Department will monitor biological counts in the vicinity of the Work. Whenever safe levels are exceeded, the Contractor will be notified to correct conditions immediately.
 - 1. All work shall be stopped on the project whenever a hazardous infection control deficiency exists.
 - 2. Contractor shall take immediate action to correct all deficiencies.
 - 3. Failure of Contractor to correct such deficiencies will result in corrective action taken by the Owner and deduction of all costs to correct the deficiencies from the Contract.
- B. To prevent the proliferation of mold fungal spores, all water damaged building materials must be replaced or remediated.

1.10 INFECTION CONTROL PERMIT

- A. An Infection Control Permit is required for Class III or higher procedures and any activity in a Group 4 Infection Control Group.
- B. When required, obtain Infection Control Permit from the Owner's Facilities Planning and Development Department before beginning any demolition or construction work.
- C. Infection Control Permit to be displayed at entrance to Work area during entire construction period.
- D. Return permit at completion of Work to the Owner's Safety Department.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Sheet Plastic: Fire retardant polyethylene, 6 mil thickness.
- B. Barrier Doors: Solid core wood in metal frame, painted.

- C. HEPA Equipped Air Filtration Machines: Forced Air 2000EC HEPA equipped air filtration units as manufactured by Advanced Containment Systems, Inc., www.acsi-us.com. Provide HEPA filter, primary and secondary filters or equal.
- D. Exhaust Hoses: Heavy duty, flexible steel reinforced; Ventilation Blower Hose, R360G as manufactured by Federal Hose Mfg. Co., www.federalhose.com, or equal.
- E. Adhesive Walk Off Mats: Provide minimum size mats of 24 inches x 36 inches. Product: "Clean-Walk Mats" as manufactured by 3M, solutions.3m.com, or equal.
- F. Disinfectant: Owner-approved disinfectant.
- G. Control Cube: Portable Ceiling Access Module, "Kontrol Kube Top Sider." with heavy duty vinyl enclosure as manufactured by Fiberlock Technologies, Inc., www.kontrolkube.com, or equal.

2.02 BARRIERS

- A. Closed door with masking tape applied over the frame and door is acceptable for projects that can be contained within a single room.
- B. Construction, demolition, or reconstruction not capable of containment within a single room must have the following barriers erected:
 - 1. Air-tight plastic barrier that extends from floor to ceiling. Seams must be sealed with duct tape to prevent dust and debris from escaping.
 - 2. Drywall barrier erected to structure above with joints covered or sealed to prevent dust and debris from escaping.
 - 3. Seal all penetrations in existing barriers air tight.
 - 4. Barriers at penetration of ceiling envelopes, chases, and ceiling spaces to stop movement of air and debris.
 - 5. Ante-room or double entrance openings that allow for workers to remove protective clothing or vacuum off existing clothing.
 - 6. At elevator shafts or stairways within the field of construction.
 - 7. Overlapping flap minimum 2 feet wide at polyethylene enclosures for personnel access.

PART 3 EXECUTION

3.01 GENERAL

3.02 INSTALLATION

- A. Temporary construction barriers and closures above ceilings shall be dust tight.
- B. Removal of debris shall be in tightly covered containers.
- C. Adhesive mats or carpets at barricade entrances and in the ante-room shall be kept clean and changed daily, or as necessary, to prevent accumulation of dust.
- D. Any dust tracked outside of barrier shall be removed immediately. Cleaning outside barrier to be done by HEPA filtered vacuum or damp mop.
- E. Any ceiling access panels opened for investigation beyond sealed areas shall be replaced immediately when unattended.
- F. Block off all existing ventilation ducts within the construction area. Method of capping ducts shall be dust tight and withstand air flow. Make provisions for supplementary temporary ventilation to adjacent areas affected by capping of existing ductwork.
- G. When openings are made into existing ceilings, use Control Cube or provide polyethylene enclosure around ladder selaing off opening, fitted tight to ceiling and floor. Provide thorough cleaning of existing surfaces which become exposed to dust.
- H. Removal of construction barriers and ceiling protection shall be done carefully between the hours of 7 PM and 5 AM, outside of normal work hours. Vacuum and clean all surfaced free of dust after the removal.

- I. When access panels are opened in occupied areas, for work above ceilings, use Control Cube or provide polyethylene enclosure around ladder sealing off opening, fitted tight to ceiling and floor.
- J. All vacuuming outside areas not under negative pressure to be with a certified HEPA filtered vacuum.
- K. Construct ante-room to maintain negative air flow from clean area through ante-room and into work area.

3.03 INFECTION CONTROL PROCEDURES

- A. The Contractor is responsible for obtaining the Infection Control Permit from the Owner's Facilities Planning and Development Department prior to commencing construction.
- B. The Owner's Safety Department, Facilities Planning and Development Department, and Infection Control Department will evaluate every work order. They reserve the right to add requirements to a project on an individual basis.
- C. The Owner's Facilities Planning and Development Department, and Infection Control Department will make periodic visits to work site to ensure compliance with policy.
- D. Class I:
 - 1. Execute Work by methods to minimize raising dust from construction operations.
 - 2. Immediately replace any ceiling tile displaced for visual inspection.
- E. Class II:
 - 1. Provide active means to prevent air-borne dust from dispersing into atmosphere.
 - 2. Water mist work surfaces to control dust while cutting.
 - 3. Seal unused doors with masking tape.
 - 4. Block off and seal air vents.
 - 5. Wipe Work surfaces with disinfectant.
- F. Class III:
 - 1. Obtain Infection Control permit from the Owner's Facilities Planning and Development or Safety Department before construction begins.
 - 2. Isolate HVAC system in area where Work is being done to prevent contamination of duct system.
 - 3. Complete all critical barriers before construction begins or implement Control Cube method.
 - 4. Maintain negative air pressure within Work Site utilizing HEPA equipped air filtration units.
 - 5. Contain construction waste before transport in tightly covered containers.
 - 6. Cover transport receptacles or carts. Tape covering.
 - 7. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.
 - 8. Place dust mat at entrance and exit of work area.
 - 9. Remove isolation of HVAC system in areas where Work is being performed.
- G. Class IV:
 - 1. Obtain Infection Control Permit from the Owner's Facilities Planning and Development or Safety Department before construction begins.
 - 2. Isolate HVAC system in area where Work is being done to prevent contamination of duct system.
 - 3. Complete all critical barriers or implement Control Cube method before construction begins.
 - 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.
 - 5. Seal holes, pipes, conduits, and punctures appropriately.
 - 6. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave the work site.
 - 7. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the area.

8. Provide adhesive walk off mats at entrance to work area within the anteroom. Replace used mats with new mats in accordance with manufacturer's recommendations.
9. Do not remove barriers from work area until completed project is inspected by the Owner's Safety and Infection Control departments and thoroughly cleaned by the Owner's Environmental Services department.
10. Vacuum work area with HEPA filtered vacuums.
11. Wet mop area with disinfectant.
12. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction.
13. Contain construction waste before transport in tightly covered containers.
14. Cover transport receptacles or carts. Tape covering.
15. Remove isolation of HVAC system in areas where work is being performed.

3.04 FIELD QUALITY CONTROL

- A. Contractor is responsible for maintaining equipment and replacement of HEPA and other filters in accordance with manufacturer's recommendations.
- B. Field inspection and testing will be performed by the Owner's Safety and Infection Control departments.
- C. Owner's Safety department will confirm specified air velocity whenever barricades are erected or modified.
- D. Owner's personnel will monitor air quality throughout project.

3.05 ENFORCEMENT

- A. For breach of this infection control policy the Owner will stop the work on the project, and the Contractor shall pay for all associated costs incurred by the Owner, as well as for correction of the Work.
- B. The Owner's Safety Department, Facilities Planning and Development Department, and Infection Control Department will record the following:
 1. Document each violation with photographs.
 2. Extract Contractor or department information from the work tag.
 3. Maintain a record of all infection control violations.
- C. Violations of infection control policies may affect status as a responsible Contractor for bidding future work.

END OF SECTION

SECTION 23 01 10

HVAC SYSTEM CLEANING

Part 1 -- Special Provisions

1.01 Qualification of the HVAC System Cleaning Contractor:

- (A) The HVAC system cleaning contractor shall be a certified member of the National Air Duct Cleaners Association (NADCA), or shall maintain membership in a nationally recognized non-profit industry organization dedicated to the cleaning of HVAC systems.
- (B) The HVAC system cleaning contractor shall have a minimum of one (1) Air System Cleaning Specialist (ASCS) certified by NADCA on a full time basis, or shall have staff certified by a nationally recognized certification program and organization dedicated to the cleaning of HVAC systems. The specialist shall be responsible for the total work herein specified.
- (C) Firms shall be regularly engaged in HVAC system maintenance with an emphasis on HVAC system cleaning and decontamination.
- (D) Equipment, Materials and Labor: The HVAC system cleaning contractor shall possess and furnish all necessary equipment, materials and labor to adequately perform the specified services.
 - 1. The contractor shall assure that its employees have received safety equipment training, medical surveillance programs, individual health protection measures, and manufacturer's product and material safety data sheets (MSDS) as required for the work by the U.S. Occupational Safety and Health Administration, and as described by this specification. For work performed in countries outside of the U.S.A., contractors should comply with applicable national safety codes and standards.
 - 2. The contractor shall maintain a copy of all current MSDS documentation and safety certifications at the site at all times, as well as comply with all other site documentation requirements of applicable OSHA programs and this specification
 - 3. Contractor shall submit to the **owner** all Material Safety Data Sheets (MSDS) for all chemical products proposed to be used in the cleaning process.
- (F) Licensing: The HVAC system cleaning contractor shall provide proof of maintaining the proper license(s), if any, as required to do work in this state. Contractor shall comply with all Federal, state and local rules, regulations, and licensing requirements.

1.02 Standards.

(A) NADCA Standards: The HVAC system cleaning contractor shall perform the services specified here in accordance with the current published standards of the National Air Duct Cleaners Association (NADCA).

1. All terms in this specification shall have their meaning defined as stated in the NADCA Standards.
2. NADCA Standards must be followed with no modifications or deviations being allowed.

1.03 Documents

(A) Record Drawings: The **owner** will provide electronic copy of facility record drawings including HVAC ductwork shop drawings and past duct system cleaning drawings to the contractor after award of contract.

Part 2 -- HVAC System Cleaning Specifications and Requirements

2.01 Scope of Work

(A) Scope: This section defines the **minimum** requirements necessary to render HVAC components clean, and to verify the cleanliness through inspection and/or testing in accordance with items specified herein and applicable NADCA Standards. The Contractor shall be responsible for the removal of visible surface contaminants and deposits from within the HVAC system in strict accordance with these specifications. The HVAC system includes any interior surface of the facility's medium pressure rated air distribution system for conditioned spaces and/or occupied zones. This includes the cold and hot air supply ducts from the air handlers to terminal units.

2.02 HVAC System Inspections and Site Preparations

(A) HVAC System Evaluation: Prior to the commencement of any cleaning work, the HVAC system cleaning contractor shall perform a visual inspection of the HVAC system to determine appropriate methods, tools, and equipment required to satisfactorily complete this project.

1. Damaged system components found during the inspection shall be documented and brought to the attention of the **owner**.

(B) Site Evaluation and Preparations: Contractor shall conduct a site evaluation, and establish a specific, coordinated plan which details how each area of the building will be protected during the various phases of the project.

2.03 General HVAC System Cleaning Requirements

(A) Containment: Debris removed during cleaning shall be collected and precautions must be taken to ensure that Debris is not otherwise dispersed outside the HVAC system during the cleaning process.

- (B) Particulate Collection: Where the Particulate Collection Equipment is exhausting inside the building, HEPA filtration with 99.97% collection efficiency for 0.3-micron size (or greater) particles shall be used. When the Particulate Collection Equipment is exhausting outside the building, Mechanical Cleaning operations shall be undertaken only with Particulate Collection Equipment in place, including adequate filtration to contain Debris removed from the HVAC system. When the Particulate Collection Equipment is exhausting outside the building, precautions shall be taken to locate the equipment down wind and away from all air intakes and other points of entry into the building.
- (C) Controlling Odors: All reasonable measures shall be taken to control offensive odors and/or mist vapors during the cleaning process.
- (D) Component Cleaning: Cleaning methods shall be employed such that all HVAC system components must be Visibly Clean as defined in applicable standards (see NADCA Standards). Upon completion, all components must be returned to those settings recorded just prior to cleaning operations.
- (E) Air-Volume Control Devices: Dampers and any air-directional mechanical devices inside the HVAC system must have their position marked prior to cleaning and, upon completion, must be restored to their marked position.
- (F) Service Openings: The contractor shall utilize service openings, as required for proper cleaning, at various points of the HVAC system for physical and mechanical entry, and inspection.
1. Contractor shall utilize the existing service openings already installed in the HVAC system where possible.
 2. Other openings shall be created where needed and they must be created so they can be sealed in accordance with industry codes and standards.
 3. Closures must not significantly hinder, restrict, or alter the air-flow within the system.
 4. Closures must be properly insulated to prevent heat loss/gain or condensation on surfaces within the system.
 5. Openings must not compromise the structural integrity of the system.
 6. Construction techniques used in the creation of openings should conform to requirements of applicable building and fire codes, and applicable NFPA, SMACNA and NADCA Standards.
 7. Cutting service openings into flexible duct is not permitted. Flexible duct shall be disconnected at the ends as needed for proper cleaning and inspection.
 8. Rigid fiber glass ductboard duct systems shall be resealed in accordance with NAIMA recommended practices. Only closure techniques which comply with UL Standard 181 or UL Standard 181a are suitable for fiber glass duct system closures.

9. All service openings capable of being re-opened for future inspection or remediation shall be clearly marked and shall have their location reported to the **owner** in project report documents.

(G) Ceiling sections (tile): The contractor may remove and reinstall ceiling sections to gain access to HVAC systems during the cleaning process.

(H) Duct Systems: Contractor shall:

1. Create service openings in the system as necessary in order to accommodate cleaning of otherwise inaccessible areas.
2. Mechanically clean all duct systems to remove all visible contaminants, such that the systems are capable of passing Cleaning Verification Testings (see NADCA Standards).

2.04 Health and Safety

(A) Safety Standards: Cleaning contractors shall comply with all applicable federal, state, and local requirements for protecting the safety of the contractors' employees, building occupants, and the environment. In particular, all applicable standards of the Occupational Safety and Health Administration (OSHA) shall be followed when working in accordance with this specification.

(B) Occupant Safety: No processes or materials shall be employed in such a manner that they will introduce additional hazards into occupied spaces.

(C) Disposal of Debris. All Debris removed from the HVAC System shall be disposed of in accordance with applicable federal, state and local requirements.

2.05 Mechanical Cleaning Methodology

(A) Source Removal Cleaning Methods: the HVAC system shall be cleaned using Source Removal mechanical cleaning methods designed to extract contaminants from within the HVAC system and safely remove contaminants from the facility. It is the contractor's responsibility to select Source Removal methods which will render the HVAC system Visibly Clean and capable of passing cleaning verification methods (See applicable NADCA Standards) and other specified tests, in accordance with all general requirements. No cleaning method, or combination of methods, shall be used which could potentially damage components of the HVAC system or negatively alter the integrity of the system.

1. All methods used shall incorporate the use of vacuum collection devices that are operated continuously during cleaning. A vacuum device shall be connected to the downstream end of the section being cleaned through a predetermined opening. The vacuum collection device must be of sufficient power to render all areas being cleaned under negative pressure, such that containment of debris and the protection of the indoor environment is assured.

2. All vacuum devices exhausting air inside the building shall be equipped with HEPA filters (minimum efficiency), including hand-held vacuums and wet-vacuums.

3. All vacuum devices exhausting air outside the facility shall be equipped with Particulate Collection including adequate filtration to contain Debris removed from the HVAC system. Such devices shall exhaust in a manner that will not allow contaminants to re-enter the facility. Release of debris outdoors must not violate any outdoor environmental standards, codes or regulations.

4. All methods require mechanical agitation devices to dislodge debris adhered to interior HVAC system surfaces, such that debris may be safely conveyed to vacuum collection devices. Acceptable methods will include those which will not potentially damage the integrity of the ductwork, nor damage porous surface materials such as liners inside the ductwork or system components.

(B) Methods of Cleaning Fibrous Glass Insulated Components:

1. Fibrous glass thermal or acoustical insulation elements present in any equipment or ductwork shall be thoroughly cleaned with HEPA vacuuming equipment, while the HVAC system is under constant negative pressure, and not permitted to get wet in accordance with applicable NADCA and NAIMA standards and recommendations.

2. Cleaning methods used shall not cause damage to fibrous glass components and will render the system capable of passing Cleaning Verification Tests (see NADCA Standards).

(C) Damaged Fibrous Glass Material

1. If there is any evidence of damage, deterioration, delamination, friable material, mold or fungus growth, or moisture such that fibrous glass materials cannot be restored by cleaning or resurfacing with an acceptable insulation repair coating, they shall be identified for replacement.

2. When requested or specified, Contractor must be capable of remediating exposed damaged insulation in air handlers and/or ductwork requiring replacement.

3. Replacement material: In the event fiber glass materials must be replaced, all materials shall conform to applicable industry codes and standards, including those of UL and SMACNA.

Replacement of damaged insulation is **not** covered by this specification.

(D) Biocidal Agents and Coatings

1. Biocidal agents shall only be applied if active fungal growth is reasonably suspected, or where unacceptable levels of fungal contamination have been verified through testing.

2. Application of any biocidal agents used to control the growth of fungal or bacteriological contaminants shall be performed after the removal of surface deposits and debris.

3. Only biocidal agents registered by the U.S. Environmental Protection Agency (EPA) specifically for use within HVAC system shall be used.
4. Biocidal agents shall be applied in strict accordance with manufacturer's instructions.
5. Biocidal coating products for both porous and non-porous surfaces shall be EPA registered, water soluble solutions with supporting efficacy data and MSDS records.
6. Biocidal coatings shall be applied according to manufacturer's instructions. Coatings shall be sprayed directly onto interior ductwork surfaces, rather than "fogged" downstream onto surfaces. A continuous film must be achieved on the surface to be treated by the coating application. Application of any biocidal coatings shall be in strict accordance with manufacturer's minimum millage surface application rate standards for effectiveness.

2.06 Cleanliness Verification

- (A) General: Verification of HVAC System cleanliness will be determined after mechanical cleaning and before the application of any treatment or introduction of any treatment-related substance to the HVAC system, including biocidal agents and coatings.
- (B) Visual Inspection: the HVAC system shall be inspected visually to ensure that no visible contaminants are present.
 1. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean; however, the **owner** reserves the right to further verify system cleanliness through gravimetric or wipe testing analysis testing as specified herein.
 2. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.
- (C) Gravimetric Analysis: At the discretion and expense of the **owner**, sections of the HVAC system may be tested for cleanliness using the NADCA Vacuum Test (gravimetric analysis) as specified in applicable NADCA Standards. Levels of debris collected shall be equal to or less than acceptable levels defined in applicable NADCA Standards.
 1. If gravimetric analysis determines that levels of debris are equal to or lower than those levels specified in applicable NADCA standards, the system shall be considered clean and shall have passed cleanliness verification.
 2. If gravimetric analysis determines that levels of debris exceed those specified in applicable NADCA standards, the system shall not be considered clean and those sections of the system which failed cleanliness verification shall be re-cleaned at the expense of the HVAC system cleaning contractor.
 3. Gravimetric analysis shall be performed by a qualified third party experienced in testing of this nature.

4. Cleanliness verification shall be performed immediately after mechanical cleaning and before the HVAC system is restored to normal operation.

2.07 Pre-Existing System Damage

(A) Contractor is not responsible for problems resulting from prior inappropriate or careless cleaning techniques of others.

2.08 Post-Project Report

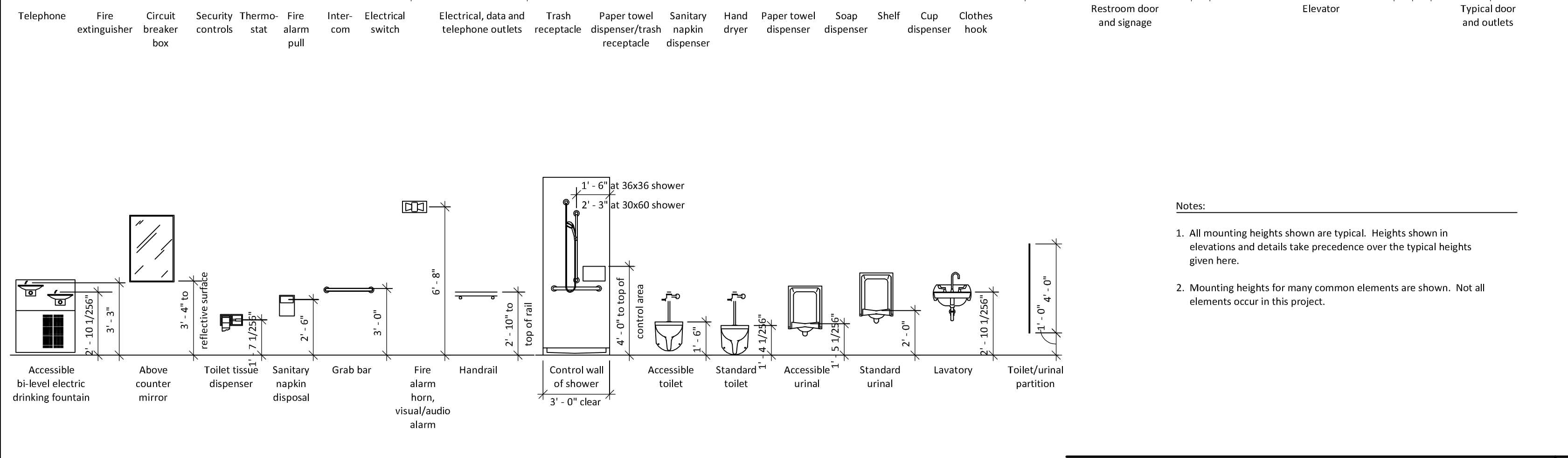
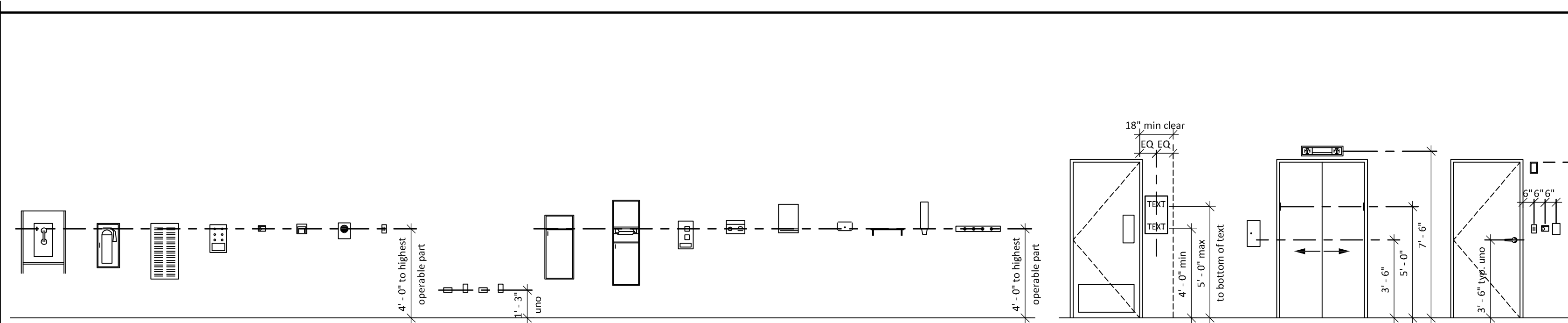
(A) At the conclusion of the project, the Contractor shall provide a report to the **owner** indicating the following:

1. Success of the cleaning project, as verified through visual inspection and/or gravimetric analysis.
2. Areas of the system found to be damaged and/or in need of repair.

2.09 Applicable Standards and Publications -- The following current standards and publications of the issues currently in effect form a part of this specification to the extent indicated by any reference thereto:

- (A) National Air Duct Cleaners Association (NADCA): NADCA 1992-01, "Mechanical Cleaning of Non-Porous Air Conveyance System Components," 1992
- (B) National Air Duct Cleaners Association (NADCA): "Understanding Microbial Contamination in HVAC Systems," 1996.
- (C) National Air Duct Cleaners Association (NADCA): "Introduction to HVAC System Cleaning Services," 1995.
- (D) National Air Duct Cleaners Association (NADCA) NADCA Standard 05 "Requirements for the Installation of Service Openings in HVAC Systems," 1997.
- (E) Underwriters' Laboratories (UL): UL Standard 181
- (F) American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE): Standard 62-89, "Ventilation for Acceptable Indoor Air Quality"
- (G) Environmental Protection Agency (EPA): "Building Air Quality" December, 1991
- (H) Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): "HVAC Duct Construction Standards - Metal and Flexible," 1985
- (I) North American Insulation Manufacturers Association (NAIMA): "Cleaning Fibrous Glass Insulated Air Duct Systems." 1993

- **END OF SECTION** -



Notes:
 1. All mounting heights shown are typical. Heights shown in elevations and details take precedence over the typical heights given here.
 2. Mounting heights for many common elements are shown. Not all elements occur in this project.

Typical Mounting Heights 14

Symbol	Description
	Reflected Ceiling Plan
	Surface mounted incandescent, compact fluorescent or LED downlight
	Recessed incandescent, compact fluorescent or LED downlight
	Lay-in or recessed fluorescent light troffers - prismatic lens
	Lay-in or recessed fluorescent light troffers - parabolic lens
	Lay-in or recessed direct and indirect fluorescent light
	Suspended fluorescent strip fixture
	Suspended architectural fluorescent strip fixture
	Wall mounted architectural fixture
	Under cabinet fluorescent light fixture
	Speaker
	Smoke detector
	Supply air grille
	Return/exhaust air grille
	Sprinkler head
	Ceiling/wall/md. exit sign - arrow/line indicates direction

Symbol	Description
	Height 110V, 20A duplex outlet (Height indicated if not standard)
	Height 110V, 20A duplex dedicated outlet (Height indicated if not standard)
	Height 220V, 30A duplex outlet (Height indicated if not standard)
	Height 110V, 20A quadplex outlet (Height indicated if not standard)
	110V, 20A flush floor mounted duplex outlet
	Flush floor mounted telephone outlet
	Telephone outlet (RJ11) (Height indicated if not standard)
	Computer data outlet (RJ45) (Height indicated if not standard)
	Combined telephones/computer data outlet (Height indicated if not standard)
	Electrical/communications junction box

Symbol	Description
	Fire Alarm Strobe
	Fire Alarm Pull
	Thermostat
	Door operator push button
	Card reader
	Nurse call alarm panel
	Single pole switch
	3-way switch
	Dimmer switch
	Fire extinguisher cabinet
	Fire extinguisher on bracket
	Zone valve

Symbol	Description
	Electrical, voice, data, voice/data outlets in elevation

Symbol	Description
	Medical gases/Lab gas outlets (Air, Vacuum, Oxygen, Waste Anes Gas, Nitrogen, Slide)

Notes:
 1. See the individual drawings for additional symbol legends for symbols not shown.
 2. Refer to the Construction Specifications Institute's (CSI) publication TD-2.6, Standard Reference Symbols, 10/91 Edition, for additional building element symbols not shown here or elsewhere in the Drawings.
 3. See additional legends located in the specific discipline drawings (Structural, MEP, etc.) for building element symbols used on those discipline drawings.

Section	Description	Symbol	Designators
Acoustical Ceiling Board	Plaster with Expanded Metal Lath		BM = Coordinate, Elevation, or Station Sequence Designation
Aluminum	Plastic Glazing		No = Detail Number Dwg = Sheet Number
Brick	Plastic Laminate (Large Scale)		No = Alphanumeric Grid Designation
Carpets	Plywood		No = Detail Number Dwg = Sheet Number
Ceramic Tile	Precast Concrete, Cast Stone		No = Detail Number Dwg = Sheet Number
Concrete	Resilient Flooring, Pre-Molded joint filler		No = Detail Number Dwg = Sheet Number
Concrete Masonry Unit	Rigid Insulation Board		No = Detail Number Dwg = Sheet Number
Earth	Sand, Grout		No = Detail Number Dwg = Sheet Number
Exterior Insulation and Finishing System	Steel		No = Detail Number Dwg = Sheet Number
Insulation - batt or blanket	Steel		No = Detail Number Dwg = Sheet Number
Finished Wood, Hardwood	Ceramic Tile		No = Door Type HS = Hardware Set
Glass	Concrete, Plaster, Lime-stone, Synthetic Stone		No = Detail Number Dwg = Sheet Number
Gravel, Coarse Porous Fill	Glass, Mirrors		No = Equipment Designation
Gypsum Board	Metal, Plastic Laminate		No = Equipment Designation
Gypsum Sheathing	Gypsum Board or Plaster		No = Equipment Designation
Oriented Standard Board (OSB)	Fire-finished Metal Suspension Grid with Lay-in Panels		No = Equipment Designation
Ornamental Metal, Bronze, Brass	Particle Board		No = Equipment Designation

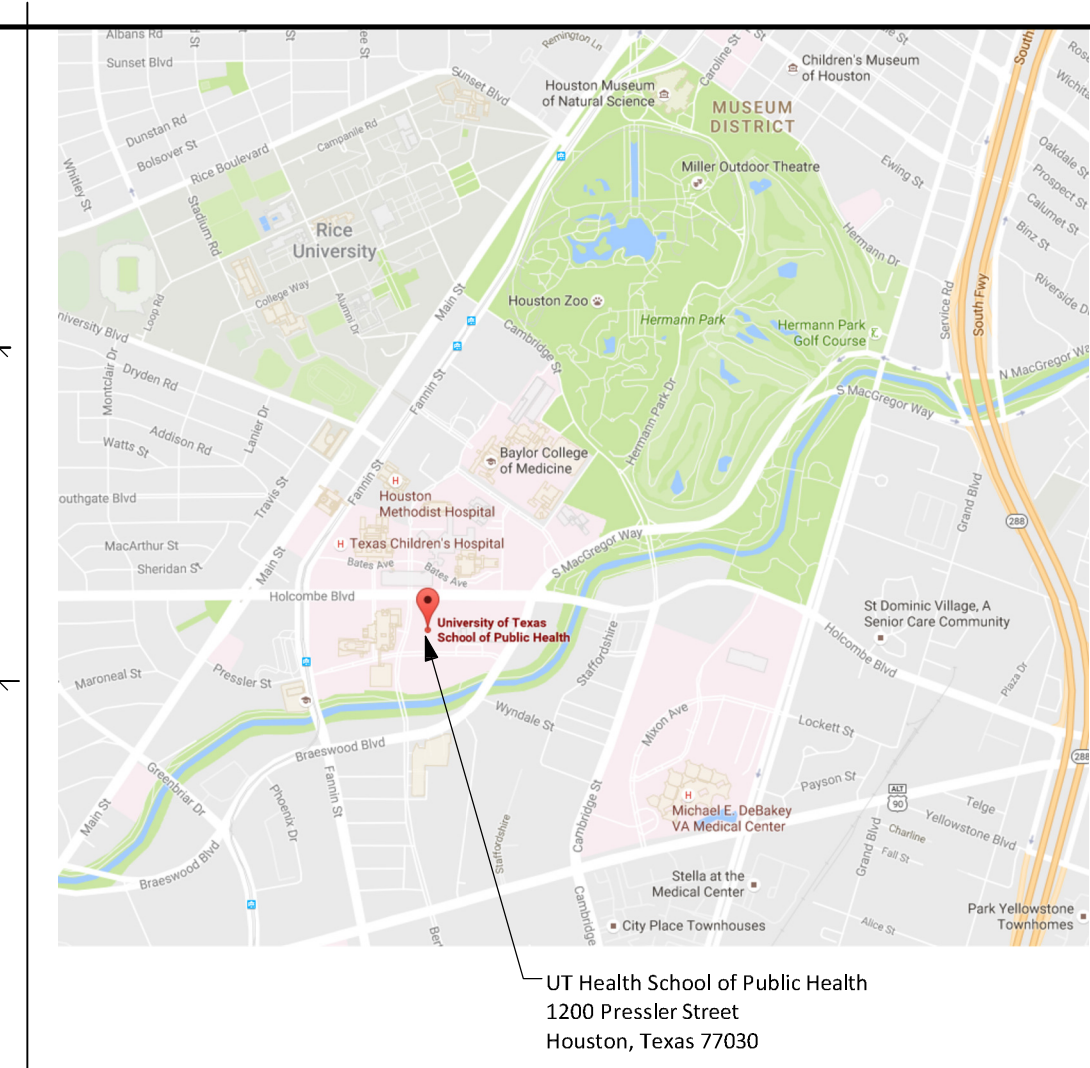
Note: Refer to the Construction Specifications Institute's (CSI) publication TD-2.6, Standard Reference Symbols, 10/91 Edition, for additional material indications not shown.

Standard Material Indications 11

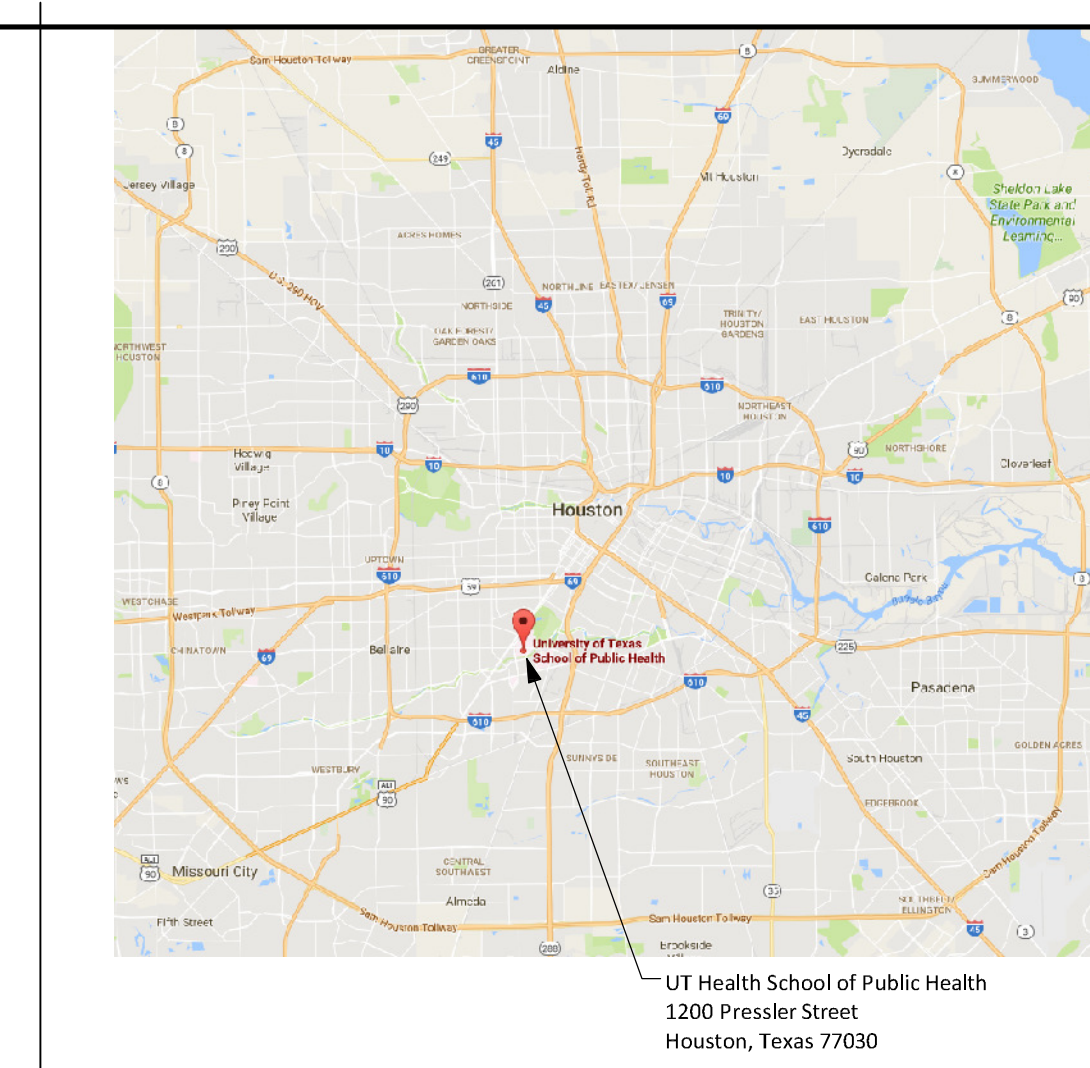
The project consists of the renovation of existing conference rooms and converting them into an electrical switchgear room at level 2 of the UT Health School of Public Health Building located at 1200 Pressler Street, Houston, TX 77030.

Symbol	Description
	Keyed Note Indicator
	North Indicator
	Partition Type Indicator
	Revision Indicator
	Room Identifier
	Room and Finish Type Identifier
	Toilet Accessory Identifier

Note: Refer to the Construction Specifications Institute's (CSI) publication TD-2.6, Standard Reference Symbols, 10/91 Edition, for additional material indications not shown.



Project Location Map 10



Project Vicinity Map 5

Applicable Codes and Standards
 1. International Building Code, 2012 Edition (IBC)
 2. NFPA 101, Life Safety Code, 2015 Edition (LSC)
 3. NFPA 1, Fire Code, 2012 Edition
 4. Texas Department of Licensing and Regulation (TDLR) - Texas Accessibility Standards of the Architectural Barriers Act, 2012
 5. International Mechanical Code, 2012 Edition (IMC)
 6. International Plumbing Code, 2012 Edition (IPC)
 7. International Energy Conservation Code, 2009 Edition (IECC)
 8. NFPA 10 - Fire Extinguishers (Referenced by IBC)
 9. NFPA 13 - Installation of Sprinkler Systems (Referenced by IBC)
 10. NFPA 70 - National Electrical Code (Referenced by IBC)
 11. NFPA 12 - National Fire Alarm Code (Referenced by IBC)
 12. NFPA 80 - Fire Doors and Fire Windows (Referenced by IBC)
 13. NFPA 110 - Standard for Emergency and Standby Power Systems
 14. NFPA 220 - Standard on Types of Building Construction (Referenced by NFPA 101)

Occupancy Classification
 Business Group 9 (20A-3) (IBC)
 Business (6.1.1.1) (IBC)

Construction Classification
 Type I (IBC)
 Type II (222) (NFPA 220)

Fire Resistance Ratings (IBC Table 601)
 1. Party Walls: N/A
 2. Fire Wall: N/A
 3. Occupancy Separations: N/A
 4. Interior Bearing Walls: N/A
 5. Corridor Walls (1004.3.2.1): Non-Rated, Smoke Resistant
 6. Smoke Barrier Walls: 1-Hour, 20-Min. Doors
 7. Hazardous Area Protection (Only Applicable Areas / Most Restrictive Requirements Show):
 Heat Plant Rooms (HP): 2-Hours, 30-min. doors
 Laboratories (LAB, NFPA): Non-Rated Separation
 Central Laundry (CL, NFPA): 1-Hour
 Storage > 100 Sq. Ft. (IBC, NFPA): 1-Hour
 Storage < 100 > 50 Sq. Ft. (NFPA): Non-Rated Separation
 Sailed Linen Rooms (NPA): 1-Hour
 8. Structural Frame Supporting Roof Only (See 4-G-102): 2-Hours
 9. Structural Frame (See 14-G-102): 2-Hours
 10. Floor Construction (See 14-G-102): 2-Hours
 11. Roof Construction (Including Beams and Joists) (See 24-G-102): N/A
 12. Exterior Bearing Walls: N/A
 13. Exterior Non-Bearing Walls: Non-Combustible Permitted (yard-30 Ft.)
 14. Unprotected Exterior Openings: Non-Combustible
 15. Interior Non-Bearing Walls: Non-Combustible
 16. Shaft and Vertical Exit Enclosure Walls (707.4): 2-Hours, 30-min. doors
 17. Through penetrations in fire-resistive walls and floors are protected with an approved firestop system installed as tested in accordance with ASTM E814.
 18. Joints in and between fire-resistance-rated walls and floor/roof assemblies are protected with fire-resistant joint systems tested in accordance with the requirements of UL 2079.

Fire Protection
 1. A sprinkler system installed in conformance to NFPA 13 is required. (IBC)
 2. All sprinkler heads in the smoke compartment containing patient sleeping rooms shall be quick-response type. (IBC, NFPA)
 3. A manual fire alarm system and automatic fire detection system is required. An electrically supervised, automatic smoke detection system is required in corridors, and waiting areas that are open to corridors.
 4. Fire extinguishers are required to be located no more than 75 ft. travel distance from any point. (NFPA 10)
 5. All fire extinguishers shall have a UL rating of 4A-GBC. (NFPA 10)
 6. Maximum allowable area per fire extinguisher: 11,250 Sq. Ft.
 7. Fire extinguishers provided per floor: 2

Occupant Load and Egress (IBC Table 1004.1.1)
 1. Exit Width:
 Exit Width Required: (0.2 in./Person) (NFPA): 46 inches
 Exit Width Provided: 58 inches
 4. Arrangement of Exits:
 Minimum Number of Exits Required (IBC): 3
 Number of Exits Provided: 4
 Minimum Separation Permitted (1/2 Diagonal Dimension of Building): 65 feet
 5. Maximum Allowable Travel Distance (NFPA, IBC): 41 feet
 300 Ft., Any Point to Exit
 150 Ft., Any Exit Access Door to Exit

Finishes
 1. Walls and Ceilings: ASTM E 84 Class A or B (NFPA, IBC)
 Exception: May be Class C in rooms with capacity less than 4. (NFPA, IBC)
 Exception: Class C waistcoat less than 1,000 sq. ft. permitted in lobby.

General	M-803
G-100 General Information	M-803 Details
G-101 Fire Resistive Assemblies Design Reference	M-804 Details
G-102 Fire Resistive Assemblies Design Reference	
G-110 Fire Safety Plan - Level 2	

Structural	M-805
S3.01 General Layout and Details	M-805 Demolition - One Line Diagram
S3.01 Steel Access Platform Plan and Details	M-805 Demolition - One Line Diagram
S3.01 Beam Support Layout for Electrical Equipment	M-805 Demolition - One Line Diagram (Emergency)
S3.02 Beam Details	M-805 Demolition - One Line Diagram
A-105 Deck/Slab Plan - Level 2	M-805 Proposed - One Line Diagram
A-111 Floor Plan - Basement	M-805 Proposed - One Line Diagram
A-113 Floor Plan - Level 2	M-805 Proposed - One Line Diagram
A-115 Floor Plans - Levels 3-6	M-805 Proposed - One Line Diagram
A-116 Floor Plans - Levels 7-10	M-805 Proposed - One Line Diagram
A-100 Reflected Ceiling Plan - Level 2	M-805 Proposed - One Line Diagram
A-520 Partition Types and Interior Construction Details	M-805 Proposed - One Line Diagram
A-540 Door, Window Details, and Schedules	M-805 Proposed - Emergency One Line Diagram
A-100M Reflected Ceiling Plans	M-805 Electrical Riser Diagram-E-012
A-520M Partition Types and Interior Construction Details	M-805 Electrical Riser Diagram-E-013

Mechanical	M-806
M-001 Notes and Legend	M-806 Existing - Third Floor Panel Schedules
M-002 Schedules	M-806 Existing - Fourth Floor Panel Schedules
M-003 Schedules	M-806 Existing - Fourth Floor Panel Schedules
M-004 Schedules	M-806 Existing - Fifth Floor Panel Schedules
M-101 Basement Floor Plan - HVAC - Demo	M-806 Existing - Fifth Floor Panel Schedules
M-102 2nd Floor Plan - HVAC - Demo	M-806 Existing - Sixth Floor Panel Schedules
M-103 3rd Floor Plan - HVAC - Demo	M-806 Existing - Seventh Floor Panel Schedules
M-104 4th Floor Plan - HVAC - Demo	M-806 Existing - Eighth Floor Panel Schedules
M-105 5th Floor Plan - HVAC - Demo	M-806 Existing - Ninth Floor Panel Schedules
M-106 6th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-107 7th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-108 8th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-109 9th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-110 10th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-111 Penthouse - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-200 Basement Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-201 1st Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-202 2nd Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-203 3rd Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-203A 3rd Floor Plan - Air Flow Diagram	M-806 Existing - Tenth Floor Panel Schedules
M-204 4th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-205 5th Floor Plan - HVAC - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-206 6th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-206A 6th Floor Plan - Air Flow Diagram	M-806 Existing - Tenth Floor Panel Schedules
M-207 7th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-207A 7th Floor Plan - Air Flow Diagram	M-806 Existing - Tenth Floor Panel Schedules
M-208 8th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-209 9th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-210 10th Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-211 Penthouse - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-212 2nd Floor Plan - HVAC - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-300 Enlarged Plan - Typical Lobby - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-301 Enlarged Plan - Typical Lobby - Details	M-806 Existing - Tenth Floor Panel Schedules
M-400 Enlarged Central Plant - Basement Floor Plan - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-401 Enlarged Central Plant - Basement Floor Plan - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-402 Enlarged Basement Floor Plan - Mechanical Rooms - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-403 Enlarged Plan - 2nd Floor - Mechanical Room - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-404 Enlarged Plan - 2nd Floor - Mechanical Room - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-405 Enlarged Plan - 3rd Floor - Mechanical Room - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-406 Enlarged Plan - 3rd Floor - Mechanical Room - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-407 Enlarged Plan - Typical 4th-7th Floor - Mechanical Room - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-408 Enlarged Plan - Typical 4th-7th Floor - Mechanical Room - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-409 Enlarged Plan - Typical 8th-10th Floor - Mechanical Room - Demo	M-806 Existing - Tenth Floor Panel Schedules
M-410 Enlarged Plan - Typical 8th-10th Floor - Mechanical Room - Proposed	M-806 Existing - Tenth Floor Panel Schedules
M-411 Alternate - Enlarged Plan - Typical 8th-10th Floor - Mechanical Room	M-806 Existing - Tenth Floor Panel Schedules

Mechanical	M-807
M-001 Notes and Legend	M-807 Existing - Third Floor Panel Schedules
M-002 Schedules	M-807 Existing - Fourth Floor Panel Schedules
M-003 Schedules	M-807 Existing - Fourth Floor Panel Schedules
M-004 Schedules	M-807 Existing - Fifth Floor Panel Schedules
M-101 Basement Floor Plan - HVAC - Demo	M-807 Existing - Fifth Floor Panel Schedules
M-102 2nd Floor Plan - HVAC - Demo	M-807 Existing - Sixth Floor Panel Schedules
M-103 3rd Floor Plan - HVAC - Demo	M-807 Existing - Seventh Floor Panel Schedules
M-104 4th Floor Plan - HVAC - Demo	M-807 Existing - Eighth Floor Panel Schedules
M-105 5th Floor Plan - HVAC - Demo	M-807 Existing - Ninth Floor Panel Schedules
M-106 6th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-107 7th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-108 8th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-109 9th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-110 10th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-111 Penthouse - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-200 Basement Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-201 1st Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-202 2nd Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-203 3rd Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-203A 3rd Floor Plan - Air Flow Diagram	M-807 Existing - Tenth Floor Panel Schedules
M-204 4th Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-205 5th Floor Plan - HVAC - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-206 6th Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-206A 6th Floor Plan - Air Flow Diagram	M-807 Existing - Tenth Floor Panel Schedules
M-207 7th Floor Plan - HVAC - Proposed	M-807 Existing - Tenth Floor Panel Schedules
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M-300 Enlarged Plan - Typical Lobby - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-301 Enlarged Plan - Typical Lobby - Details	M-807 Existing - Tenth Floor Panel Schedules
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M-401 Enlarged Central Plant - Basement Floor Plan - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-402 Enlarged Basement Floor Plan - Mechanical Rooms - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-403 Enlarged Plan - 2nd Floor - Mechanical Room - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-404 Enlarged Plan - 2nd Floor - Mechanical Room - Proposed	M-807 Existing - Tenth Floor Panel Schedules
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M-406 Enlarged Plan - 3rd Floor - Mechanical Room - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-407 Enlarged Plan - Typical 4th-7th Floor - Mechanical Room - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-408 Enlarged Plan - Typical 4th-7th Floor - Mechanical Room - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-409 Enlarged Plan - Typical 8th-10th Floor - Mechanical Room - Demo	M-807 Existing - Tenth Floor Panel Schedules
M-410 Enlarged Plan - Typical 8th-10th Floor - Mechanical Room - Proposed	M-807 Existing - Tenth Floor Panel Schedules
M-411 Alternate - Enlarged Plan - Typical 8th-10th Floor - Mechanical Room	M-807 Existing - Tenth Floor Panel Schedules

Mechanical	M-808
M-001 Notes and Legend	M-808 Existing - Third Floor Panel Schedules
M-002 Schedules	M-808 Existing - Fourth Floor Panel Schedules
M-003 Schedules	M-808 Existing - Fourth Floor Panel Schedules
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M-207A 7th Floor Plan - Air Flow Diagram	M-808 Existing - Tenth Floor Panel Schedules
M-208 8th Floor Plan - HVAC - Proposed	M-808 Existing - Tenth Floor Panel Schedules
M-209 9th Floor Plan - HVAC - Proposed	M-808 Existing - Tenth Floor Panel Schedules
M-210 10th Floor Plan -	

0 1/2" = 1'

CONTROL POINT & FIELD DEVICE SCHEDULE - 8-10 FLOOR ALTERNATE #1														
SYS TYPE	EQ LOCATION	AREA SERVED	EQUIPMENT	POINT DESCRIPTOR	AI	AO	DI	DO	HW	FIELD DEVICE	NOTES			
DUAL DUCT TERMINAL UNIT WITH DOAS	MECHANICAL ROOM	8TH - 10TH FLOOR	AHU-8E AHU-8W AHU-9E AHU-9W AHU-10E AHU-10W	R/A TEMP	X						NEW TEMP SENSOR			
				R/A RELATIVE HUMIDITY	X							NEW RH SENSOR		
				R/A CO2	X							NEW CARBON DIOXIDE SENSOR		
				R/A DAMPER		X						NEW DAMPER ACTUATOR		
				SMOKE DETECTOR				X				NEW SMOKE DETECTOR	2 PER UNIT INTERLOCK TO VSD & FACP	
				H/A TEMP	X							NEW TEMP SENSOR		
				PREFILTER DP	X							NEW DP SENSOR		
				FINAL FILTER DP	X							NEW DP SENSOR		
				SUPPLY FAN S/S					X				NEW VSD	
				S/F HIGH STATIC				X			X		NEW DIFFERENTIAL PRESSURE SWITCH	HW INTERLOCK WITH VSD
				S/F VFD SPEED CONTROL				X					NEW VFD SPEED CONTROL	
				S/F STATUS	X								NEW CURRENT SENSOR	
				COOLING VALVE	X		X						NEW CONTROL VALVE	
				COLD S/A TEMP	X								NEW TEMP SENSOR	
				HEATING VALVE	X								NEW CONTROL VALVE	
				HOT S/A TEMP	X								NEW TEMP SENSOR	
				COLD S/A DP	X								NEW DP SENSOR	REMOTE
				HOT S/A DP	X								NEW DP SENSOR	REMOTE
RELIEF AIR DAMPER			X						NEW DAMPER ACTUATOR					
DOAS PT O/A AHU	MECHANICAL ROOM	8TH - 10TH FLOOR	0AHU-8 0AHU-9 0AHU-10	O/A DAMPER		X					NEW DAMPER ACTUATOR			
				PT O/A FILTER DP	X							NEW DP SENSOR		
				PT O/A AIRFLOW	X							NEW AIR FLOW STATION		
				PT O/A PREHEATING VALVE	X							NEW CONTROL VALVE		
				PT O/A HOT DECK TEMP	X							NEW TEMP SENSOR		
				PT O/A PREHEAT CIRC PUMP			X					NEW HOA MOTOR STARTER		
				PT/OA FREEZE			X		X			NEW FREEZESTAT	INTERLOCK TO PT O/A DAMPER	
				PT O/A COOLING VALVE	X		X		X			NEW CONTROL VALVE		
				PT O/A COLD DECK	X							NEW TEMP SENSOR		
				ECON O/A DAMPER	X							NEW DAMPER ACTUATOR		
				ECON O/A AIRFLOW	X							NEW AIR FLOW STATION		
				SMOKE DETECTOR					X			NEW SMOKE DETECTOR	INTERLOCK TO VSD & FACP	
				SUPPLY FAN S/S					X			NEW VSD		
				S/F HIGH STATIC				X			X		NEW DIFFERENTIAL PRESSURE SWITCH	HW INTERLOCK WITH VSD
				S/F VFD SPEED CONTROL	X			X					NEW VFD SPEED CONTROL	
				S/F STATUS	X								NEW CURRENT SENSOR	

CONTROL POINT & FIELD DEVICE SCHEDULE - TYP FAN COIL UNIT													
SYS TYPE	EQ LOCATION	AREA SERVED	EQUIPMENT	POINT DESCRIPTOR	AI	AO	DI	DO	HW	FIELD DEVICE	NOTES		
CONSTANT VOLUME	VARIES	VARIES	FCU-XX	SPACE TEMP		X				NEW SPACE TEMP SENSOR			
				COOLING VALVE			X				NEW CONTROL VALVE		
				SUPPLY FAN S/S					X			NEW HOA MOTOR STARTER	
				SUPPLY FAN STATUS						X		NEW CURRENT SWITCH	
				SUPPLY AIR TEMP	X							NEW TEMP SENSOR	

CONTROL POINT & FIELD DEVICE SCHEDULE - MISC VAV TERMINAL UNITS												
SYS TYPE	SYS #	EQ LOCATION	AREA SERVED	EQUIPMENT	POINT DESCRIPTOR	AI	AO	DI	DO	HW	FIELD DEVICE	NOTES
VAV COOLING ONLY TERMINALS	AHU-2W	2ND FLOOR MECH ROOM	2ND FLOOR MECH ROOM	VAV-2-1	ZONE DAMPER		X				NEW DAMPER ACTUATOR	
					PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
	AHU-1E	2ND FLOOR MECH ROOM	2ND FLOOR MECH ROOM	VAV-2-2	SPACE TEMP	X					NEW ROOM TEMP SENSOR	
					ZONE DAMPER		X				NEW DAMPER ACTUATOR	
	AHU-3W	3RD FLOOR MECH ROOM	3RD FLOOR MECH ROOM	VAV-3-1	PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
					SPACE TEMP	X					NEW ROOM TEMP SENSOR	
	AHU-4W	4TH FLOOR MECH ROOM	4TH FLOOR MECH ROOM	VAV-4-1	PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
					SPACE TEMP	X					NEW ROOM TEMP SENSOR	
	AHU-5W	5TH FLOOR MECH ROOM	5TH FLOOR MECH ROOM	VAV-5-1	ZONE DAMPER		X				NEW DAMPER ACTUATOR	
					PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
	AHU-6W	6TH FLOOR MECH ROOM	6TH FLOOR MECH ROOM	VAV-6-1	SPACE TEMP	X					NEW ROOM TEMP SENSOR	
					PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
	AHU-7W	7TH FLOOR MECH ROOM	7TH FLOOR MECH ROOM	VAV-7-1	ZONE DAMPER		X				NEW DAMPER ACTUATOR	
					PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
	AHU-8W	8TH FLOOR MECH ROOM	8TH FLOOR MECH ROOM	VAV-8-1	SPACE TEMP	X					NEW ROOM TEMP SENSOR	
					ZONE DAMPER		X				NEW DAMPER ACTUATOR	
	AHU-8W	8TH FLOOR FREEZER FARM	8TH FLOOR FREEZER FARM	VAV-8-2	PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
					SPACE TEMP	X					NEW ROOM TEMP SENSOR	
	AHU-8W	8TH FLOOR FREEZER FARM	8TH FLOOR FREEZER FARM	VAV-8-3	ZONE DAMPER		X				NEW DAMPER ACTUATOR	
					PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR	
AHU-8W	8TH FLOOR FREEZER FARM	8TH FLOOR FREEZER FARM	VAV-8-4	SPACE TEMP	X					NEW ROOM TEMP SENSOR		
				ZONE DAMPER		X				NEW DAMPER ACTUATOR		
AHU-8W	8TH FLOOR FREEZER FARM	8TH FLOOR FREEZER FARM	ROOM RELIEF DAMPERS	ROOM RELIEF DAMPER				X		NEW DAMPER ACTUATOR		
				ROOM RELIEF DAMPER				X		NEW DAMPER ACTUATOR		
AHU-9W	9TH FLOOR MECH ROOM	9TH FLOOR MECH ROOM	VAV-9-1	ZONE DAMPER		X				NEW DAMPER ACTUATOR		
				PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR		
AHU-10W	10TH FLOOR MECH ROOM	10TH FLOOR MECH ROOM	VAV-10-2	SPACE TEMP	X					NEW ROOM TEMP SENSOR		
				PRIMARY AIR FLOW	X					NEW AIR FLOW SENSOR		

THERMAL IMAGING DEMAND CONTROL VENTILATION - ALTERNATE #8												
SYS TYPE	AREA SERVED	EQUIPMENT	POINT DESCRIPTOR	AI	AO	DI	DO	HW	FIELD DEVICE	NOTES		
VAV DUAL DUCT	RM W308	AHU-3W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER	SEE ALL NOTES BELOW		
	RM E625	AHU-6E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E635	AHU-6E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM W604	AHU-6W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM W608	AHU-6W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E735	AHU-7E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E735	AHU-7E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E01	AHU-8E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM W02	AHU-8W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM W04	AHU-8W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM I02A	AHU-1W	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM I02B	AHU-1E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E305	AHU-3E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E325	AHU-3E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
	RM E335	AHU-3E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER			
RM E345	AHU-3E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER				
RM E605	AHU-6E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER				
RM E725	AHU-7E	SPACE OCCUPANCY						NEW THERMAL IMAGING PEOPLE COUNTER				

PROVIDE FOR LAN COMMUNICATION INTERFACE TO SENSOR SYSTEMS

NOTES:

- PROVIDE THERMAL IMAGING PEOPLE COUNTER SYSTEMS. APPROVED MANUFACTURERS INCLUDE SENSOURCE, IRISYS, EVOLVPLUS OR EQUAL.
- PROVIDE COMPLETE SYSTEMS INCLUDING FIELD DEVICE SENSORS, PROCESSORS, SOFTWARE, AND COMMUNICATIONS INTERFACES.
- PROVIDE CEILING MOUNTED THERMAL IMAGING SENSORS AT THE ENTRANCE DOORS TO EACH ROOM.
- PROVIDE SYSTEMS WITH LAN COMMUNICATION INTERFACES. INTERFACE SYSTEMS WITH BAS SYSTEM FOR ACTIVE DEMAND VENTILATION CONTROL.
- INCLUDE MANUFACTURER AUTHORIZED INSTALLATION SUPERVISION, TESTING & START-UP SERVICES, CALIBRATION & ADJUSTMENT, DEMONSTRATION & OWNER TRAINING.
- INCLUDE 1 YEAR DURATION MANUFACTURER AUTHORIZED SERVICE AND SUPPORT SERVICES.

BAS SEQUENCE OF OPERATION
DURING SCHEDULE OCCUPIED MODE, RESET OUTSIDE AIRFLOW SETPOINT 15 CFM (ADD) PER COUNTED OCCUPANT IN LIEU OF CO2 FEEDBACK RESET. MONITOR AND DISPLAY ROOM OCCUPANCY AND SYSTEM R/A CO2 CONCENTRATION LEVELS.



**UT HEALTH
SCIENCE
SCHOOL OF
PUBLIC HEALTH**

1200 PRESSLER ST.
HOUSTON, TX 77030



REVISIONS

05/31/2017	ISSUED FOR BID
07/28/2017	ADDENDUM 1
08/16/2017	ADDENDUM 2
09/13/2017	ADDENDUM 3

Sheet Information

Date	31 MARCH 2017
Job Number	-
Drawn	KN, KT, CJT
Checked	IT, SK
Approved	MAF, SK

Title

CONTROLS POINTS

Sheet
M706
ISSUED FOR BID